



62nd

International Astronautical Congress
3 - 7 October 2011, Cape Town, South Africa

Final Programme



REPUBLIC OF
SOUTH AFRICA



*African
Astronaissance*

A giant leap into space science and technology – a new era in service of humanity

SANSA's **mandate** is to provide for the promotion and use of space and cooperation in space-related activities, foster research in space science, advance scientific engineering through human capital and support the creation of an environment conducive to industrial development in space technologies within the framework of national government policy.

Our **vision** is to be a leading contributor to advancing society through space science and technology.

Our **mission** is to:

- Implement South Africa's National Space Strategy.
- Integrate and manage South Africa's space activities:
 - industrial development in space science and technology
 - space research and infrastructure
 - outreach, skills development and capacity building
 - international cooperation in space-related activities.

SANSA Earth Observation

Improved livelihoods through space

- World-class Earth Observation Centre.
- Key remote sensing technologies and services.
- Satellite imagery and geo-information for:
 - natural disasters
 - public safety and security
 - health-related issues
 - infrastructure and utilities
 - environmental conservation and effective land use.

SANSA Space Science

Creating knowledge and developing skills

- Space science research.
- Magnetic-related services and products for the defence, aerospace, navigation and communications industries.
- Space weather: measure, interpret, forecast and predict.
- Industrial development of space technology.
- Knowledge and skills in space science, technology and engineering.
- Awareness in space science and technology.

SANSA Space Operations

Letting satellites work for us

- Operate ground station and 10 full-motion antennae 24/7.
- Launch and lifecycle support of more than 20 satellites annually.
- Satellite signal tracking and receipt.
- Orbit transfers, testing and mission control.
- Ground infrastructure for international clients.
- Navigation signal accuracy and reliability.

SANSA Space Engineering

Advancing our future through space technology

- Satellite assembly, integration and testing facility and upgrades.
- Satellite system and sub-system development.
- Advanced manufacturing technology initiatives.
- Knowledge and skills in space systems for South Africa's space technology base.
- Local and international partnerships.

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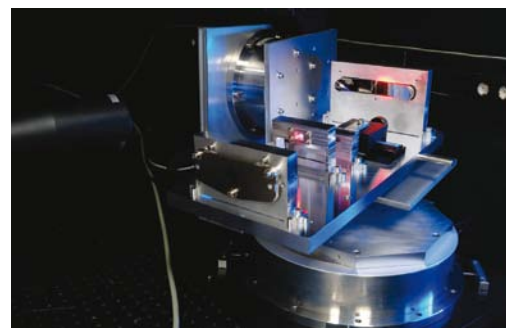
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Astronomy

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for life

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TNO.NL

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1 Welcome Messages

1.1 Message from President of the International Astronautical Federation

I welcome you to the 62nd International Astronautical Congress and to beautiful Cape Town. This is the first IAC to be held in Africa and, with its theme *African Astronaissance*, it has already proved to be a great stimulus for space activities throughout the continent.

Once again, the 62nd IAC offers a programme to suit everybody. In these pages, you will find information about the 31 symposia, nine Plenary Events, three Highlight Lectures and three Late Breaking News. In addition, there are details about the 21st UN/IAF Workshop entitled "Space for Human and Environmental Security", the exhibition, the Third International Cluster Forum and many more.

The Plenary Events have been arranged to inform attendees about current space activities and plans worldwide.

The technical programme – both oral and poster sessions – offers content for specialised audiences of space scientists, engineers, managers and lawyers, also addressing students and young professionals. More than 2200 abstracts have been submitted and the best 1600 papers were selected during the 2011 Spring Meeting for presentation. These papers and presentations are available on the DVD you will find in your Congress bag.

An International Astronautical Congress could not take place without the hard work by the integrated teams of the International Programme Committee, the Local Organising Committee, and the IAF Secretariat. I would like to use this opportunity to thank all of them, but especially the IPC and its Co-Chairs, the IPC Steering Committee and the Plenary Event organisers, for having worked successfully to create such a high quality programme.

I hope you enjoy your time in Cape Town!

Berndt Feuerbacher

President
International Astronautical Federation



1.2 Message from the Local Organising Committee

On behalf of the Local Organising Committee for the IAC 2011, it is my great pleasure to welcome you to Cape Town for the 62nd International Astronautical Congress.

This is the first time that the IAC is held on the African continent, and this year also marks the 60th anniversary of the International Astronautical Federation (IAF). In some cultures, the start of the 60th year of life is associated with the start of a new phase in one's life. Perhaps the holding of the IAC 2011 in Africa for the first time signals the start of a new phase of life for the IAF as well.

This is a very special time in the development of the space arena in Africa. We are seeing the emergence of a number of space agencies on the continent, and also a strengthening of intra-African cooperation in the space arena.

The theme of the Congress is thus fittingly titled *African Astronaissance*, in recognition of the birth of space activities in a number of countries across the continent.

This first International Astronautical Congress in Africa will provide an opportunity for the space world to meet with their African counterparts, and for African space professionals to experience all that the IAC has to offer.

The LOC has been working hard for the past three years to deliver a great congress to you, the participants.

A large number of international space-related entities have been working together for the past three years, aligning their activities in Africa, to build up to this congress, which will surely be a historic milestone on Africa's road to the stars.

In its quest to strengthen the IAF on a regional basis, the Federation has initiated a number of regional groups. During this Congress, the African Regional Group of the IAF will be launched.

The host city, Cape Town, is a very beautiful location, with many attractions. In 1580, Sir Francis Drake wrote in his logbook "*It is the fairest cape and the most stately thing we saw in the whole circumference of the globe.*" We trust that you will take the opportunity to experience a taste of what Cape Town and South Africa have to offer.

To all our delegates, distinguished guests, exhibitors and sponsors, welcome to Cape Town and welcome to the IAC 2011. I trust this will be a memorable and exciting experience for you all.

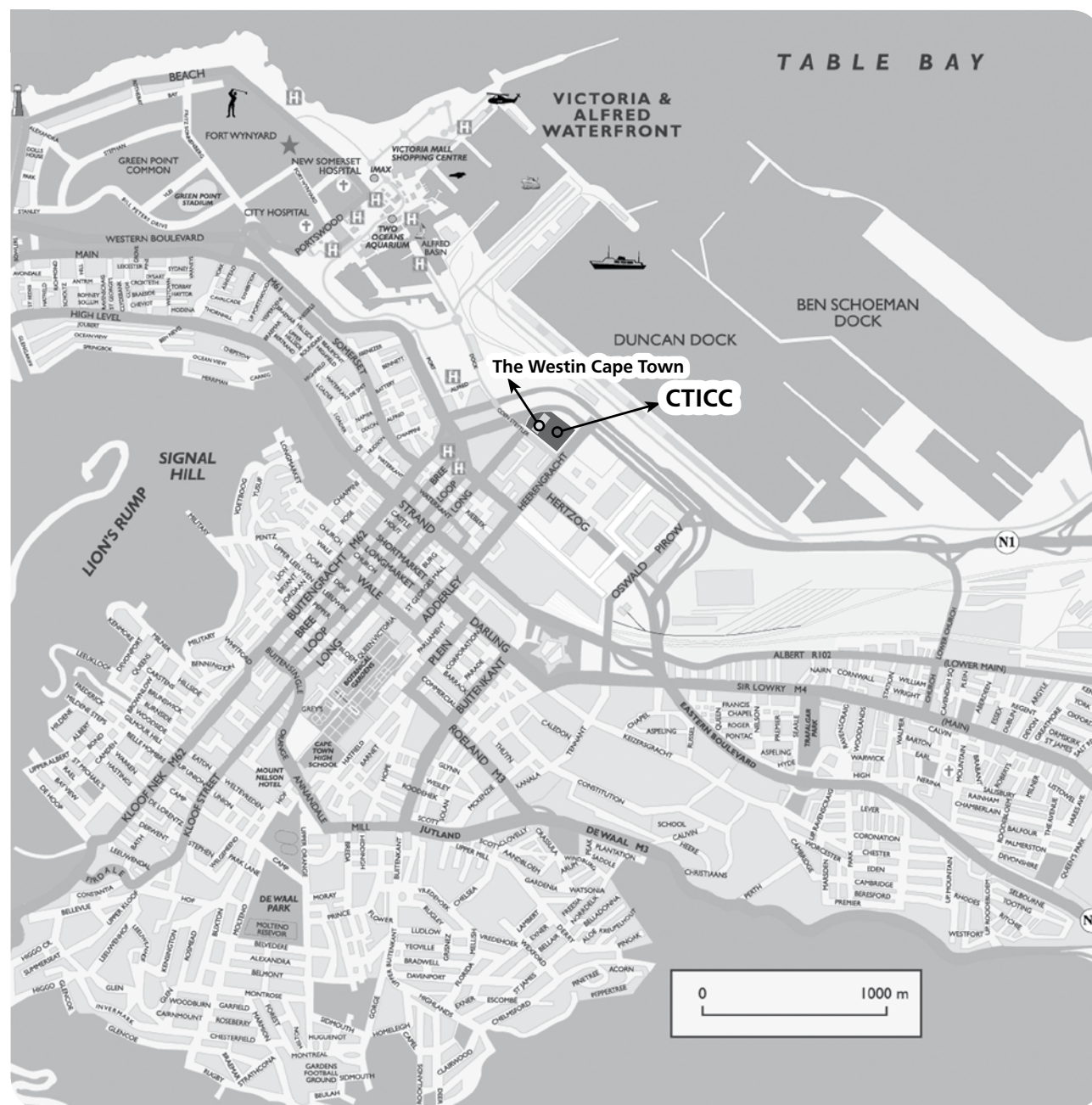
Peter Martinez

Chairman
Local Organising Committee



2 General Information

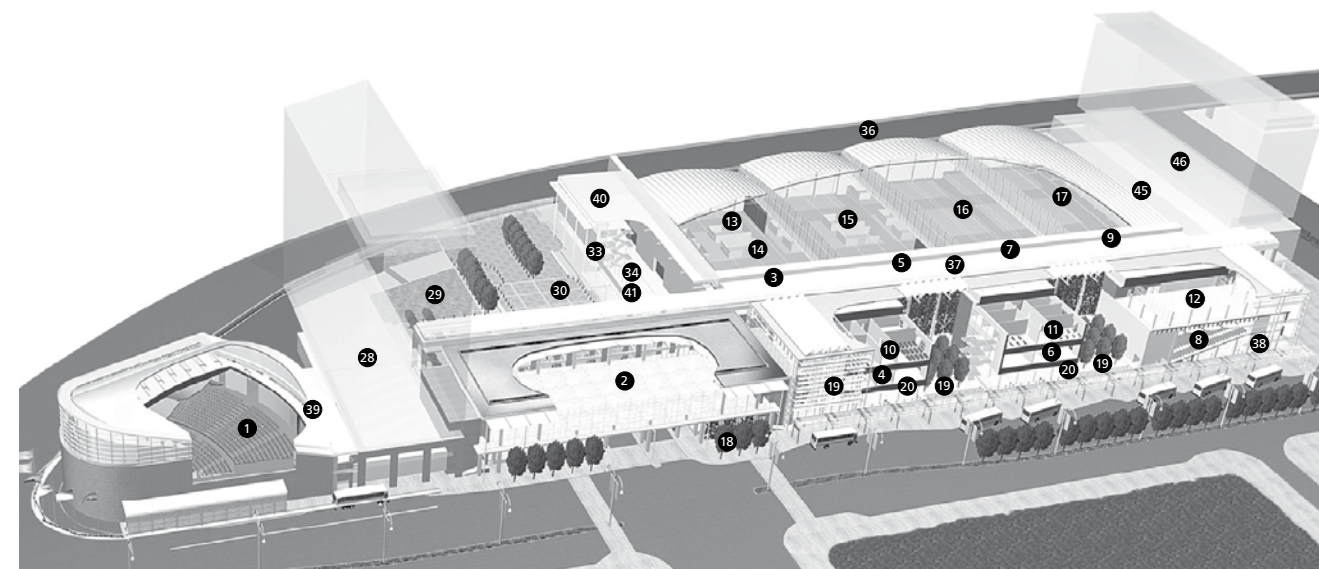
2.1 City Map of Cape Town



2.2 The Venue: Cape Town International Congress Centre (CTICC)

Convention Square, 1 Lower Long Street, Cape Town 8001, South Africa
www.cticc.co.za

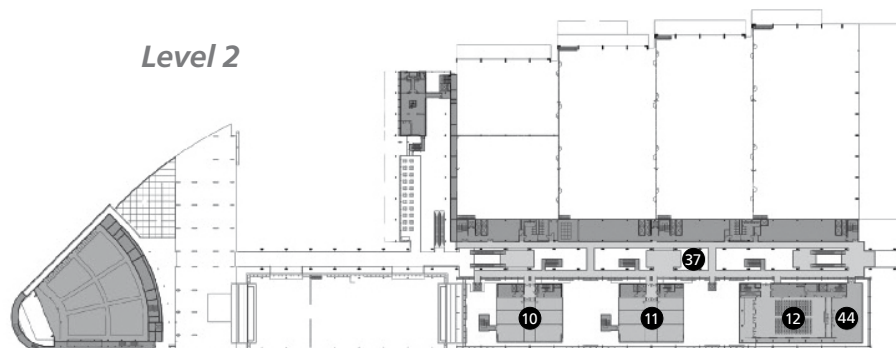
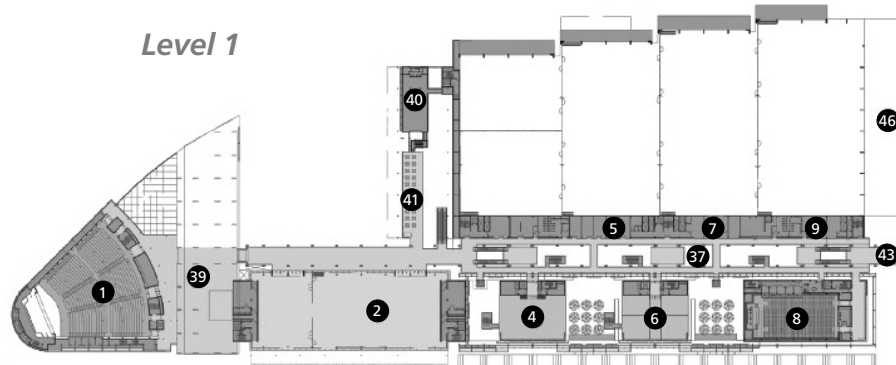
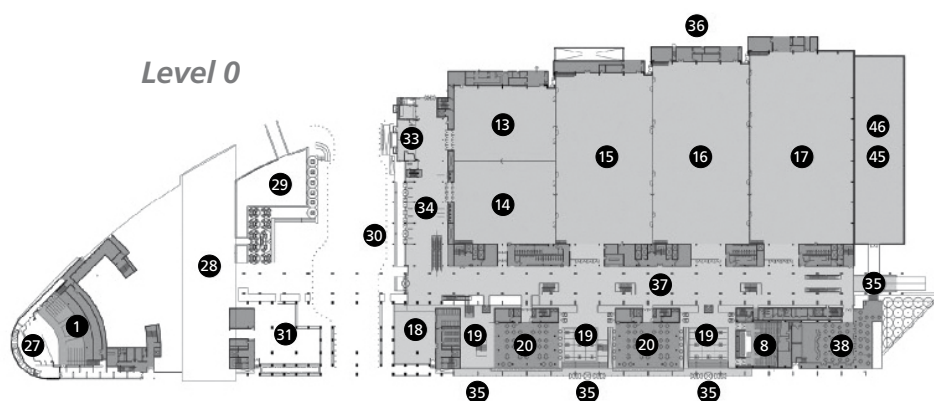
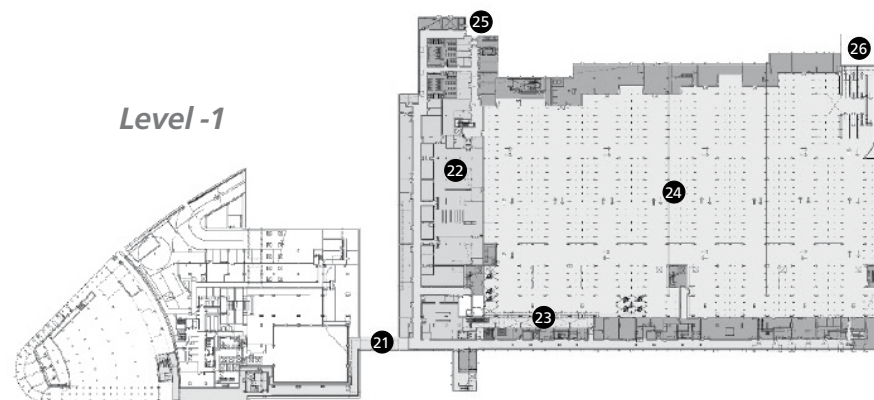
Floor Plans



- | | | |
|--|--|--|
| ① Auditorium I | ②⑩ ①① Meeting Rooms | ②⑩ Jasinum and Strelitzia Restaurants |
| ② Ballroom | ③ Boardroom | ②⑧ The Westin Cape Town |
| ③ Boardroom | ④ ⑥ ⑩ ①① Meeting Rooms | ②⑨ Canal Head & Ferry Terminal |
| ④ ⑥ ⑩ ①① Meeting Rooms | ⑤ ⑦ ⑨ Meeting Suites | ③① Convention Square and Main Entrance |
| ⑤ ⑦ ⑨ Meeting Suites | ⑫ Roof Terrace Room | ③③ Business Centre and Coffee Shop |
| ⑫ Roof Terrace Room | ⑬ Exhibition Hall 1A | ③④ Main Foyer |
| ⑬ Exhibition Hall 1A | ⑭ Exhibition Hall 1B | ③⑥ Marshalling Yard |
| ⑭ Exhibition Hall 1B | ⑮ Exhibition Hall 2 | ③⑦ Gallery Walkway |
| ⑮ Exhibition Hall 2 | ⑯ Exhibition Hall 3 | ③⑧ Marimba Restaurant |
| ⑯ Exhibition Hall 3 | ⑰ Exhibition Hall 4 | ③⑨ Auditorium Foyer |
| ⑰ Exhibition Hall 4 | ⑱ Clivia, Jasminum and Strelitzia Conservatories | ④① Management Offices |
| ⑱ Clivia, Jasminum and Strelitzia Conservatories | | ④② Lounge |
| | | ④⑤ Exhibition Hall 4B |
| | | ④⑥ Convention Tower |

Floor Plans

- ① Auditorium I
- ② Ballroom
- ③ Boardroom
- ④ ⑥ ⑩ ⑪ Meeting Rooms
- ⑧ Auditorium II
- ⑤ ⑦ ⑨ Meeting Suites
- ⑫ Roof Terrace Room
- ⑬ Exhibition Hall 1A
- ⑭ Exhibition Hall 1B
- ⑮ Exhibition Hall 2
- ⑯ Exhibition Hall 3
- ⑰ Exhibition Hall 4
- ⑱ Registration Foyer
- ⑲ Clivia, Jasminum and Strelitzia Conservatories
- ⑳ Jasminum and Strelitzia Restaurants
- ㉑ Service Corridors
- ㉒ Main Kitchen
- ㉓ Lower Foyer Entrance
- ㉔ P3 Parking Entrance
- ㉕ Deliveries
- ㉖ P3 Parking Entrance
- ㉗ Stage
- ㉘ The Westin Cape Town
- ㉙ Canal Head & Ferry Terminal
- ㉚ Convention Square and Main Entrance
- ㉛ The Westin Town Foyer
- ㉜ Business Centre and Coffee Shop
- ㉝ Main Foyer
- ㉞ Entrances
- ㉟ Marshalling Yard
- ㊱ Gallery Walkway
- ㊲ Marimba Restaurant
- ㊳ Auditorium Foyer
- ㊴ Management Offices
- ㊵ Lounge
- ㊶ Viewing Gallery
- ㊷ Outside Terrace
- ㊸ Exhibition Hall 4B
- ㊹ Convention Tower



2.3 Contact and Opening Hours

IAF Office

CTICC, 1st Floor, Room 1.74

Friday 30 September – Friday 7 October
08:00 – 18:00

IAA Office

CTICC, 1st Floor, Room 1.54

Saturday 1 October
10:00 – 17:00

Sunday 2 October
08:00 – 11:30

Monday 3 October
12:00 – 17:00

Tuesday 4 October – Thursday 6 October
08:00 – 17:00

Friday 7 October
08:00 – 14:00

IISL Members' Room

CTICC, 1st Floor, Room 1.53

Monday 3 October
13:00 – 16:00

Tuesday 4 October – Wednesday 5 October
09:00 – 16:00

Thursday 6 October – Friday 7 October
09:00 – 13:00

LOC Office

CTICC, 1st Floor, Room 1.72

Friday 30 September – Friday 7 October
07:30 – 19:30

IAF Members' Lounge

CTICC, Ground Floor, Registration Foyer

Sunday 2 October – Friday 7 October
08:00 – 17:00

Author Preparation Room

CTICC, 1st Floor, Room 1.54

Sunday 2 October – Friday 7 October
08:00 – 17:00

Registration, Message, Info Desk

CTICC, Ground Floor, Registration Foyer

In order to register, please bring along your letter of confirmation, which entitles you to pick up your Congress documents.

Saturday 1 October

08:00 – 18:00

Sunday 2 October

08:00 – 19:00

Monday 3 October – Thursday 6 October
08:00 – 18:00

Friday 7 October
08:00 – 17:00

International Press Centre

CTICC, 1st Floor, Translation Booths, Auditorium 2

Saturday 1 October
13:00 – 20:00

Sunday 2 October – Thursday 6 October
07:30 – 20:00

Friday 7 October
07:30 – 17:00

Press Briefings

CTICC, 1st Floor, Room 1.41

Sunday 2 October
17:30

Tuesday 4 October – Thursday 6 October
13:30 – 14:30

There will be no Press Briefings on
Monday 3 October and Friday 7 October

Exhibition Hall

CTICC, Ground Floor, Exhibition Hall 4 & 4B

Monday 3 October
12:00 – 21:00

Tuesday 4 October – Thursday 6 October
10:00 – 18:00

Public Day: Friday 7 October
10:00 – 17:00

Congress Organiser (CityGuide SA)

**CTICC, Ground Floor, Registration Foyer
Gardrobe**

Friday 30 September – Friday 7 October
07:30 – 19:30

Telephone:

In South Africa: 086 104 8433

Elsewhere: +27-21-555-4152

E-mail: enquiries@iac2011.com

2.4 Useful Information

Registration Fees

Registration Category	ON SITE (Non-African)	ON SITE (African)
Full-paying participants	€ 895	€ 447.50
Full-paying participants who are employees or elected officers of an IAF member organisation	€ 810	€ 405
Retired persons meeting the IAF's minimum requirements	€ 490	€ 245
Young professionals sponsored by an IAF member organisation	€ 330	€165
Full-time students (no age limit)	€ 170	€ 87.50
Accompanying persons (Maximum 1 per full-paying or retired participant)	€ 50	€ 25
Accredited Press	Free of Charge	Free of Charge

Eligibility and Requirements

Full-paying participants – NON MEMBERS

- Each full-paying participant is entitled to enroll ONE accompanying person along with his/her registration at 50 Euros

Full-paying participants – MEMBERS (IAF, IAA, IISL)

- Employees or elected officers of an IAF member organisation
- Current members of the IAA
- Current members of the IISL
- Each full-paying participant is entitled to enroll ONE accompanying person along with his/her registration at 50 Euros

Retired persons

- Retired persons refer to those who were born on or after 27 September 1950 and are full-time retired
- Retired persons must prove their date of birth by providing their ID card to the congress secretariat
- Retired person is entitled to enroll ONE accompanying person along with his/her registration at 50 Euros

Young professionals

Young professionals refer to those who were born on or after 27 September 1976

- Young professionals must prove their date of birth by providing their ID card to the congress secretariat

Full-time students

- Full-time students must prove their status by providing photocopies of their student ID and passport to the congress secretariat
- Participants must be enrolled in full-time education

Accompanying persons

- Registration of one accompanying person per "full paying participant" or "retired person" is 50 Euros
- Accompanying persons will not have access to the IAC Technical Sessions

Accredited Press

- Media accreditation is dealt with directly by the IAF and applications can be made via the IAF website www.iafastro.org
- Journalists must have a recognised accreditation from their country and be able to demonstrate proof of their work
- On site registration is possible

What is covered by the fee?

Delegates, students:

- Admission to all Congress Sessions
- Admission to all Industry-Supported Symposia
- Admission to the Exhibition
- Access to the Opening Ceremony
- Access to the Closing Ceremony
- Admission to the Welcome Reception on 3 October 2011
- Coffee Breaks
- One Congress bag including Final Programme and Abstracts DVD

Accompanying persons:

- Access to the Opening Ceremony
- Access to the Closing Ceremony
- Admission to the Welcome Reception on 3 October 2011
- Access to Plenaries and Highlight Lectures

At the Congress Centre

Name Badges

Black:	Organiser
Orange:	Local Organiser
Blue:	Delegate
Yellow:	Accompanying person
Grey:	Media
Green:	Exhibitor
Brown:	Young Professional
Pink:	Student

Posters

The Poster Sessions will take place in the Clivia Conservatory & Jasminum Restaurant on the Ground Floor of the CTICC.

Coffee Breaks

Tea/coffee stations will be spread throughout the CTICC on the different floors close to the session venues. You will also be able to find tea/coffee serving stations in Exhibition Hall 4 & 4B.

Internet

There is an internet station located within Exhibition Hall 4 & 4B. There is also wireless available in specific areas in the exhibition area. Wireless vouchers can also be purchased at the reception of the CTICC.

In Cape Town

Language

While the most commonly spoken language in Cape Town is Afrikaans, English is most commonly understood here. But, as English is only one of South Africa's 11 official languages, a strong vernacular has developed, and English-speaking visitors might have a hard time recognising some of the words. We're a friendly bunch in Cape Town, so if you're totally confused, just ask and we'll have you speaking South African "now now"! Here is some local lingo to get you started:

ENGLISH	AFRIKAANS	XHOSA
Cape Town	Kaapstad	eKapa
Good morning	Goeiemôre	Molo/Molweni (pl.)
Goodbye	Totsiens	Hambe/Hambanikahle
Thank you	Dankie	Enkosi
Yes	Ja	Ewe
No	Nee	Hayi
How much?	Hoeveel?	Yimalini le?
Expensive	Duur	iDhulu
Hot	Warm	Shushu
Cold	Koud	Banda
Friend	Vriend	Umhlobo
Good/OK	Lekker	Kulungile
Excuse me	Skuus	Uxolo
How are you?	Hoe gaan dit?	Uphilile

Climate and Clothing

It is spring in Cape Town in October. Days are a pleasant temperature, cooling towards evening, but often more enjoyable for visitors not accustomed to the heat. It is advised that you wear light clothes during the day but wear something warm in the evening.

Currency/ Credit Cards/ Banking

The local currency in South Africa is the South African Rand (ZAR).

Cape Town International Airport has a 24-hour foreign exchange service, as well as various cash machines. There is an abundance of cash machines and foreign exchange outlets throughout Cape Town and the vast majority of retail outlets and service providers in the city have credit card facilities.

Most banks are open between 09:00 and 15:30 on weekdays and 09:00 and 11:00 on Saturdays. Banks are closed on Sundays and public holidays.

There is no law regarding tipping for services, but it is generally expected that restaurant and bar patrons will leave a gratuity of between 10% and 15% of the total bill.

All major credit cards are accepted throughout the city.

Electricity

Electricity in South Africa is 230 Volts, alternating at 50 cycles per second. If you travel to South Africa with a device that does not accept 230 Volts at 50 Hertz, you will need a voltage converter.

Health Care

Cape Town has a number of established private hospitals that are capable of delivering world-class health care in the event of an emergency or for planned medical procedures. It is advisable to avoid state hospitals, as these are generally inadequately equipped and often understaffed.

Tap water is safe to drink, unless stated otherwise by the establishment concerned.

No special inoculations are required for adults before or after arriving in or after leaving Cape Town.

Insurance

Visitors to South Africa should arrange health and travel insurance before arriving in the country, in the event of an accident or emergency.

Time Zone

GMT + 2.00

Public Transport

Driving

Rental cars can be arranged on arrival at Cape Town International Airport. You can book a car by contacting info@capetown.travel. You can also call Cape Town Tourism at +27 (0)21 487 6800 or make a booking at any Cape Town Tourism Visitor Information Centre.

In South Africa, cars are right-hand drive and travel on the left-hand side of the road. The general speed limit on highways is 120km/h (75mph). On secondary roads it is 100km/h (60mph). In built-up areas it is usually 60km/h (35mph) unless otherwise indicated.

Any valid driver's licence is accepted provided it bears the photograph and signature of the holder and is printed in English.

Shuttle

Shuttle services are small buses that provide transport from the airport to various points in Cape Town, for a set fee.

These are operated from kiosks in the International and Domestic Arrivals halls at the airport.

Contact Cape Town Tourism Visitor Information Centre at Domestic and International Arrivals to book a shuttle or taxi.

Taxis

Meter taxis are available from Cape Town International Airport. Inquire about rates with the driver.

Rikkis are mid-priced taxis that operate in and around the central city. Yellow Rikki phones are situated in a number of spots in the city, allowing you to place a free call to book a Rikki.

Contact them at +27 (0)861 745 547 or contact Cape Town Tourism to make a booking.

Bus

MyCiTi buses

- R5 per trip: Gardens – Civic – Waterfront service
- R10 per trip: Gardens – Civic – Waterfront feeder service
Table View – Civic Centre main feeder service
West Coast feeder service
- R50 per trip: Airport service (children 4-11 years R25)

When does it run?

MyCiTi bus runs seven days a week in Cape Town and depending on day and time, every 10 or 20 minutes.

Schedule: Gardens – Civic – Waterfront service

Monday - Friday:

- 05:45 to 06:30: every 20 minutes
- 06:30 to 09:00: every 10 minutes
- 09:00 to 16:30: every 20 minutes
- 16:30 to 18:00: every 10 minutes
- 18:00 to 22:00: every 20 minutes

Saturday:

- 06:45 to 22:00: every 20 minutes

Sunday and public holidays:

- 07:45 to 22:00: every 20 minutes

For exact locations, visit www.capetown.gov.za/mycity and download the map.

Useful Telephone Numbers

Emergency police response:	10111
Ambulance and fire services:	10177
Cape Town emergency services (landline):	107
Cape Town emergency services (cellphone):	+27 (0)21 480 7700
Emergency response (cellphone):	112 (the operator will redirect your call)
City Park Hospital:	+27 (0)21 480 6111

Security

- Cape Town has a well-established police force, consisting of highly trained officers.
- Visitors should not walk around alone at night, particularly in areas without adequate streetlights.
- Visitors are also advised not to accept advice from strangers when using cash machines.
- Social workers advise against giving money to beggars and street children.
- Keep valuable documents locked away in a safe place.
- For security emergencies, call the Flying Squad on 10111.

Disclaimer

Neither the National Research Foundation, the South African Astronomical Observatory nor the Congress Organisers accept liability for damages and/or losses of any kind which may be incurred by delegates or by any persons accompanying them, both during the official activities and the excursions. Delegates and accompanying persons participate in all events and tours at their own risk.

Delegates are strongly advised to take out insurance against loss, accidents or damage that could be incurred during the Congress.



3 Organisers

3.1 The International Astronautical Federation (IAF)

Founded in 1951, the International Astronautical Federation is the world's leading space advocacy body with more than 200 members on six continents including all leading space agencies, space companies, societies, associations and institutes worldwide.

Following its theme "A space-faring world cooperating for the benefit of humanity", the Federation advances knowledge about space, fostering the development and application of space assets by advancing global cooperation.

As organiser of the annual International Astronautical Congress (IAC), and other meetings on specific subjects, the IAF actively encourages the development of astronautics for peaceful purposes and supports the dissemination of scientific and technical information related to space.

International Astronautical Federation
94bis, avenue de Suffren
75015 Paris, France

T: +33 1 45 67 42 60
F: +33 1 42 73 21 20
W: www.iafastro.org
E: info@iafastro.org

IAF Member Organisations 2011

Associations and Professional Societies

- Agrupación Astronáutica Española, *Spain*
- American Astronautical Society (AAS), *United States*
- American Institute of Aeronautics and Astronautics (AIAA), *United States*
- Association Aéronautique & Astronautique de France (AAAF), *France*
- Association of Arab Remote Sensing Centers (AARSC), *Libya*
- Association of Specialist Technical Operators in Space (ASTOS), *United Kingdom*
- Associazione Italiana di Aeronautica e Astronautica (AIDAA), *Italy*
- Astronaute Club Européen (ACE), *France*
- Astronautical Society of India, *India*
- ATUCOM - Tunisian Association for Communication and Space Sciences, *Tunisia*
- Austrian Research Promotion Agency, *Austria*
- Canadian Aeronautics & Space Institute (CASI), *Canada*
- Chinese Society of Astronautics, *China*
- Croatian Astronautical and Rocket Federation (HARS), *Croatia*
- Cyprus Astronautical Society, *Cyprus*
- Czech Space Alliance, *Czech Republic*
- Danish Astronautical Society, *Denmark*
- Deutsche Gesellschaft für Luft- und Raumfahrt, Lilienthal-Oberth e.V. (DGLR), *Germany*
- Engineers Australia, *Australia*
- Enterprise Estonia, *Estonia*
- EURISY, *France*
- European Conference for Aero-Space Sciences (EUCASS), *Belgium*
- Eurospace, *France*
- Federación Argentina Astronáutica (FAA), *Argentina*
- Finnish Astronautical Society, *Finland*
- GIFAS, *France*
- Hungarian Astronautical Society (MANT), *Hungary*
- Institut Français d'Histoire de l'Espace, *France*
- International Association for the Advancement of Space Safety, *The Netherlands*
- Internationaler Förderkreis für Raumfahrt – Hermann Oberth – Wernher von Braun e.V., *Germany*



- Israel Society of Aeronautics & Astronautics, *Israel*
- Japan Society for Aeronautics and Space Sciences (JSASS), *Japan*
- Japanese Rocket Society, *Japan*
- Lithuanian Space Association (LSA), *Lithuania*
- National Space Society, *United States*
- Netherlands Society for Aerospace (NVR), *The Netherlands*
- Norsk Astronautisk Forening, *Norway*
- Polish Astronautical Society, *Poland*
- Proespaço - The Portuguese Association of Space Industries, *Portugal*
- Russian Academy of Sciences, *Russia*
- Secure World Foundation, *United States*
- Space Generation Advisory Council (SGAC), *Austria*
- SpaceNed, *The Netherlands*
- Swedish Society for Aeronautics and Astronautics, *Sweden*
- SwissSpace Association, *Switzerland*
- The British Interplanetary Society, *United Kingdom*
- The Chinese Aeronautical and Astronautical Society located in Taipei, Taiwan, *China*
- The Korean Society for Aeronautical and Space Sciences, *Republic of Korea*
- The Planetary Society, *United States*
- TÜBITAK, *Turkey*
- World Space Week Association, *United States*
- X PRIZE Foundation, *United States*

Industry

- A9C Capital, *Bahrain*
- Acutronic Switzerland Ltd., *Switzerland*
- Aerojet-General Corporation, *United States*
- Ångström Aerospace Corporation (AAC), *Sweden*
- Arianespace, *France*
- Astrium GmbH, *Germany*
- Astrium SAS France, *France*
- Astrium UK, *United Kingdom*
- Astronautic Technology SDN BHD, *Malaysia*
- Carlo Gavazzi Space, *Italy*
- Dassault Aviation, *France*
- Deimos Space S.L., *Spain*
- Dutch Space, *The Netherlands*
- EADS CASA Espacio S.L., *Spain*
- EADS Sodern, *France*
- Eumetsat, *Germany*
- Eurokot Launch Services GmbH, *Germany*
- Euroconsult, *France*
- GMV, *Spain*
- GomSpace Aps, *Denmark*

- HE Space Operations, *Germany*
- IHI Aerospace Co, Ltd., *Japan*
- Invap S.E., *Argentina*
- Israel Aerospace Industries. Ltd., *Israel*
- Kayser-Threde GmbH, *Germany*
- Kentucky Space, *United States*
- Khrunichev State Research & Production Space Center, *Russia*
- Lavochkin Association, *Russia*
- Law Offices of Sterns and Tennen, *United States*
- Lockheed Martin Corporation, *United States*
- MDA Corporation, *Canada*
- Microcosm, Inc., *United States*
- Mitsubishi Electric Corporation, *Japan*
- Mitsubishi Heavy Industries, Ltd., *Japan*
- MT Aerospace AG, *Germany*
- NEC Toshiba Space Systems, Ltd., *Japan*
- Neptec Design Group, *Canada*
- Northrop Grumman Space Technology, *United States*
- Novespace, *France*
- OHB-System AG, *Germany*
- Ramirez de Arellano y Abogados, S.C. Law Firm, *Mexico*
- RUAG Space AB, *Sweden*
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- Satrec Initiative, *Republic of Korea*
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- SES, *Luxemburg*
- Sirius XM Radio, *United States*
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- Snecma, *France*
- Space Canada Corporation, *Canada*
- Space Commercial Services Holdings (Pty) Ltd, *South Africa*
- Space Enterprise Partnerships Limited, *United Kingdom*
- Space Systems/Loral, *United States*
- Starsem, *France*
- Sun Space and Information Systems, *South Africa*
- Sunsat Energy Council, *United States*
- Surrey Satellite Technology Ltd, *United Kingdom*
- SSC, *Sweden*
- Techno System Developments S.R.L., *Italy*
- Telesat Canada, *Canada*
- Telespazio S.p.A., *Italy*
- Thales Alenia Space Italia, *Italy*
- Thales Alenia Space, *France*
- The Aerospace Corporation, *United States*
- The Boeing Company, *United States*
- TNO, *The Netherlands*

- United Space Alliance, *United States*
- VEGA, *United Kingdom*
- Viettel Technologies Joint Stock Company, *Vietnam*
- Virgin Galactic L.L.C., *United States*
- Volvo Aero Corporation, *Sweden*
- Yuzhnoye State Design Office, *Ukraine*
- ZARM Fab GmbH, *Germany*

Research and Development

- Andøya Rocket Range, *Norway*
- Center for Strategic and International Studies (CSIS), *United States*
- Central Research Institute of Machine Building (FSUE/ TSNIIMASH), *Russia*
- CIRA Italian Aerospace Research Centre, *Italy*
- CSIRO Marine & Atmospheric Research, *Australia*
- European Space Policy Institute (ESPI), *Austria*
- Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), *United States*
- ICARE-CNRS, *France*
- Instituto de Aeronáutica e Espaço (IAE), *Brazil*
- Instituto Mexicano del Espacio Exterior, INMEE, A.C., *Mexico*
- Instituto Nacional de Pesquisas Espaciais (INPE), *Brazil*
- Instituto Nacional de Técnica Aeroespacial (INTA), *Spain*
- Italian National Research Council - CNR, *Italy*
- Korea Astronomy and Space Science Institute, *Republic of Korea*
- Libyan Center for Remote Sensing and Space Science (LCRSSS), *Libya*
- National Aerospace Laboratory (NLR), *The Netherlands*
- National Oceanic and Atmospheric Administration (NOAA), *United States*
- Nigerian Meteorological Agency, *Nigeria*
- Odyssey Space Research, *United States*
- Office National d'Etudes et de Recherches Aérospatiales (ONERA), *France*
- Rocket Research Institute, Inc., *United States*
- Samara Space Centre "TsSKB-Progress", *Russia*
- Shamakhy Astrophysical Observatory, *Azerbaijan*
- U.S. Geological Survey, *United States*
- von Karman Institute for Fluid Dynamics, *Belgium*

Space Agencies and Offices

- Aerospace Research Institute (ARI), *Iran*
- Agence Spatiale Algérienne (ASAL), *Algeria*

- Agustín Codazzi Geographic Institute, *Colombia*
- Belgian Science Policy (BELSPO), *Belgium*
- Brazilian Space Agency (AEB), *Brazil*
- Bulgarian Aerospace Agency, *Bulgaria*
- Canadian Space Agency (CSA), *Canada*
- Centre National de la Cartographie et de la Télédétection (CNCT), *Tunisia*
- Centre National d'Etudes Spatiales (CNES), *France*
- Centre Royal de Télédétection Spatiale (CRTS), *Morocco*
- Centro de Investigación y Difusión Aeronáutico-Espacial (CIDA-E), *Uruguay*
- Centro Para el Desarrollo Tecnológico Industrial (CDTI), *Spain*
- Comisión Nacional de Actividades Espaciales (CONAE), *Argentina*
- Commission d'Astronautique de l'Academie Roumaine, *Romania*
- Czech Space Office (CSO), *Czech Republic*
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), *Germany*
- Ecole Polytechnique Fédérale de Lausanne (EPFL), *Switzerland*
- Ecuadorian Civilian Space Agency (EXA), *Ecuador*
- European Space Agency (ESA), *France*
- Federal Space Agency (ROSCOSMOS), *Russia*
- General Organization of Remote Sensing (GORS), *Syria*
- Geo-Informatics and Space Technology Development Agency (GISTDA), *Thailand*
- Indian Space Research Organization (ISRO), *India*
- Indonesian National Institute of Aeronautics and Space (LAPAN), *Indonesia*
- Israel Space Agency (ISA), *Israel*
- Italian Space Agency (ASI), *Italy*
- Japan Aerospace Exploration Agency (JAXA), *Japan*
- King Abdulaziz City for Science & Technology (KACST), *Saudi Arabia*
- Korea Aerospace Research Institute (KARI), *Republic of Korea*
- National Aeronautics and Space Administration (NASA), *United States*
- National Aerospace Agency (NASA) of Azerbaijan Republic, *Azerbaijan*
- National Research Foundation (NRF), *South Africa*
- National Space Agency of Ukraine (NSAU), *Ukraine*
- National Space Research and Development Agency, Abuja, (NSRDA), *Nigeria*

- Netherlands Space Office (NSO), *The Netherlands*
- Norwegian Space Centre (NSC), *Norway*
- Pakistan Space and Upper Atmosphere Research Commission (SUPARCO), *Pakistan*
- Space Technology Institute (STI), *Vietnam*
- UK Space Agency, *United Kingdom*

Universities

- Centre Spatial de Liège, *Belgium*
- Department of Space Studies, University of North Dakota, *United States*
- International Space University (ISU), *France*
- Moscow Aviation Institute, *Russia*

- RMIT University, Australia, *Australia*
- School of Engineering, UNAM, *Mexico*
- Space Policy Institute, George Washington University, *United States*
- Stellenbosch University, *South Africa*
- The John Hopkins University Applied Physics Laboratory, *United States*
- University of Alabama in Huntsville, *United States*
- University of the Western Cape, *South Africa*
- University of Valencia, *Spain*
- University of Vigo, *Spain*
- Victorian Space Science Education Centre, *Australia*

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Pierre-François Mouriaux, Technical Coordinator

Valérie Leenhardt, Administrative Assistant

3.2 The International Academy of Astronautics (IAA)

The International Academy of Astronautics (IAA) was founded in 1960 by Theodor von Karman. Most of the space pioneers were elected as Academicians including: Mikhail Tikhonravov, Valentin Glushko, Herman Oberth, Eugen Sänger, Irene Sänger-Bredt, Wernher von Braun, Yuri Gagarin, Valentina Tereshkova, Alexei Leonov, William Pickering, James Van Allen, M. V. Keldysh, Boris Chertok, Neil Armstrong, Buzz Aldrin, Valery Polyakov, Luigi Broglio, Arthur C. Clarke and Stark Draper. The Academy is an independent international community of leading experts committed to expanding the frontiers of space, the newest realm of human activity. To foster the development of astronautics, the Academy undertakes a number of activities, including the recognition of outstanding contributors through election and awards. It also facilitates professional communication, develops and promotes new ideas and initiatives, engages the public, and fosters a sense of community among the members. This is a unique non-governmental organisation established in 1960 and recognised by the United Nations in 1996.

It is an honorary society with an action agenda (www.iaaweb.org). With 1200 elected members and corresponding members from 84 nations, it works closely with space agencies, industry, the academic community and the national science and engineering academies to determine needs and objectives and to help shape policy and forge cooperation by means of studies, position papers, conferences and publications. (see <http://iaaweb.org/content/view/273/412/>). The IAA published 9 studies in 2010 and is engaged in the preparation of 40 studies. The Academy publishes the journal *Acta Astronautica* containing refereed papers.

With its Program Committees and under the purview of its Scientific Activities Committee (SAC) the Academy organises yearly (<http://iaaweb.org/content/view/182/301/>) about 20 conferences and regional meetings focused on the development and promotion of new initiatives. This activity includes also, in cooperation with the International Astronautical Federation and the International Institute of Space Law, the traditional contribution to the International Astronautical Congress (IAC) where the Academy sponsors 11 symposia. The Academy also continues to enjoy its participation in the COSPAR Assemblies by sponsoring and co-sponsoring symposia.

The value of the Academy derives from its members and the Board of Trustees with its Vice-Presidents Yannick d'Escatha, Dr. Stanislav Konyukhov (†), Hiroki Matsuo and Liu Jyuan. Although the IAA has many connections to these and other similar organisations, it is distinctive as the only international Academy of elected members in the broad area of astronautics and space.

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IAA Declaration during the Heads of Space Agencies Summit, Washington DC, USA, Nov 2010

Board of Trustees of the International Academy of Astronautics



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3.3 Academy Day

International Academy of Astronautics (IAA)
Joint with the Academy of Sciences of South Africa (ASSAf)
and the Royal Society of South Africa (RS)

Sunday 2 October 2011

IAA Plenary Session Room Auditorium 2

Open to IAC participants

14:30 Welcome Addresses by Gopalan Madhavan Nair, President, International Academy of Astronautics, Don Cowan (RS) and Robin Crewe (ASSAf).

Commemorative Lecture "100th Anniversary of Academician Mikhail Yangel, Outstanding Scientist and Missile and Space Systems Chief Designer", by IAA Academician Leonid Kushma, Former President of Ukraine.

28th IAA Scientific Lecture "From Mercury Orbit: New Views of an Old Planet", by IAA Academicians Stamatios M. Krimigis, Sean C. Solomon, Ralph L. McNutt, and the MESSENGER team.

'Hayabusa', the World's First Sample and Return Mission from an Asteroid, Itokawa, and the Future Applications by IAA Academician Junichiro Kawaguchi, JAXA.

German Space Cooperation Experience and Summit follow-on Initiatives for Africa by IAA Academician Johann-Dietrich Woerner, DLR, Germany.

Round Table "Space at the Service of Human and Environmental Security"
In the framework of the International Academy of Astronautics presence in Africa initiated in 2003 and its exceptional participation to the 2011 UN/IAF Workshop in Cape Town.





3.4 The International Institute of Space Law (IISL)

Founded in 1960, the International Institute of Space Law (IISL) is an independent non-governmental organisation dedicated to fostering the development of space law. In the pursuit of its stated purpose, the IISL organises meetings, colloquia and competitions on legal and social science aspects of space activities, oversees the preparation and commissioning of studies and reports, and publishes books and proceedings on space law. The membership of the Institute is composed of individuals and institutions from more than forty countries who have been elected on the basis of their contributions to the field of space law or other social sciences related to space activities.

The IISL holds its annual Colloquium on current issues in space law at the International Astronautical Congress and the Colloquium Proceedings are published each year by the AIAA. During the IAC the IISL also co-organises annual Scientific-Legal Roundtables with the International Academy of Astronautics (IAA), the 26th of which will be held this year in Cape Town. The themes of the sessions to be held during this year's Colloquium can be found elsewhere in this programme.

The IISL is an officially recognised observer at sessions of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and organises an annual symposium for the delegates of the COPUOS Legal Subcommittee with the European Centre for Space Law. Since 2001, the Institute has organized dedicated space law conferences in several countries, including Singapore, China, India, Thailand, and the USA. It has also organised the annual *Eilene M. Galloway Symposium on Critical Issues in Space Law* in Washington, DC since 2006. The IISL issues Statements that inform the debate on the most pressing issues in the arena of space law. During the annual Colloquia, the IISL strives to address topics that are of interest to all space actors and invites all IAC attendees to attend and participate in our sessions.

Since 1990, the IISL has also organised the Manfred Lachs Space Law Moot Court Competition. The competition is based on a hypothetical space law case written by the IISL members and student teams from Europe, North America and the Asia Pacific region participate. Preliminary competitions are held each spring in the different regions. The regional champions then compete at the World Finals, which take place at the IAC and are judged each year by judges of the International Court of Justice.

We hope to see many of you during our 54th Colloquium in Cape Town - and we look forward to many enriching debates and exchanges!

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Vladlen S. Vereshchetin, Russia
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Gennady P. Zhukov, Russia

3.5 20th MANFRED LACHS SPACE LAW MOOT COURT COMPETITION

Thursday, 6 October 2011, 3pm
The High Court of Cape Town



The Manfred Lachs Space Law Moot Court Competition is organized annually by the International Institute of Space Law (IISL). Preliminary regional competitions are organized each spring. The winning teams of the preliminaries meet in the World Finals held in conjunction with the annual IISL Space Law Colloquium, and are judged by sitting Judges of the International Court of Justice.

This year, for the 20th competition, three teams, from Europe, North America and the Asia Pacific region, will compete in the World Finals. These events will take place in Cape Town during the IAC. The 2011 Problem is entitled the *“Case concerning Environmental Contamination and Harmful Interference in Space Activities” (Zuris v. Nova Freedonia)*. This case raises complex issues arising from environmental contamination on both Earth and Mars as a result of hypothetical research missions to Mars.

The semi-final will be held on Tuesday, 4 October in a closed session. The Final Round will be held on Thursday, 6 October from 3 pm to 6 pm at the High Court of Cape Town and will be judged by three members of the International Court of Justice in The Hague. In parallel with the main competition, the finals of the African Introductory Round will take place at the High Court at 11 am on 6 October. The purpose of this introductory round is to work towards creating a new African Regional Round of the competition from 2012 onwards.

All who are interested in attending the Final Round are welcome and are requested to contact the IISL at secretary@iislweb.org to arrange for bus transportation. Following the awards ceremony at the conclusion of the Final Round, the IISL will host its annual dinner. The dinner is reserved for IISL Members and special guests by invitation only.

All timings are subject to confirmation at the start of the IAC and will be announced at various locations. Representatives of the media wishing to attend may contact the IISL Secretary or IAC organizers.

Competition Website: www.iislweb.org/lachsmoot

Competition Facebook Page: www.facebook.com/spacemoot

Dr. Martha Mejia-Kaiser, Co-Chair, Manfred Lachs Moot Court Committee

Dr. Les Tennen, Co-Chair, Manfred Lachs Moot Court Committee

IISL Executive Secretary: Corinne M. Jorgenson, secretary@iislweb.org

IISL Assistant Executive Secretary: Mark J. Sundahl, mark.sundahl@law.csuohio.edu



3.6 The Local Organising Committee

Members of the Local Organising Committee are



CHAIRMAN

Dr Peter Martinez

National Research Foundation



CONFERENCE ORGANISER

Jonathan Weltman

CityGuide SA



IPC CO-CHAIR

Sias Mostert

Space Commercial Services Holdings



MEDIA LIAISON

Kechil Kirkham

Research Africa



MOOT COURT COMPETITION & INTERNATIONAL MEETING FOR MEMBERS OF PARLIAMENTS

Carla Sharpe



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Lara van Zyl

Paragon Conventions



HOUSING AND TOURISM

Tonya van Rooyen

CityGuide SA



LOGISTICS

Leigh Weltman

CityGuide SA



LOC SECRETARY

Margaret Kumalo

National Research Foundation

4 Congress Programme

4.1 Message from the IPC Co-Chairs

We are proud to welcome you to Cape Town for the 62nd International Astronautical Congress. This is the first time that the Congress will be hosted on African soil and fittingly the event has been themed "African Astronaissance". The South African space community has been looking forward to and preparing for a week of information exchange and collaboration with delegates from across the globe, working towards realising the many benefits space technology can offer Africa and the world.

The week will present delegates the opportunity to attend plenary events, lectures and over 150 technical sessions running concurrent to the exhibition in the Cape Town International Convention Centre. This event is an important milestone in the South African space enterprise, which started with listening to the first signals from Sputnik and calculating the orbit. Nowadays, South Africa plays an important role in space observation, support for launches, building its own satellites and providing various information services to many different users. South Africa has proven to be an emerging hub of ground-based space science and technology and is now formally venturing into space again.

It is notable that the Congress starts on 3 October, exactly 59 years after the launch of the first man-made object to reach space. We hope that this Congress will be equally memorable and ground breaking, providing a platform for communication, interaction and cooperation.

IPC CO-CHAIRS:
Sias Mostert and **Antonio Moccia**

4.2 Programme at a Glance

	08.00	09.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00	21.00	22.00
Friday 30 Sept															UN/IAF Welcome Reception
Saturday 1 Oct											IPC General Meeting				UN/IAF Workshop Dinner
Sunday 2 Oct															Academy Dinner
Monday 3 Oct															
Tuesday 4 Oct															
Wednesday 5 Oct															
Thursday 6 Oct															
Friday 7 Oct															

4.3 Information for Authors

All authors are asked to upload their manuscripts and multimedia presentations prior to the Congress in order to make them available to all participants on the *Interactive Congress Guide DVD*. You can still update your manuscripts and multimedia presentations with the latest developments through the IAF website or in the **Author Preparation Room** (Room 1.54) on the 1st Floor of the CTICC.

Your presentation will be automatically preloaded on the computer of the Technical Session room. Please note that speakers are not allowed to insert USB memory sticks or CD-ROMs in the PC of the Technical Session room. Therefore, all updates need to be uploaded **prior to the day before the Technical Session takes place, 18:00 local time**. Later changes cannot be reflected on your final presentation.

The room dedicated to authors (Presentation Preparation Room) is equipped with computers (MS Windows XP - Compatible) with CD/DVD drivers and USB ports. It will be open during following hours:

Sunday 2 October - Friday 7 October 08:00 - 17:00

Our help desk team will assist you in uploading multimedia presentations during operating hours.

Speakers are requested to report to their allocated Technical Session room 20 minutes prior to the start of their session to meet with the Session Chairs and to check their presentation. Do not forget to bring two printed courtesy copies of your manuscript and a backup copy of your presentation. Some Session Chairs might also ask you for a short biography to introduce you at the session.

4.4. Opening Ceremony

Day: 3 October 2011
 Time: 10:00
 Place: Exhibition Hall 2 & 3, CTICC, Ground Floor

Join us at the opening ceremony of IAC 2011 where you will be treated to the best of local talent and experience the cultures of beautiful Cape Town and South Africa.



4.5 Closing Ceremony

Day: 7 October 2011
Time: 17:15
Place: CTICC, Auditorium 1

The Closing Ceremony provides a formal closing of the activities of the 62nd International Astronautical Congress. It is also the occasion to present the IAF's annual awards, given to individuals and groups that have distinguished themselves in space cooperation and space activities at the global level:

The Allan D. Emil Memorial Award is presented for an outstanding contribution to space science, space technology, space medicine or space law.

The Frank J. Malina Astronautics Medal is awarded to an educator who has demonstrated excellence in taking the fullest advantage of the resources available to him/her to promote the study of astronautics and related space science.

The Luigi G. Napolitano Award is presented by the Education Committee of the IAF to a young scientist under the age of 30 years, who has contributed significantly to the advancement of the aerospace science and has given a paper at the IAC on the contribution.

The IAF Student Awards recognise the best papers presented by students at the IAC in the undergraduate and graduate categories.

At the end of the ceremony, the Congress flag will be handed over to the next host country – Italy.



4.6 Plenary Events

Plenary 1:

Heads of Agencies Plenary

Monday 3 October 13:30-15:00

Heads of Agencies will provide an overview of their current programmes and insight into future plans, giving views on actual developments and potential international opportunities. An interactive discussion with the audience will follow.



Charles Bolden

Administrator,
National Aeronautics and Space
Administration,
United States



Keiji Tachikawa

President,
Japan Aerospace Exploration
Agency,
Japan



Vladimir Popovkin

Head,
Federal Space Agency (Roscosmos),
Russia



Steve MacLean

President,
Canadian Space Agency,
Canada



Jean-Jacques Dordain

Director General,
European Space Agency



Chen Qiufa

Administrator,
China National Space
Administration (CNSA),
China



K Radhakrishnan

Chairman,
Indian Space Research
Organisation,
India



Sandile Malinga

Chief Executive Officer,
South African National Space
Agency

MODERATOR: Uli Bobinger

Plenary 2:

African Space Leaders Round Table

Monday 3 October 18:15-19:15

As part of Africa Space Day, heads of space agencies from throughout the continent gather in a special plenary, discussing how space technology can transform lives on the continent.



Azzedine Oussedik

Agence Spatiale Algérienne (ASAL), Algeria



Mohamed El Bachir Chok

Centre National de la Cartographie et de la Télédétection (CNCT), Tunisia



Seidu Oneilo Mohammed

National Space Research and Development Agency, Nigeria



Driss El Hadani

Centre Royal de Télédétection Spatiale (CRTS), Morocco



Sandile Malinga

Chief Executive Officer, South African National Space Agency, South Africa



Shaukat A. Abdulrazak

National Council for Science & Technology (NCST), Kenya



MODERATOR

Johann-Dietrich Woerner

Chairman of the Executive Board, DLR, Germany

Plenary 3:

From Space to Earth - Challenges and Opportunities

Tuesday 4 October 08:30-10:00

Space agency heads, CEOs of space manufacturing industry and other panel members will discuss how the needs of their countries can be met from space, talk about issues pertaining to their sector and describe how satellite communications and Earth Observation can benefit Africa.



Azzedine Oussedik

Agence Spatiale Algérienne (ASAL), Algeria



Luigi Pasquali

Chairman and CEO, Thales Alenia Space Italia, Italy



Seidu Oneilo Mohammed

National Space Research and Development Agency, Nigeria



John Hornsby

President, MDA Geospatial Services Inc., Canada



Sandile Malinga

Chief Executive Officer, South African National Space Agency, South Africa



Hiroyuki Inahata

Group Vice President, Space Systems Division, Mitsubishi Electric Corporation, Japan



James Chilton

Vice President, Exploration Launch Systems, The Boeing Company, United States



INTRODUCTION & CONCLUSION

Jean-Yves Le Gall

Chairman and CEO,
Arianespace,
France



MODERATOR

Virendra Jha

Canadian Space Agency,
Canada

Plenary 4:

Impact of Satellite Communications in a Global Market: Future Direction in the 21st Century

Tuesday 4 October 14:00-15:00

The plenary will address how satellites are contributing to entry of developing and industrialising countries into the global market, benefiting human society in general.



Kevin Viret

Regional Director Africa,
Yahsat,
United Arab Emirates



Johnathan Osler

Managing Director, Africa Sales,
Intelsat,
Luxemburg



Didier Le Boulc'h

R&D and Product Policy Director,
Thales Alenia Space,
France



Omar Trujillo

Regional Vice President Africa,
03b Networks,
United Kingdom



Joaquim Pereira de Lima

Managing Director,
Eutelsat Madeira,
Portugal



Jean-Paul Hoffmann

Vice President, Corporate
Communications,
SES,
Luxemburg

Plenary 5:

Monitoring Fresh Water from Space with a Focus on Africa

Wednesday 5 October 09:00-10:00

Access to fresh water is crucial to human survival. This Plenary Event will explore how we measure amounts of fresh water from space and what the Earth science models are showing relative to the future availability of water. Socio-economic impacts resulting from the changes in surface and aquifer water storage will also be profiled. The discussion will address relationships between policy decisions and access to fresh water. A number of international programs addressing the distribution of water-related data will be discussed, including ESA's TIGER, and NASA's SERVIR.



Ahmed er Raji

Royal Centre for Remote Sensing
(CRTS),
Morocco



Wilbur K. Ottichilo

Member of Parliament,
National Assembly,
Kenya



MODERATOR

James Graf

Deputy Director for Earth Science
and Technology
Jet Propulsion Laboratory
Pasadena CA
United States

Plenary 6:

Next Generation Visions for Earth Observations in the 21st Century

Wednesday 5 October 14:00-15:00

This plenary provides an opportunity for students and young professionals to share their ideas on how space-based Earth observation systems can be improved and sustained, ensuring that future decisions are informed by the best quality environmental data products.



Katrina Laygo

Applied Science DEVELOP National
Program,
National Aeronautics and Space
Administration,
United States



Sean Curry

Graduate Student,
Georgia Institute of Technology,
United States



H. Aziz Kayihan

Graduate Student,
Erciyes University,
Turkey



Jason Jones

Applied Science DEVELOP National
Program,
National Aeronautics and Space
Administration,
United States



Vanessa Villamar

Applied Science DEVELOP
National Program,
National Aeronautics and Space
Administration,
Mexico



Dmitry Rachkin

Graduate Student,
Bauman Moscow State Technical
University,
Russia



MODERATOR

Philemon Mjwara

Co-chair of the intergovernmental
Group on Earth Observations
(GEO),
South Africa



MODERATOR

Michael Freilich

Earth Science Division Director,
National Aeronautics and Space
Administration,
United States

Plenary 7:

IAA Heads of Space Agencies Summit Follow-On

Thursday 6 October 09:00-10:00

On 17 November 2010, leaders of 30 space agencies from around the world gathered in Washington, DC, USA for an unprecedented IAA Heads of Space Agencies Summit and welcomed the IAA Summit Declaration. The Academy will present and discuss the follow-on activities.



Gopalan Madhavan Nair

President,
International Academy of
Astronautics (IAA),
India



Enrico Saggese

President,
Italian Space Agency,
Italy



Seidu Oneilo Mohammed

Director General,
National Space Research and
Development Agency,
Nigeria



Ray Johnson

Chief Technology Officer,
Lockheed Martin Corporation,
United States



MODERATOR

Jean-Michel Contant

Secretary General,
International Academy of
Astronautics (IAA),
France

Plenary 8:

Human Space Flight: Fifty Years in Orbit

Thursday 6 October 14:00-15:00

The year 2011 marks the anniversary of 50 years of human spaceflight. This celebratory panel will feature astronauts representing several countries and spacecraft experiences and they will engage the audience in a question and answer session.



Valery Ryumin

Former cosmonaut on Soyuz,
Salyut, Mir, and Shuttle,
Russia



Chiaki Mukai

Former astronaut on Space Shuttle,
Japan



Catherine Coleman

Current NASA astronaut on
Shuttle, Soyuz, and ISS,
United States



Jean-Loup Chrétien

Former astronaut on Soyuz,
Salyut, Mir, and Shuttle,
France



MODERATOR
Philippe Jung
France



MODERATOR
Igor Sorokin
Deputy Head of Space Stations
Utilization Center, S.P. Korolev
Rocket and Space Corporation
Energia
Russia

Plenary 9:

South African and African Space Activities

Friday 7 October 12:15 - 13:45

This special plenary will focus upon the opportunities and challenges of space from a South African perspective.



Sandile Malinga
CEO,
South African National Space
Agency (SANSA),
South Africa



Terry Newby
Program Manager,
Earth Observation (Remote
Sensing),
ARC,
South Africa



Val Munsami
Deputy Director General:
Research, Development and
Innovation,
DST,
South Africa



Raoul Hodges
Managing Director,
South African National Space
Agency, SANSA Space Operations,
South Africa



Konrad Wessels
Principal Researcher and Research
Group Leader,
Council for Scientific and Industrial
Research,
South Africa



Lee-Anne McKinnel
Managing Director,
South African National Space
Agency, SANSA Space Science,
South Africa



Bernard Fanaroff
Project Director,
South African SA Telescope Project,
South Africa



Herman Steyn
Professor in Electronic Engineering,
Head of Electrical and Electronic
Engineering Department,
University of Stellenbosch,
South Africa



MODERATOR
Nomfuneko Majaja
Chief Director,
Advanced Manufacturing,
DTI,
South Africa

4.7 Highlight Lectures

Highlight Lecture 1

The Amazing Flying Machine: The Space Shuttle's Technical Advancements and Contributions to the Next Generation

Tuesday 4 October 18:15-19:15

This lecture will focus on the technical and operational advancements introduced by the Space Shuttle, reviewing these advances and discussing their impact on future space vehicle design and operation.



John P. Shannon
NASA Space Shuttle Program
Manager,
National Aeronautics and Space
Administration,
United States



INTRODUCED BY
William Gerstenmaier
NASA Associate Administrator,
Space Operations Mission Directorate,
National Aeronautics and Space
Administration,
United States

ORGANISER: **John-David F. Bartoe**, National Aeronautics and Space Administration/Ames Research Center,
United States

Highlight Lecture 2

Direction of International Earth Science Programmes

Wednesday 5 October 18:15-19:15

In this highlight lecture, the direction of the NASA Earth Science Program will be addressed, with particular emphasis on the roles of international collaboration in both the global observational system and the use of space-based information for direct, world-wide societal benefit.



Michael Freilich

Director,
Earth Science Division,
National Aeronautics and Space
Administration,
United States



INTRODUCED BY

James Graf

Jet Propulsion Laboratory,
National Aeronautics and Space
Administration,
United States

ORGANISER: James E. Graf, Deputy Director for Earth Science, National Aeronautics and Space Administration/Jet Propulsion Laboratory, United States

Highlight Lecture 3

A Road Map for Space Astronomy in the Next Decades

Thursday 6 October 18:15-19:15

Space satellites have given astrophysicists a unique opportunity to explore the invisible part of the electromagnetic spectrum and drastically improve our knowledge of the universe. The increasing size, complexity and cost of large space observatories places a growing emphasis on large international collaboration.



Pietro Ubertini

INAF,
Italy



INTRODUCED BY

Sergio Volonte

European Space Agency
France

ORGANISER: Sergio Volonte, European Space Agency, France

4.8 Symposium Keynote Speakers

	Symposium Keynote Lectures	Date	Time	Room
A1	SPACE LIFE SCIENCES SYMPOSIUM			
	Personal Growth Following Long-Duration Space Flight <i>Dr. Peter Suedfeld, University of British Columbia, Canada</i>	3 October	15:00	TS-09
A4	40th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI)			
	Invited Billingham Cutting Edge Lecture <i>Dr. Pete Worden, National Aeronautics and Space Administration (NASA), Ames Research Center, United States</i>	5 October	15:00	TS-11
A6	SPACE DEBRIS SYMPOSIUM			
	Space Debris: A 50-year retrospective and a Look Forward <i>Mr. Nicholas L. Johnson, National Aeronautics and Space Administration (NASA), United States</i>	6 October	15:00	TS-11
B1	EARTH OBSERVATION SYMPOSIUM			
	The Role of Remote Sensing in Assessing the Impact of Remote Sensing on Understanding Global Climate Change and Biodiversity <i>Mr. Bob Scholes, CSIR, South Africa</i>	3 October	15:00	TS-05
	Data Sharing in GEOSS <i>Dr. Humbulani Mudau, Group on Earth Observation (GEO), Switzerland</i>	6 October	15:00	TS-05
B2	SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM			
	Increasing Civil Capabilities in the Modernized GPS Era <i>Mr. Tom Sheridan, US Air Force, United States</i>	6 October	15:00	TS-14
	The Alphas Product Line Qualification and Acceptance of the First Service Module <i>Mr. Philippe Sivad, European Space Agency (ESA), The Netherlands</i>	4 October	10:00	TS-14
	Supporting Disaster Countermeasure Activities Using WINDS Satellite Link <i>Dr. Takashi Takahashi, Japan Aerospace Exploration Agency (JAXA), Japan</i>	5 October	10:00	TS-14
B3	HUMAN SPACE ENDEAVOURS SYMPOSIUM			
	Keynote Lecture <i>Dr. William H. Gerstenmaier, National Aeronautics and Space Administration (NASA), United States</i>	3 October	15:00	TS-03



	Symposium Keynote Lectures	Date	Time	Room
C1	ASTRODYNAMICS SYMPOSIUM			
	Breakwell Lecture: Orbital Mechanics about Small Bodies <i>Prof. Daniel Scheeres, University of Colorado, United States</i>	5 October	10:00	TS-04
C2	MATERIALS AND STRUCTURES SYMPOSIUM			
	SANTINI MEMORIAL LECTURE: Space Challenges and Opportunities for Human Benefit <i>Dr. Michael Yarymovych, United States</i>	4 October	15:00	TS-17
C3	SPACE POWER SYMPOSIUM			
	The Opportunity for Space Technology to Energize the Economic Development of Africa <i>Wael Almazeedi, QGEN</i>	3 October	15:00	TS-08
D2	SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM			
	Perspectives on the Future of Commercial Crew and Cargo Space Transportation Systems <i>Michael D. Griffin, University of Alabama in Huntsville, United States</i> <i>Franck Culbertson, Orbital Sciences Corporation, United States</i> <i>Gwen Shotwell, SpaceX, United States</i> <i>Mark Sirangelo, Sierra Nevada Corporation, United States</i>	5 October	15:00	TS-02
D3	9th SYMPOSIUM ON STEPPING STONES TO THE FUTURE: STRATEGIES, ARCHITECTURES, CONCEPTS AND TECHNOLOGIES			
	Building Blocks for Development and Discovery in Space <i>Mr. John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States</i>	3 October	15:00	TS-11
D4	9th SYMPOSIUM ON VISIONS AND STRATEGIES FOR FAR FUTURES			
	From Far to Near Future; Perspectives and Challenges - IAA and IAF Past and Present Reflections <i>Dr. Alain Dupas, European Bank for Reconstruction and Development, France</i>	4 October	15:00	TS-11
D6	SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES			
	Keynote: Continual Improvement of FAA Commercial Space Transportation Safety Regulations <i>Dr. George Nield, Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States</i>	4 October	10:00	TS-03
E1	SPACE EDUCATION AND OUTREACH SYMPOSIUM			
	Keynote Lecture <i>Mr. Bill Nye, The Planetary Society, United States</i>	4 October	15:00	TS-13
	Promoting Workforce Excellence Through Knowledge Sharing at NASA <i>Dr. Edward J. Hoffman, National Aeronautics and Space Administration (NASA), United States</i>	5 October	15:00	TS-13

	Symposium Keynote Lectures	Date	Time	Room
	Close Encounters with the Hubble Space Telescope <i>Claude Nicollier, EPFL, Switzerland</i>	3 October	15:00	TS-13
	Art Experiment by the Water and Light on the ISS-JEM "KIBO" <i>Prof. Takuro Osaka, University of Tsukuba, Japan</i>	7 October	09:00	TS-13
	The Importance of Reaching Out to Society: Education Enables Us to Envision and Pursue Our Dreams <i>Dr. Chiaki Mukai, Japan Aerospace Exploration Agency (JAXA), Japan</i>	7 October	14:00	TS-09
E3	24th SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS			
	International Cooperation for Human Spaceflight <i>Dr. Scott Pace, Space Policy Institute, George Washington University, United States</i>	7 October	09:00	TS-08
	Future Planetary Robotic Exploration and the Need for International Cooperation: The IAA Heads of Agencies Study Report <i>Mr. Gregg Vane, United States</i>	7 October	09:30	TS-08
	Climate Change and Green Systems: A Report from the IAA 50th Anniversary Study Group <i>Mr. John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States</i>	7 October	10:00	TS-08
	Space-Based Disaster Management: The Need for International Cooperation <i>Dr. Ranganath Navalgund, Space Applications Centre (ISRO), India</i>	7 October	10:30	TS-08
E5	22nd SYMPOSIUM ON SPACE ACTIVITY AND SOCIETY			
	Improved Public Awareness - Scholarly and Commercial Recognition of Space Products and Services <i>Mr. Kevin Cook, Space Foundation, United States</i>	6 October	10:00	TS-13
E7	54TH IISL COLLOQUIUM ON THE LAW OF OUTER SPACE			
	Third Nandasiri Jasentuliyana Lecture on Space Law <i>Dr. Abdul Koroma, International Court of Justice, The Netherlands</i>	4 October	10:00	TS-12

4.9 Congress Sessions and Events by Day

Monday, 3 October 2011		Room
10:00 - 12:00	Opening Ceremony	Exhibition Hall 2 & 3
12:00 - 12:30	Opening of the Exhibition	Exhibition Hall 4
13:30 - 15:00	Plenary Event 1 – Heads of Agency Plenary	Exhibition Hall 2 & 3
15:00 - 18:00	Technical Sessions	Room
A1.1	Behaviour, Performance and Psychosocial Issues in Space	TS-09
A3.1	Space Exploration Overview	TS-01
A6.1	Measurements	TS-12
B1.1	International Cooperation in Earth Observation Missions	TS-05
B2.1	Advanced Technologies	TS-14
B3.1	Overview Session (Present and Near-Term Human Space Flight Programs)	TS-03
B4.2	Small Space Science Missions	TS-10
C1.1	Mission Design, Operations and Optimization - Part 1	TS-04
C2.1	Space Structures I - Development and Verification (Space Vehicles and Components)	TS-17
C3.1	Space-based Solar Power Architectures – New Governmental and Commercial Concepts and Ventures	TS-08
C4.1	Propulsion Systems I	TS-06
D1.1	Innovative and Visionary Space Systems Concepts	TS-18
D2.1	Launch Vehicles in Service or in Development	TS-02
D3.1	Strategies and Architectures to Establish a “Stepping Stone” Approach to our Future in Space	TS-11
D5.1	A Big Challenge : Safety in Aerospace Missions	TS-15
E1.1	Lift Off - Primary and Secondary Space Education	TS-13
E2.1	Student Conference – Part 1	TS-16
E3.1	National and International Space Policies and Programmes for African Development	TS-07
V1	Space Operations Committees Virtual Forum	Vasco de Gamma (Westin Hotel)
18:15 - 19:15	Plenary Event 2 - African Space Leaders Round Table	Exhibition Hall 2 & 3
19:15	Welcome Reception	Exhibition Hall

Tuesday, 4 October 2011		Room
08:30 - 10:00	Plenary Event 3 - From Space To Earth. Challenges and Opportunities	Auditorium 2
10:00 - 13:00	Technical Sessions	Room
A1.2	Human Physiology in Space	TS-15
A3.2A	Moon Exploration – Part 1	TS-01
A4.1	SETI I : SETI Science and Technology	TS-11
B1.2	Future Earth Observation Systems	TS-05
B2.2	Advanced Systems	TS-14

B4.1	12th UN/IAA Workshop on Small Satellite Programmes at the Service of Developing Countries	TS-10
B6.1	Human Spaceflight Operations Concepts	TS-07
C1.2	Mission Design, Operations and Optimization - Part 2	TS-04
C2.2	Space Structures II - Development and Verification (Deployable and Dimensionally Stable Structures)	TS-17
C3.2	Technologies and Experiments related to Wireless Power Transmission	TS-08
C4.2	Propulsion Systems II	TS-06
D1.2	Enabling Technologies for Space Systems	TS-18
D2.2	Launch Services, Missions, Operations and Facilities	TS-02
D6.1	Commercial Spaceflight Safety and Emerging Issues	TS-03
E1.2	On Track - Undergraduate and Postgraduate Space Education	TS-13
E2.2	Student Conference – Part 2	TS-16
E6.1	The General Role of Government in Encouraging Space Industry Applications	TS-09
E7.1	Nandasiri Jasentuliyana Keynote Lecture on Space Law & 3rd Young Scholars Session	TS-12
14:00 - 15:00	Plenary Event 4 - Impact of Satellite Communications in a Global Market: Future Direction in the 21st Century	Auditorium 2
15:00 - 18:00	Technical Sessions	Room
A2.1	Gravity and Fundamental Physics	TS-06
A3.2B	Moon Exploration – Part 2	TS-01
A5.1	Near Term Strategies for Lunar Surface Infrastructure	TS-14
B1.3	Earth Observation Sensors and Technology	TS-05
B3.2	How Can We Best Apply Our Experience to Future Human Missions?	TS-03
B4.3	Small Satellite Operations	TS-10
C1.3	Orbital Dynamics - Part 1	TS-04
C2.3	Space Structures - Dynamics and Microdynamics	TS-17
C3.3	Advanced Space Power Technologies and Concepts; Part 1	TS-08
D1.3	System Engineering Tools, Processes & Training (I)	TS-18
D2.3	Upper Stages, Space Transfer, Entry and Landing Systems	TS-02
D4.1	Human Exploration in Deep Space	TS-11
E1.4	Calling Planet Earth - Space Outreach To The General Public	TS-13
E2.3	Student Team Competition	TS-16
E3.2	International Space Exploration Policies and Programmes	TS-07
E4.1	50th Anniversary of Manned Space Flight	TS-15
E4.4	History of South African Contribution to Astronautics	TS-15
E6.2	New Business Models in Traditional Space Industry Applications	TS-09
E7.2	Legal Issues of Commercial Human Spaceflight	TS-12
18:15 - 19:15	Highlight Lecture 1 - The Amazing Flying Machine: The Space Shuttle's Technical Advancements and Contributions to the Next Generation	Auditorium 2

Wednesday, 5 October 2011		Room
08:15 - 09:00	Late Breaking News 1 - The Global Exploration Roadmap	Auditorium 2
09:00 - 10:00	Plenary Event 5 - Monitoring Fresh Water from Space with a Focus on Africa	Auditorium 2
10:00 - 13:00	Technical Sessions	Room
A1.3	Medical Care for Humans in Space	TS-09
A2.2	Fluid and Materials Sciences	TS-16
A3.3A	Mars Exploration – Part 1	TS-01
A6.2	Modelling and Risk Analysis	TS-15
B1.4	Earth Observation Data Management Systems	TS-05
B2.3	Fixed and Broadcast Communications	TS-14
B3.3	ISS Utilization	TS-03
B4.4	Small Earth Observation Missions	TS-10
C1.4	Orbital Dynamics - Part 2	TS-04
C2.4	New Materials and Structural Concepts	TS-17
C4.3	Propulsion Technology	TS-06
D1.4	Space Systems Architectures	TS-18
D2.4	Future Space Transportation Systems	TS-02
D3.2	Concepts, Technologies, Infrastructures and Systems for the Exploration and Utilisation of Space	TS-11
E3.3	The space economy in emerging space countries	TS-07
E5.1	Habitation Throughout the Solar System	TS-13
E7.3	Africa: Space Law and Applications - Past, Present, and Future	TS-12
13:00 - 16:00	V2 Entrepreneurship and Investment Committee Virtual Forum	Vasco de Gamma (Westin Hotel)
14:00 - 15:00	Plenary Event 6 - Next Generation Visions for Earth Observation in the 21st Century	Auditorium 2
15:00 - 18:00	Technical Sessions	Room
A1.4	Radiation Fields, Effects and Risks in Human Space Missions	TS-09
A2.3	Microgravity Experiments from Sub-orbital to Orbital Platforms	TS-16
A3.3B	Mars Exploration – Part 2	TS-01
A4.2	SETI II : SETI and Society	TS-11
A5.2	Long Term Scenarios for Human Moon/Mars Presence	TS-14
A6.3	Hypervelocity Impacts and Protection	TS-15
A7.1	Long Term Perspective	TS-08
B3.4.-B6.6	Sustainable Operations of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia	TS-03
B4.5	Access to Space for Small Satellite Missions	TS-10
B5.1	Integrated Applications End-to-End Solutions	TS-05
C1.5	Attitude Dynamics - Part 1	TS-04
C2.5	Smart Materials and Adaptive Structures	TS-17
C4.4	Electric Propulsion	TS-06
D1.5	Lessons Learned in Space Systems	TS-18
D2.5	Future Space Transportation Systems Technologies	TS-02

E1.3	Enabling The Future – Developing the Project Management and the Technical Space Workforce	TS-13
E3.4	Assuring the Long-Term Sustainability of Outer Space Activities	TS-07
E7.4	Environmental Aspects of Space Law and of Space Activities	TS-12

17:00 - 18:00	Technical Sessions	Room
A7.2	Technology Needs (1)	TS-08

18:15 - 19:15	Highlight Lecture 2 - The Direction of International Earth Science Programmes	Auditorium 2
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Thursday, 6 October 2011		
08:15 - 09:00	Late Breaking News 2 - NASA's Orion Crew Vehicle: Recent Design and Mission Decisions	Auditorium 2
09:00 - 10:00	Plenary Event 7 - IAA Heads of Space Agencies Summit Follow-On	Auditorium 2
10:00 - 13:00	Technical Sessions	Room
A1.5	Astrobiology and Exploration	TS-09
A2.4	Science Results from Ground Based Research	TS-16
A7.3	Technology Needs (2)	TS-08
B1.5	Earth Observation Applications and Economic Benefits	TS-05
B2.4	Mobile Satellite Communications and Navigation Technology	TS-14
B3.5	Astronauts: Those Who Make It Happen	TS-03
B4.6A	Generic Technologies for Small/Micro Platforms	TS-10
C1.6	Attitude Dynamics - Part 2	TS-04
C2.6	Space Environmental Effects and Spacecraft Protection	TS-17
C4.5	Hypersonic and Combined Cycle Propulsion	TS-06
D1.6	System Engineering Tools, Processes and Training (2)	TS-18
D2.6	Future Space Transportation Systems Verification and In-Flight Experimentation	TS-02
D4.2	Public/Private Innovative Initiatives in Human Spaceflight Round Table	TS-11
D5.2	Knowledge Management and Collaboration in Space Activities	TS-15
E1.8	Space Education and Outreach	TS-01
E4.2	Memoirs and Organisational histories	TS-12
E5.2	Verifying and Validating the Impact of Technology Transferred from Space	TS-13
E7.6.-E3.5	26th IAA/IISL Scientific-Legal Roundtable: Towards Space Debris Remediation (Invited Papers only)	TS-07
13:00 - 16:00	V3 Human Space Endeavours Committee Virtual Forum	Vasco de Gamma (Westin Hotel)
14:00 - 15:00	Plenary Event 8 - Human Space Flight: Fifty Years in Orbit	Auditorium 2
15:00 - 18:00	Technical Sessions	Room
A1.6	Life Support and EVA Systems	TS-09
A2.5	Facilities and Operations of Microgravity Experiments	TS-16
A3.4	Small Bodies Missions and Technologies	TS-01

A5.3.-B3.6	Joint session on Human and Robotic Partnerships to Realise Space Exploration Goals	TS-03
A6.6	Space Debris Detection and Characterisation	TS-11
A7.4	Technology Needs (3)	TS-18
B1.6	Improving Earth Observation thru Data Sharing	TS-05
B2.5	Space Navigation Systems and Services	TS-14
B4.6B	Generic Technologies for Nano/Pico Platforms	TS-10
B6.2	New Operations Concepts	TS-07
C1.7	Guidance, Navigation and Control - Part 1	TS-04
C2.7	Space Vehicles – Mechanical/Thermal/Fluidic Systems	TS-17
C4.6	Missions Enabled by new Propulsion Technology and Systems	TS-06
D2.7	Small Launchers: concepts and operations	TS-02
D5.3	Space Weather Prediction and Protection of Space Missions from Its Effects	TS-15
E1.5	New Worlds - Innovative Space Education and Outreach	TS-13
E4.3	Scientific & Technical History	TS-12
E8.1	Multilingual Astronautical Terminology	TS-08

16:00 - 18:00	Technical Sessions	Room
A7.5	Lessons Learned	TS-18
18:15 - 19:15	Highlight Lecture 3 - Revolutionising Astrophysics from Space	Auditorium 2

Friday, 7 October 2011

08:15 - 09:00	Late Breaking News 3 - NigeriaSat-2 and NigeriaSat-X successfully launched - A milestone in the implementation of Nigeria's space programme	Auditorium 2
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09:00 - 12:00	Technical Sessions	Room
A1.7	Biology in Space	TS-09
A2.6	Microgravity Sciences Onboard the International Space Station and Beyond	TS-16
A3.5	Solar System Exploration	TS-01
A5.4	Going beyond the Earth-Moon system: Human Missions to Mars, Libration points, and NEO's	TS-14
A6.4	Mitigation and Standards	TS-15
B3.7	Enablers for the Future Human Missions	TS-03
B4.8	Hitchhiking to the Moon	TS-10
B6.3	Training Relevant for Operations, including Human Spaceflight	TS-07
C1.8	Guidance, Navigation and Control - Part 2	TS-04
C2.8	Specialized Technologies, including Nanotechnology	TS-17
C4.7.-C3.5	Joint Session on Nuclear Propulsion and Power	TS-06
D2.8	Heavy lift launchers capabilities and new missions	TS-02
D4.4	Space Elevators and Tethers	TS-11
E1.6	Water From Space: Societal, Educational and Cultural Aspects	TS-13
E3.6	IAA 2010 Space Summit Reporting and Way Forward	TS-08
E6.3	New Space Industry Applications	TS-05

E7.5	Recent Developments in Space Law	TS-12
V4	Space Communications and Navigation Committee Virtual Forum	Vasco de Gama (Westin Hotel)

12:15 - 13:45	Plenary Event 9 - South African and African Space Activities	Auditorium 2
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14:00 - 17:00	Technical Sessions	Room
A2.7	Microgravity Processes onboard Large Space Platforms	TS-16
A6.5	Space Debris Removal Issues	TS-15
B2.6	Near-Earth and Interplanetary Communications	TS-14
B4.7	Space Systems and Architectures Featuring Cross-Platform Compatibility	TS-10
B5.2	Tools and Technology in support of Integrated Applications	TS-05
C1.9	Guidance, Navigation and Control - Part 3	TS-04
C2.9	Advancements in Materials Applications and Rapid Prototyping	TS-17
C4.8	Advanced Propulsion: "Non Electric Non Chemical"	TS-06
D2.9	Private Human Access to Space: Sub-orbital and Orbital missions: Joint session D2 with Commercial Spaceflight Safety Commission D6	TS-02
D3.4	Space Technology and Systems Management Practices and Tools	TS-11
E1.7.-A1.8	Living In Space - Education And Outreach In Space Life Sciences and infrastructure Development for Capacity Building	TS-09
E5.3	The Effect of Space Visualization Tools in Commercial Markets	TS-13
E7.7.-B3.8	Joint IAF/IISL Session on Policy and Law of Human Space Missions	TS-03

17:15 - 18:15	Closing Ceremony	Auditorium 1
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4.10 Technical Sessions by Symposium

A1	SPACE LIFE SCIENCES SYMPOSIUM
1	Behaviour, Performance and Psychosocial Issues in Space
2	Human Physiology in Space
3	Medical Care for Humans in Space
4	Radiation Fields, Effects and Risks in Human Space Missions
5	Astrobiology and Exploration
6	Life Support and EVA Systems
7	Biology in Space
8.-E1.7	Living In Space - Education and Outreach in Space Life Sciences and Infrastructure Development for Capacity Building
A2	MICROGRAVITY SCIENCES AND PROCESSES
1	Gravity and Fundamental Physics
2	Fluid and Materials Sciences
3	Microgravity Experiments from Sub-Orbital to Orbital Platforms
4	Science Results from Ground Based Research
5	Facilities and Operations of Microgravity Experiments
6	Microgravity Sciences Onboard the International Space Station and Beyond



7	Microgravity Processes Onboard Large Space Platforms
P	Microgravity Sciences and Processes - Poster Session
A3	SPACE EXPLORATION SYMPOSIUM
1	Space Exploration Overview
2.P	Moon Exploration - Poster Session
2A	Moon Exploration – Part 1
2B	Moon Exploration – Part 2
3.P	Mars Exploration - Poster Session
3A	Mars Exploration – Part 1
3B	Mars Exploration – Part 2
4	Small Bodies Missions and Technologies
4.P	Small Bodies Missions and Technologies - Poster Session
5	Solar System Exploration
5.P	Solar System Exploration - Poster Session
A4	40th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – The Next Steps
1	SETI I: SETI Science and Technology
2	SETI II: SETI and Society
A5	14th HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM
1	Near Term Strategies for Lunar Surface Infrastructure
2	Long Term Scenarios for Human Moon/Mars Presence
3.-B3.6	Joint Session on Human and Robotic Partnerships to Realise Space Exploration Goals
4	Going Beyond the Earth-Moon System: Human Missions to Mars, Libration Points, and NEO's
A6	SPACE DEBRIS SYMPOSIUM
1	Measurements
2	Modelling and Risk Analysis
3	Hypervelocity Impacts and Protection
4	Mitigation and Standards
5	Space Debris Removal Issues
6	Space Debris Detection and Characterisation
A7	SYMPOSIUM ON NEW TECHNOLOGIES FOR FUTURE SPACE ASTRONOMY MISSIONS
1	Long Term Perspective
2	Technology Needs (1)
3	Technology Needs (2)
4	Technology Needs (3)
5	Lessons Learned
B1	EARTH OBSERVATION SYMPOSIUM
1	International Cooperation in Earth Observation Missions
2	Future Earth Observation Systems
3	Earth Observation Sensors and Technology
4	Earth Observation Data Management Systems
5	Earth Observation Applications and Economic Benefits
6	Improving Earth Observation Through Data Sharing



B2	SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM
1	Advanced Technologies
2	Advanced Systems
3	Fixed and Broadcast Communications
4	Mobile Satellite Communications and Navigation Technology
5	Space Navigation Systems and Services
6	Near-Earth and Interplanetary Communications
B3	HUMAN SPACE ENDEAVOURS SYMPOSIUM
1	Overview Session (Present and Near-Term Human Space Flight Programs)
2	How Can We Best Apply Our Experience to Future Human Missions?
3	ISS Utilisation
4.-B6.6	Sustainable Operations of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia
5	Astronauts: Those Who Make It Happen
6.-A5.3	Joint Session on Human and Robotic Partnerships to Realise Space Exploration Goals
7	Enablers for the Future Human Missions
8.-E7.7	Joint IAF/IISL Session on Policy and Law of Human Space Missions
B4	15th SYMPOSIUM ON SMALL SATELLITE MISSIONS
1	12 th UN/IAA Workshop on Small Satellite Programmes at the Service of Developing Countries
2	Small Space Science Missions
3	Small Satellite Operations
4	Small Earth Observation Missions
5	Access to Space for Small Satellite Missions
6A	Generic Technologies for Small/Micro Platforms
6B	Generic Technologies for Nano/Pico Platforms
7	Space Systems and Architectures Featuring Cross-Platform Compatibility
8	Hitchhiking to the Moon
B5	SYMPOSIUM ON INTEGRATED APPLICATIONS
1	Integrated Applications End-to-End Solutions
2	Tools and Technology in Support of Integrated Applications
B6	SPACE OPERATIONS SYMPOSIUM
1	Human Spaceflight Operations Concepts
2	New Operations Concepts
3	Training Relevant for Operations Including Human Spaceflight
4	Flight Control Operations Virtual Forum
6.-B3.4	Sustainable Operations of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia
C1	ASTRODYNAMICS SYMPOSIUM
1	Mission Design, Operations and Optimization - Part 1
2	Mission Design, Operations and Optimization - Part 2
3	Orbital Dynamics - Part 1
4	Orbital Dynamics - Part 2
5	Attitude Dynamics - Part 1
6	Attitude Dynamics - Part 2



- 7 Guidance, Navigation and Control - Part 1
- 8 Guidance, Navigation and Control - Part 2
- 9 Guidance, Navigation and Control - Part 3

C2 MATERIALS AND STRUCTURES SYMPOSIUM

- 1 Space Structures I - Development and Verification (Space Vehicles and Components)
- 2 Space Structures II - Development and Verification (Deployable and Dimensionally Stable Structures)
- 3 Space Structures - Dynamics and Microdynamics
- 4 New Materials and Structural Concepts
- 5 Smart Materials and Adaptive Structures
- 6 Space Environmental Effects and Spacecraft Protection
- 7 Space Vehicles – Mechanical/Thermal/Fluidic Systems
- 8 Specialized Technologies Including Nanotechnology
- 9 Advancements in Materials Applications and Rapid Prototyping

C3 SPACE POWER SYMPOSIUM

- 1 Space-Based Solar Power Architectures – New Governmental and Commercial Concepts and Ventures
- 2 Technologies and Experiments Related to Wireless Power Transmission
- 3 Advanced Space Power Technologies and Concepts: Part 1
- 4 Advanced Space Power Technologies and Concepts: Part 2
- 5.-C4.7 Joint Session on Nuclear Propulsion and Power

C4 SPACE PROPULSION SYMPOSIUM

- 1 Propulsion Systems I
- 2 Propulsion Systems II
- 3 Propulsion Technology
- 4 Electric Propulsion
- 5 Hypersonic and Combined Cycle Propulsion
- 6 Missions Enabled by New Propulsion Technology and Systems
- 7.-C3.5 Joint Session on Nuclear Propulsion and Power
- 8 Advanced Propulsion: "Non Electric Non Chemical"

D1 SPACE SYSTEMS SYMPOSIUM

- 1 Innovative and Visionary Space Systems Concepts
- 2 Enabling Technologies for Space Systems
- 3 System Engineering Tools, Processes & Training (1)
- 4 Space Systems Architectures
- 5 Lessons Learned in Space Systems
- 6 System Engineering Tools, Processes and Training (2)

D2 SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

- 1 Launch Vehicles in Service or in Development
- 2 Launch Services, Missions, Operations and Facilities
- 3 Upper Stages, Space Transfer, Entry and Landing Systems
- 4 Future Space Transportation Systems
- 5 Future Space Transportation Systems Technologies
- 6 Future Space Transportation Systems Verification and In-Flight Experimentation

- 7 Small Launchers: Concepts and Operations
- 8 Heavy Lift Launchers Capabilities and New Missions
- 9 Private Human Access to Space: Sub-Orbital and Orbital Missions: Joint Session D2 with Commercial Spaceflight Safety Commission D6

D3 9th SYMPOSIUM ON STEPPING STONES TO THE FUTURE: STRATEGIES, ARCHITECTURES, CONCEPTS AND TECHNOLOGIES

- 1 Strategies and Architectures to Establish a "Stepping Stone" Approach to our Future in Space
- 2 Concepts, Technologies, Infrastructures and Systems for the Exploration and Utilisation of Space
- 4 Space Technology and Systems Management Practices and Tools

D4 9th SYMPOSIUM ON VISIONS AND STRATEGIES FOR FAR FUTURES

- 1 Human Exploration in Deep Space
- 2 Public/Private Innovative Initiatives in Human Spaceflight Round Table
- 4 Space Elevators and Tethers

D5 44th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES

- 1 A Big Challenge : Safety in Aerospace Missions
- 2 Knowledge Management and Collaboration in Space Activities
- 3 Space Weather Prediction and Protection of Space Missions from its Effects

D6 SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES

- 1 Commercial Spaceflight Safety and Emerging Issues

E1 SPACE EDUCATION AND OUTREACH SYMPOSIUM

- 1 Lift Off - Primary and Secondary Space Education
- 2 On Track - Undergraduate And Postgraduate Space Education
- 3 Enabling The Future – Developing the Project Management and the Technical Space Workforce
- 4 Calling Planet Earth - Space Outreach To The General Public
- 5 New Worlds - Innovative Space Education and Outreach
- 6 Water From Space: Societal, Educational and Cultural Aspects
- 7.-A1.8 Living in Space - Education and Outreach in Space Life Sciences and Infrastructure Development for Capacity Building
- 8 Space Education and Outreach

E2 41st STUDENT CONFERENCE

- 1 Student Conference – Part 1
- 2 Student Conference – Part 2
- 3 Student Team Competition

E3 24th SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS

- 1 National and International Space Policies and Programmes for African Development
- 2 International Space Exploration Policies and Programmes
- 3 The Space Economy in Emerging Space Countries
- 4 Assuring the Long-Term Sustainability of Outer Space Activities
- 5.-E7.6 26th IAA/IISL Scientific-Legal Roundtable: Towards Space Debris Remediation (Invited Papers only)
- 6 IAA 2010 Space Summit Reporting and Way Forward





E4	45th IAA HISTORY OF ASTRONAUTICS SYMPOSIUM
1	50 th Anniversary of Manned Space Flight
2	Memoirs and Organisational Histories
3	Scientific & Technical History
4	History of South African Contribution to Astronautics
E5	22nd SYMPOSIUM ON SPACE ACTIVITY AND SOCIETY
1	Habitation Throughout the Solar System
2	Verifying and Validating the Impact of Technology Transferred from Space
3	The Effect of Space Visualization Tools in Commercial Markets
E6	BUSINESS INNOVATION SYMPOSIUM
1	The General Role of Government in Encouraging Space Industry Applications
2	New Business Models in Traditional Space Industry Applications
3	New Space Industry Applications
E7	54TH IISL COLLOQUIUM ON THE LAW OF OUTER SPACE
1	Nandasiri Jasentuliyana Keynote Lecture on Space Law & 3rd Young Scholars Session
2	Legal Issues of Commercial Human Spaceflight
3	Africa: Space Law and Applications - Past, Present, and Future
4	Environmental Aspects of Space Law and of Space Activities
5	Recent Developments in Space Law
6.-E3.5	26 th IAA/IISL Scientific-Legal Roundtable: Towards Space Debris Remediation (Invited Papers only)
7.-B3.8	Joint IAF/IISL Session on Policy and Law of Human Space Missions
E8	MULTILINGUAL ASTRONAUTICAL TERMINOLOGY SYMPOSIUM
1	Multilingual Astronautical Terminology
V	VIRTUAL FORUMS
1	Space Operations Committee Virtual Forum
2	Entrepreneurship and Investment Committee Virtual Forum
3	Human Space Endeavours Committee Virtual Forum
4	Space Communications and Navigation Committee Virtual Forum



4.11. Technical Session Papers ordered by Symposium

PLEASE NOTE THAT POSTER SESSIONS WILL BE HELD FROM TUESDAY 4 OCTOBER - THURSDAY 6 OCTOBER FROM 13:00 - 14:00 IN THE CLIVIA CONSERVATORY & JASMINUM RESTAURANT, GROUND FLOOR, CTICC.

NOTE: For the convenience of participants, the Final Programme is slimmer and lighter than it has been in past years. In order to achieve this aim, the selection of data has had to be strict. Additional information and data can be found on the websites of:

The IAF at: www.iafastro.org
 The IAA at: www.iaaweb.org
 The IISL at: www.iislweb.org
 The LOC at: www.iac2011.com

Information on papers presented at Technical Sessions can be found on the DVD distributed at registration or at: www.iafastro.org/index.html?title=IAC2011_Technical_Programme.

An up-to-date list of Committee Meetings is at: www.iafastro.org/docs/2011/iac/IAC2011_Meetings.pdf.

An alphabetical index of authors is available both on the DVD and at: www.iafastro.org/index.html?title=IAC2011_Authors.

A1. SPACE LIFE SCIENCES SYMPOSIUM

Coordinator: Peter Graef (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Ronald J. White (South Dakota School of Mines & Technology, United States);

A1.1. Behaviour, Performance and Psychosocial Issues in Space

October 3 2011, 15:00 — TS-09

Chair: Nick Kanas (University of California and Veterans Affairs Medical Center, United States); Peter Suedfeld (University of British Columbia, Canada);

Rapporteur: Vadim Gushin (Institute for Biomedical Problems, Russia);

IAC-11.A1.1.1
 PERSONAL GROWTH FOLLOWING LONG-DURATION SPACE FLIGHT
 Peter Suedfeld, University of British Columbia, Canada

IAC-11.A1.1.2
 THEMATIC CONTENT ANALYSIS OF WORK-FAMILY INTERACTIONS: RETIRED COSMONAUTS' REFLECTIONS
 Deyar Asmaro, Simon Fraser University, Canada

IAC-11.A1.1.3
 UNIVERSAL VALUES OF CANADIAN ASTRONAUTS
 Jelena Brcic, University of British Columbia, Canada

IAC-11.A1.1.4
 THE EFFECTS OF EXTREME ISOLATION ON LONELINESS AND COGNITIVE CONTROL PROCESSES: ANALYSES OF THE LODGEAD DATA OBTAINED DURING THE MARS-105 AND THE MARS-520 STUDIES
 Bernadette van Baarsen, VU medisch centrum, The Netherlands

IAC-11.A1.1.5
 INCREASED CREWMEMBER AUTONOMY DURING LONG-DURATION SPACE MISSIONS
 Nick Kanas, University of California and Veterans Affairs Medical Center, United States

IAC-11.A1.1.6
 THE "US VS. THEM" PHENOMENON: LESSONS FROM A LONG DURATION HUMAN MARS MISSION SIMULATION
 Melissa M. Battler, University of Western Ontario, Canada

IAC-11.A1.1.7
 STUDY OF INTERRELATIONS OF A FUNCTIONAL INTRA-GROUP "LEADER-SLAVE" ROLE AND LEVEL OF STRESS-RESISTANCE WITH DYNAMICS OF NEUROENDOCRINE STATUS IN THE CONDITIONS OF LONG-TERM CONFINEMENT
 Galina Vasylieva, RF SRC - Institute of Biomedical Problems of the RAS, Russia

IAC-11.A1.1.8
 THE EFFECT OF NATURAL SOUND: STRESS-RELATED SALIVARY AMYLASE AND MOOD STATES
 Ayako Ono, Tohoku University Graduate School of Medicine, Japan

IAC-11.A1.1.9
 "DUSK TURNING-DOWN" PHENOMENON DURING 60-DAY HEAD-DOWN BED REST EXPERIMENT
 Jun Wang, Astronaut Center of China, China

IAC-11.A1.1.10
 THE MARS500-EXPERIMENT "6DF" – A TEACHING AND TESTING APPROACH – FIRST RESULTS
 Bernd Johannes, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

**IAC-11.A1.1.11**

FUTURE INTERFACE TECHNOLOGIES FOR MANNED SPACE MISSIONS (poster)

Daniela Markov-Vetter, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A1.1.12

MARS-500 PSYCHOLOGICAL CREW SUPPORT – A CONCEPT FOR FUTURE HUMAN EXPLORATION MISSIONS (poster)

Elena Feichtinger, European Space Agency (ESA), Russia

IAC-11.A1.1.13

PSYCHOLOGICAL, PSYCHOSOCIAL AND PSYCHIATRIC ISSUES AS A PART OF HEALTH AND SAFETY POLICY OF SPACE TOURISM INDUSTRY.(poster)

Rushi Ghadawala, Aryavarta Space Organization, India

IAC-11.A1.1.14

APPLICATION OF EQUIPMENT SONOCARD FOR FUNCTIONAL RESERVES EVALUATION DURING EXTRAVEHICULAR ACTIVITY (poster)

Elena Luchitskaya, Institute for Biomedical Problems, Russia

IAC-11.A1.1.15

MUSIC APPRECIATION AS PSYCHOLOGICAL INTERVENTIONS FOR ASTRONAUTS (poster)

Junting Dong, CASC, China

A1.2. Human Physiology in Space

October 4 2011, 10:00 — TS-15

Chair: *Inessa Kozlovskaya (Institute for Biomedical Problems, Russia); Satoshi Iwase (Aichi Medical University, Japan);*

Rapporteur: *Hanns-Christian Gunga (Charité - University Medicine Berlin, Germany);*

IAC-11.A1.2.1

CAROTID DISTENSIBILITY FOLLOWING A LONG-DURATION STAY ON THE INTERNATIONAL SPACE STATION

Andrew Robertson, University of Waterloo, Canada

IAC-11.A1.2.2

DAY- VS. NIGHT TIME HEART RATE VARIABILITY CHANGES IN MICROGRAVITY: EXPERIMENTS “PNEUMOCARD” AND “SONOCARD”

Irina Funtova, Institute for Biomedical Problems, Russia

IAC-11.A1.2.3

DESIGN OF A BICYCLE SIMULATION FOR EXTENDED DURATION MANNED-SPACEFLIGHT

Nicholas Coombe, University of New South Wales, Australia

IAC-11.A1.2.4

A MATHEMATICAL MODEL OF OXYGEN TRANSPORT IN SKELETAL MUSCLE DURING SPACEFLIGHT

Laura Causey, The City College of New York, United States

IAC-11.A1.2.5

ESTIMATING IN-VIVO VISCOELASTIC PROPERTIES OF SKELETAL MUSCLE FROM THEIR NATURAL VIBRATIONS

Akibi Archer, Georgia Institute of Technology, United States

IAC-11.A1.2.6

DEVELOPMENT OF THE ESA SUBJECT LOADING SYSTEM (SLS) FOR THE NASA SECOND GENERATION TREADMILL T2 ON THE ISS

Dirk Claessens, Qinetiq Space, Belgium

IAC-11.A1.2.7

ACCELERATION ON BOARD THE ISS: 24-7 PHYSICAL ACTIVITY MONITOR FOR ASTRONAUTS

Yoshino Sugita, International Space University (ISU), France

IAC-11.A1.2.8

PRELIMINARY DATA OF CHANGES IN THERMOREGULATION IN ASTRONAUTS ON ISS USING A NEW NON-INVASIVE HEAT FLUX DOUBLESSENSOR

Andreas Werner, Charité - University Medicine Berlin, Germany

IAC-11.A1.2.9

IMMUNE DYSREGULATION IN SPACEFLIGHT

Laura Drudi, McGill University, Canada

IAC-11.A1.2.10

THE EFFECT OF ARTIFICIAL GRAVITY DURING SHORT-TERM EXPOSURE TO SIMULATED MICROGRAVITY ON CARDIOVASCULAR RESPONSES TO ORTHOSTATIC STRESS

Laura Fitzgibbon, Canada

IAC-11.A1.2.11

EFFECTS OF 15 DAY -6 DEGREE HEAD DOWN BED REST (HDBR) ON FEMALE ORTHOSTATIC TOLERANCE

Tan Cheng, China Astronaut Research and Training Center, China

IAC-11.A1.2.12

TRANSMEMBRANE DRUG TRANSPORT IN MICROGRAVITY

Sergi Vaquer Araujo, Universitat Autònoma de Barcelona, Spain

IAC-11.A1.2.13

HYDRAULIC SIMULATION OF THE CARDIOVASCULAR SYSTEM IN SPACE AND POST-FLIGHT (poster)

Niccolo Cymbalist, Concordia University, Canada

IAC-11.A1.2.14

ILLUSIONS IN SPACE: THE IMPACT OF WEIGHTLESSNESS ON OUR PERCEPTION OF AMBIGUOUS IMAGES (poster)

Alexander Melinyshyn, Canada

IAC-11.A1.2.15

CARDIOVASCULAR RESPONSES TO DAILY ACTIVITY AND EXERCISE COUNTERMEASURES ON THE INTERNATIONAL SPACE STATION (poster)

Katelyn Fraser, University of Waterloo, Canada

IAC-11.A1.2.16

STUDY OF OPERATORS UNDER EXTREME CONDITIONS (poster)

Georgi Sotirov, Space and Solar-Terrestrial Research Institute, Bulgarian Academy of Sciences, Bulgaria

IAC-11.A1.2.17

MICROGRAVITY INDUCED CHANGES IN LEFT VENTRICULAR CONFORMATION IN A FINITE ELEMENT MODEL OF THE HEART (poster)

Richard Summers, University of Mississippi, United States

IAC-11.A1.2.18

MONITORING DESYNCHRONIZATION OF THE CIRCADIAN TIMING SYSTEM IN SPACE AND DURING ISOLATION AND CONFINEMENT (poster)

Alexander Christoph Stahn, Center for Space Medicine Berlin (ZWMB), Germany

A1.3. Medical Care for Humans in Space

October 5 2011, 10:00 — TS-09

Chair: *Rupert Gerzer (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Anatoly I. Grigoriev (Russian Academy of Sciences, Russia);*

Rapporteur: *Patrik Sundblad (European Space Agency (ESA), The Netherlands);*

IAC-11.A1.3.1

ADVANCING INNOVATION THROUGH COLLABORATION: IMPLEMENTATION OF THE NASA SPACE LIFE SCIENCES STRATEGY

Jeffrey R. Davis, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States

IAC-11.A1.3.2

PRELIMINARY STUDIES ON THE EVALUATION OF PROBIOTIC EFFECTIVENESS IN SPACEFLIGHT

Vyacheslav Ilyin, RF SRC - Institute of Biomedical Problems of the RAS, Russia

IAC-11.A1.3.3

MEDICAL CARE FOR TEENAGERS IN SPACE: VIEW FROM THE FLIGHT PAEDIATRICIAN

Igor Fierens, United Kingdom

IAC-11.A1.3.4

SURGERY IN SPACE: WHERE ARE WE NOW?

Marlene Grenon, University of California, San Francisco, United States

IAC-11.A1.3.5

PRESENTATIVE SURGICAL REMOVAL OF THE APPENDIX PRIOR TO A SPACE-FARING MISSION

Barbara Wysocki, University of Alberta, Canada

IAC-11.A1.3.6

AUTOMATED, MINIATURIZED INSTRUMENT FOR SPACE BIOLOGY APPLICATIONS AND THE MONITORING OF THE ASTRONAUT'S HEALTH ONBOARD THE ISS

Fathi Karouia, National Aeronautics and Space Administration (NASA)/Ames Research Center, United States

IAC-11.A1.3.7

USING DIAGNOSTIC AND MATHEMATICAL MODELS TO DETERMINE RED BLOOD CELL DESTRUCTION RESULTING FROM SPACE FLIGHT ANEMIA

Romy Seth, University of Toronto, Canada

IAC-11.A1.3.8

THE EFFECT OF MODERATE DIETARY SALT REDUCTION ON BLOOD PRESSURE IN YOUNG HEALTHY MALE SUBJECTS DURING THE MARSS00 PROJECT.

Kathrin Jüttner, Germany

IAC-11.A1.3.9

JBR GROUP STUDY OF BIO-MEDICAL EXPERIMENTS RESULTS:

MDRS CREW 100B ILEWG EUROMOONMARS CREW

Balwant Rai, Kepler Space University, United States

IAC-11.A1.3.10

TELEHEALTH CONCEPT FOR MEDICAL CARE DURING EXPLORATION-CLASS MISSIONS

Annie Martin, Ecole Polytechnique de Montreal, Canada

IAC-11.A1.3.11

STRESS AND IMMUNE CHANGES DURING 5 DAYS OF SHORT TERM BED REST IN -6 DEGREES HEAD DOWN TILT AND ARTIFICIAL GRAVITY INTERVENTIONS

Matthias Feuerecker, University of Munich, Germany

IAC-11.A1.3.12

SALIVARY HORMONES, CEREBRAL BLOOD FLOWS, RESPIRATORY PATTERNS AND CARDIOVASCULAR RESPONSES TO ACTIVE STANDING AND PASSIVE HEAD UP TILT

Nandu Goswami, Medical Universitz of Graz, Austria

A1.4. Radiation Fields, Effects and Risks in Human Space Missions

October 5 2011, 15:00 — TS-09

Chair: *Günther Reitz (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Giovanni De Angelis (SERCO S.p.A, Italy);*

Rapporteur: *Nicole Buckley (Canadian Space Agency, Canada);*

IAC-11.A1.4.1

CURRENT STATUS AND RESULTS OF THE HAMLET PROJECT

Günther Reitz, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A1.4.2

FURTHER ANALYSIS OF THE SPACE SHUTTLE EFFECTS ON THE ISS SAA DOSES

Tsvetan Dachev, Space and Solar-Terrestrial Research Institute, Bulgarian Academy of Sciences, Bulgaria

IAC-11.A1.4.3

PREPARING FOR ACTIVE PERSONAL DOSIMETRY ON THE INTERNATIONAL SPACE STATION

Lawrence Pinsky, University of Houston, United States

IAC-11.A1.4.4

RECENT OBSERVATIONS OF SPACE RADIATION ENVIRONMENT IN A HUMAN PHANTOM ONBOARD ISS BY LIULIN-5 PARTICLE TELESCOPE

Jordanka Semkova, Space and Solar-Terrestrial Research Institute, Bulgarian Academy of Sciences, Bulgaria

IAC-11.A1.4.5

COMBINED TRITEL/PILLE COSMIC RADIATION AND DOSIMETRIC MEASUREMENTS (COCORAD) IN THE BEXUS PROJECT

Balazs Zabori, Budapest University of Technology and Economics, Hungary

IAC-11.A1.4.6

LUNAR RADIATION ENVIRONMENT: FINAL COMPARISONS BETWEEN MODELS AND THE CHANDRAYAAN-1 RADOM EXPERIMENT DATA

Giovanni De Angelis, SERCO S.p.A, Italy

IAC-11.A1.4.7

COMPARISON OF THE EXPERIMENTAL DATA AND NUMERICAL SIMULATION FOR THE PRODUCTION OF COSMOGENIC NUCLIDES ON THE LUNAR SURFACE

Kyeong Ja Kim, Korea, Republic of

IAC-11.A1.4.8

MARS SYSTEM RADIATION ENVIRONMENT MODELING FOR THE LIULIN-PHOBUS INVESTIGATION OF THE PHOBOS SAMPLE RETURN MISSION

Giovanni De Angelis, SERCO S.p.A, Italy

IAC-11.A1.4.9

ESTIMATES OF CARRINGTON-CLASS SOLAR PARTICLE EVENT RADIATION EXPOSURES AS A FUNCTION OF ALTITUDE IN THE ATMOSPHERE OF MARS

Lawrence W. Townsend, University of Tennessee, United States

IAC-11.A1.4.10

RADIATION SHIELDING OF LUNAR REGOLITH/POLYETHYLENE COMPOSITES AND LUNAR REGOLITH/WATER MIXTURES

Quincy Johnson, Prairie View A&M University, United States

IAC-11.A1.4.11

NASA SPACE RADIATION RESEARCH SUMMER SCHOOL

Dudley Goodhead, NASA, United Kingdom

IAC-11.A1.4.12

THE EFFECT OF ACUTE DOSE CHARGE PARTICLE RADIATION ON EXPRESSION OF DNA REPAIR GENES IN MICE

Christina Randall, Texas Southern University, United States

IAC-11.A1.4.13

IDENTIFICATION OF TISSUE-SPECIFIC MICRORNA RESPONSE IN MICE FOLLOWING EXPOSURE TO ENERGETIC PROTONS

Olufisayo Jejelowo, Texas Southern University, United States

IAC-11.A1.4.14

EFFECTS OF SPACEFLIGHT ON CANDIDA ALBICANS

Nellen Nwaobasi, Texas Southern University, United States

IAC-11.A1.4.15

ANALYSIS OF THE SPACE RADIATION EFFECT ON THE NEMATODE C.ELEGANS THROUGH THE GROUND SIMULATION OF THE LONG DURATION SPACE FLIGHT

Soyeon Yi, Korea Aerospace Research Institute, Korea, Republic of



**IAC-11.A1.4.16**

JBR STUDY OF HUMAN FACTORS IN MARS ANALOGUE: MDRS CREW 100B ILEWVG EUROMOONMARS CREW

Balwant Rai, Kepler Space University, United States

A1.5. Astrobiology and Exploration

October 6 2011, 10:00 — TS-09

Chair: Petra Rettberg (*Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*); Pascale Ehrenfreund (*Space Policy Institute, George Washington University, United States*);

Rapporteur: Inge ten Kate (*National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States*);

IAC-11.A1.5.1

THE CAREX PROJECT AND ROADMAP FOR RESEARCH ON LIFE IN EXTREME ENVIRONMENTS

Nicolas Walter, European Science Foundation, France

IAC-11.A1.5.2

SULFUR ISOTOPES AS A PROXY FOR EARLY EARTH ATMOSPHERE: CONSTRAINTS FOR HABITABILITY ON OTHER PLANETS

Kristyn Rodzinyak, McGill University, Canada

IAC-11.A1.5.3

ASTROBIOLOGY ANALOGUE FIELD RESEARCH SUPPORTING SPACE MISSIONS

Bernard Foing, European Space Agency (ESA), The Netherlands

IAC-11.A1.5.4

CATALYTIC PEPTIDE HYDROLYSIS BY MINERAL SURFACE: IMPLICATIONS FOR THE ORIGIN OF LIFE ON PLANETARY SURFACES

Karina Marshall-Bowman, International Space University (ISU), United States

IAC-11.A1.5.5

MINIATURIZED SUBMERSIBLE FOR EXPLORATION OF AQUEOUS ENVIRONMENTS ON EARTH AND BEYOND

Jonas Jonsson, Uppsala University - Ångström Space Technology Centre, Sweden

IAC-11.A1.5.6

ANALYSIS OF MICROBIAL DIVERSITY BY PCR IN A MARS ANALOGUE ENVIRONMENT – THE MARS DESERT RESEARCH STATION

Cora S. Thiel, University of Muenster, Germany

IAC-11.A1.5.7

AUTOMATED, MINIATURIZED INSTRUMENT FOR MEASURING GENE EXPRESSION IN SPACE - THE DOORS TO NEW BIOLOGY IN SPACE

Andrew Pohorille, National Aeronautics and Space Administration (NASA)/Ames Research Center, United States

IAC-11.A1.5.8

DEVELOPMENT OF AN AUTOMATED SAMPLE EXTRACTION AND PREPARATION SYSTEM FOR ASTROBIOLOGY IN SITU RESEARCH APPLICATIONS

Kennda Lynch, Colorado School of Mines, United States

IAC-11.A1.5.9

IRON/SULFUR BACTERIA AS MODEL ORGANISMS FOR A PUTATIVE MARTIAN ECOSYSTEM

Petra Rettberg, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A1.5.10

ANTARCTIC COLD DESERT HYPOLITHS - ASTROBIOLOGICAL MODELS OF CRYPTIC LIFE

Don Cowan, University of the Western Cape, South Africa

IAC-11.A1.5.11

DETECTION OF METABOLIC ACTIVITY BY 125I- IODODEOXYURIDINE INCORPORATION INTO DNA IN COLWELLIA PSYCHRERYTHRAEA OVER A TEMPERATURE RANGE FROM 8°C TO -40°C

Fathi Karouia, National Aeronautics and Space Administration (NASA)/Ames Research Center, United States

IAC-11.A1.5.12

PRELIMINARY RESULTS FROM A CREWED MARS EXPLORATION SIMULATION AT THE RIO TINTO ANALOGUE SITE

Gernot Groemer, Austrian Space Forum, Austria

IAC-11.A1.5.13

CRYPTIC DESERT BIOTOPES AS MARTIAN ANALOGUES (poster)

Thulani Makhalanyane, University of the Western Cape, South Africa

IAC-11.A1.5.14

EXPLORING THE MICROBIAL DIVERSITY OF A MARS-LIKE ANTARCTIC ENVIRONMENT (poster)

Francesca Stomeo, University of the Western Cape, South Africa

IAC-11.A1.5.15

HYPERVELOCITY ARTIFICIAL METEOROID EXPERIMENT (HAME) – A FEASIBILITY STUDY (poster)

Jorgina Busquets, EADS Astrium, United Kingdom

A1.6. Life Support and EVA Systems

October 6 2011, 15:00 — TS-09

Chair: Chiaki Mukai (*Japan Aerospace Exploration Agency (JAXA), Japan*); Bernhard Koch (*Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*);

Rapporteur: Terrence G. Reese (*National Aeronautics and Space Administration (NASA), United States*);

IAC-11.A1.6.1

A PROMISING METHOD OF LIQUID SEPARATION IN ORBITAL STATIONS' LIFE SUPPORT SYSTEMS

Anna Kapitsa, Russia

IAC-11.A1.6.2

CARBON DIOXIDE REMOVAL SYSTEM FOR CLOSED LOOP ATMOSPHERE REVITALIZATION, CANDIDATE SORBENTS SCREENING AND TEST RESULTS

Emily Mattox, University of Alabama in Huntsville, United States

IAC-11.A1.6.3

MICROBIOLOGICAL CHARACTERISTICS OF THE ENVIRONMENT OF THE INTERNATIONAL SPACE STATION

Nataliya Novikova, Institute for Biomedical Problems of the Russian Academy of Sciences, Russia

IAC-11.A1.6.4

DEVELOPMENT OF EVA SUIT DESIGN AND OPERATIONAL PROCEDURES FOR LUNAR EXPLORATION

Vinita Marwaha, VEGA Space GmbH, United Kingdom

IAC-11.A1.6.5

EVA OPERATIONS AROUND A NEAR EARTH ASTEROID

Maria Antonietta Viscio, Thales Alenia Space Italia, Italy

IAC-11.A1.6.6

ENVIRONMENTAL CONTROL AND LIFE SUPPORT SYSTEMS FOR HUMAN EXPLORATION MISSIONS TO NEAR EARTH OBJECTS AND BEYOND

Emil Nathanson, University of Stuttgart, Germany

IAC-11.A1.6.7

STUDY ON THE TECHNIQUE OF SIMULATED SPACE WASTEWATER TREATMENT WITH A BIOREACTOR

Weidang Ai, China Astronaut Research and Training Center, China

IAC-11.A1.6.8

REGENERATIVE LIFE SUPPORT SYSTEMS UTILIZED DURING AN INITIAL STAGE OF MANNED LUNAR BASE CONSTRUCTION

Leonid Bobe, NIICHIMMASH, Russia

IAC-11.A1.6.9

ON THE DEVELOPMENT OF A UREA FUEL CELL INTERFACED DOC SYSTEM: HARVESTING ENERGY FROM WASTEWATER

Eduardo Nicolau, University of Puerto Rico, Puerto Rico

IAC-11.A1.6.10

STUDY OF SELECTING ON LIGHT SOURCE USED FOR MICRO-ALGAE CULTIVATION IN SPACE

Weidang Ai, China Astronaut Research and Training Center, China

IAC-11.A1.6.11

GREENHOUSE REGENERATIVE AGRICULTURE FOR SPACE SYSTEMS – A NEW RESEARCH INITIATIVE AT THE GERMAN AEROSPACE CENTER (DLR)

Daniel Schubert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A1.6.12

PLANTING THE SEED FOR FUTURE REMOTE TERRESTRIAL AND SPACE-BASED PLANT PRODUCTION SYSTEMS: RECENT OPERATIONS OF THE ARTHUR CLARKE MARS GREENHOUSE

Matthew Bamsey, University of Guelph, Canada

IAC-11.A1.6.13

MICRO-CLIMATE CONTROL DEVELOPMENT, LIMITATIONS, AND OPTIMIZATION FOR LOW PRESSURE SPACE GREENHOUSES

Joshua Nelson, United States

IAC-11.A1.6.14

ENVIHAB – A NEW, ANALOGUE RESEARCH FACILITY AT THE GERMAN AEROSPACE CENTER DLR

Elke Rabbow, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A1.6.16

PROPOSAL OF EXPERIMENTAL REPRODUCTION METHOD OF VARIABLE GRAVITY AND GAIT ANALYSIS OF BIPED ROBOT (poster)

Yusuke Matsumoto, Keio University, Japan

IAC-11.A1.6.17

ANALYSIS OF WALKING UNDER MICROGRAVITY USING PASSIVE WALKING RIMLESS WHEEL (poster)

Tatsuhiko Ikeda, Keio University, Japan

A1.7. Biology in Space

October 7 2011, 09:00 — TS-09

Chair: Catharine Conley (*National Aeronautics and Space Administration (NASA), United States*); Ludmila Buravkova (*Institute for Biomedical Problems, Russia*);

Rapporteur: Jancy C. McPhee (*National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States*);

IAC-11.A1.7.1

MICROGRAVITY MODELS TO INVESTIGATE CELLULAR MECHANISMS IN MICROGRAVITY-INDUCED BONE LOSS

Laura Rose, University of Alberta, Canada

IAC-11.A1.7.2

DETERMINING THE EFFECTS OF SIMULATED MICROGRAVITY ON THE DEVELOPMENT OF CRANIAL NEURAL CREST-DERIVED TISSUES

Sara Edsall, Canada

IAC-11.A1.7.3

HYPERGRAVITY EFFECTS ON PROLIFERATION AND DIFFERENTIATION OF C2C12 MUSCLE-LIKE CELLS

Gianni Ciofani, Italian Institute of Technology (ITT), Italy

IAC-11.A1.7.4

TERRAFORMING MARS - A POSSIBILITY OR DAYDREAM IN THE 21ST CENTURY

TOBILOBA IDOWU, Nigeria

IAC-11.A1.7.5

REORIENTATION OF CORTICAL MICROTUBULES IN HYPOCOTYL CELLS OF ARABIDOPSIS THALIANA UNDER CLINOROTATION

Zhang Yue, China

IAC-11.A1.7.6

ANTIMICROBIAL TESTING IN REDUCED GRAVITY ENVIRONMENTS

David Joseph Smith, University of Washington, United States

IAC-11.A1.7.7

ANALYSIS OF THROMBUS FORMATION DYNAMICS IN ADAMTS13-/- MICE AFTER ENDOTHELIAL INJURY

Christopher Skipwith, University of Pennsylvania, United States

IAC-11.A1.7.8

EFFECTS OF DIFFERENT MODALITIES OF SIMULATED MICROGRAVITY ON EMBRYONIC DEVELOPMENT OF ZEBRAFISH, DANIO RERIO

Matthew Stoyek, Dalhousie University, Canada

IAC-11.A1.7.9

FURTHER DEVELOPMENT ON CONTROVERSIAL VIEW OF TERRESTRIAL AND EXTRATERRESTRIAL ORIGINS OF LIFE

BRIJ TEWARI, University of Guyana, Guyana

IAC-11.A1.7.10

AQUATIC ANIMAL EXPERIMENT ON THE ISS AND THE AQUATIC HABITAT

Nobuyoshi FUJIMOTO, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A1.7.11

POSTFLIGHT INVESTIGATION OF ASTROBIOLOGICAL FACILITIES EXPOSE-E AND EXPOSE-R

Carlos Pereira, RUAG Space, Switzerland

IAC-11.A1.7.12

CRANFIELD ASTROBIOLOGICAL STRATOSPHERIC SAMPLING EXPERIMENT (CASS•E): OVERALL PERFORMANCE OF THE EXPERIMENT DURING FLIGHT AND PARTICLE COLLECTION FILTER ANALYSIS

Clara M. Juanes-Vallejo, Cranfield University, United Kingdom

IAC-11.A1.7.13

EFFECTS OF PHOTOBIOMODULATION IN OSTEOCLAST FORMATION IN VITRO: A PILOT STUDY

Lisa Anderson-Antle, NASA Exploration Systems Mission Directorate - Wisconsin Space Grant Consortium Fellowship, United States

IAC-11.A1.7.14

ROLE OF CURCUMIN AGAINST MODELED MICROGRAVITY-INDUCED INFLAMMATORY PATHWAYS

Anita Lewis, Texas Southern University, United States

A1.8. Living In Space - Education and Outreach in Space Life Sciences and Infrastructure Development for Capacity Building

October 7 2011, 14:00 — TS-09

Chair: Andrea Boese (*Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*); Marilyn Steinberg (*Canadian Space Agency, Canada*); Lyn Wigbels (*American Astronautical Society (AAS), United States*);

Rapporteur: Rachid Amekrane (*Astrium GmbH, Germany*); Marlene MacLeish (, United States);



IAC-11.E1.7.-A1.8.1

THE FRENCH SOUTH AFRICAN INSTITUTE OF TECHNOLOGY POSTGRADUATE PROGRAMME IN SATELLITE SYSTEMS ENGINEERING – SKILLS DEVELOPMENT FOR THE SOUTH AFRICAN SPACE INDUSTRY

Robert Van Zyl, Cape Peninsula University of Technology, South Africa

IAC-11.E1.7.-A1.8.2

THE COSPAR CAPACITY BUILDING INITIATIVE
Carlos Gabriel, European Space Agency (ESA), Spain

IAC-11.E1.7.-A1.8.3

THE UNITED NATION'S POSTGRADUATE DIPLOMA PROGRAMME IN SPACE SCIENCE AND TECHNOLOGY APPLICATIONS: THE NIGERIAN EXPERIENCE

Oladosu Olakunle, Obafemi Awolowo University, Nigeria

IAC-11.E1.7.-A1.8.4

SPACE: EDUCATION FOR EVERYBODY: EVERYWHERE
Antonio Eduardo Gutierrez Nava, Centre National d'Etudes Spatiales (CNES), France

IAC-11.E1.7.-A1.8.5

MISSION X: TRAIN LIKE AN ASTRONAUT PILOT STUDY
Charles Lloyd, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.7.-A1.8.6

THE EUROPEAN ALTERED GRAVITY STUDENT NETWORK
Tariq Al-Marahleh Montes, LEEM, Spain

IAC-11.E1.7.-A1.8.7

GLOBAL PARTNERSHIPS: EXPANDING THE FRONTIERS OF SPACE EXPLORATION EDUCATION
Marlene MacLeish, United States

IAC-11.E1.7.-A1.8.8

ISS EDUCATION PROGRAM "JAXA SEEDS IN SPACE I"
Tamotsu Nakano, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E1.7.-A1.8.9

COMMUNICATING SPACE LIFE SCIENCES - SOME GENERIC REFLECTIONS ABOUT PUBLIC RELATIONS AND MEDIA ACTIVITIES
Mathias Spude, Astrium GmbH, Germany

IAC-11.E1.7.-A1.8.9

FRAGILE OASIS: CONNECTING SPACE AND EARTH. LEARN. ACT. MAKE A DIFFERENCE.
Beth Beck, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.7.-A1.8.10

THE IMPORTANCE OF REACHING OUT TO SOCIETY: EDUCATION ENABLES US TO ENVISION AND PURSUE OUR DREAMS
Chiaki Mukai, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A2.1.1

DEVELOPMENT OF A SATELLITE AND LUNAR LASER RANGER AND ITS FUTURE APPLICATIONS IN SOUTH AFRICA
Ludwig Combrinck, South Africa

IAC-11.A2.1.2

USING SOLAR SAILS TO TEST FUNDAMENTAL PHYSICS
Roman Ya. Kezerashvili, New York City College of Technology, United States

IAC-11.A2.1.3

3D SIMULATIONS OF GRANULAR GAS IN A VIBRATING BOX: DEMONSTRATION OF A LARGE BOUNDARY EFFECT DUE TO DISSIPATION BY COLLISIONS WHICH IS NOT PROBAGATING SHOCK WAVE

Pierre Evesque, Ecole Centrale de Paris, France

IAC-11.A2.1.4

ACES (ATOMIC CLOCK ENSEMBLE IN SPACE) MISSION STATUS AND OUTLOOK

Marc Peter Hess, Astrium Space Transportation, Germany

IAC-11.A2.1.5

PROSPECTS FOR APPLICATIONS OF COLD ATOMS IN MICROGRAVITY ENVIRONMENT
Claus Laemmerzahl, ZARM - University of Bremen, Germany

IAC-11.A2.1.6

MAIUS - A ROCKET BORNE ATOM-OPTICAL EXPERIMENT
Stephan Seidel, Leibniz Universität Hannover, Germany

IAC-11.A2.1.7

PRE-FLIGHT VERIFICATION OF THE DIFFERENTIAL ACCELEROMETERS OF THE MICROSCOPE MISSION
Guillaume Pionnier, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France

IAC-11.A2.1.8

ADAPTION OF HPS TO THE MICROSCOPE MISSION
Meike List, ZARM - University of Bremen, Germany

IAC-11.A2.1.9

SPACE-QUEST: MISSION PROPOSAL FOR QUANTUM OPTICS EXPERIMENTS IN SPACE
Rupert Ursin, Austrian Academy of Sciences, Austria

IAC-11.A2.1.10

QUANTUS I – PERFORMING ATOM OPTICAL EXPERIMENTS IN THE DROP TOWER BREMEN
Hauke Müntinga, ZARM - University of Bremen, Germany

IAC-11.A2.1.11

MATTER WAVE INTERFEROMETRY IN MICROGRAVITY AND ITS APPLICATIONS FOR HIGH PRECISION MEASUREMENTS AND EARTH OBSERVATION

Markus Krutzik, Humboldt University of Berlin, Germany

A2.2. Fluid and Materials Sciences

October 5 2011, 10:00 — TS-16

Chair: Raimondo Fortezza (Telespazio Italy); Nickolay N. Smirnov (Moscow Lomonosov State University, Russia);

Rapporteur: Jean-Claude Legros (Université Libre de Bruxelles, Belgium);

IAC-11.A2.2.1

NUMERICAL SIMULATIONS ON THE STABILITY OF PREMIXED SPHERICAL FLAMES UNDER MICRO-GRAVITY CONDITIONS
Kai Schneider, CNRS - L3M - IMT, France

IAC-11.A2.2.2

SUPERCOMPUTER MODELING OF POLY-DISPERSED SPRAYS EVAPORATION AND COMBUSTION IN A HEATED ATMOSPHERE
Nickolay N. Smirnov, Moscow Lomonosov State University, Russia

IAC-11.A2.2.3

FEASIBILITY STUDY FOR APPLICATION OF OPTICAL TWO WAVELENGTH TECHNIQUES TO MEASUREMENT OF THE SORET COEFFICIENTS IN TERNARY MIXTURES
Valentina Shevtsova, Université Libre de Bruxelles, Belgium

IAC-11.A2.2.4

EVAPORATION EFFECTS ON THERMOCAPILLARY CONVECTION IN VAPOR-LIQUID SYSTEM
Qiu-Sheng Liu, Institute of Mechanics, Chinese Academy of Sciences, China

IAC-11.A2.2.5

THREE-DIMENSIONAL NUMERICAL SIMULATION OF BUBBLE DYNAMICS, OSCILLATION AND BREAKUP UNDER FORCED VIBRATION IN MICROGRAVITY
Mohammad Movassat, University of Toronto, Canada

IAC-11.A2.2.6

TWO DEGREE OF FREEDOM MODEL OF CHAOTIC DRIPPING IN REDUCED GRAVITY
Barnaby Osborne, Kingston University, United Kingdom

IAC-11.A2.2.7

CONFINED AND NOT CONFINED NUCLEATE BOILING UNDER TERRESTRIAL AND MICROGRAVITY CONDITIONS
Reinaldo Rodrigues de Souza, Universidade Federal de Santa Catarina UFSC, Brazil

IAC-11.A2.2.8

MICROGRAVITY EXPERIMENTS ON THE COLUMNAR-EQUIAXED TRANSITION IN SOLIDIFICATION OF THE TRANSPARENT ALLOY SYSTEM NEOPENTYLGLYCOL-CAMPHOR
Laszlo Sturz, Access e.V., Germany

IAC-11.A2.2.9

EXPERIMENTAL AND NUMERICAL STUDY OF IMPINGING BUBBLY JETS IN MICROGRAVITY CONDITIONS
Francesc Suñol, Universitat Politècnica de Catalunya (UPC), Spain

IAC-11.A2.2.10

SURFACE TENSION EFFECTS ON MICROGRAVITY BOILING
Eric Becnel, University of Alabama in Huntsville, United States

IAC-11.A2.2.11

THERMO-ELECTRO-HYDRODYNAMIC INSTABILITIES IN A DIELECTRIC LIQUID UNDER MICROGRAVITY
Innocent Mutabazi, Université du Havre, France

IAC-11.A2.2.12

FLUID FLOW ANALYSIS FOR PULSE DETONATION THRUSTERS (poster)
Yuriy Philippov, Faculty of Mechanics and Mathematics Moscow M.V.Lomonosov State University, Russia

IAC-11.A2.2.13

NUMERICAL SIMULATION OF RAREFIED MULTI-PHASE PLUME FLOWS AT HIGH ALTITUDES (poster)
Jie Li, National University of Defense Technology, China

A2.3. Microgravity Experiments from Sub-Orbital to Orbital Platforms

October 5 2011, 15:00 — TS-16

Chair: Ziad Saghir (Ryerson University, Canada); Raffaele Savino (University of Naples "Federico II", Italy);

Rapporteur: Vladimir Pletser (European Space Agency (ESA), The Netherlands);

IAC-11.A2.3.1

DLR MATERIAL PHYSICS ROCKET MAPHEUS: DEVELOPMENT, EXPERIMENT OVERVIEW AND RESEARCH
Martin Siegl, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A2.3.2

THE FIRST JOINT EUROPEAN PARTIAL-G PARABOLIC FLIGHT CAMPAIGN: A JOINT APPROACH BETWEEN ESA, CNES AND DLR TO CONDUCT SCIENCE AND TO PREPARE EXPLORATION AT MOON AND MARS GRAVITY LEVELS
Vladimir Pletser, European Space Agency (ESA), The Netherlands

IAC-11.A2.3.3

CARBON NANOTUBES EXPERIMENT IN MICROGRAVITY
Alessandro La Neve, Brazil

IAC-11.A2.3.4

ROBUST REACTION CONTROL OF SPACE MANIPULATORS: THEORY AND SIMULATED MICROGRAVITY TESTS
Silvio Cocuzza, CISAS – "G. Colombo" Center of Studies and Activities for Space, University of Padova, Italy

IAC-11.A2.3.5

MICRO-GRAVITY EXPERIMENTS OF TEMPERATURE GRADIENT INDUCED DUST EJECTIONS FROM PLANETARY SURFACES ONBOARD A PARABOLIC FLIGHT
Tim Jankowski, Universität Duisburg-Essen, Germany

IAC-11.A2.3.6

INVESTIGATION TO DETERMINE ROTATIONAL STABILITY OF ON-ORBIT PROPELLANT STORAGE AND TRANSFER SYSTEMS UNDERGOING OPERATIONAL FUEL TRANSFER SCENARIOS
Nathan Silvernail, Embry Riddle Aeronautical University, United States

IAC-11.A2.3.7

REXUS 12 SUAINETH EXPERIMENT: DEPLOYMENT OF A WEB IN MIRCOCRAVITY CONDITIONS USING CENTRIFUGAL FORCES
Thomas Sinn, University of Strathclyde/Advanced Space Concept Laboratory, United Kingdom

IAC-11.A2.3.8

THE PLATFORM FOR ACQUISITION OF ACCELERATION DATA II (PAANDA II) – AN INSTRUMENT TO MONITOR RESIDUAL ACCELERATIONS IN MICROGRAVITY ENVIRONMENTS
Marcelo C. Tosin, State University of Londrina, Brazil

IAC-11.A2.3.9

HEATER-INDUCED THERMAL EFFECTS ON THE DRAG FREE TEST MASSES OF LISA PATHFINDER
Ferran Gibert Gutiérrez, Institut d'Estudis Espacials de Catalunya, Spain

IAC-11.A2.3.10

THE MICROGRAVITY MISSIONS IN BRAZILIAN INSTITUTE OF AERONAUTICS AND SPACE.
Flávio de Azevedo Corrêa, Jr, Instituto de Aeronáutica e Espaço (IAE), Brazil

IAC-11.A2.3.11

SOUNDING ROCKETS: A SPECIAL PLATFORM FOR MICROGRAVITY RESEARCH
Antonio Verga, European Space Agency (ESA), The Netherlands

IAC-11.A2.3.12

TECHNOLOGY DEVELOPMENT FOR FUNDAMENTAL PHYSICS SPACE MISSIONS AIMING AT HIGH PRECISION GRAVITATIONAL FIELD MEASUREMENTS
Hanns Selig, ZARM - University of Bremen, Germany

IAC-11.A2.3.13

INVERTASE ENZYME BIOCHEMICAL REACTION EXPERIMENT IN MICROGRAVITY (poster)
Alessandro La Neve, Brazil



A2.4. Science Results from Ground Based Research

October 6 2011, 10:00 — TS-16

Chair: Valentina Shevtsova (*Université Libre de Bruxelles, Belgium*); Antonio Viviani (*Seconda Università di Napoli, Italy*);

Rapporteur: Nickolay N. Smirnov (*Moscow Lomonosov State University, Russia*);

IAC-11.A2.4.1

PRELIMINARY STUDY ON THE ESTIMATION OF HORIZONTAL DILUTION POTENTIAL OF AIR POLLUTANTS OVER SOME CITIES IN NIGERIA USING WIND DATA

Bernadette Isikwue, *University, Nigeria*

IAC-11.A2.4.2

IGNITION PROPERTIES OF COMBUSTIBLE SOLIDS IN A SIMULATED LOW-GRAVITY ENVIRONMENT

Shuang-Feng Wang, *Institute of Mechanics, Chinese Academy of Sciences, China*

IAC-11.A2.4.3

FLUSHING OUT ENTRAPPED VISCOUS FLUID FROM POROUS MEDIUM

Nickolay N. Smirnov, *Moscow Lomonosov State University, Russia*

IAC-11.A2.4.4

THE SURFACE OSCILLATION OF THERMOCAPILLARY CONVECTION IN SHALLOW ANNULAR POOLS

Qi KANG, *National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences., China*

IAC-11.A2.4.5

ANALYSIS OF HEAT TRANSFER ACROSS LIQUID/GAS INTERFACE IN CYLINDRICAL COLUMN

Yury Gaponenko, *University of Brussels, Belgium*

IAC-11.A2.4.6

EFFECT OF HEAT TRANSFER THROUGH FREE SURFACE ON BUOYANT-THERMOCAPILLARY CONVECTION IN THIN LIQUID LAYERS

Li DUAN, *National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences., China*

IAC-11.A2.4.7

EXPRESSIONS FOR THE EVAPORATION AND CONDENSATION COEFFICIENTS IN THE HERTZ-KNUDSEN RELATION

Aaron Persad, *University of Toronto, Canada*

IAC-11.A2.4.8

BUBBLE AND SLUG FLOWS CHARACTERISTIC LENGTHS IN A MICROCHANNEL

Santiago Arias, *Universitat Politècnica de Catalunya (UPC), Spain*

IAC-11.A2.4.9

THE THERMOLAB PROJECT: THERMOPHYSICAL PROPERTY MEASUREMENTS IN AN ELECTROMAGNETIC LEVITATION DEVICE UNDER REDUCED GRAVITY CONDITIONS

Hans Fecht, *University Ulm, Germany*

IAC-11.A2.4.10

INVESTIGATION OF TWO-PHASE INTERFACIAL BEHAVIORS ON PROPELLANT REORIENTATION IN DROP TOWER

Qiu-Sheng Liu, *Institute of Mechanics, Chinese Academy of Sciences, China*

IAC-11.A2.4.11

ON THE EVALUATION OF THERMODIFFUSION AND SIMULATION OF CONVECTION IN SEMICONDUCTOR-MOLTEN METAL MIXTURES

Elham Jafar-Salehi, *Ryerson University, Canada*

IAC-11.A2.4.12

NON-EQUILIBRIUM SOLIDIFICATION, MODELLING FOR MICROSTRUCTURE ENGINEERING OF INDUSTRIAL ALLOYS (NEQUISOL)

Dieter Herlach, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

A2.5. Facilities and Operations of Microgravity Experiments

October 6 2011, 15:00 — TS-16

Chair: Marcus Dejmek (*Canadian Space Agency, Canada*); Rainer Willnecker (*Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*);

Rapporteur: Peter Hofmann (*Kayser-Threde GmbH, Germany*);

IAC-11.A2.5.1

ELECTRO-MAGNETIC LEVITATOR - A WORKING HORSE FOR MATERIALS SCIENCE EXPERIMENT ON ISS

Ulrich Kuebler, *Astrium GmbH, Germany*

IAC-11.A2.5.2

ELECTROSTATIC LEVITATION FURNACE FOR ISS/KIBO

Keiji Murakami, *Japan Aerospace Exploration Agency (JAXA), Japan*

IAC-11.A2.5.3

TRANSPARENT ALLOYS, A MULTI-USE FACILITY FOR DIRECTIONAL SOLIDIFICATION EXPERIMENTS IN ISS

Dirk Claessens, *Qinetiq Space, Belgium*

IAC-11.A2.5.4

DECLIC, SOON TWO YEARS OF SUCCESSFUL OPERATIONS

Gabriel Pont, *Centre National d'Études Spatiales (CNES), France*

IAC-11.A2.5.5

THE MICROGRAVITY VIBRATION ISOLATION SUBSYSTEM PERFORMANCE RESULTS FOR THE EUROPEAN SPACE AGENCY'S FLUID SCIENCE LABORATORY

Derrick Piontek, *Canadian Space Agency, Canada*

IAC-11.A2.5.6

ELECTRONIC DESIGN FOR CHINESE MICROGRAVITY ACTIVE VIBRATION ISOLATION SYSTEM

Wenbo Dong, *Chinese Academy of Sciences, China*

IAC-11.A2.5.7

DRAGONLAB PAYLOAD CONSOLIDATION AND EXPORT CONTROL FRAMEWORKS

Dustin Doud, *SpaceX, United States*

IAC-11.A2.5.8

20TH ANNIVERSARY OF MICROGRAVITY EXPERIMENTS AT THE DROP TOWER BREMEN AND 25TH ANNIVERSARY OF THE CENTER OF APPLIED SPACE TECHNOLOGY AND MICROGRAVITY (ZARM)

Thorben Könnemann, *ZARM Fab GmbH, Germany*

IAC-11.A2.5.9

RE-ENTRY ANALYSIS OF RESEARCH ROCKETS PAYLOADS

Andreas Stamminger, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.A2.5.10

THE IMPROVED ORION SOUNDING ROCKET AS A VEHICLE FOR STUDENT EXPERIMENTS.

Mark Uitendaal, *Swedish Space Corporation, The Netherlands*

A2.6. Microgravity Sciences Onboard the International Space Station and Beyond

October 7 2011, 09:00 — TS-16

Chair: Jules Kenol (*National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States*); Rodolfo Monti (*University of Naples "Federico II", Italy*);

Rapporteur: Christoph Pütz (*Astrium Space Transportation, Germany*);

IAC-11.A2.6.1

ISS RESEARCH PRIORITIES OF THE GERMAN PHYSICAL SCIENCES PROGRAM

Rainer Kuhl, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.A2.6.2

APPLICATIONS OF ISS EXPERIMENTAL RESULTS TO SPACECRAFT SYSTEMS DESIGN: EXAMPLES IN CAPILLARITY

Mark Weislogel, *Portland State University, United States*

IAC-11.A2.6.3

FLOW STABILITY EXPERIMENTS ON THE INTERNATIONAL SPACE STATION (ISS)

Peter Canfield, *ZARM - University of Bremen, Germany*

IAC-11.A2.6.4

NUCLEATE BOILING IN LONG-TERM CRYOGENIC PROPELLANT STORAGE IN MICROGRAVITY

Cyrill B. Muratov, *United States*

IAC-11.A2.6.5

STUDY OF HEAT TRANSFER ENHANCEMENT BY VIBRATIONS IN THE MICROGRAVITY EXPERIMENTS

Valentina Shevtsova, *Université Libre de Bruxelles, Belgium*

IAC-11.A2.6.6

THE EFFECTS OF VARIOUS ASPECT RATIOS ON CRITICAL MARANGONI NUMBER WITH HIGH PRANDTL FLUIDS AND ITS THEORETICAL ANALYSIS

Shinichi Yoda, *ISAS/JAXA, Japan*

IAC-11.A2.6.7

NON MARANGONI MOTION OF A BUBBLE UNDER A TEMPERATURE GRADIENT

Daniel Beysens, *CEA, France*

IAC-11.A2.6.8

HIGH QUALITY PROTEIN CRYSTAL GROWTH EXPERIMENT ONBOARD "KIBO"

Satoshi Sano, *Japan Aerospace Exploration Agency (JAXA), Japan*

IAC-11.A2.6.9

CIM DEVICE FOR ENZYME KINETICS EXPERIMENT ABOARD THE INTERNATIONAL SPACE STATION

Alessandro La Neve, *Brazil*

IAC-11.A2.6.10

STRONGLY COUPLED DUSTY PLASMAS IN LABORATORY AND MICROGRAVITY: EXPERIMENTS AND MODELING

Oleg Petrov, *Institution of the Russian Academy of Sciences Joint Institute for High Temperatures of the Russian Academy of Sciences, Russia*

IAC-11.A2.6.11

THE CONTROL OF INSPECTOR SATELLITES VIA RELAY SATELLITES

Enrico Stoll, *RapidEye AG, Germany*

A2.7. Microgravity Processes Onboard Large Space Platforms

October 7 2011, 14:00 — TS-16

Chair: Peter Hofmann (*Kayser-Threde GmbH, Germany*);

Christoph Pütz (*Astrium Space Transportation, Germany*);

Rapporteur: Qi KANG (*National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences., China*);

IAC-11.A2.7.1

MULTI-USER EXPOSURE FACILITIES ON EXTERNAL SITES OF THE INTERNATIONAL SPACE STATION

Peter Hofmann, *Kayser-Threde GmbH, Germany*

IAC-11.A2.7.2

MULTIPHASE TRANSFORMATIONS OF GLASS-FORMING ALLOYS INVESTIGATED ON EARTH AND IN REDUCED GRAVITY

Dieter Herlach, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.A2.7.3

STRONGLY COUPLED COULOMB SYSTEMS OF CHARGED DIAMAGNETIC PARTICLES IN NONUNIFORM MAGNETIC FIELD: LABORATORY AND MICROGRAVITY EXPERIMENTS

Oleg Petrov, *Institution of the Russian Academy of Sciences Joint Institute for High Temperatures of the Russian Academy of Sciences, Russia*

IAC-11.A2.7.4

DEVELOPMENT OF EXPERIMENTALLY DERIVED ENGINEERING MODELS FOR THE SIMULATION OF THERMAL STRATIFICATION AND SLOSH-INDUCED PRESSURE DROP IN CRYOGENIC PROPELLANT TANKS

Arnold van Foreest, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.A2.7.5

RESEARCH OF IMPACT DYNAMICS MODELING BASED ON PROBE-CONE DOCKING MECHANISM

Xiang Zhang, *College of Aerospace and Materials Engineering, National University of Defense Technology, China*

IAC-11.A2.7.6

THE LIGHT SCATTERING UNIT FOR THE ICAPS-IPE FACILITY ON BOARD THE ISS

A.Chantal Levasseur-Regourd, *CNRS - LATMOS, France*

IAC-11.A2.7.7

IRENE - ITALIAN RE-ENTRY NACELLE FOR MICROGRAVITY EXPERIMENTS

Edmondo Bassano, *Telespazio S.p.A., Italy*

IAC-11.A2.7.8

THERMAL CONTROL SYSTEM DESIGN FOR A UNIVERSITY LOW COST BIOMEDICAL PAYLOAD

Chantal Cappelletti, *Scuola di Ingegneria Aerospaziale, Italy*

A3. SPACE EXPLORATION SYMPOSIUM

Coordinator: Christian Sallaberger (*MDA Corporation, Canada*); Bernard Foing (*European Space Agency (ESA), The Netherlands*);

A3.2.P. Moon Exploration - Poster Session — Poster Area

Chair: Bernard Foing (*European Space Agency (ESA), The Netherlands*); David Korsmeyer (*National Aeronautics and Space Administration (NASA), United States*);

Rapporteur: William H. Siegfried (*The Boeing Company, United States*); Sylvie Espinasse (*European Space Agency (ESA), The Netherlands*);



IAC-11.A3.2.P.1

MICROWAVE EXTRACTION OF WATER FROM LUNAR REGOLITH (poster)
Houssam Toutanji, University of Alabama in Huntsville, United States

IAC-11.A3.2.P.2

OPTIMIZATION DESIGN OF FREE RETURN ORBIT FOR MANNED LUNAR MISSION (poster)
Qi-bo Peng, National University of Defense Technology, China

IAC-11.A3.2.P.3

ELECTROMAGNETIC ENERGY ASSISTED MECHANICAL DRILLING AND ITS APPLICATIONS IN SPACE EXPLORATION (poster)
Alexandre Burelle, McGill University, Canada

IAC-11.A3.2.P.4

MPE, THE GERMAN LUNAR MOBILE PAYLOAD ELEMENT (poster)
Peter Hofmann, Kayser-Threde GmbH, Germany

IAC-11.A3.2.P.5

THE HIGH PERFORMANCE SOLID STATE MASS MEMORY FOR CHANG'E-2 (poster)
Bin Chen, CSSAR/CAS, China

IAC-11.A3.2.P.6

FRICTION CHARACTERISTICS OF SOFT LANDING SYSTEM OF LUNAR LANDER (poster)
Min Luo, China Academy of Space Technology (CAST), China

IAC-11.A3.2.P.7

DEVELOPMENT OF KOREAN GROUND STATION IN LUNAR MISSION (poster)
Durk-Jong Park, Korea Aerospace Research Institute, Korea, Republic of

IAC-11.A3.2.P.8

THE DESIGN OF PAYLOADS CONTROLLER OF CE-3 LUNAR ROVER (poster)
Changyi Zhou, CSSAR, China

IAC-11.A3.2.P.9

ADAPTIVE TERRAIN RELATIVE NAVIGATION FOR SPACE APPLICATIONS (poster)
Shyama Chakraborty, United States

IAC-11.A3.2.P.10

RESEARCH AND SIMULATION ANALYSIS OF STEREO MATCHING TECHNOLOGY OF LUNAR ROVER (poster)
Xing Zhou, Shanghai Key Laboratory of Spacecraft Mechanism, Aerospace System Engineering Shanghai, China

IAC-11.A3.2.P.11

A NOVEL MPPT METHOD USED FOR SOLAR PV POWER SYSTEM OF LUNAR ROVER (poster)
Chen Zhao, Shanghai Key Laboratory of Spacecraft Mechanism, Aerospace System Engineering Shanghai, China

IAC-11.A3.2.P.12

CRATER DETECTION TECHNIQUES ON DEMS FOR AUTOMATIC GENERATION OF LUNAR SURFACE DATABASE IN OPTICAL TERRAIN ABSOLUTE NAVIGATION (poster)
Marco Mammarella, GMV, Spain

IAC-11.A3.2.P.13

INITIAL ORBIT DETERMINATION OF INITIAL PHASE OF CISLUNAR TRANSFER TRAJECTORY WITH SPACE-BASED ANGLE MEASUREMENTS (poster)
Lei Liu, Science and technology on aerospace flight dynamics laboratory, China

IAC-11.A3.2.P.14

EXPERIMENTAL PARAMETRIC ANALYSIS OF IRINGS LUNAR WHEEL DESIGN (poster)
Michele Faragalli, McGill University, Canada

IAC-11.A3.2.P.15

INVESTIGATING THE BEHAVIOUR OF IRINGS WHEELS IN VARIOUS OPERATING SCENARIOS (poster)
Daniel Oyama, McGill University, Canada

IAC-11.A3.2.P.16

PRE-PROCESS OF IMAGE OF HAZARD RECOGNITION METHOD BASED ON SINGLE CAMERA (poster)
Jianjun Zhu, Department of Engineering, The University of Tokyo, Japan

IAC-11.A3.2.P.17

ENGINEERING-ORIENTED OPTIMIZATION DESIGN OF ENTRY INTERFACE FOR MANNED LUNAR RETURN MISSION (poster)
Hong-xin Shen, National University of Defense Technology, China

IAC-11.A3.2.P.18

USE OF A STAR-AIDED INERTIAL NAVIGATION SYSTEM FOR THE RIMRES PROJECT (poster)
Davide Padeletti, ZARM - University of Bremen, Germany

IAC-11.A3.2.P.19

HYBRID ROBOTIC COMMUNITY STRATEGIES FOR LUNAR SURFACE EXPLORATION (poster)
Francisco García-de-Quirós, School of Engineering, University of Glasgow, United Kingdom

IAC-11.A3.2.P.20

POWER SUPPLY OPTIONS FOR LUNAR OXYGEN PRODUCTION PLANTS: OVERVIEW, SYSTEM TRADES AND EVALUATION (poster)
Andy Braukhane, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.2.P.21

MICRO-ROVER MISSION CONCEPT FOR THE CANADIAN, AMERICAN, BRITISH LUNAR EXPLORER (CABLE) (poster)
Yunlong Lin, York University, Canada

IAC-11.A3.2.P.22

HELIUM 3 MINING AND EXTRACTION FROM THE MOON FOR A WORLDWIDE ENERGY PRODUCTION (poster)
Ugur Guven, India

IAC-11.A3.2.P.23

OPEN-PLAN: AN "OPEN SOURCE", PRIVATELY FUNDED, RETURN TO THE MOON MISSION – AN UPDATE AND FURTHER WORK. (poster)
Paul Graham, United States

IAC-11.A3.2.P.24

PROPAGATION OF ERRORS IN MOON TRANSFER TRAJECTORIES (poster)
Zhao Yuhui, Nanjing University, China

IAC-11.A3.2.P.25

HOW TO DEVELOP THE MOON LEGALLY AND SURVIVE TO TALK ABOUT IT (poster)
Declan O'Donnell, United Societies in Space, Inc., United States

IAC-11.A3.2.P.26

RELIABILITY AND ROBUSTNESS ANALYSIS OF EARTH-MOON MISSION IN PRESENCE OF UNCERTAINTY (poster)
Masoud Ebrahimi, K. N. Toosi University of Technology, Iran

IAC-11.A3.2.P.27

GEOTECHNICAL DATA DETERMINATION FROM SPACE PENETRATORS AND SAMPLING DEVICES AND ITS USEFULNESS FOR PLANETARY BODY EXPLORATION (poster)
Karol Seweryn, Space Research Center PAS, Poland

A3.1. Space Exploration Overview

October 3 2011, 15:00 — TS-01

Chair: *Christian Sallaberger (MDA Corporation, Canada); Luc Frécon (Thales Alenia Space France, France);*

Rapporteur: *Robert D. Richards (, United States); Eun-Sup Sim (Korea Aerospace Research Institute, Korea, Republic of);*

IAC-11.A3.1.1

FRENCH INSTRUMENTS FOR IN-SITU MISSIONS: PAST PRESENT AND FUTURE
Pierre W. Bousquet, Centre National d'Etudes Spatiales (CNES), France

IAC-11.A3.1.2

ESA STRATEGY FOR EXPLORATION AND THE LUNAR LANDER MISSION
Bruno Gardini, European Space Agency (ESA), The Netherlands

IAC-11.A3.1.3

VERIFICATION OF LANDING SYSTEM TOUCHDOWN DYNAMICS - A STATUS REPORT OF A GERMAN JOINT CO-OPERATIVE TEAM ON LANDING TECHNOLOGY
Robert Buchwald, Astrium GmbH, Germany

IAC-11.A3.1.4

PROSPECT OF CHINA LUNAR EXPLORATION PROGRAM AND PLANETARY SPACE EXPLORATION
Ming Li, China Academy of Space Technology (CAST), China

IAC-11.A3.1.5

EMERGING SYSTEMS FOR SPACE ACCESS AND UTILIZATION
Shamim Rahman, National Aeronautics and Space Administration (NASA)/Stennis Space Center, United States

IAC-11.A3.1.6

GOOGLE LUNAR X PRIZE: A COMMERCIAL LUNAR VENTURE
Nicole Jordan, X PRIZE Foundation, United States

IAC-11.A3.1.7

ASSESSMENT OF AFRICAN SPACE ANALOGUES
Andrea Jaime-Albalat, European Space Agency (ESA), Spain

IAC-11.A3.1.8

CHINESE KUAFU PROJECT SPACE ENVIRONMENT DETECTION ON L1 POINT
Shenyi Zhang, Chinese Academy of Sciences, China

IAC-11.A3.1.9

MARS-THE NEXT FRONTIER TO SPACE EXPLORATION
Muhammad Shadab Khan, India

IAC-11.A3.1.10

WHY WANDERING AMONG THE STARS? SPACE EXPLORATION AND ETHICAL CHALLENGE
Jacques Arnould, Centre National d'Etudes Spatiales (CNES), France

A3.2A. Moon Exploration – Part 1

October 4 2011, 10:00 — TS-01

Chair: *Bernard Foing (European Space Agency (ESA), The Netherlands); David Korsmeyer (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *William H. Siegfried (The Boeing Company, United States); Sylvie Espinasse (European Space Agency (ESA), The Netherlands);*

IAC-11.A3.2A.1

INTRODUCTION: RECENT LUNAR HIGHLIGHTS
Bernard Foing, European Space Agency (ESA), The Netherlands

IAC-11.A3.2A.2

PRELIMINARY EXPLORATION RESULTS OF CHANG'E-2 LUNAR SATELLITE
Huixian Sun, CSSAR/CAS, China

IAC-11.A3.2A.3

STATUS OF CURRENT ORBITERS
David Korsmeyer, National Aeronautics and Space Administration (NASA), United States

IAC-11.A3.2A.4

A CURRENT OVERVIEW OF THE GOOGLE LUNAR X PRIZE
Nicole Jordan, X PRIZE Foundation, United States

IAC-11.A3.2A.5

NAVIGATION AND CONTINGENCY ANALYSIS OF THE EUROPEAN STUDENT MOON ORBITER
Massimo Vetrivano, University of Strathclyde, United Kingdom

IAC-11.A3.2A.6

UPDATE ON THE GLXP MISSION PLAN FOR THE BARCELONA MOON TEAM
Marc Zaballa Camprubi, Galactic Suite SL, Spain

IAC-11.A3.2A.7

TALARIS PROJECT UPDATE: OVERVIEW OF FLIGHT TESTING AND DEVELOPMENT OF A PROTOTYPE PLANETARY SURFACE EXPLORATION HOPPER
Christopher Rossi, Massachusetts Institute of Technology (MIT), United States

IAC-11.A3.2A.8

TEAM ROCKET CITY SPACE PIONEERS – AN INDUSTRIAL APPROACH TO THE GOOGLE LUNAR X PRIZE COMPETITION
Steve Cook, Dynetics, United States

IAC-11.A3.2A.9

COMMERCIAL PAYLOAD DELIVERY TO THE LUNAR SURFACE ON ASTROBOTIC TECHNOLOGY'S INITIAL MISSIONS
David Gump, Astrobotic Technology Inc., United States

IAC-11.A3.2A.10

DESIGN, DEVELOPMENT AND PERFORMANCE FACETS OF A PROTOTYPE LASER INDUCED BREAKDOWN SPECTROSCOPE (LIBS) INSTRUMENT FOR CHANDRAYAAN-2 ROVER
A.S. Laxmiprasad, Laboratory for Electro-Optics Systems (LEOS)-ISRO, India

IAC-11.A3.2A.11

JAPANESE MOON LANDER SELENE-2 - STUDY STATUS IN 2011 -
Tatsuaki Hashimoto, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A3.2A.12

PANEL DISCUSSION A
Bernard Foing, European Space Agency (ESA), The Netherlands

A3.2B. Moon Exploration – Part 2

October 4 2011, 15:00 — TS-01

Chair: *Bernard Foing (European Space Agency (ESA), The Netherlands); David Korsmeyer (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *William H. Siegfried (The Boeing Company, United States); Sylvie Espinasse (European Space Agency (ESA), The Netherlands);*

IAC-11.A3.2B.1

THE ESA LUNAR LANDER MISSION
Alain Pradier, European Space Agency (ESA), The Netherlands

IAC-11.A3.2B.2

SCIENCE AND PAYLOAD ACTIVITIES IN SUPPORT OF THE ESA LUNAR LANDER
James Carpenter, European Space Agency (ESA), The Netherlands

IAC-11.A3.2B.3

LUNAR LANDER PHASE B1 - STATUS, MISSION AND SYSTEM CONCEPT
Thomas Diedrich, Astrium GmbH, Germany

**IAC-11.A3.2B.4**

A LUNAR MOBILE PAYLOAD ELEMENT AND OTHER DEVELOPMENTS FOR MOON EXPLORATION

Friedhelm Claasen, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.2B.5

NASA'S ROBOTIC LUNAR LANDER PROJECT UPDATE

Brian Morse, The John Hopkins University Applied Physics Laboratory, United States

IAC-11.A3.2B.6

PREPARING FOR FUTURE PLANETARY EXPLORATION: AN AUTONOMOUS HAZARD AVOIDANCE AND PRECISION LANDING SYSTEM

Jean-Francois Hamel, NGC Aerospace Ltd., Canada

IAC-11.A3.2B.7

COMPARISON OF OPTICAL TERRAIN ABSOLUTE NAVIGATION TECHNIQUES FOR PINPOINT LUNAR LANDING

Marco Mammarella, GMV, Spain

IAC-11.A3.2B.8

PETROGRAPHIC STUDIES OF BASALTIC ROCKS FROM A MOON-MARS ANALOGUE: HVERAGERÐI, ICELAND.

Abigail Calzada Díaz, Universidad de Oviedo, Spain

IAC-11.A3.2B.9

ON ADVANCED MOBILITY CONCEPTS FOR INTELLIGENT PLANETARY SURFACE EXPLORATION

Bernd Schäfer, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.2B.10

THE INTEGRATED CANADIAN SCIENCE-CLASS PLANETARY ROVER PROTOTYPE

Ryan McCoubrey, MDA, Canada

IAC-11.A3.2B.11

KOREAN LUNAR LANDER DEMONSTRATOR DEVELOPMENT

Gwanghyeok Ju, Korea Aerospace Research Institute, Korea, Republic of

IAC-11.A3.2B.12

PANEL DISCUSSION: ROBOTIC VILLAGE

Bernard Foing, European Space Agency (ESA), The Netherlands

A3.3A. Mars Exploration – Part 1

October 5 2011, 10:00 — TS-01

Chair: *Vincenzo Giorgio (Thales Alenia Space Italia, Italy);*

Walter Faulconer (Strategic Space Solutions, LLC, United States);

Rapporteur: *Marc D. Rayman (Jet Propulsion Laboratory - California Institute of Technology, United States); Amalia Ercoli Finzi (Politecnico di Milano, Italy);*

IAC-11.A3.3A.1

THE SCIENCE CONTRIBUTIONS OF THE JOINT ESA/NASA 2016 EXOMARS TRACE GAS ORBITER AND THE POTENTIAL IMPACT ON FUTURE MARS EXPLORATION

Ramon P. De Paula, National Aeronautics and Space Administration (NASA), United States

IAC-11.A3.3A.2

EXOMARS 2016 MISSION DESIGN

Carlo Cassi, Thales Alenia Space Italia, Italy

IAC-11.A3.3A.3

CONCEPTUAL STUDY AND KEY TECHNOLOGY DEVELOPMENT FOR MARS AEROFlyBY SAMPLE COLLECTION

Kazuhisa FUJITA, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A3.3A.4

ACCURACY SIMULATION OF ORBIT DETERMINATION FOR YH-1

Songjie HU, China

IAC-11.A3.3A.5

A CANADIAN MARS SAMPLE RETURN TECHNOLOGY DEPLOYMENT

Mark Barnet, MDA, Canada

IAC-11.A3.3A.6

NUCLEAR PROPULSION IN SPACECRAFT AS A UNIQUE SOLUTION FOR A MARS MISSION

Gurunadh Velidi, India

IAC-11.A3.3A.7

SPACE OR SUICIDE ,YES WE CAN !

Emmanuel Eetrakakis, The Mars Society, Mozambique

IAC-11.A3.3A.8

HABITABILITY STUDIES IN PREPARATION FOR FUTURE MARS MISSIONS

Pascale Ehrenfreund, Space Policy Institute, George Washington

University, United States

IAC-11.A3.3A.9

EXOMARS EDM DESIGN AND DEVELOPMENT PLAN

Maurizio Capuano, Thales Alenia Space Italia, Italy

IAC-11.A3.3A.10

PLANETARY ENVIRONMENTAL TESTING CHAMBER

Tim van Zoest, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.3A.11

PESSEF: PLANETARY ENVIRONMENT SURFACE AND SUBSURFACE EMULATION FACILITY

Ivano Musso, ALTEC, Italy

IAC-11.A3.3A.12

THE PAYLOAD CONTROLLER OF YH-1 (poster)

Junshe An, CSSAR/CAS, China

IAC-11.A3.3A.13

UNCERTAINTY ANALYSIS OF MARS ENTRY FLIGHT USING TIME-DEPENDENT POLYNOMIAL CHAOS (poster)

Zhu Shengying, School of Astronautics Science and Technology, Beijing Institute of Technology, China

IAC-11.A3.3A.14

THERMAL NUMERICAL SIMULATION AND EXPERIMENTATION VALIDATION OF YINGHUO-1 MARS EXPLORER (poster)

Zhonglin Xu, Shanghai Institute of Satellite Engineering, China

A3.3B. Mars Exploration – Part 2

October 5 2011, 15:00 — TS-01

Chair: *Vincenzo Giorgio (Thales Alenia Space Italia, Italy);*

Walter Faulconer (Strategic Space Solutions, LLC, United States);

Rapporteur: *Marc D. Rayman (Jet Propulsion Laboratory - California Institute of Technology, United States); Amalia Ercoli Finzi (Politecnico di Milano, Italy);*

IAC-11.A3.3B.1

TECHNOLOGY DEVELOPMENTS FOR ESA'S MARS ROBOTIC EXPLORATION PREPARATION

Sanjay Vijendran, European Space Agency (ESA), The Netherlands

IAC-11.A3.3B.2

A NEW SPECTROMETER CONCEPT FOR MARS EXPLORATION

Maria Colombo, Instituto Nacional de Tecnica Aeroespacial (INTA), Spain

IAC-11.A3.3B.3

A COMPACT SPATIAL HETERODYNE REMOTE RAMAN SPECTROMETER FOR MARS EXPLORATION

Craig Underwood, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.A3.3B.4

EXOMARS DRILL TOOL PERFORMANCE IN MARS-LIKE ENVIRONMENTAL CONDITIONS

Piergiovanni Magnani, Selex Galileo, Italy

IAC-11.A3.3B.5

IDENTIFICATION OF THE FORCES BETWEEN REGOLITH AND A RECIPROCATING DRILL-HEAD: PERSPECTIVES FOR THE EXPLORATION OF MARTIAN REGOLITH

Thibault Gouache, Surrey Space Centre, University of Surrey/ Université de Toulouse, ISAE, ICA,

IAC-11.A3.3B.6

PRELIMINARY RESULTS FROM THE TRACTION PERFORMANCE TESTING OF THE EXOMARS ROVER LOCOMOTION PERFORMANCE MODEL

Nildeep Patel, Astrium UK, United Kingdom

IAC-11.A3.3B.7

ADAPTIVE FLEXIBLE WHEEL FOR PLANETARY EXPLORATION

Olaf Krömer, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.3B.8

SCIENCE-INFLUENCED GUIDANCE OF MICRO-ROVER SCOUTS USING BAYESIAN NETWORKS

Marc Gallant, Faculty of Engineering, Carleton University, Canada

IAC-11.A3.3B.9

DESIGN AND CONTROL OF MONO TILT-ROTOR (MTR) AEROBOT ("HYPERION") AS A MARS SCOUT

Craig Underwood, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.A3.3B.10

IMPLEMENTATION OF NAVIGATION SYSTEM FOR ENTRY DESCENT AND LANDING MISSIONS

Marco Mammarella, GMV, Spain

IAC-11.A3.3B.11

ACCELERATED AEROBRAKING TECHNOLOGY IN THE MARS EXPLORATION

Lu Qisheng, Shanghai Institute of Satellite Engineering, China

A3.4. Small Bodies Missions and Technologies

October 6 2011, 15:00 — TS-01

Chair: *Susan McKenna-Lawlor (Space Technology (Ireland) Ltd., Ireland);*

Stephan Ulamec (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);

Rapporteur: *Marc D. Rayman (Jet Propulsion Laboratory - California Institute of Technology, United States); Norbert Frischauf (QASAR Technologie(s) GmbH, Austria);*

IAC-11.A3.4.1

THE ROSETTA MISSION – HOW TO EXPLORE SOLAR SYSTEM FORMATION

Rita Schulz, European Space Agency (ESA), The Netherlands

IAC-11.A3.4.2

ROSETTA ENTERS HIBERNATION

Paolo Ferri, European Space Agency (ESA), Germany

IAC-11.A3.4.3

ROSETTA LANDER - AFTER SEVEN YEARS OF CRUISE, PREPARED FOR HIBERNATION

Stephan Ulamec, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.4.4

POWER PRODUCTION FOR SMALL BODIES LANDERS: POST-LAUNCH ACTIVITIES ON PHILAE'S POWER SUBSYSTEM

Francesco Topputo, Politecnico di Milano, Italy

IAC-11.A3.4.5

MAGIC (MOBILE AUTONOMOUS GENERALIZED INSTRUMENT CARRIER)

Tim van Zoest, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A3.4.6

SMALL CARRY-ON IMPACTOR OF HAYABUSA-2 MISSION

Takanao Saiki, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A3.4.7

FUTURE IN-SITU EXPLORATION TOOLS FOR ASTEROIDS AND COMETS

Martin Hilchenbach, Max-Planck-Institut für Sonnensystemforschung, Germany

IAC-11.A3.4.8

WINNING ENTRY OF THE SPACE GENERATION ADVISORY COUNCIL'S MOVE AN ASTEROID TECHNICAL PAPER COMPETITION 2011

Andrew Bacon, Systems Engineering & Assessment Ltd, United Kingdom

IAC-11.A3.4.9

ASTER: A BRAZILIAN MISSION TO AN ASTEROID

Othon Winter, Univ. Estadual Paulista - UNESP, Brazil

IAC-11.A3.4.11

SELF-STABILIZING AND CONTROLLED ORBITS FOR PROXIMITY OPERATIONS AT NEAR-EARTH ASTEROIDS

Aline Zimmer, University of Stuttgart, Germany

IAC-11.A3.4.12

ACCESSIBILITY OF MAIN-BELT ASTEROIDS AND LOW-THRUST SAMPLE RETURN TRAJECTORY DESIGN (poster)

ZHAO Guoqiang, Tsinghua University, China

IAC-11.A3.4.13

CONSTRAINT ATTITUDE PATH GENERATION OF SPACECRAFT BASED ON RAPIDLY EXPLORING RANDOM TREE AND QUADRATIC PROGRAMMING (poster)

Xiaojun Cheng, School of Astronautics, Harbin Institute of Technology, China

A3.5. Solar System Exploration

October 7 2011, 09:00 — TS-01

Chair: *Junichiro Kawaguchi (Japan Aerospace Exploration Agency (JAXA), Japan); Mariella Graziano (GMV, Spain);*

Rapporteur: *James Middleton (, Canada); William H. Siegfried*

(The Boeing Company, United States);

IAC-11.A3.5.1

MESSENGER AT MERCURY: A MID-TERM REPORT

Peter D. Bedini, Johns Hopkins University Applied Physics Laboratory, United States

IAC-11.A3.5.2

FEASIBLE PROFILES OF SCIENTIFIC AND TECHNICAL EXPERIMENTS IN FRAME OF "VENERA-D" MISSION.

INTERNATIONAL COOPERATION ASPECTS

Viktor A. Vorontsov, Lavochkin Association, Russia

IAC-11.A3.5.3

SOLAR PROBE PLUS MISSION UPDATE

Brian Morse, The John Hopkins University Applied Physics Laboratory, United States



**IAC-11.A3.5.4**

THE SOLAR ORBITER MISSION

*Elizabeth Seward, Astrium UK, United Kingdom***IAC-11.A3.5.5**

OSS: AN OUTER SOLAR SYSTEM MISSION TOWARDS NEPTUNE, TRITON AND KBO

*Agnes Levy, ONERA, France***IAC-11.A3.5.6**

RC-SIM: RADIOCOMM SIGNALS FOR RETRIEVAL OF PLANETARY GEOPHYSICAL PARAMETERS

*Fernando E. Alemán, GMV, Spain***IAC-11.A3.5.7**

SPECTROMETERS AND IMAGING CAMERAS FOR PLANETARY REMOTE SENSING

*Giampaolo Preti, Selex Galileo, Italy***IAC-11.A3.5.8**

HYBRID OPTIONS FOR THE JUPITER GANYMEDE ORBITER

*Raul Cadenas, GMV, Spain***IAC-11.A3.5.9**

SUBSURFACE PENETRATION TOOLS FOR IN-SITU MEASUREMENTS ON PLANETARY BODIES

*Tim van Zoest, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany***IAC-11.A3.5.10**

HOPPING VEHICLES FOR RAPID REGIONAL EXPLORATION OF THE SURFACE OF TITAN

*Ted Steiner, Massachusetts Institute of Technology (MIT), United States***IAC-11.A3.5.11**

POTENTIAL REGIONS FOR FINDING SMALL SATELLITES AND DUST PARTICLES IN THE PLUTO'S SYSTEM: IMPLICATIONS FOR THE NEW HORIZONS MISSION (poster)

*Silvia Giuliatti-Winter, São Paulo State University (UNESP), Brazil***IAC-11.A3.5.12**

THE RETURN CAPSULE LANDING AND IMPACT ANALYSIS FOR THE SAMPLE RETURN MISSION (poster)

*Jia He, Beijing Institute of Space Mechanics & Electricity, China***IAC-11.A3.5.13**

PLANETARY SCIENCE GEOMETRY VISUALIZATION TOOL FOR PLANNING (poster)

*Marc Costa, European Space Agency (ESA), Spain***IAC-11.A3.5.14**

MERCURY IMAGING X-RAY SPECTROMETER (MIXS) IN BEPICOLOMBO MISSION: ENVIRONMENTAL TESTS (poster)

*Miriam Pajas, Instituto Nacional de Técnica Aeroespacial (INTA), Spain***IAC-11.A3.5.15**

FEASIBILITY STUDY OF BALLOON-TYPE ATMOSPHERIC ENTRY PROBE FOR TITAN (poster)

*Daisuke Akita, Tokyo Institute of Technology, Japan***IAC-11.A3.5.16**

STRATEGY OF THE SOLAR SYSTEM EXPLORATION NEEDS TO BE REVISED (poster)

*Vladimir Anisichkin, Academy of Sciences, Russia***A4. 40th SYMPOSIUM ON THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE (SETI) – THE NEXT STEPS**

Coordinator: Seth Shostak (SETI Institute, United States);
Claudio Maccone (International Academy of Astronautics (IAA), Italy);

A4.1. SETI I : SETI Science and Technology**October 4 2011, 10:00 — TS-11**

Chair: *H. Paul Shuch (The SETI League, Inc., United States); Seth Shostak (SETI Institute, United States);*

Rapporteur: *Carol Oliver (University of New South Wales, Australia);*

IAC-11.A4.1.1

INTRODUCTION TO SETI SCIENCE AND TECHNOLOGY

*H. Paul Shuch, The SETI League, Inc., United States***IAC-11.A4.1.2**

INVITED PESEK LECTURE: EXPLORATION RATHER THAN SPECULATION – ASSEMBLING THE PUZZLE OF POTENTIAL LIFE BEYOND EARTH

*Martin Dominik, SUPA, University of St Andrews, United Kingdom***IAC-11.A4.1.3**

NEW DATA ACQUISITION AND PROCESSING SYSTEM FOR THE SETI-ITALIA DR. STELIO MONTEBUGNOLI, NATIONAL INSTITUTE FOR ASTROPHYSICS, ITALY

*Stelio Montebugnoli, National Institute for Astrophysics, Italy***IAC-11.A4.1.5**

SIGNATURES OF MACHINE INTELLIGENCE

*John Elliott, Leeds Metropolitan University, United Kingdom***IAC-11.A4.1.6**

LARGE-SIZE MESSAGE CONSTRUCTION FOR ETI LOGICAL EXISTENCE EXPRESSED IN LINGUA COSMICA

*Alexander Ollongren, Leiden University, The Netherlands***IAC-11.A4.1.7**

EXTENDING SETI TO NEARBY GALAXIES

*Claudio Maccone, International Academy of Astronautics (IAA), Italy***A4.2. SETI II : SETI and Society****October 5 2011, 15:00 — TS-11**

Chair: *Alex Antonites (University of Pretoria, South Africa);*

Douglas Vakoch (SETI Institute and California Institute of Integral Studies, United States);

Rapporteur: *John Traphagan (University of Texas, United States);*

IAC-11.A4.2.1

INVITED BILLINGHAM CUTTING EDGE LECTURE

*Pete Worden, National Aeronautics and Space Administration (NASA)/Ames Research Center, United States***IAC-11.A4.2.2**

UNIVERSALS IN THE UNIVERSE?

*Alex Antonites, SETI League, South Africa***IAC-11.A4.2.3**

ON THE CONCRETE SIGNATURE OF LINCOS

*John Elliott, Leeds Metropolitan University, United Kingdom***IAC-11.A4.2.4**

SEEKING INTELLIGENCE FAR BEYOND OUR OWN

*Seth Shostak, SETI Institute, United States***IAC-11.A4.2.4**

LA TIERRA HABLA (EARTH SPEAKS): AN ONLINE SPANISH LANGUAGE SURVEY ABOUT INTERSTELLAR COMMUNICATION

*Douglas Vakoch, SETI Institute and California Institute of Integral Studies, United States***IAC-11.A4.2.5**

A PROTOCOL FOR MESSAGING TO EXTRATERRESTRIALS - LAUNCH OF AN EDUCATIONAL AND INTERACTIVE WEBSITE

*Julia DeMarines, International Space University (ISU), United States***IAC-11.A4.2.6**

A MATHEMATICAL MODEL FOR SOCIETAL ASPECTS OF SETI

*Claudio Maccone, International Academy of Astronautics (IAA), Italy***IAC-11.A4.2.7**

INFLUENCE OF WORKS OF FICTION ON THE PERCEPTIONS OF SETI

*Arjun Reddy, PES School of Engineering, India***A5. 14th HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM**

Coordinator: Christian Sallaberger (MDA Corporation, Canada);

Wendell Mendell (National Aeronautics and Space Administration (NASA), United States);

A5.1. Near Term Strategies for Lunar Surface Infrastructure**October 4 2011, 15:00 — TS-14**

Chair: *Maria Antonietta Perino (Thales Alenia Space Italia, Italy);*

Wendell Mendell (National Aeronautics and Space Administration (NASA), United States);

Rapporteur: *Bernard Foing (European Space Agency (ESA), The Netherlands);*

IAC-11.A5.1.1

BUILDING BLOCKS ANALYSIS FOR FLEXIBLE SPACE EXPLORATION ARCHITECTURES

*Juergen Schlutz, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany***IAC-11.A5.1.2**

DECISION-BASED SYSTEM ARCHITECTING FOR LUNAR SURFACE SYSTEMS

*Arthur Guest, Massachusetts Institute of Technology (MIT), United States***IAC-11.A5.1.3**

ANALOGUE MARS AND LUNAR OUTPOST AND HABITAT DESIGN CONSIDERATIONS, WITH FURTHER LESSONS LEARNED FROM EXISTING MARS AND LUNAR HABITATS.

*Paul Graham, United States***IAC-11.A5.1.4**

RESOLVE: GROUND TRUTH FOR POLAR LUNAR VOLATILES AS A RESOURCE

*William Larson, National Aeronautics and Space Administration (NASA)/Kennedy Space Center, United States***IAC-11.A5.1.5**

ACCESSING IN-SITU RESOURCES

*Stephen Indyk, Rutgers University, United States***IAC-11.A5.1.6**

SAMPLE SELECTION WITH ROBOT UAV ASSISTANCE : THE SALM SAINTE-ROSE / MDRS CREW 100 A DISTANT SUPPORT EXPERIMENT

*Guy Pignolet, Science Sainte Rose, La Reunion***IAC-11.A5.1.7**

IDENTIFYING AND CHARACTERIZING VXB EVENTS ON THE LUNAR SURFACE FROM THE SUPRATHERMAL ION DETECTOR EXPERIMENT (SIDE) THAT WAS PART OF APOLLO 14 MISSION.

*Mindy Krzykowski, United States***IAC-11.A5.1.8**

THE MECHANICAL DESIGN OF A EARTH-BASED DEMONSTRATOR FOR THE ROBOTIC LUNAR LANDER DEVELOPMENT PROJECT

*Timothy Cole, The John Hopkins University Applied Physics Laboratory, United States***IAC-11.A5.1.9**

FOOTPAD-TERRAIN INTERACTION TESTS WITH THE ROBOTIC LANDING AND MOBILITY TEST FACILITY (LAMA)

*Silvio Schröder, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany***IAC-11.A5.1.10**

DYNAMICS SIMULATION OF CHANGING DIAMETER FOR A FLEXIBLE DIAMETER-VARIABLE WHEEL OF LUNAR ROVER

*Zhe Wang, Beijing Institute of Astronautical Systems Engineering, China***IAC-11.A5.1.11**

THE USE OF ORBITING REFLECTORS TO DECREASE THE TECHNOLOGICAL CHALLENGES OF SURVIVING THE LUNAR NIGHT

*Russell Bewick, University of Strathclyde, United Kingdom***IAC-11.A5.1.12**

A NOVEL GEOMETRIC CORRECTION METHOD OF DISTORTED IMAGE

*Jin Wang, Institute of Optics and Electronics, Chinese Academy of Sciences, China***A5.2. Long Term Scenarios for Human Moon/ Mars Presence****October 5 2011, 15:00 — TS-14**

Chair: *William H. Siegfried (The Boeing Company, United States); Uwe Apel (Hochschule Bremen, Germany);*

Rapporteur: *Nadeem Ghafoor (MDA, Canada);*

IAC-11.A5.2.1

ESA LUNAR IN-SITU RESOURCE UTILISATION (ISRU) BREADBOARDING ACTIVITIES AND CONCEPTUAL DESIGN FOR A LUNAR DEMONSTRATOR

*Emanuele Monchieri, Compagnia Generale per lo Spazio, Italy***IAC-11.A5.2.2**

NEW GREENHOUSE CONCEPT FOR PLANETARY RESEARCH BASES

*Daniel Schubert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany***IAC-11.A5.2.3**

DEVELOPMENT AND DEMONSTRATION OF SUSTAINABLE SURFACE INFRASTRUCTURE FOR MOON/MARS EXPLORATION

*Gerald Sanders, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States***IAC-11.A5.2.4**

SPACEROAD – A SOCIAL SCIENCES AND HUMANITIES-BASED RATIONALE FOR HUMAN SPACE EXPLORATION

*Jean Claude Worms, European Space Foundation, France***IAC-11.A5.2.5**

ESTABLISHING A NEAR-TERM HUMAN TOEHOLD ON MARS AS A PRELUDE TO COLONIZATION: A FEASIBILITY STUDY

*Arthur Guest, Massachusetts Institute of Technology (MIT), United States***IAC-11.A5.2.6**

IMPACT OF HUMAN FACTORS ON THE GROWING RATE OF A MARTIAN POPULATION

Jean Marc Salotti, Planete Mars, France



A5.3.-B3.6. Joint Session on Human and Robotic Partnerships to Realise Space Exploration Goals

October 6 2011, 15:00 — TS-03

Chair: Christian Sallaberger (MDA Corporation, Canada);
Anthony R. Gross (National Aeronautics and Space Administration (NASA), United States);

Rapporteur: Rainer Willnecker (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Massimiliano Bottacini (European Space Agency (ESA), The Netherlands);

IAC-11.A5.3.-B3.6.1

HUMAN/AUTOMATION TRADE METHODOLOGY FOR CREWED EXPLORATIONS

Anthony R. Gross, National Aeronautics and Space Administration (NASA), United States

IAC-11.A5.3.-B3.6.2

AN INTERDISCIPLINARY APPROACH TO HUMAN-ROBOTIC COOPERATION IN MARS EXPLORATION

Dag Evensberger, International Space University (ISU), Germany

IAC-11.A5.3.-B3.6.3

ENABLING CONTROL TECHNOLOGIES FOR TELESURGERY
Tamas Haidegger, Budapest University of Technology and Economics, Hungary

IAC-11.A5.3.-B3.6.4

HUMAN-ROBOTIC PARTNERSHIP LESSONS-LEARNED DURING SIMULATED MARS SURFACE EXCURSIONS THE RIO TINTO ANALOGUE SITE

Gernot Groemer, Austrian Space Forum, Austria

IAC-11.A5.3.-B3.6.5

DEVELOPMENT STATUS OF THE REX-J MISSION, ASTRONAUT SUPPORT ROBOT EXPERIMENT ON THE ISS/JEM
Mitsushige Oda, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A5.3.-B3.6.6

CANADIAN-LED ANALOGUE MISSIONS IN PREPARATION FOR LUNAR AND MARTIAN SAMPLE RETURN.

Marianne Mader, University of Western Ontario, Canada

IAC-11.A5.3.-B3.6.7

FROM ROBOTIC ASTRONAUT ASSISTANT REQUIREMENTS TO DEMONSTRATION: THE CASE OF SPACEPARTNER
Seppo Heikkilä, Aalto University School of Science and Technology, Finland

IAC-11.A5.3.-B3.6.8

HUMAN AND ROBOTIC PARTNERSHIPS FROM EUROMOONMARS ANALOGUE MISSIONS 2011

Jeffrey Hendrikse, Astrium GmbH, Germany

IAC-11.A5.3.-B3.6.9

DESIGN AND DEVELOPMENT OF A GROUND BASED ROBOTIC TUNNELING WORM FOR OPERATION IN HARSH ENVIRONMENTS
Joshua Johnson, University of Alabama in Huntsville, United States

IAC-11.A5.3.-B3.6.10

THE RESEARCH OF CONTROL SYSTEM ARCHITECTURE OF CHINESE SPACE REMOTE MANIPULATOR
ZHANG XIAO DONG, CAST, China

A5.4. Going Beyond the Earth-Moon System: Human Missions to Mars, Libration Points, and NEO's

October 7 2011, 09:00 — TS-14

Chair: Ernst Messerschmid (University of Stuttgart, Germany);
Lionel Suchet (Centre National d'Etudes Spatiales (CNES), France);

Rapporteur: Gerhard Schwehm (European Space Agency (ESA), Spain);

IAC-11.A5.4.1

ENTERING THE INTERPLANETARY GATEWAY: SHORT-DURATION HUMAN MISSIONS TO NEAR-EARTH OBJECTS

Anthony Genova, National Aeronautics and Space Administration (NASA), United States

IAC-11.A5.4.2

ISECG SPACE EXPLORATION GOALS, OBJECTIVES, AND BENEFITS
Kohtaro Matsumoto, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A5.4.3

ADVANCED MISSION ANALYSIS OF HUMAN EXPLORATION MISSIONS TO NEAR-EARTH ASTEROIDS

Aline Zimmer, University of Stuttgart, Germany

IAC-11.A5.4.4

APOPHIS EXPRESS, A UNIQUE OPPORTUNITY FOR A HUMAN VISIT TO A NEO IN 2029

Jean-Yves Prado, Centre National d'Etudes Spatiales (CNES), France

IAC-11.A5.4.5

FIRST HUMAN EXPEDITION TO A NEA: MISSION DEFINITION, ARCHITECTURE CONCEPTS PRESENTATION, SELECTION AND ASSESSMENT

Andrea Messidoro, Politecnico di Torino, Italy

IAC-11.A5.4.6

HUMAN EXPLORATION MISSION TO A NEAR EARTH ASTEROID

Maria Antonietta Viscio, Thales Alenia Space Italia, Italy

IAC-11.A5.4.7

A SIMPLIFIED, MINIMAL RISK ARCHITECTURAL STRATEGY FOR THE EXPLORATION OF NEAR-EARTH OBJECTS

Rob Landis, NASA Ames Research Center, United States

IAC-11.A5.4.8

MISSION ANALYSIS FOR A SPACE MEDICAL CENTER OF AN EXPLORATION GATEWAY AT A LUNAR LIBRATION POINT
Stéphanie Lizy-Destrez, SUPAERO- Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, France

IAC-11.A5.4.9

CONCEPT FOR A FUTURE DEEP SPACE EXPLORATION ATV-CREW VEHICLE

Bernd Bischof, EADS Astrium Space Transportation GmbH, Germany

IAC-11.A5.4.10

MARS LITE, AN AFFORDABLE WAY TO SOLVE MARS'S MYSTERIES

Dana Andrews, Andrews Space, United States

IAC-11.A5.4.11

2-4-2 CONCEPT FOR A MANNED MISSION TO MARS

Jean Marc Salotti, Planete Mars, France

A6. SPACE DEBRIS SYMPOSIUM

Coordinator: Nicholas L. Johnson (National Aeronautics and Space Administration (NASA), United States); Christophe Bonnal (Centre National d'Etudes Spatiales (CNES), France);

A6.1. Measurements

October 3 2011, 15:00 — TS-12

Chair: Thomas Schildknecht (Astronomical Institute University of Bern (AIUB), Switzerland); Vladimir Agapov (Keldysh Institute of Applied Mathematics, RAS, Russia);

Rapporteur: Patrick Seitzer (University of Michigan, United States);

IAC-11.A6.1.1

FEASIBILITY OF USING THE INSTRUMENTATION RADARS AT OTB TO DETECT AND TRACK SPACE DEBRIS

Jacob Venter, South Africa

IAC-11.A6.1.2

DEDICATED ISON SUBNETWORK OF OBSERVATORIES FOR ROSCOSMOS PROJECT

Igor Molotov, Keldysh Institute of Applied Mathematics, RAS, Russia

IAC-11.A6.1.3

RESULTS OF OPTICAL SURVEYS FOR SPACE DEBRIS IN MEO
Thomas Schildknecht, Astronomical Institute University of Bern (AIUB), Switzerland

IAC-11.A6.1.4

GEO AND HEO DEBRIS OBJECTS TRACKING IMPROVEMENT USING AMR AND BRIGHTNESS DISTRIBUTION INFO
Vladimir Agapov, Keldysh Institute of Applied Mathematics, RAS, Russia

IAC-11.A6.1.5

SIMULTANEOUS MULTI-FILTER OPTICAL PHOTOMETRY OF GEO DEBRIS

Patrick Seitzer, University of Michigan, United States

IAC-11.A6.1.6

FURTHER ANALYSIS OF INFRARED SPECTROPHOTOMETRIC OBSERVATIONS OF HIGH AREA TO MASS RATIO (HAMR) OBJECTS IN GEO

Mark Skinner, Boeing, United States

IAC-11.A6.1.7

PHYSICAL CHARACTERIZATION OF SPACE DEBRIS IN THE GEOSYNCHRONOUS REGION

Alessandro Rossi, IFAC-CNR & ISTI-CNR, Italy

IAC-11.A6.1.8

DATA ACQUISITION SOFTWARE FOR ISON PROJECT
Vladimir Kouprianov, Central Astronomical Observatory, RAS, Russia

IAC-11.A6.1.9

ORBIT ESTIMATION FROM A SMALL SET OF MEASUREMENTS
Chikako Hirose, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A6.1.10

DATA FUSION FOR GEOSYNCHRONOUS SATELLITE ORBIT DETERMINATION
David Vallado, Center for Space Standards and Innovation, United States

IAC-11.A6.1.11

METHODS OF REGISTRATION OF THE RADIOACTIVE SPACE DEBRIS (poster)
Kirill A. Boyarchuk, Research Institute for Electromechanics, Russia

IAC-11.A6.1.12

INITIAL ORBIT DETERMINATION OF SPACE DEBRIS BASED ON THE SPARSE SPACE-BASED ANGLE MEASUREMENT (poster)
Lei Liu, Science and technology on aerospace flight dynamics laboratory, China

IAC-11.A6.1.13

THE OBSERVATION OF OPERATIONAL DEBRIS IN GEO AND ITS CHARACTERISTIC ANALYSES (poster)
Jianning Xiong, Purple Mountain Astronomical Observatory, China

IAC-11.A6.1.14

COMBINATION OF LIGHT CURVE MEASUREMENTS AND ORBIT DETERMINATION FOR SPACE DEBRIS IDENTIFICATION (poster)
Carolyn Früh, Astronomical Institute University of Bern (AIUB), Switzerland

A6.2. Modelling and Risk Analysis

October 5 2011, 10:00 — TS-15

Chair: Carmen Pardini (ISTI-CNR, Italy); Darren McKnight (Integrity Applications Incorporated (IAI), United States);

Rapporteur: Carsten Wiedemann (Technical University of Braunschweig, Germany);

IAC-11.A6.2.1

ANALYSIS OF THE RESIDUAL RISK OF LETHAL COLLISIONS FOR LEO SATELLITES DUE TO NON CATALOGUED OBJECTS
Emmanuelle HODY, ONERA, France

IAC-11.A6.2.2

ANALYSIS OF CLOSE APPROACHES BETWEEN SMALL SATELLITES AND CATALOGUE OBJECTS
Chen Shenyan, Beihang University, China

IAC-11.A6.2.3

COLLISION RISK ASSESSMENT FOR PERTURBED ORBITS VIA VALIDATED GLOBAL OPTIMIZATION
Alessandro Morselli, Politecnico di Milano, Italy

IAC-11.A6.2.4

EVALUATION OF THE MAXIMUM COLLISION PROBABILITY USING A PRECISE PROPAGATION MODEL, THE COSMOS2251 AND IRIDIUM33 SATELLITES COLLISION CASE STUDY
M. Navabi, Shahid Beheshti University, G.C., Iran

IAC-11.A6.2.5

CURRENT AND FUTURE IMPACT RISKS FROM SMALL DEBRIS TO OPERATIONAL SATELLITES
J.-C. Liou, National Aeronautics and Space Administration (NASA), United States

IAC-11.A6.2.6

NEW INSIGHTS ON THE ORBITAL DEBRIS COLLISION HAZARD AT GEO
Darren McKnight, Integrity Applications Incorporated (IAI), United States

IAC-11.A6.2.7

A NEW LOOK AT THE GEO AND NEAR-GEO REGIMES: OPERATIONS, DISPOSALS, AND DEBRIS
Nicholas L. Johnson, National Aeronautics and Space Administration (NASA), United States

IAC-11.A6.2.8

EVASIVE MANEUVERS IN SPACE DEBRIS ENVIRONMENT AND TECHNOLOGICAL PARAMETERS
Antonio Delson Jesus, Brazilian Space Agency (AEB), Brazil

IAC-11.A6.2.9

MASTER-2009 SMALL PARTICLE FLUX
Sven Kevin Flegel, Technische Universität Braunschweig, Germany

IAC-11.A6.2.10

OVERVIEW OF THE RESULTS OF ATV-1 RE-ENTRY OBSERVATION CAMPAIGN
Ana Blasco, GMV, Spain

IAC-11.A6.2.11

DEVELOPMENT OF AN INFRARED SENSOR MODEL FOR SPACE DEBRIS OBSERVATIONS (poster)
Johannes Gelhaus, Technische Universität Braunschweig, Germany

IAC-11.A6.2.12

LETHAL COLLISIONS AND THE IMPACT ON THE DESIGN OF A EUROPEAN SPACE SITUATIONAL AWARENESS SYSTEM (poster)
Timothy Newman, European Space Agency (ESA), Spain

IAC-11.A6.2.13

INNOVATIVE ORBIT DETERMINATION ALGORITHMS FOR DEBRIS SURVEILLANCE IN THE LEO REGION. (poster)
Linda Dimare, University of Pisa, Italy



IAC-11.A6.2.14
VISUALIZING THE SPACE DEBRIS ENVIRONMENT (poster)
Marek Möckel, Technische Universität Braunschweig, Germany

IAC-11.A6.2.15
A STUDY OF THEORETICAL MODELING ON LRCS OF SPACE TARGETS (poster)
Gu Jun, State Key-Lab of Electromagnetic Environment Research, Shanghai, China, China

IAC-11.A6.2.16
FLUX CALCULATION USING POPULATION EVENT CLOUDS (poster)
Carsten Wiedemann, Technical University of Braunschweig, Germany

A6.3. Hypervelocity Impacts and Protection

October 5 2011, 15:00 — TS-15

Chair: *Sergey Meshcheryakov (TSNIIMASH, Russia); Frank Schäfer (Fraunhofer EMI, Germany);*

Rapporteur: *James Hyde (Barrios Technology/ESC Group - NASA, United States);*

IAC-11.A6.3.1
HYPERVELOCITY IMPACT TESTING OF ADVANCED MATERIALS AND STRUCTURES FOR MICROMETEOROID AND ORBITAL DEBRIS SHIELDING
Shannon Ryan, Defence Science and Technology Organisation (DSTO), Australia

IAC-11.A6.3.2
VERIFICATION ON HYPERVELOCITY IMPACT TESTS OF EJECTA AND DATA ANALYSIS OF WITNESS PLATES AFTER THE IMPACT TESTS
Yasuhiro Akahoshi, Kyushu Institute of Technology, Japan

IAC-11.A6.3.3
INTERPRETATION OF IMPACT FEATURES ON THE SURFACE OF THE WFPC-2 RADIATOR
Phillip Anz-Meador, ESCG/Jacobs, United States

IAC-11.A6.3.4
ELECTRICAL RESPONSE OF CURRENT-CARRYING SPACE-GRADE HARNESSSES TO HYPERVELOCITY IMPACT
Martin Rudolph, Fraunhofer EMI, Germany

IAC-11.A6.3.5
ELECTRICAL BREAKDOWNS ON SC SURFACES DUE TO MICROPARTICLES IMPACTS
Sergey Meshcheryakov, TSNIIMASH, Russia

IAC-11.A6.3.6
ELECTRICAL EFFECTS OF HYPERVELOCITY IMPACTS
Ashish Goel, Stanford University, United States

IAC-11.A6.3.7
SHUTTLE HYPERVELOCITY IMPACT DATABASE
James Hyde, Barrios Technology/ESC Group - NASA, United States

IAC-11.A6.3.8
FRAGMENT CHARACTERISTIC OF SIMULATED SPACECRAFT UNDER HYPERVELOCITY IMPACT
Shengwei Lan, China Aerodynamics Research and Development Center, China

IAC-11.A6.3.9
IMPROVEMENTS FOR SPACE MISSION PROTECTION AGAINST SPACE-DEBRIS HAZARDS
Jeffrey Apeldoorn, OHB-System AG, Germany

IAC-11.A6.3.10
COMPUTATIONAL METHODOLOGY TO PREDICT SATELLITE SYSTEM-LEVEL EFFECTS FROM UNTRACKABLE SPACE DEBRIS
Nathan Welty, Fraunhofer EMI, Germany

IAC-11.A6.3.11
DEVELOPMENT OF IN-SITU MICRO-DEBRIS MEASUREMENT SYSTEM
Yukihito Kitazawa, IHI Corporation, Japan

IAC-11.A6.3.12
DEVELOPMENT OF AN IMPLOSION-DRIVEN HYPERVELOCITY LAUNCHER FOR ORBITAL DEBRIS AND MICROMETEOROID SIMULATION
Justin Huneault, McGill University, Canada

IAC-11.A6.3.13
LOCALIZATION TECHNIQUE OF SPACE DEBRIS IMPACTING SPACECRAFT BASED ON PVDF SENSOR (poster)
Xuezhong Wen, China Aerodynamics Research and Development Center, China

IAC-11.A6.3.14
SIMULATION OF HVI ON ALUMINUM FOAM AND MODEL PARAMETER ANALYSIS (poster)
Xing Lan, BUAA, China

IAC-11.A6.3.15
HYPERVELOCITY IMPACT EQUIVALENCE ANALYSIS AND SIMULATION OVER 10KM/S (poster)
Xiaotian Zhang, Beihang University, China

IAC-11.A6.3.16
CHARACTERISTICS OF ACOUSTIC EMISSION WAVE PRODUCED BY HYPERVELOCITY IMPACT IN INTEGRALLY STIFFENED ALUMINUM PLATES (poster)
Wugang LIU, Beijing Institute of Structure & Environment Engineering, China

IAC-11.A6.3.17
TEST AND NUMERICAL SIMULATION OF MULTILAYER MESH BUMPER UNDER HYPERVELOCITY IMPACT (poster)
Hong Chen, China Aerodynamics Research and Development Center, China

IAC-11.A6.3.18
ENERGY ABSORPTION BEHAVIOR OF SPACECRAFT CARBON-EPOXY COMPOSITE WALL AT OBLIQUE ANGLE FOR HYPERVELOCITY IMPACTS IN LOW EARTH ORBIT ENVIRONMENT (poster)
Abrar-Ul-Haq Khan Baluch, Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of

IAC-11.A6.3.19
THE INFLUENCE OF HONEYCOMB SANDWICH STRUCTURE ON HYPERVELOCITY IMPACT DAMAGE (poster)
Zhaoxia Ma, China Aerodynamics Research and Development Center, China

IAC-11.A6.3.20
SPACE DEBRIS FRAGMENTS IMPACT ON CONTAINMENTS FILLED WITH TWO-PHASE FLUID (poster)
Nickolay N. Smirnov, Moscow Lomonosov State University, Russia

IAC-11.A6.3.21
SHIELDED AND UNSHIELDED LOOP HEAT PIPE IN SPACECRAFT TO HYPERVELOCITY IMPACTS (poster)
Yuhua Huo, China Academy of Space Technology (CAST), China

IAC-11.A6.3.22
A SPACE DEBRIS PROTECTION METHOD FOR SPACE SOLAR CELLS (poster)
Chen Mengjiong, China Aerospace Science and Technology Corporation (CASC), China

IAC-11.A6.3.23
A STUDY OF DAMAGE ON AL-MESH BUMPER BY HYPERVELOCITY IMPACT OF AL-SPHERES (poster)
Gongshun Guan, Harbin Institute of Technology, China

IAC-11.A6.3.24
EFFECT OF MULTI LAYERS INSULATION ON DAMAGE OF ALUMINUM MESH /PLATE SHIELD UNDER HYPERVELOCITY PROJECTILES IMPACT (poster)
Gongshun Guan, Harbin Institute of Technology, China

IAC-11.A6.3.25
EXPERIMENTAL RESEARCH ON PERFORMANCE OF HYBRID WHIPPLE SHIELD WITH AL-MESH AND BASALT FIBER WOVEN (poster)
Bin Jia, Harbin Institute of Technology, China

IAC-11.A6.3.26
EUROPEAN IMPACT TEST RESULTS DATABASE (poster)
Frank Schäfer, Fraunhofer EMI, Germany

A6.4. Mitigation and Standards

October 7 2011, 09:00 — TS-15

Chair: *Fernand Alby (Centre National d'Etudes Spatiales (CNES), France); Richard Crowther (Rutherford Appleton Laboratory, United Kingdom);*

Rapporteur: *V. Adimurthy (Indian Space Research Organization (ISRO), India);*

IAC-11.A6.4.1
P2-ROTECT : PREDICTION, PROTECTION & REDUCTION OF ORBITAL EXPOSURE TO COLLISION THREATS – GENERAL OVERVIEW AND FIRST RESULTS
Sébastien Merit, Office National d'Etudes et de Recherches Aéronautiques (ONERA), France

IAC-11.A6.4.2
PREDICTION OF NEAR-EARTH SPACE DEBRIS POPULATION AND FUTURE SPACE OBJECT DISPOSAL MEASURES
Michael Yakovlev, Central Research Institute of Machine Building (FSUE/TSNIIMASH), Russia

IAC-11.A6.4.3
POST-DISPOSAL ORBITAL EVOLUTION OF SATELLITES AND UPPER STAGES USED BY THE GPS AND GLONASS NAVIGATION CONSTELLATIONS: THE LONG-TERM IMPACT ON THE MEDIUM EARTH ORBIT ENVIRONMENT
Carmen Pardini, ISTI-CNR, Italy

IAC-11.A6.4.4
PROSPECT OF SPACE DEBRIS MITIGATION RESEARCH IN CHINA FOR NEXT FIVE YEARS
Ming Li, China Academy of Space Technology (CAST), China

IAC-11.A6.4.5
SYNERGY OF DEBRIS MITIGATION AND REMOVAL
Hugh G. Lewis, University of Southampton, United Kingdom

IAC-11.A6.4.6
A PASSIVE HIGH-ALTITUDE SATELLITE DE-ORBITING DEVICE USING SOLAR RADIATION PRESSURE AND THE J2 EFFECT
Charlotte Lücking, University of Strathclyde, United Kingdom

IAC-11.A6.4.7
A SAIL DEPLOYMENT MECHANISM FOR ACTIVE PREVENTION AND REDUCTION OF SPACE DEBRIS
Toshinori Kuwahara, Tohoku University, Japan

IAC-11.A6.4.8
TEATHER-LESS SPACECRAFT DEORBIT SYSTEM USING LORENTZ FORCE
Niccolo Cymbalist, Concordia University, Canada

IAC-11.A6.4.9
SPACE DEBRIS & THE SPACE ELEVATOR
Robert E Penny, Cholla Space Systems, United States

A6.5. Space Debris Removal Issues

October 7 2011, 14:00 — TS-15

Chair: *Heiner Klinkrad (European Space Agency (ESA), Germany); Seishiro Kibe (Japan Aerospace Exploration Agency (JAXA), Japan);*

Rapporteur: *John Opiela (Jacobs Sverdrup, United States);*

IAC-11.A6.5.1
CAN WE HAVE AN END TO THE DEBRIS ISSUE?
Tetsuo Yasaka, QPS Institute, Japan

IAC-11.A6.5.2
AN ACTIVE DEBRIS REMOVAL TRADE-OFF
Cristo Vera, Technical University of Madrid (UPM), Spain

IAC-11.A6.5.3
CONCEPT OF OPERATIONS FOR LEO DEBRIS REMOVAL USING HIGH PERFORMANCE COMPUTING
Adam White, University of Southampton, United Kingdom

IAC-11.A6.5.4
EXPANDING FOAM APPLICATION FOR ACTIVE SPACE DEBRIS REMOVAL SYSTEMS
Pierpaolo Pergola, University of Pisa, Italy

IAC-11.A6.5.5
ORBITAL DEBRIS-DEBRIS COLLISION AVOIDANCE
James Mason, African Space Institute / Universities Space Research Association / NASA, United States

IAC-11.A6.5.6
PROPELLANTLESS DEORBITING OF SPACE DEBRIS BY BARE ELECTRODYNAMIC TETHERS
Juan R. Sanmartin, Universidad Politécnica de Madrid, Spain

IAC-11.A6.5.7
REDEMPTION: A MICROGRAVITY EXPERIMENT TO TEST FOAM FOR SPACE DEBRIS REMOVAL
Fabrizio Piergentili, University of Bologna, Italy

IAC-11.A6.5.8
ROGER A POTENTIAL ORBITAL SPACE DEBRIS REMOVAL SYSTEM
Juergen Starke, Astrium GmbH, Germany

IAC-11.A6.5.9
SPACE DEBRIS REMOVAL WITH AN ION BEAM SHEPHERD SATELLITE: DYNAMICS AND CONTROL
Claudio Bombardelli, Technical University of Madrid (UPM), Spain

IAC-11.A6.5.10
THE USE OF ADAPTED UPPER STAGES FOR THE REMOVAL OF SATELLITE AND ROCKET BODY DEBRIS FROM UNSTABLE ORBITAL REGIONS
Alexander Ronse, Delft University of Technology (TU Delft), The Netherlands

IAC-11.A6.5.11
APPROACHING TRAJECTORY OPTIMIZATION FOR DISPOSED UNCONTROLLED ROTATING GEO SATELLITE CAPTURE BASED ON PSEUDOSPECTRAL METHOD (poster)
Ren Xianhai, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.A6.5.12
SPACE DEBRIS REMOVAL: A TECHNOLOGICAL AND POLITICAL OVERVIEW (poster)
Whitney Lohmeyer, North Carolina State University, United States



A6.6. Space Debris Detection and Characterisation

October 6 2011, 15:00 — TS-11

Chair: Fabrizio Piergentili (University of Bologna, Italy); Vladimir Kouprianov (Central Astronomical Observatory, RAS, Russia);

Rapporteur: Mark Mulrooney (National Aeronautics and Space Administration (NASA), United States);

IAC-11.A6.6.1

SPACE DEBRIS: A 50-YEAR RETROSPECTIVE AND A LOOK FORWARD

Nicholas L. Johnson, National Aeronautics and Space Administration (NASA), United States

IAC-11.A6.6.2

PERFORMANCE ASSESSMENT OF UPDATED TWO-LINE ELEMENT SETS IN SUPPORT OF NASA GEO ORBITAL DEBRIS STUDIES

Thomas Kelecý, Boeing Integrated Defense Systems, United States

IAC-11.A6.6.3

STUDENT DESIGNED SOLUTIONS FOR IN-ORBIT DETECTION AND TRACKING OF SMALL ORBITAL DEBRIS

Lisa Tunstall, University of Alabama in Huntsville, United States

IAC-11.A6.6.4

RESIDENT SPACE OBJECT MASS-SPECIFIC INERTIA MATRIX ESTIMATION FROM PHOTOMETRIC DATA

Richard Linares, University at Buffalo, United States

IAC-11.A6.6.5

CONSOLIDATION OF EUROPEAN SPACE SITUATIONAL AWARENESS ARCHITECTURE REQUIREMENTS FOR CATALOGUING OF LEO RESIDENT OBJECTS

Florent Muller, Office National d'Etudes et de Recherches Aéropatiales (ONERA), France

IAC-11.A6.6.6

STUDY ON DEBRIS DETECTION, IDENTIFICATION AND ORBIT RECONSTRUCTION USING GROUND AND SPACE BASED TELESCOPES.

Luigi Ansalone, Sapienza University Rome, Italy, Italy

IAC-11.A6.6.7

ANALYTIC ASSESSMENT OF SENSOR UNCERTAINTY FOR APPLICATION TO SPACE OBJECT TRACKING AND CORRELATION

Ryan Weisman, Texas A&M University, United States

IAC-11.A6.6.8

LEO ORBITAL DEBRIS TRAJECTORY ASSESSMENT UTILIZING A LIQUID CRYSTAL SHUTTER

Mark Mulrooney, National Aeronautics and Space Administration (NASA), United States

A7. SYMPOSIUM ON NEW TECHNOLOGIES FOR FUTURE SPACE ASTRONOMY MISSIONS

Coordinator: Sergio Volonte (European Space Agency (ESA), France);

A7.1. Long Term Perspective

October 5 2011, 15:00 — TS-08

Chair: Sergio Volonte (European Space Agency (ESA), France);

IAC-11.A7.1.2

THE NASA ASTROPHYSICS PROGRAM (INVITED)

Jakob van Zyl, National Aeronautics and Space Administration (NASA), United States

IAC-11.A7.1.3

ESA COSMIC VISION AND TECHNOLOGY WORK PLAN (INVITED)

Frederic Safa, The Netherlands

IAC-11.A7.1.4

CURRENT PROJECTS AND FUTURE PLAN OF SPACE ASTRONOMY IN CHINA (INVITED)

Shuang-Nan Zhang, Institute of High Energy Physics & National Astronomical Observatories, Chinese Academy of Sciences, China

IAC-11.A7.1.5

CANADIAN SPACE ASTRONOMY: OBSERVATIONS AND OPPORTUNITIES

Alain Ouellet, Canadian Space Agency, Canada

IAC-11.A7.1.6

SCIENCE DRIVERS FOR COMMUNITY DRIVEN SPACE ASTRONOMY MISSIONS

Carol Christian, STScI, United States

A7.2. Technology Needs (1)

October 5 2011, 17:00 — TS-08

Chair: Sergio Volonte (European Space Agency (ESA), France);

IAC-11.A7.2.1

TECHNOLOGY NEEDS FOR GAMMA RAY ASTRONOMY (INVITED)

Neil Gehrels, National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States

IAC-11.A7.2.2

TECHNOLOGY DEVELOPMENT NEEDED FOR FUTURE X RAY ASTRONOMY MISSIONS (INVITED)

P. de Korte, The Netherlands

A7.3. Technology Needs (2)

October 6 2011, 10:00 — TS-08

Chair: Sergio Volonte (European Space Agency (ESA), France);

IAC-11.A7.3.1

JAPANESE PLANS AND TECHNOLOGIES FOR FUTURE HIGH-ENERGY ASTROPHYSICS (INVITED)

Madoka Kawaharada, ISAS/JAXA, Japan

IAC-11.A7.3.2

BLACKHOLE DETECTION TECHNIQUES USING SPACE BASED OBSERVATIONAL SYSTEMS IN HIGH EARTH ORBIT

Seetesh Pande, Individual collaboration, India

IAC-11.A7.3.3

NEW TECHNOLOGIES FOR FUTURE SPACE INFRARED MISSIONS (INVITED)

Takao Nakagawa, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A7.3.4

SPACE ASTRONOMY AND OUR UNDERSTANDING OF MASSIVE STAR FORMATION

James Okwe Chibueze, Space Generation Advisory Council (SGAC), Japan

IAC-11.A7.3.5

PANEL SETTING ERROR MODAL ANALYSIS FOR PRECISION RADIO TELESCOPES

Daniel Okoh, National Space Research and Development Agency, Nigeria, Nigeria

IAC-11.A7.3.6

THE CANADIAN CONTRIBUTION TO THE JAMES WEBB SPACE TELESCOPE: THE FINE GUIDANCE SENSOR (FGS) AND THE TUNABLE FILTER IMAGER (TFI).

Isabelle Tremblay, Canadian Space Agency, Canada

IAC-11.A7.3.7

A SMOOTH-WALLED FEEDHORN ANTENNA DESIGN FOR ASTROPHYSICAL INSTRUMENTATION IN SPACE

Patricia Voll, Stanford University, United States

IAC-11.A7.3.8

FEASIBILITY STUDY OF RADIO TELESCOPE ARRAY AND COMMUNICATION SYSTEM DEVELOPMENT ON THE FAR SIDE OF THE MOON.

Justin Trammell, University of Houston, United States

IAC-11.A7.3.9

SPACE-TIME METROLOGY AND FUNDAMENTAL PHYSICS FROM SPACE (INVITED)

Stefano Vitale, Università di Trento, Italy

IAC-11.A7.3.10

THE SPACE-TIME EXPLORER AND QUANTUM TEST OF THE EQUIVALENCE PRINCIPLE MISSION (STE-QUEST)

Naceur Gaaloul, Institute of Quantum Optics, Germany

A7.4. Technology Needs (3)

October 6 2011, 15:00 — TS-18

Chair: Sergio Volonte (European Space Agency (ESA), France);

IAC-11.A7.4.1

TECHNOLOGY FOR FUTURE EXOPLANET MISSIONS (INVITED)

Peter R. Lawson, Jet Propulsion Laboratory - California Institute of Technology, United States

IAC-11.A7.4.2

THE SOLAR MAGNETISM EXPLORER (SOLMEX) SATELLITE DESIGN

Dominik Quantius, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.A7.4.3

COHERENCE-BASED SPECKLE IDENTIFICATION THROUGH DEFORMABLE MIRROR PERTURBATIONS

Elizabeth Jensen, Princeton University, United States

A7.5. Lessons Learned

October 6 2011, 16:00 — TS-18

Chair: Sergio Volonte (European Space Agency (ESA), France);

IAC-11.A7.5.1

SPACECRAFT STATUS AND PROGRESS FOR GAIA, THE NEXT ESA SCIENCE CORNERSTONE MISSION

Charles Koeck, EADS Astrium, France

IAC-11.A7.5.2

LESSONS LEARNT OF THE HERSCHEL / PLANCK PROGRAMME

Jean-Jacques Juillet, Thales Alenia Space France, France

IAC-11.A7.5.3

HIGH TEMPERATURE AND IRRADIANCE TECHNOLOGIES FOR BEPICOLOMBO AND SOLAR ORBITER MISSIONS

Charles Koeck, EADS Astrium, France

IAC-11.A7.5.4

A CHALLENGE FOR INDUSTRY: SPACE SCIENCE PAYLOADS EXAMPLE: THE XXM NEWTON MISSION

Timo Stuffer, Kayser-Threde GmbH, Germany

IAC-11.A7.5.5

ROUND TABLE ON HOW TO COPE WITH TECHNICAL CHALLENGES FOR FUTURE SPACE ASTRONOMY MISSIONS: INDUSTRY, THE SCIENTIFIC COMMUNITY AND SPACE AGENCIES (MODERATED BY DR. TIMO STUFFER)

Timo Stuffer, Kayser-Threde GmbH, Germany

B1. EARTH OBSERVATION SYMPOSIUM

Coordinator: John W. Hussey (Consultant, United States); Pierre Ranzoli (Eumetsat, Germany);

B1.1. International Cooperation in Earth Observation Missions

October 3 2011, 15:00 — TS-05

Chair: John W. Hussey (Consultant, United States); Pierre Ranzoli (Eumetsat, Germany);

Rapporteur: David Brent Smith (National Oceanic and Atmospheric Administration (NOAA), United States);

IAC-11.B1.1.1

CEOS UPDATE

Enrico Saggese, Italian Space Agency (ASI), Italy

IAC-11.B1.1.2

THE ROLE OF REMOTE SENSING IN ASSESSING THE IMPACT OF REMOTE SENSING ON UNDERSTANDING GLOBAL CLIMATE CHANGE AND BIODIVERSITY

Bob Scholes, CSIR, South Africa

IAC-11.B1.1.3

INTERNATIONAL COOPERATION ON CLIMATE CHANGE MONITORING VIA SATELLITES

Mariel John, Space Foundation, United States

IAC-11.B1.1.4

COOPERATION FOR INTER-OPERATION OF GROUND STATIONS BETWEEN EARTH OBSERVATION SATELLITE OPERATORS

Ravit Sachasiri, Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand

IAC-11.B1.1.5

COSMO-SKYMED DUAL-USE AND MULTI-NATIONAL EXPERIENCED CHALLENGES AND OPERATIONAL IMPLICATIONS

Manfredi Porfilio, Italian Space Agency (ASI), Italy

IAC-11.B1.1.6

INTERNATIONAL COOPERATION FOR THE NEXT GENERATION DECISION AND POLICY ANALYSIS SYSTEM

Elizabeth Newton, University of Alabama in Huntsville, United States

IAC-11.B1.1.7

ONE YEAR INTO THE SUCCESS OF THE COMS MISSION

Herve Lambert, EADS Astrium, France

IAC-11.B1.1.8

ADDRESSING TRANSNATIONAL SECURITY REQUIREMENTS THROUGH A COMMERCIAL SAR CONSORTIUM

Nicole Herrmann, Space Policy Institute, George Washington University, United States

IAC-11.B1.1.9

GMES SPACE COMPONENT - PROGRAMME OVERVIEW

Josef Aschbacher, European Space Agency (ESA), Italy

IAC-11.B1.1.10

EUROPEAN CIVIL-MILITARY SYNERGIES IN THE FIELD OF EARTH OBSERVATION

Denis J.P. Moura, European Defence Agency, Belgium

B1.2. Future Earth Observation Systems

October 4 2011, 10:00 — TS-05

Chair: Benoît Boissin (Centre National d'Etudes Spatiales (CNES), France); Gilles Corlay (EADS Sodern, France);

Rapporteur: Bruce K. Quirk (U.S. Geological Survey, United States);

**IAC-11.B1.2.1**

CONCEPT STUDY OF A LEO CONSTELLATION OF NANOSATELLITES FOR NEAR REAL TIME OPTICAL REMOTE SENSING

Jasper Bouwmeester, Delft University of Technology (TU Delft), The Netherlands

IAC-11.B1.2.2

THE POLE-SITTER MISSION CONCEPT: AN OVERVIEW OF RECENT DEVELOPMENTS AND POSSIBLE FUTURE APPLICATIONS

Matteo Ceriotti, University of Strathclyde, United Kingdom

IAC-11.B1.2.3

NEW TRENDS FOR ADVANCED OPTICAL IMAGING SYSTEMS FOR EARTH OBSERVATION

Marie-José LEFEVRE-FONOLLOSA, Centre National d'Etudes Spatiales (CNES), France

IAC-11.B1.2.4

OCEANOGRAPHIC CONSTELLATION MODELLING FOR FINE SCALE ALTIMETRY

Mike Cutter, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B1.2.5

EMERGING MARITIME SURVEILLANCE TECHNOLOGIES

Frank te Hennepe, OHB-System AG, Germany

IAC-11.B1.2.6

THE MISSION AND SYSTEM DESIGN OF GMES SENTINEL-1

Massimiliano Marcozzi, Thales Alenia Space Italia, Italy

IAC-11.B1.2.7

CARBONSAT - CANDIDATE FOR ESA EARTH EXPLORER 8 MISSION

Robert Ernst, OHB-System AG, Germany

IAC-11.B1.2.8

PRISMA: THE ITALIAN PRECURSOR OF AN OPERATIONAL HYPERSPECTRAL IMAGING MISSION

Andrea Sacchetti, Carlo Gavazzi Space, Italy

IAC-11.B1.2.9

NOVEL IMAGING STRATEGIES FOR A HIGH RESOLUTION GEOSTATIONARY OPTICAL SATELLITE AFRICA-GEO-SAT1

Wolfgang Luck, CSIR, South Africa

IAC-11.B1.2.10

GEO STATIONARY OPTICAL OBSERVATION FROM THE MEDIUM TO THE HIGH RESOLUTION

Cyrille TOURNEUR, EADS Astrium, France

IAC-11.B1.2.11

SPACE FOR A HEALTH INFORMATION NETWORK ON EARTH (poster)

Bianca Szalai, International Space University (ISU), France

IAC-11.B1.2.12

TECHNICAL CHALLENGES AND SYSTEM REQUIREMENTS FOR A VERY LOW PERIGEE SATELLITE, A COMPREHENSIVE DESIGN STUDY (poster)

Farid Gamgami, OHB-System AG, Germany

B1.3. Earth Observation Sensors and Technology

October 4 2011, 15:00 — TS-05

Chair: Andrew Court (TNO, The Netherlands); Yean Joo Chong (National University of Singapore, Rep. Of Singapore);

Rapporteur: Luigi Bussolino (Bussolino and Associates, Italy);

IAC-11.B1.3.1

COSMO-SKYMED FULL CONSTELLATION ORBITAL FLEXIBILITY AND INTERFEROMETRIC CAPABILITIES

Manfredi Porfilio, Italian Space Agency (ASI), Italy

IAC-11.B1.3.2

A NEW GENERATION OF DISASTER MONITORING CONSTELLATION IMAGERS

Mike Cutter, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B1.3.3

MULTIPLE APERTURE EARTH OBSERVATION SYSTEMS

JM (Hans) Kuiper, Delft University of Technology (TU Delft), The Netherlands

IAC-11.B1.3.4

TWO DECADES OF ELECTROSTATIC ACCELEROMETERS FOR SPACE GEODESY: PAST OR FUTURE?

Bernard Foulon, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France

IAC-11.B1.3.5

CALIBRATION METHODS AND SPECTRAL RETRIEVAL OF A SLAB WAVEGUIDE SPATIAL HETERODYNE SPECTROMETER

Kenneth Sinclair, York University, Canada

IAC-11.B1.3.6

LONG-TERM STABLE INTERNAL CALIBRATION CHAIN FOR A SPACE-BORNE INTEGRATED PATH DIFFERENTIAL ABSORPTION LIDAR SYSTEM.

Maximilian Freudling, Kayser-Threde GmbH, Germany

IAC-11.B1.3.7

TROPOMI, THE NETHERLANDS ORIGINATED ATMOSPHERIC TRACE GAS INSTRUMENT IN THE LINE OF SCIAMACHY AND OMI

Johan de Vries, Dutch Space, The Netherlands

IAC-11.B1.3.8

HIGH RESOLUTION PRECIPITATION SENSING IN GEO ORBIT USING MULTIBEAM RADIOMETER OF MILLIMETER WAVE

Rui You, China Academy of Space Technology (CAST), China

IAC-11.B1.3.9

SPACEBORN SCALAR MAGNETOMETERS FOR EARTH'S FIELD STUDIES

Jean-Michel LEGER, CEA, France

IAC-11.B1.3.10

THE FRENCH-GERMAN CLIMATE MISSION MERLIN

Timo Stuffer, Kayser-Threde GmbH, Germany

IAC-11.B1.3.11

BALLOONSAT AS A PLATFORM FOR DEPLOYING THE NEUTRON COUNTER

Mark Becnel, University of Alabama in Huntsville, United States

IAC-11.B1.3.12

NANOSATELLITE, ALBERTASAT-1, THERMAL IR SENSOR CALIBRATION/VALIDATION EXPERIMENTS AND CAMPAIGNS USING UAV AND PILOTED AIRCRAFTS OVER VARYING LANDSCAPES (poster)

Benjamin Lange, University of Alberta, Canada

IAC-11.B1.3.13

OPTIMIZATION OF MULTIWALLED CARBON NANOTUBE PHOTON ABSORBERS FOR MID- AND FAR-INFRARED TELESCOPES (poster)

John Rigueur, Vanderbilt University, United States

IAC-11.B1.3.14

ADVANCEMENTS OF SATELLITE REMOTE SENSING TECHNOLOGY IN ATMOSPHERE TRACE GASES OBSERVATION (poster)

Min Wei, Beijing Institute of Satellite Information Engineering, China

B1.4. Earth Observation Data Management Systems

October 5 2011, 10:00 — TS-05

Chair: Bruce K. Quirk (U.S. Geological Survey, United States); Carlo Olivieri (University of Rome "La Sapienza", Italy);

Rapporteur: Pierre Ranzoli (Eumetsat, Germany);

IAC-11.B1.4.1

CONTRIBUTIONS TO GLOBAL MONITORING OF ENVIRONMENT AND SECURITY (GMES) BY THE GERMAN REMOTE SENSING DATA CENTER

Gunter Schreiber, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B1.4.2

GEOSPATIAL ANALYSIS OF WETLAND AREAS IN LOKOJA, NIGERIA (1986-2007).

MOMOHJIMOH YUSUF, National Space Research and Development Agency, Abuja, Nigeria, Nigeria

IAC-11.B1.4.3

AUTOMATED LANDSAT PRODUCT GENERATION: INTEGRATING THE USGS'S OPEN SOURCE LPGS SYSTEM WITH A MULTI-MISSION ORDERING AND PRODUCTION SYSTEM

Soeren Schwartz, Werum Software & Systems AG, Germany

IAC-11.B1.4.4

A DETAILED STUDY OF CLASSIFIERS IN MULTI-SPECTRAL PATTERN RECOGNITION AND THEIR OPTIMIZATION

P R Goutham, PES School of Engineering, India

IAC-11.B1.4.5

PREPARING FUTURE MISSION DATA SYSTEMS FOR SECURE SPACE COMMUNICATIONS

Michael Koller, European Space Agency (ESA), Germany

IAC-11.B1.4.6

HIGH RESOLUTION AND FREQUENT REVISITS - A FEASIBILITY ASSESSMENT OF A BUSINESS CASE FOR AN END-TO-END EARTH OBSERVATION SYSTEM

Patrick Hambloch, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B1.4.7

DEVELOPMENT OF SATELLITE CONTROL SOFTWARE FOR THEOS-2

Pirada Techavijit, Geo-Informatics and Space Technology Development Agency (GISTDA), Thailand

IAC-11.B1.4.8

NOVEL ARCHITECTURE FOR REAL-TIME EARTH OBSERVATION AND DISASTER MANAGEMENT

Irene Farquhar, United States

IAC-11.B1.4.9

DESIGN AND IMPLEMENTATION OF MASSIVE SATELLITE REMOTE SENSING INFORMATION PROCESSING SYSTEM

Hua Liu, Beijing Institute of Satellite Information Engineering, China

IAC-11.B1.4.10

THE REARCH OF THE CS ALGORITHM IN SA-BISAR (poster)

Sun Zheng, University of electronic science and technology of China, China

B1.5. Earth Observation Applications and Economic Benefits

October 6 2011, 10:00 — TS-05

Chair: Luigi Bussolino (Bussolino and Associates, Italy); Paul Kamoun (Thales Alenia Space France, France);

Rapporteur: Yean Joo Chong (National University of Singapore, Rep. Of Singapore);

IAC-11.B1.5.1

COMPARISON OF SATELLITE SURVEYING TO TRADITIONAL SURVEYING METHODS FOR THE RESOURCES INDUSTRY

Barnaby Osborne, Kingston University, United Kingdom

IAC-11.B1.5.2

COSMO-SKYMED CONSTELLATION FULLY DEPLOYED: OVERVIEW AND EXPLOITATION

Maria Libera Battagliere, Italian Space Agency (ASI), Italy

IAC-11.B1.5.3

SOCIO-ENVIRONMENTAL IMPACTS OF LAND COVER CHANGE IN THE PANAMA CANAL WATERSHED

Zachary Langford, University of Alabama in Huntsville, United States

IAC-11.B1.5.4

ON THE GLOBAL GEODETIC OBSERVING SYSTEM: AFRICA'S PREPAREDNESS AND CHALLENGES

Joel Ondego Botai, University of Pretoria, South Africa

IAC-11.B1.5.5

GULF OF MEXICO DEEPWATER HORIZON OIL SPILL DISASTER: STUDY OF THE USE OF ASTER, MODIS, AND LANDSAT ETM+ COMBINED WITH UAVSAR L-BAND RADAR TO MONITOR OIL IN COASTAL WETLANDS FROM THE DEEPWATER HORIZON SPILL

Katrina Laygo, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.B1.5.6

AIRBORNE HYPERSPECTRAL IMAGERY APPLICATIONS IN SOUTH AFRICA

Alex Fortescue, Southern Mapping Company, South Africa

IAC-11.B1.5.7

TESTING AN IONOSPHERIC SIGNATURE ANOMALIES ANALYSIS METHOD ON KHARTOUM (MS = 5.5) EARTHQUAKE

Enoch Elemo, African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria

IAC-11.B1.5.8

REMOTE SENSING BASED STUDY OF MINING IMPACTED CHANGES IN GOA, INDIA, OVER THREE DECADES

Lisa Kuchy, United States

IAC-11.B1.5.9

SPACE TECHNOLOGY APPLICATION; CASE OF DISASTER RISK REDUCTION IN CAMEROON

Buh Gaston, Cameroon

IAC-11.B1.5.10

REMOTE SENSING WATER TRANSPARENCY MEASUREMENT FOR TROPIC STATE MONITORING OF LAKES AND RESERVOIRS

Michelle Aten, National Center for Remote Sensing, Air, and Space Law & University of Mississippi School of Law, United States

IAC-11.B1.5.11

URBAN DEVELOPMENT TREND AND CLIMATE CHANGE STUDY OVER SOUTHERN CITIES IN NIGERIA USING REMOTE SENSING AND GIS TECHNIQUES.

Abdul-Rahman Adegbite, Nigerian Space Research Developing Agency, Nigeria

IAC-11.B1.5.12

APPLICATION OF AEROSPACE METHODS OF MONITORING FOR THE BENEFIT OF OIL-AND-GAS INDUSTRY

Nikolay Sevastyanov, Gazprom Space Systems, Russia

B1.6. Improving Earth Observation Through Data Sharing

October 6 2011, 15:00 — TS-05

Chair: Jan Kolar (Czech Space Office, Czech Republic); David Brent Smith (National Oceanic and Atmospheric Administration (NOAA), United States);

Rapporteur: Paul Kamoun (Thales Alenia Space France, France);

IAC-11.B1.6.1

DATA SHARING IN GEOSS

Humbulani Mudau, Group on Earth Observation (GEO), Switzerland

**IAC-11.B1.6.2**

THE PROGRESS OF SETTING UP GEOSS AFTER NOVEMBER 2010 – THE NECESSITY TO SECURE ADHERENCE TO ITS DATA SHARING GUIDELINES

Catherine Doldirina, McGill University, Canada

IAC-11.B1.6.3

GMES SPACE COMPONENT DATA ACCESS AND ITS ROLE IN COORDINATED ENVIRONMENTAL INFORMATION SUPPLY

Luca Martino, SERCO S.p.A, Italy

IAC-11.B1.6.4

ENHANCING GLOBAL CLIMATE DATA EXCHANGE TO BETTER MONITOR CLIMATE CHANGE AND EMPOWER POLICY MAKERS, SCIENTISTS AND THE COMMUNITY.

Muhammad Shafiq, Innsbruck University, Innsbruck and Space Generation Advisory Council, Austria

IAC-11.B1.6.5

USING SPACE APPLICATIONS TO IMPROVE AGRICULTURAL OUTPUT IN AFRICA

Nsih Mirabell Kum, Cameroon

IAC-11.B1.6.6

PROTECTING THE PANAMA CANAL WATERSHED THROUGH THE EXCHANGE OF GEOSPATIAL DATA

Zachary Langford, University of Alabama in Huntsville, United States

IAC-11.B1.6.7

FORMOSAT-2 SATELLITE TO SUPPORT THE GLOBAL RELIEF OPERATIONS

An-Ming Wu, National Space Organization, Taiwan, China

B2. SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM

Coordinator: Joe M. Straus (The Aerospace Corporation, United States); Otto Koudelka (Graz University of Technology and Joanneum Research, Austria);

B2.1. Advanced Technologies

October 3 2011, 15:00 — TS-14

Chair: Edward W. Ashford (Ashford Aerospace Consulting, United States); M.G. Chandrasekhar (Devas Multimedia Pvt. Ltd., United States);

Rapporteur: Elemer Bertenyi (E. Bertenyi & Associates Inc., Canada);

IAC-11.B2.1.1

THE FRONTIER RADIO: COMMON SOFTWARE DEFINED RADIO PROCESSING PLATFORM FOR MULTIPLE SPACE MISSION CLASSES

Wesley Millard, The John Hopkins University Applied Physics Laboratory, United States

IAC-11.B2.1.2

DESIGN, DEVELOPMENT, AND PRE-FLIGHT TESTING OF THE COMMUNICATIONS, NAVIGATION AND NETWORKING RECONFIGURABLE TESTBED (CONNECT) TO INVESTIGATE SOFTWARE DEFINED RADIO ARCHITECTURE ON THE INTERNATIONAL SPACE STATION (ISS)

Harry A. Cikaneck, National Aeronautics and Space Administration (NASA), United States

IAC-11.B2.1.3

SDR-BASED AD HOC SPACE NETWORKS (SASNETS)

Pedro Rodrigues, Tekever, Portugal

IAC-11.B2.1.4

SPACE-QUEST: ABSOLUTE SECURE COMMUNICATION BASED ON QUANTUM CRYPTOGRAPHY

Rupert Ursin, Austrian Academy of Sciences, Austria

IAC-11.B2.1.5

SCINTILLATION MODEL OF LASER BEAM PROPAGATION IN SATELLITE-TO-GROUND ATMOSPHERIC LINKS

Morio Toyoshima, National Institute of Information and Communications Technology, Japan

IAC-11.B2.1.6

OPTICALLY CONTROLLED BEAM FORMING NETWORK FOR MULTIPLE BEAM ANTENNA

Akira Akaishi, National Institute of Information and Communications Technology, Japan

IAC-11.B2.1.7

RADIATION PATTERN EVALUATION WITH SURFACE DISTORTION ERROR IN LARGE REFLECTOR ANTENNA MOUNTED ON COMMUNICATION SATELLITE FOR HYBRID MOBILE COMMUNICATION SYSTEM

Teruaki Orikasa, National Institute of Information and Communications Technology, Japan

IAC-11.B2.1.8

CONNECTION ADMISSION CONTROL BASED ON CHANNEL CAPACITY ESTIMATION FOR KA-BAND ALL-IP SATELLITE COMMUNICATIONS

Jorge Diaz del Rio, VEGA, Spain

IAC-11.B2.1.9

TAKING AMATEUR RADIO INTO SPACE

Hans van de Groenendaal, AMSAT UK, South Africa

IAC-11.B2.1.10

ARGOS: HYPER AMPLIFICATION MANIFOLD FOR ENHANCING GROUND STATION RECEPTION

Ronnie Nader, Ecuadorian Civilian Space Agency (EXA), Ecuador

IAC-11.B2.1.11

SPACEWIRE AND ITS COMPARISON WITH ETHERNET AND AFDX

Wei Zheng, China Academy of Space Technology (CAST), China

B2.2. Advanced Systems

October 4 2011, 10:00 — TS-14

Chair: Robert Prevaux (Space Systems/Loral, United States); Ryutaro Suzuki (National Institute of Information and Communications Technology, Japan);

Rapporteur: Morio Toyoshima (National Institute of Information and Communications Technology, Japan);

IAC-11.B2.2.1

DEVELOPMENT OF THE TELEMETRY TRANSMITTER FOR THE SMALL SATELLITE FLYING LAPTOP

Ulrich Beyermann, University of Stuttgart, Germany

IAC-11.B2.2.2

HIGH DATA RATE MODULATOR USING MULTI-PHASE MODULATION TECHNIQUES IN 8GHZ SATELLITE TRANSMISSION SYSTEM

Fitri Dewi Jaswar, Astronautic Technology SDN BHD, Malaysia

IAC-11.B2.2.3

END-TO-END PERFORMANCE OF LEO SATELLITE USING VCM TECHNIQUES

Mario Cossu, Thales Alenia Space Italia, Italy

IAC-11.B2.2.4

IMPLEMENTATION OF A KA-BAND COMMUNICATION PATH FOR ON-ORBIT SERVICING

Jan Harder, Technical University of Munich, Germany

IAC-11.B2.2.5

SPACEWIRE FOR PAYLOAD AND PLATFORM CONTROL APPLICATIONS

Steve Parkes, University of Dundee, United Kingdom

IAC-11.B2.2.6

THE ALPHABUS PRODUCT LINE QUALIFICATION AND ACCEPTANCE OF THE FIRST SERVICE MODULE

Philippe Sivic, European Space Agency (ESA), The Netherlands

IAC-11.B2.2.7

DESIGN OF A 40/50 GHZ SATELLITE GROUND STATION FOR FADE MITIGATION EXPERIMENTS

Otto Koudelka, Graz University of Technology and Joanneum Research, Austria

IAC-11.B2.2.8

SPACE COMMUNICATIONS PROTOCOLS FOR FUTURE OPTICAL SATELLITE-DOWNLINKS

Dirk Giggenbach, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B2.2.9

PERFORMANCE CHARACTERISTICS OF THE SMALL OPTICAL TRANSPONDER (SOTA) ONBOARD MICRO-SATELLITE

Yoshisada Koyama, National Institute of Information and Communications Technology, Japan

IAC-11.B2.2.10

EVALUATION OF THE OPTICAL COMMUNICATION SYSTEM FOR SMALL OPTICAL TRANSPONDER (SOTA) BASED ON THE LABORATORY TEST

Hideki Takenaka, National Institute of Information and Communications Technology, Japan

IAC-11.B2.2.11

FIBER-OPTIC, LEO-BASED, COMMUNICATIONS RING

Andrew Meulenberg, HiPi Consulting, United States

IAC-11.B2.2.12

A NOVEL WIRELESS REMOTE COMMUNICATION SCHEME FOR FINITE ASTRONAUTS

Yong Xuan, China Astronaut Research and Training Center, China

B2.3. Fixed and Broadcast Communications

October 5 2011, 10:00 — TS-14

Chair: Otto Koudelka (Graz University of Technology and Joanneum Research, Austria); Desraj Venugopal (Devas Multimedia Pvt. Ltd., India);

Rapporteur: Moon-Beom Heo (Korea Aerospace Research Institute, Korea, Republic of);

IAC-11.B2.3.1

SATELLITE BROADCAST USAGE AND LIFE TEST OF HIGH POWER S-BAND TRAVELING WAVE TUBE AMPLIFIERS

Robert Briskman, Sirius XM Radio, United States

IAC-11.B2.3.2

CHANGING THE ECONOMICS OF UNIVERSAL SATELLITE TV AND INTERNET IN AFRICA

Alex da Silva Curiel, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B2.3.3

INTEGRATION OF FIXED, BROADCAST, MOBILE SATELLITE SERVICES AND TERRESTRIAL SERVICES : WAY TO FUTURE

Venugopal Desraj, Devas Multimedia Pvt. Ltd., India

IAC-11.B2.3.4

AN ADVANCED RESEARCH ENVIRONMENT FOR KA-BAND SATELLITE COMMUNICATIONS

Jürgen Letschnik, Technical University of Munich, Germany

IAC-11.B2.3.5

AN ADAPTIVE SATELLITE COMMUNICATIONS SYSTEM

Toshio Asai, National Institute of Information and Communications Technology, Japan

IAC-11.B2.3.6

INVESTIGATING POSSIBLE CORRELATIONS BETWEEN MID-LATITUDE ELECTRICALLY CHARGED PARTICLE PRECIPITATION AND L-BAND IONOSPHERIC SCINTILLATION

Ben Opperman, National Research Foundation (NRF), South Africa

IAC-11.B2.3.7

DAY-TO-DAY VARIABILITY OF THE THICKNESS OF E-LAYER IN LOW LATITUDE EQUATORIAL ANOMALY DURING THE LOW SOLAR ACTIVITY

Emmanuel Oladipo Abe, Federal government of Nigera, Nigeria

IAC-11.B2.3.8

DEMONSTRATION OF MONOPULSE TRACKING ANTENNA SYSTEM AND SEPARATION DISTANCE CONSTRAINT ANALYSIS IN LAB ENVIRONMENT

Shahnaz Yasir, SUPARCO, Pakistan

IAC-11.B2.3.9

MULTIBEAM ANTENNA POINTING MEASUREMENT BASED ON COMMUNICATION BEAMS FOR COMMUNICATION SATELLITES

Dong Chen, China Academy of Space Technology (CAST), China

IAC-11.B2.3.10

THE TINY ADJUST METHOD OF CONTOUR GAIN OF SHAPED REFLECTOR ANTENNA EXPRESSED BY ZERNIKE POLYNOMIALS

Xie Sulong, Academy of Space Electronic Information Technology, China

IAC-11.B2.3.11

SPCS-TP RELAY DESIGN AND TEST

Wang Chunfeng, China Academy of Space Technology (CAST), China

IAC-11.B2.3.12

SUPPORTING DISASTER COUNTERMEASURE ACTIVITIES USING WINDS SATELLITE LINK

Takashi Takahashi, Japan Aerospace Exploration Agency (JAXA), Japan

B2.4. Mobile Satellite Communications and Navigation Technology

October 6 2011, 10:00 — TS-14

Chair: Robert Briskman (Sirius XM Radio, United States); Jean-Paul Aguttes (Centre National d'Etudes Spatiales (CNES), France);

Rapporteur: Desraj Venugopal (Devas Multimedia Pvt. Ltd., India);

IAC-11.B2.4.1

ESA IRIS PROGRAMME: DESIGN OF A NEW SATELLITE COMMUNICATIONS SYSTEM FOR AIR TRAFFIC MANAGEMENT

Nathalie RICARD, European Space Agency (ESA), The Netherlands

IAC-11.B2.4.2

GNSS BASED RELATIVE NAVIGATION OF FORMATION SATELLITE WITH LONG BASELINE

Jae-Ik Park, Korea Aerospace Research Institute, Korea, Republic of

IAC-11.B2.4.3

GLONASS STATUS, PERFORMANCE AND MODERNIZATION EFFORTS

Sergey Revnivkykh, TSNIIMASH, Russia

IAC-11.B2.4.4

AN IMPROVED SCHEME OF MULTIPATH MITIGATION BASED ON BOC

Shao Xingquan, University of electronic science and technology of China, China

IAC-11.B2.4.5

THE ANALYSIS OF POSSIBILITY OF USE OF THE UKRAINIAN GEOSTATIONARY COMMUNICATION SATELLITE FOR THE DECISION OF NAVIGATION-GEODETIC PROBLEMS.

Sergei Matvienko, Yuzhnoye SDO European Representation, Ukraine



IAC-11.B2.4.6

RESEARCH ON ACQUISITION ALGORITHM OF DYNAMIC RECONFIGURABLE MULTI-CONSTELLATION SATELLITE NAVIGATION SIGNAL ON MODULE LEVER
Zong Zhulin, University of electronic science and technology of China, China

IAC-11.B2.4.7

RELATIVE NAVIGATION WITH HIGH-FREQUENCY RADIO WAVES
Daniel Bindel, ZARM - University of Bremen, Germany

IAC-11.B2.4.8

REGENERATIVE REPEATING PERFORMANCE OF AN ONBOARD PACKET SWITCH FOR THE FADING CHANNEL IN GEOSTATIONARY SATELLITE ORBIT
Shinichi Taira, National Institute of Information and Communications Technology, Japan

IAC-11.B2.4.9

AN IMPROVED GENETIC ALGORITHM BASED LINK OPTIMIZATION FOR TDRS
Tong Yang, China Academy of Space Technology (CAST), China

IAC-11.B2.4.10

THE CLOCK-BASED METHOD FOR GPS RECEIVER POSITIONING UNDER THREE SATELLITES
YunLong Teng, University Electronic Science & Technology, China

IAC-11.B2.4.11

RESEARCH ON METHOD OF IDENTIFYING SIMULTANEOUS MULTI-FAULTY AND FAULT-TOLERANCE IN FILTER BASED ON RESIDUAL
Yong Zhi Wen, College of Aerospace and Material Engineering, National University of Defense Technology, China

IAC-11.B2.4.12

THE ERROR MODEL OF TWO WAY SATELLITE TIME TRANSFER FOR A LOW-RATE DYNAMIC OBJECT

Zongwen Wu, China

IAC-11.B2.4.13

PERFORMANCE ANALYSIS AND OPTIMIZATION DESIGN OF THE CHAOTIC SEQUENCE USED AS SPREAD-SPECTRUM SEQUENCE IN APPLICATION
ChengJi Pan, BITTT, China

B2.5. Space Navigation Systems and Services

October 6 2011, 15:00 — TS-14

Chair: *Calin Rosetti (International Academy of Astronautics (IAA), France); Rita Lollock (The Aerospace Corporation, United States);*

Rapporteur: *Dipak Srinivasan (The John Hopkins University Applied Physics Laboratory, United States);*

IAC-11.B2.5.1

INCREASING CIVIL CAPABILITIES IN THE MODERNIZED GPS ERA
Nicholas Feranec, United States

IAC-11.B2.5.2

VARIATION OF TOTAL ELECTRON CONTENT AND THEIR EFFECT ON GNSS OVER AKURE, NIGERIA.
Oladosu Olakunle, Obafemi Awolowo University, Nigeria

IAC-11.B2.5.3

GPS PSEUDO RANGE ERROR ANALYSIS WITH PRECISE ISS STRUCTURE MODELING BETWEEN HTV AND ISS NAVIGATION
Takeshi Yabushita, Mitsubishi Electric Corporation, Japan

IAC-11.B2.5.4

ORBITAL MONITORING OF AUTOMATIC DEPENDENT SURVEILLANCE – BROADCAST (ADS-B) SIGNALS FOR IMPROVED AIR TRAFFIC SURVEILLANCE IN REMOTE AND OCEANIC AIRSPACE
Raymond Francis, University of Western Ontario, Canada

IAC-11.B2.5.5

RADIONAVIGATION SATELLITE SERVICE (RNSS) AND THE ITU RADIO REGULATIONS
Attila MATAS, International Telecommunication Union (ITU), Switzerland

IAC-11.B2.5.6

GLOBAL CLOCK SYNCHRONIZATION FOR A SATELLITE ARRAY IN SPACE
Raj Thilak Rajan, ASTRON, The Netherlands

IAC-11.B2.5.7

SPACECRAFT NAVIGATION BY THE SPACE OBJECTS' RADIO EMISSION
Dmytro Grosheliev, Dniepropetrovsk National University, Ukraine

IAC-11.B2.5.8

A COMPARISON OF ATTITUDE DETERMINATION METHODS: THEORY AND EXPERIMENTS
Kristian Jenssen, Norwegian University of Science and Technology, Norway

IAC-11.B2.5.9

APPLICATION RESEARCH OF PHMI DYNAMIC ALLOCATION BASED ON VFODP THEORY IN RAIM ALGORITHM
Chengjun Guo, China

IAC-11.B2.5.10

A NOVEL ACQUISITION ARCHITECTURE FOR GNSS RECEIVER BASED ON DOWN SAMPLING AND CORDIC ALGORITHM
Wu Peng, University of electronic science and technology of China, China

IAC-11.B2.5.11

RESEARCH OF AUTONOMOUS ORBIT DETERMINATION OF NAVIGATION CONSTELLATION USING SATELLITE-TO-SATELLITE TRACKING DATA
Hua Huang, Nanjing University, China

IAC-11.B2.5.12

METHOD OF IMPROVING ACCURACY OF AUTOMATED ORBIT DETERMINATION FOR GEO SATELLITES USING GPS
Zhang Chen, Beijing University of Aeronautics and Astronautics, China

IAC-11.B2.5.13

POSITIONING PRECISION ANALYSIS OF COMPASS INTEGRATED WITH GPS
Weihua Ma, Northwestern Polytechnical University, China

B2.6. Near-Earth and Interplanetary Communications

October 7 2011, 14:00 — TS-14

Chair: *Manfred Wittig (European Space Agency (ESA), The Netherlands); Ramon P. De Paula (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *A. Bhaskaranarayana (Indian Space Research Organization (ISRO), India);*

IAC-11.B2.6.1

FEASIBILITY ASSESSMENT OF OPTICAL TECHNOLOGIES FOR RELIABLE HIGH CAPACITY FEEDER LINKS
Norbert Witternigg, Joanneum Research, Austria

IAC-11.B2.6.2

FREE-SPACE LASER COMMUNICATIONS FOR SATELLITE DOWNLINKS: MEASUREMENTS OF THE ATMOSPHERIC CHANNEL
Florian Moll, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B2.6.3

ENHANCING GROUND COMMUNICATION OF DISTRIBUTED SPACE SYSTEMS
Prem Sundaramoorthy, Delft University of Technology (TU Delft), The Netherlands

IAC-11.B2.6.4

CHINA'S CE-2 LUNAR SATELLITE EXPERIMENT BASED ON SHORT BASELINE INTERFEROMETRY
Lue Chen, Science and technology on aerospace flight dynamics laboratory, China

IAC-11.B2.6.5

PERFORMANCE VERIFICATION OF X-BAND SATELLITE TRANSMISSION SYSTEM USING COMPUTER SIMULATION TOOL
Nurul Huda Abd Rahman, Astronautic Technology SDN BHD, Malaysia

IAC-11.B2.6.6

CONFIGURABLE X-BAND TRANSMITTER FOR SMALL SATELLITE
Yasser Ahmad, Astronautic Technology SDN BHD, Malaysia

IAC-11.B2.6.7

A NEW ROBOTIC DATA STREAMS COMPRESSION ALGORITHM FOR DEEP SPACE EXPLORATION
ShouJuan Zhang, China

IAC-11.B2.6.8

REDUNDANCY-FREE QUANTUM CODING METHODS IN SPACE COMMUNICATIONS
Laszlo Bacsardi, Budapest University of Technology and Economics, Hungary

IAC-11.B2.6.9

ANALYZING QUANTUM BASED PROTOCOLS IN LEO AND GEO SATELLITE COMMUNICATIONS
Laszlo Bacsardi, Budapest University of Technology and Economics, Hungary

IAC-11.B2.6.10

A DISCUSSION ON FIBER OPTIC COMMUNICATION AND WIDE BAND INTERNET IN SPACE
Wei Zheng, China Academy of Space Technology (CAST), China

IAC-11.B2.6.11

DISTRIBUTED QOS CONSTRAINED ROUTING ALGORITHM IN DOUBLE-LAYERED SATELLITE NETWORKS
Wang Xiaoting, Beijing Institute of Tracking and Telecommunication Technology, China

B3. HUMAN SPACE ENDEAVOURS SYMPOSIUM

Coordinator: John Uri (National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States); Carlo Mirra (EADS Astrium, The Netherlands);

B3.1. Overview Session (Present and Near-Term Human Space Flight Programs)

October 3 2011, 15:00 — TS-03

Chair: *Graham Gibbs (Canadian Space Agency, Canada); John Uri (National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States);*

Rapporteur: *Rainer Willnecker (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);*

IAC-11.B3.1.1

INVITED KEYNOTE
William H. Gerstenmaier, National Aeronautics and Space Administration (NASA)/Ames Research Center, United States

IAC-11.B3.1.2

CANADA AND THE INTERNATIONAL SPACE STATION PROGRAM: OVERVIEW AND STATUS SINCE IAC 2010
Pierre Jean, Canadian Space Agency, Canada

IAC-11.B3.1.3

EXTENDED UTILAZATION OF JAPAN'S ISS PROGRAM
Kuniaki Shiraki, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B3.1.4

BUILDING THE FUTURE ON PRESENT ACHIEVEMENTS: THE ROLE OF EUROPE IN SPACE HUMAN SPACEFLIGHT AND EXPLORATION IN THE NEXT 20 YEARS.
Simonetta Di Pippo, European Space Agency (ESA), The Netherlands

IAC-11.B3.1.5

INTERNATIONAL SPACE STATION RESEARCH FOR THE NEXT DECADE: INTERNATIONAL COORDINATION AND RESEARCH ACCOMPLISHMENTS
Julie A. Robinson, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States

IAC-11.B3.1.6

ISS AS A BASE-CAMP FOR EXPLORATION
Michael Raftery, Boeing Defense Space & Security, United States

IAC-11.B3.1.7

THE VALUE OF THE INTERNATIONAL SPACE EXPLORATION COORDINATION GROUP (ISECG) IN THE FORMULATION OF EXPLORATION CONCEPT AND PARTNERSHIPS
Douglas Cooke, National Aeronautics and Space Administration (NASA), United States

IAC-11.B3.1.8

INTERNATIONAL SPACE EXPLORATION COORDINATION GROUP - THE GLOBAL EXPLORATION ROADMAP
Bernhard Hufenbach, European Space Agency (ESA), The Netherlands

IAC-11.B3.1.9

MANNED COSMONAUTICS – THE PRESENT AND THE FUTURE
Sergey Krikalev, Yu.A. Gagarin Research and Test Cosmonaut Training Center, Russia

B3.2. How Can We Best Apply Our Experience to Future Human Missions?

October 4 2011, 15:00 — TS-03

Chair: *Dieter Sabath (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Sergey K. Shaevich (Khrunichev State Research & Production Space Center, Russia);*

Rapporteur: *Gene Rice (RWI - Rice Wiggels Int'l, United States);*

IAC-11.B3.2.1

INTERNATIONAL SPACE STATION (ISS) LESSONS LEARNED AND THEIR INFLUENCE ON PREPARATIONS FOR HUMAN EXPLORATION BEYOND LOW EARTH ORBIT
Kathleen Laurini, National Aeronautics and Space Administration (NASA), The Netherlands

IAC-11.B3.2.2

UTILIZATION IN FUTURE SPACE MANNED PROGRAMS OF THE FGB "ZARYA" DEVELOPMENT AND ADAPTATION EXPERIENCE TO THE ISS PROGRAM CHANGES
Sergey K. Shaevich, Khrunichev State Research & Production Space Center, Russia

IAC-11.B3.2.3

SPACECRAFT CONCEPTUAL DESIGN COMPARED TO THE APOLLO LUNAR LANDER
Charles Young, National Aeronautics and Space Administration (NASA), United States

**IAC-11.B3.2.4**

SHORT PROFILE FOR OF THE HUMAN SPACECRAFT SOYUZ-TMA RENDEZVOUS MISSION TO THE ISS

Rafail Murtazin, Rocket Space Corporation Energia, Russia

IAC-11.B3.2.5

MAN-MACHINE INTEGRATION FOR FUTURE SPACE EXPLORATION MISSIONS – A PERSPECTIVE

Anthony R. Gross, National Aeronautics and Space Administration (NASA), United States

IAC-11.B3.2.6

SPACE STATION ELEMENT COMMONALITY BETWEEN LEO AND LUNAR INFRASTRUCTURES

Mark Hempzell, Reaction Engines Ltd., United Kingdom

IAC-11.B3.2.7

USER-ORIENTED DESIGN STRATEGIES FOR HUMAN EXPLORATION AND HABITATS

Paivi Jukola, Helsinki University of Technology (TKK), Finland

IAC-11.B3.2.8

HOUSEKEEPING IN SPACE FOR THE FUTURE

Zhou Lin, China Academy of Space Technology (CAST), China

IAC-11.B3.2.9

AIR REVITALIZATION TECHNOLOGIES FOR MANNED LONG TERM EXPLORATION AIM TO ISS DEMONSTRATION

Masato Sakurai, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B3.2.10

WATER RECLAMATION DEMONSTRATION ON THE JEM (KIBO) FOR A FUTURE LONG-DURATION MANNED MISSION

Sogo Nakanoya, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B3.2.11

THE LASER CAMERA SYSTEM ON THE SPACE SHUTTLE: EXPERIENCES AND RECOMMENDATIONS FOR THE FUTURE

David Beach, Neptec Design Group, Canada

B3.3. ISS Utilization

October 5 2011, 10:00 — TS-03

Chair: *Carlo Mirra (EADS Astrium, The Netherlands); Kevin D. Foley (The Boeing Company, United States);*

Rapporteur: *Shannon Ryan (Defence Science and Technology Organisation (DSTO), Australia);*

IAC-11.B3.3.1

U.S. NON-PROFIT ORGANIZATION ESTABLISHED FOR PRACTICAL APPLICATIONS OF THE INTERNATIONAL SPACE STATION

Mark Uhlan, National Aeronautics and Space Administration (NASA), United States

IAC-11.B3.3.2

ACCOMPLISHMENTS AND PERSPECTIVE OF “KIBO” UTILIZATION

Tai Nakamura, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B3.3.3

ACHIEVEMENTS AND OUTLOOK OF THE ISS UTILISATION PROGRAMME OF THE EUROPEAN SPACE AGENCY

Martin Zell, European Space Agency (ESA), The Netherlands

IAC-11.B3.3.4

REINVENTING THE INTERNATIONAL SPACE STATION PAYLOAD INTEGRATION PROCESSES

William Jones, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States

IAC-11.B3.3.5

PAYLOAD INTEGRATION METHODS ON NEW RUSSIAN MODULES OF THE ISS

Igor V. Sorokin, S.P. Korolev Rocket and Space Corporation Energia, Russia

IAC-11.B3.3.6

THE UNITED NATIONS HUMAN SPACE TECHNOLOGY INITIATIVE (HSTI)

Takao Doi, UN Office of Outer Space Affairs, Austria

IAC-11.B3.3.7

PROSPECTS AND CHALLENGES OF DEVELOPING COUNTRIES IN PARTICIPATING IN THE ISS

Etim Offiong, African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria

IAC-11.B3.3.8

INDUSTRIALLY RELEVANT RESEARCH IN SPACE IN THE FRAMEWORK OF ESA’S ELIPS PROGRAMME

Martin Zell, European Space Agency (ESA), The Netherlands

IAC-11.B3.3.9

NODE 2, NODE 3 AND CUPOLA AFTER MORE THAN ONE YEAR OF ON ORBIT OPERATIONS

Annamaria Piras, Thales Alenia Space Italia, Italy

IAC-11.B3.3.10

REFRIGERATION POOL OF THREE MELFI UNITS AND ITS UTILISATION ON BOARD THE ISS

Jean Chegancas, EADS Astrium, France

B3.4.-B6.6. Sustainable Operations of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia

October 5 2011, 15:00 — TS-03

Chair: *Maria Stella Lavitola (Thales Alenia Space Italia, Italy); Bob Chesson (European Space Agency (ESA), The Netherlands);*

Rapporteur: *Rachid Amekrane (Astrium GmbH, Germany);*

IAC-11.B3.4.-B6.6.1

UNPRECEDENTED PROSPECTS FOR ISS UTILIZATION

Ulrich Kuebler, Astrium GmbH, Germany

IAC-11.B3.4.-B6.6.2

CHANGES IN COLUMBUS OPERATIONS AND OUTLOOK TO LONG-TERM OPERATION PHASE

Dieter Sabath, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B3.4.-B6.6.3

INTERFACE IMPROVEMENT IN A COMPLEX DECENTRALIZED OPERATIONS ENVIRONMENT

Berti Brigitte Meisinger, European Space Agency (ESA), Germany

IAC-11.B3.4.-B6.6.4

THE COLUMBUS GROUND SEGMENT – A PRECURSOR FOR FUTURE MANNED MISSIONS

Thomas Mueller, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B3.4.-B6.6.5

3-YEAR OF INDUSTRIAL TO THE ISS OPERATIONS OF THE ESA ELEMENTS

Massimo Salussolia, Thales Alenia Space Italia, Italy

IAC-11.B3.4.-B6.6.6

RELIEVING CREW STRESS FROM STOWAGE ISSUE AND REDUCING VOLUME OF ON-ORBIT SPARES ON ISS

Junichi Sakai, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B3.4.-B6.6.7

ADVANCED TOILET RESEARCH ON ISS IN PREPARATION FOR LONG-DURATION SPACEFLIGHT AND IN SUPPORT OF EFFICIENT WASTE MANAGEMENT ON EARTH

Akira Tsuchida, Earth-Track Corporation, Japan

IAC-11.B3.4.-B6.6.8

EXTENDING THE CAPABILITIES OF THE ISS MSS ROBOTICS

Herbert Goettmann, MDA Space Missions, Canada

IAC-11.B3.4.-B6.6.9

THE EVOLUTION OF TELE-ROBOTICS ON ISS AND ENABLING OF UNMANNED ON-ORBIT SERVICES

Richard Rembala, MDA, Canada

IAC-11.B3.4.-B6.6.10

RELAXING USOS SOLAR ARRAY CONSTRAINTS FOR RUSSIAN VEHICLE UNDOCKING

Evgeny Menkin, ARES Aerospace, United States

B3.5. Astronauts: Those Who Make It Happen

October 6 2011, 10:00 — TS-03

Chair: *Igor V. Sorokin (S.P. Korolev Rocket and Space*

Corporation Energia, Russia); Alan T. DeLuna (, United States);

Rapporteur: *Tai Nakamura (Japan Aerospace Exploration Agency (JAXA), Japan);*

IAC-11.B3.5.1

COSMONAUT AS A RESEARCHER AND A TEST-PILOT IN SPACE: FLIGHT EXPERIENCE ON THE ISS

Alexander Kalery, S.P. Korolev Rocket and Space Corporation Energia, Russia

IAC-11.B3.5.2

PERSON AUTONOMY AND VOLUNTARINESS AS IMPORTANT FACTORS IN MOTIVATION, DECISION MAKING, AND ASTRONAUT SAFETY: RESULTS FROM THE MARS-500 LODGEAD STUDY

Bernadette van Baarsen, VU medisch centrum, The Netherlands

IAC-11.B3.5.3

ASSISTIVE ROBOTIC POWER GLOVE FOR EVA

Eloise Matheson, University of Sydney, Australia

IAC-11.B3.5.4

STUDY ON THE CONTROL RULES OF X AXIS RELATIVE SPEED OF SPACECRAFT DURING THE MANUAL CONTROL RENDEZVOUS AND DOCKING

Tian Zhiqiang, China Astronaut Research and Training Center, China

IAC-11.B3.5.5

INFLUENCE OF SYSTEM DELAY ON OPERATOR PERFORMANCE IN MANUAL-CONTROLLED RENDEZVOUS AND DOCKING

Zheng Wang, China Astronaut Research and Training Center, China

IAC-11.B3.5.6

THE NEW COLUMBUS SYSTEMS TRAINING FROM ESA FOR ALL ISS ASTRONAUTS

Anette Bade, Astrium Space Transportation, Germany

IAC-11.B3.5.7

ORGANIZATION OF THE ISS CREW TRAINING IN RUSSIA AND FURTHER DEVELOPMENT OF COSMONAUT TRAINING SYSTEM

Sergey Krikalev, Yu.A. Gagarin Research and Test Cosmonaut Training Center, Russia

IAC-11.B3.5.8

HIGH ALTITUDE FREE FALL: IMPLICATIONS FOR EMERGENCY ESCAPE IN NEAR EARTH SPACE OPERATIONS

Vadim Rygalov, Department of Space Studies, University of North Dakota, United States

IAC-11.B3.5.9

ECONOMIC VALUE ANALYSIS OF THE RETURN FROM THE KOREAN ASTRONAUT PROGRAM AND THE SCIENCE CULTURE DIFFUSION ACTIVITY IN KOREA

Soyeon Yi, Korea Aerospace Research Institute, Korea, Republic of

IAC-11.B3.5.10

CHOLESTEROL OXIDASE IMMOBILIZATION ON CARBON NANOFIBER ELECTRODE (poster)

Dámaris Suazo-Dávila, NASA Harriet Jenkins Pre-Doctoral Fellowship, University of Puerto Rico, Puerto Rico

B3.6. - A5.3. Joint Session on Human and Robotic Partnerships to Realise Space Exploration Goals

October 6 2011, 15:00 — TS-03

Chair: *Christian Sallaberger (MDA Corporation, Canada); Anthony R. Gross (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *Rainer Willnecker (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Massimiliano Bottacini (European Space Agency (ESA), The Netherlands);*

IAC-11.A5.3.-B3.6.1

HUMAN/AUTOMATION TRADE METHODOLOGY FOR CREWED EXPLORATIONS

Anthony R. Gross, National Aeronautics and Space Administration (NASA), United States

IAC-11.A5.3.-B3.6.2

AN INTERDISCIPLINARY APPROACH TO HUMAN-ROBOTIC COOPERATION IN MARS EXPLORATION

Dag Evensberget, International Space University (ISU), Germany

IAC-11.A5.3.-B3.6.3

ENABLING CONTROL TECHNOLOGIES FOR TELESURGERY

Tamas Haidegger, Budapest University of Technology and Economics, Hungary

IAC-11.A5.3.-B3.6.4

HUMAN-ROBOTIC PARTNERSHIP LESSONS-LEARNED DURING SIMULATED MARS SURFACE EXCURSIONS THE RIO TINTO ANALOGUE SITE

Gernot Groemer, Austrian Space Forum, Austria

IAC-11.A5.3.-B3.6.5

DEVELOPMENT STATUS OF THE REX-J MISSION, ASTRONAUT SUPPORT ROBOT EXPERIMENT ON THE ISS/JEM

Mitsushige Oda, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.A5.3.-B3.6.6

CANADIAN-LED ANALOGUE MISSIONS IN PREPARATION FOR LUNAR AND MARTIAN SAMPLE RETURN.

Marianne Mader, University of Western Ontario, Canada

IAC-11.A5.3.-B3.6.7

FROM ROBOTIC ASTRONAUT ASSISTANT REQUIREMENTS TO DEMONSTRATION: THE CASE OF SPACEPARTNER

Seppo Heikkilä, Aalto University School of Science and Technology, Finland

IAC-11.A5.3.-B3.6.8

HUMAN AND ROBOTIC PARTNERSHIPS FROM EUROMOONMARS ANALOGUE MISSIONS 2011

Jeffrey Hendrikse, Astrium GmbH, Germany

IAC-11.A5.3.-B3.6.9

DESIGN AND DEVELOPMENT OF A GROUND BASED ROBOTIC TUNNELING WORM FOR OPERATION IN HARSH ENVIRONMENTS

Joshua Johnson, University of Alabama in Huntsville, United States

IAC-11.A5.3.-B3.6.10

THE RESEARCH OF CONTROL SYSTEM ARCHITECTURE OF CHINESE SPACE REMOTE MANIPULATOR

ZHANG XIAO DONG, CAST, China

B3.7. Enablers for the Future Human Missions

October 7 2011, 09:00 — TS-03

Chair: *Martin Zell (European Space Agency (ESA), The Netherlands); Lionel Suchet (Centre National d’Etudes Spatiales (CNES), France);*

Rapporteur: *Gi-Hyuk Choi (Korean Aerospace Research Institute, Korea, Republic of);*



**IAC-11.B3.7.1**

USAGE OF LOW EARTH STATIONS LOGISTICS EXPERIENCE FOR LUNAR INHABITED SETTLEMENTS

Sergey K. Shaevich, Khrunichev State Research & Production Space Center, Russia

IAC-11.B3.7.2

ENABLING EXPLORATION THROUGH THE INTERNATIONAL DOCKING SYSTEM STANDARD

Caris Hatfield, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States

IAC-11.B3.7.3

RESEARCH OF HUMAN FACTORS FOR SPACE EXPLORATION

Patrik Sundblad, European Space Agency (ESA), The Netherlands

IAC-11.B3.7.4

PRELIMINARY ASSESSMENT OF A SOLAR WIND SHIELD BASED ON A PLASMA-INFLATED ARTIFICIAL MAGNETOSPHERE

Salvo Marcuccio, Alta S.p.A., Italy

IAC-11.B3.7.5

A ROBOTIC SURGICAL ASSISTANT FOR ISS AND BEYOND

John Lymer, MDA, Canada

IAC-11.B3.7.6

ACLS - THE ADVANCED CLOSED-LOOP SYSTEM FOR ACCOMMODATION ON THE ISS

Klaus Bockstahler, EADS Astrium Space Transportation, Germany

IAC-11.B3.7.7

DEVELOPMENT OF A LACTATE BIOSENSOR FOR MONITORING OF THE PHYSICAL FITNESS OF ASTRONAUTS (poster)

Miraida Pagan, NASA Harriet Jenkins Pre-Doctoral Fellowship, University of Puerto Rico, United States

IAC-11.B3.7.8

TEENAGERS IN SPACE: MISSION NOT IMPOSSIBLE (poster)

Igor Fierens, United Kingdom

B3.8. - E7.7. Joint IAF/IISL Session on Policy and Law of Human Space Missions

October 7 2011, 14:00 — TS-03

Chair: *Cristian Bank (EADS Astrium Space Transportation GmbH, Germany); Lesley Jane Smith (Leuphana University of Lüneburg/ Weber-Steinhaus & Smith, Germany);*

Rapporteur: *Luise Weber-Steinhaus (, Germany);*

IAC-11.E7.7.-B3.8.1

LEGAL ISSUES IN CHINA'S POSSIBLE PARTICIPATION IN THE INTERNATIONAL SPACE STATION (ISS)

Yun Zhao, The University of Hong Kong, Hong Kong

IAC-11.E7.7.-B3.8.2

POLICY AND LAW ASPECTS OF INTERNATIONAL COOPERATION IN SPACE EXPLORATION

Christopher Johnson, International Institute of Space Law (IISL), United States

IAC-11.E7.7.-B3.8.3

NEW PARTNERSHIPS IN SPACE PROJECTS: THE LEGAL AND POLICY IMPLICATIONS OF PUBLIC AND PRIVATE PARTNERS REGARDING THE ISS

Lesley Jane Smith, Leuphana University of Lüneburg/ Weber-Steinhaus & Smith, Germany

IAC-11.E7.7.-B3.8.4

MCTR AND THE NORMS OF INTERNATIONAL COOPERATION

Sang-Myon Rhee, Seoul National University, Korea, Republic of

IAC-11.E7.7.-B3.8.5

THE RIGHT OF SELF-DEFENCE IN OUTER SPACE

José Monserrat-Filho, Brazilian Space Agency (AEB), Brazil

IAC-11.E7.7.-B3.8.6

SOME LEGAL ISSUES ON MANNED SPACE FLIGHT

Haifeng Zhao, Harbin Institute of Technology, China

IAC-11.E7.7.-B3.8.7

STATE JURISDICTION AND CONTROL OVER SPACE OBJECTS UNDER INTERNATIONAL SPACE LAW

Paul Larsen, Georgetown University Law Center, United States

IAC-11.E7.7.-B3.8.8

NATIONALITY AND LONG-ARM JURISDICTION IN COMMERCIAL SPACE TRANSPORTATION: IMPLICATIONS FOR FUTURE GLOBAL COOPERATION

Sara Langston, University of Mississippi, United States

IAC-11.E7.7.-B3.8.9

"THE LEGAL PROBLEMS OF PROVIDING THE SPACE ACTIVITY OF SPACE OBJECTS LAUNCHING BY AEROSPACE LAUNCH SYSTEMS WITH THE PARTICIPATION OF SEVERAL STATES (AIR LAUNCH PROJECT AS EXAMPLE)"

Gulnaz Khalimova, Air Launch Aerospace Corporation, Russia

IAC-11.E7.7.-B3.8.10

THE RELATIONSHIP BETWEEN RULES OF SPACE LAW AND HUMAN RIGHTS LAW: THE CASE OF THE RIGHT TO WATER

Cynthia Jimenez Monroy, Finland

IAC-11.E7.7.-B3.8.12

EXTENDING THE OUTER SPACE TREATY TO PROTECT PLANETARY ENVIRONMENTS

John D. Rummel, East Carolina University, United States

B4. 15th SYMPOSIUM ON SMALL SATELLITE MISSIONS

Coordinator: Rhoda Shaller Hornstein (National Aeronautics and Space Administration (NASA), United States); Alex da Silva Curiel (Surrey Satellite Technology Ltd, United Kingdom);

B4.1. 12th UN/IAA Workshop on Small Satellite Programmes at the Service of Developing Countries

October 4 2011, 10:00 — TS-10

Chair: *Sias Mostert (Space Commercial Services Holdings (Pty) Ltd, South Africa); Sergei Chernikov (United Nations Office at Vienna, Austria);*

Rapporteur: *Petr Lala (Czech Space Office, Czech Republic);*

Pierre Molette (, France);

IAC-11.B4.1.1

TECHNOLOGICAL LEARNING THROUGH INTERNATIONAL COLLABORATION: LESSONS FROM THE FIELD

Danielle Wood, Massachusetts Institute of Technology (MIT), United States

IAC-11.B4.1.2

SUMBANDILASAT - LEADING THE WAY FOR FUTURE SATELLITE PROGRAMMES

Khalid Manjoo, SunSpace, South Africa

IAC-11.B4.1.3

ISU SPACE STUDIES PROGRAMME 2011: TEAM PROJECT ON SMALL SATELLITES FOR CAPACITY BUILDING IN SPACE TECHNOLOGY DEVELOPMENT

Werner R. Balogh, United Nations Office for Outer Space Affairs, Austria

IAC-11.B4.1.4

HUMSAT: NANOSATELLITE CONSTELLATION APPLIED TO HUMANITARIAN SUPPORT

Fernando Aguado Agelet, University of Vigo, Spain

IAC-11.B4.1.5

PROGRESS IN THE NANOSATC-BR – CUBESATS DEVELOPMENT

Nelson Jorge Schuch, Southern Regional Space Research Center - CRS/CCR/INPE - MCT in collaboration with the Space Science Laboratory of Santa Maria - LACESM/CT - UFSM, Brazil

IAC-11.B4.1.6

NEE-01 PEGASUS: THE FIRST ECUADORIAN SATELLITE

Ronnie Nader, Ecuadorian Civilian Space Agency (EXA), Ecuador

IAC-11.B4.1.7

RECENT DEVELOPMENT OF SATELLITE TECHNOLOGY IN VIETNAM

Anh Tuan Pham, Space Technology Institute (STI), Vietnam

IAC-11.B4.1.8

PAST, PRESENT AND FUTURE OF THE ROMANIAN NANOSATELLITES PROGRAM.

Mugurel Balan, Institute for Space Sciences, Romania

IAC-11.B4.1.9

ONE SATELLITE PER COUNTRY - HOW EMERGING SPACE-FARING NATIONS CAN BENEFIT FROM TECHNOLOGY TRANSFER THROUGH FREE OPEN-SOURCE PROJECTS

Claas Ziemke, Institute of Space Systems, Universität Stuttgart, Germany

IAC-11.B4.1.10

THE PROSPECTS FOR SMALL GEOSTATIONARY COMMUNICATION SATELLITES FOR THE COUNTRIES OF ASIA-PACIFIC AND SOUTH AFRICAN REGIONS: WAYS FOR THE DEMAND MEETING

Gerald Webb, Commercial Space Technologies Ltd., United Kingdom

IAC-11.B4.1.11

EARTH OBSERVATION MICROSATELLITE CONSTELLATION FOR DISASTER MONITORING IN AFRICA (poster)

Beatriz Jilete, Spain

IAC-11.B4.1.12

CANEUS SHARED SMALL SATELLITES FOR COLLECTIVE SAFETY, SECURITY AND PROSPERITY (poster)

Milind Pimprikar, CANEUS, Canada

B4.2. Small Space Science Missions

October 3 2011, 15:00 — TS-10

Chair: *Stamatios Krimigis (The John Hopkins University, United States); Denis J.P. Moura (European Defence Agency, Belgium);*

IAC-11.B4.2.1

O/OREOS: A SUCCESSFUL MISSION OF NASA'S ASTROBIOLOGY SMALL PAYLOAD PROGRAM

Pascale Ehrenfreund, Space Policy Institute, George Washington University, United States

IAC-11.B4.2.2

FIRST IN FLIGHT RESULTS FROM THE SUN INVESTIGATION MICRO-SATELLITE PICARD

Francois BUISSON, Centre National d'Etudes Spatiales (CNES), France

IAC-11.B4.2.3

CONSIDERATIONS FOR DEVELOPING CRITICAL SPACE WEATHER CUBESAT MISSIONS

Larry Paxton, The John Hopkins University Applied Physics Laboratory, United States

IAC-11.B4.2.4

CUBESAT MISSION DESIGN FOR CHARACTERISING THE DUAL AURORAL RADAR NETWORK (SUPERDARN) FIELD OF VIEW

Robert Van Zyl, Cape Peninsula University of Technology, South Africa

IAC-11.B4.2.5

DEVELOPMENT OF CUBESAT FOR SPACE SCIENCE MISSION: CINEMA

Yongseok Lee, Kyung Hee University, Korea, Republic of

IAC-11.B4.2.6

SCIENTIFIC EXPERIMENTS ON BOARD THE GOLIAT CUBESAT

Marius Florin Trusculescu, Institute for Space Sciences, Romania

IAC-11.B4.2.7

THE ASTER MISSION: EXPLORING FOR THE FIRST TIME A TRIPLE SYSTEM ASTEROID

Elbert E.N. Macau, Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

IAC-11.B4.2.8

ASTEROIDFINDER: IMPLEMENTING A SMALL SATELLITE MISSION TO DETECT IEOS

Ross Findlay, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B4.2.9

NEOSSAT AND M3MSAT - TWO CANADIAN MICROSAT MISSIONS

Mak Tafazoli, Canadian Space Agency, Canada

IAC-11.B4.2.10

A JAPANESE MICROSATELLITE BUS SYSTEM FOR INTERNATIONAL SCIENTIFIC MISSIONS

Toshinori Kuwahara, Tohoku University, Japan

IAC-11.B4.2.11

CUBESATS FOR KEY TECHNOLOGY DEMONSTRATION TO BE LAUNCHED TOGETHER WITH THE QB50 NETWORK

Cem Ozan Asma, von Karman Institute for Fluid Dynamics, Belgium

IAC-11.B4.2.12

FASTSAT – MISSION RESULTS FROM THE SPACE TEST PROGRAM S26 MISSION

Steve Cook, Dynetics, United States

IAC-11.B4.2.13

UKUBE-1: A MULTI-PAYLOAD TECHNOLOGY DEMONSTRATION PLATFORM

Craig Clark, Clyde Space Ltd., United Kingdom

IAC-11.B4.2.14

ON THE DESIGN, MANUFACTURING AND VERIFICATION OF THE OPTICAL BENCH STRUCTURE AND MIRROR SYSTEM OF THE MICRO-ROSI X-RAY TELESCOPE. (poster)

Elias Breunig, Technische Universität München, Max-Planck-Institut für extraterrestrische Physik (MPE), Germany

IAC-11.B4.2.15

MISSION CONCEPT FOR THERMOSPHERE IN-SITU MEASUREMENT FROM NANO-SATELLITE CONSTELLATION (poster)

An-Ming Wu, National Space Organization, Taiwan, China

B4.3. Small Satellite Operations

October 4 2011, 15:00 — TS-10

Chair: *Peter M. Allan (Rutherford Appleton Laboratory, United Kingdom); Karen McBride (University of California, Los Angeles, United States);*

IAC-11.B4.3.1

CROWDSOURCING SPACE EXPLORATION WITH SPACECRAFT-ON-DEMAND

Michael Johnson, JA, United Kingdom

**IAC-11.B4.3.2**

CHALLENGES OF OPERATING THE QB50 NANOSATELLITE SWARM

Stefano Speretta, ISIS - Innovative Solutions In Space B.V., The Netherlands

IAC-11.B4.3.3

AUTONOMOUS NAVIGATION FOR TRANS-LUNAR NANO-SATELLITE MISSIONS

Frederik Belien, Delft University of Technology (TU Delft), Belgium

IAC-11.B4.3.4

DEVELOPMENT OF AUTOMATIC SATELLITE OPERATION SYSTEM - USING REIMEI GROUND STATION AS A TEST BENCH -

Hiroyuki Nagamatsu, Japan Aerospace Exploration Agency (JAXA)/ ISAS, Japan

IAC-11.B4.3.5

MULTI-SATELLITE, MULTI-STATION TT&C SCHEDULING USING MULTI-OBJECTIVE EVOLUTIONARY ALGORITHMS

Huijiao Bu, National University of Defense Technology of the Chinese People's Liberation Army, China

IAC-11.B4.3.6

CNES SOLUTION FOR A REUSABLE PAYLOAD GROUND SEGMENT

Gregory Pradels, Centre National d'Etudes Spatiales (CNES), France

IAC-11.B4.3.7

THE INTERNATIONAL SPACE INNOVATION CENTRE: EARTH OBSERVATION HUB

Peter M. Allan, Rutherford Appleton Laboratory, United Kingdom

IAC-11.B4.3.8

THE PRISMA FORMATION FLYING MISSION: SUMMARY OF THE NOMINAL MISSION AND OVERVIEW OF THE EXTENDED MISSION

Per Bodin, Swedish Space Corporation, Sweden

IAC-11.B4.3.9

A LOW COST, AGILE SPACECRAFT, FOR SPACE SITUATIONAL AWARENESS

Philip Davies, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.3.10

DESIGN OF DATA ACQUISITION, COLLECTION, PROCESSING AND ARCHIVING SYSTEM FOR PRATHAM, IIT BOMBAY'S STUDENT SATELLITE PROJECT.

Jhonny Jha, Indian Institute of Technology Bombay (IITB), India

IAC-11.B4.3.11

NOVASAT: TURNKEY SOLUTION FOR SMALL PAYLOAD IN-ORBIT DEMONSTRATION

Stanislaw Ostoja Starzewski, Novanano SAS, France

IAC-11.B4.3.12

ODIN - TEN YEARS IN ORBIT: OUTPERFORMING THE DESIGN LIFETIME WITH A FACTOR OF FIVE

Emil Vinterhav, Swedish Space Corporation, Sweden

B4.4. Small Earth Observation Missions

October 5 2011, 10:00 — TS-10

Chair: *Larry Paxton (The John Hopkins University Applied Physics Laboratory, United States); Amnon Ginati (European Space Agency (ESA), The Netherlands);*

Rapporteur: *Klaus Briess (Technische Universität Berlin, Germany);*

IAC-11.B4.4.1

A GLOBAL GEOGRAPHICAL SURVEY OF RECEIVED SIGNAL STRENGTH IN THE VHF BAND

Jacobus van Zyl, SunSpace, South Africa

IAC-11.B4.4.2

EUROPEAN SATELLITE AIS UNDER JOINT EMSA/ESA INTEGRATED APPLICATIONS PROGRAMME

Carsten Tobehn, European Space Agency (ESA), The Netherlands

IAC-11.B4.4.3

ADVANCED ON-BOARD OPERATIONS CONCEPT – ENMAP SATELLITE BUS

Kaja Aßmann, OHB-System AG, Germany

IAC-11.B4.4.4

ASTROSAT 100 : MICROSATELLITE SOLUTION FOR HIGH RESOLUTION REMOTE SENSING SYSTEMS

Charles Koeck, EADS Astrium, France

IAC-11.B4.4.5

INITIAL FLIGHT RESULTS OF THE RADIO AURORA EXPLORER

John Springmann, University of Michigan, United States

IAC-11.B4.4.6

NANOSATELLITE CONSTELLATION FOR MEASURING THE TERRESTRIAL PLASMASPHERE STRUCTURE

Hajime Fukuhara, Kyoto University, Japan

IAC-11.B4.4.7

P-GRESSION: A COST-EFFECTIVE CUBESAT PAYLOAD SOLUTION FOR EARTH'S REMOTE SENSING

Manuela Cucca, Politecnico di Torino, Italy

IAC-11.B4.4.8

STUDENT DESIGN AND DEVELOPMENT OF EARTH OBSERVATION NANOSATELLITE: ALBERTASAT-1

Jared Bottoms, University of Alberta, Canada

IAC-11.B4.4.9

THE RAPIDEYE SATELLITE CONSTELLATION AND ITS DATA SERVICES

Enrico Stoll, RapidEye AG, Germany

IAC-11.B4.4.10

A LOW COST SAR SOLUTION FOR DISASTER MANAGEMENT AND ENVIRONMENTAL MONITORING APPLICATIONS

Philip Whittaker, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.4.11

THE THERMAL HYPERSPECTRAL IMAGER: AN INSTRUMENT FOR REMOTE SENSING OF EARTH'S SURFACE, OCEANS, AND ATMOSPHERE, FROM A MICRO SATELLITE PLATFORM

Robert Wright, University of Hawaii, United States

IAC-11.B4.4.12

FIRST LIGHT FOR THE NIGERIASAT-2 IMAGING MISSION

Alex da Silva Curiel, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.4.13

FUTURE SMALL SATELLITE EO MISSIONS BASED ON TET

Clemens Kaiser, Kayser-Threde GmbH, Germany

B4.5. Access to Space for Small Satellite Missions

October 5 2011, 15:00 — TS-10

Chair: *Alex da Silva Curiel (Surrey Satellite Technology Ltd, United Kingdom); Jeffery Emdee (The Aerospace Corporation, United States);*

IAC-11.B4.5.1

SMALL LAUNCHERS FOR SMALL SATELLITE: LAUNCH EVENTS TRENDS AND PERSPECTIVE - A QUANTITATIVE ANALYSIS BASED ON HISTORICAL TRENDS (1988-2010)

Sebastien Moranta, Eurospace, France

IAC-11.B4.5.2

PAST PRESENT AND FUTURE NANOSATELLITE LAUNCH OPPORTUNITIES

Freddy Pranajaya, University of Toronto, Canada

IAC-11.B4.5.3

THE CHANGING LAUNCH SOLUTIONS FOR THE SMALL SATELLITE SECTOR

Alex da Silva Curiel, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.5.4

CUBESAT LAUNCH EXPERIENCES AND NEW LAUNCH OPPORTUNITIES

Jordi Puig-Suari, California Polytechnic State University, United States

IAC-11.B4.5.5

REDUCTION TO PRACTICE OF A MICRO ROCKET ENGINE FOR SMALL LAUNCHER PROPULSION

Natalya Brikner, Duke University, United States

IAC-11.B4.5.6

A PLATFORM TO LAUNCH UNIVERSITY SATELLITES: UNIPLAT

Chantal Cappelletti, Scuola di Ingegneria Aerospaziale, Italy

IAC-11.B4.5.7

FLYMATE: ADVANCED NANOSATELLITE DEPLOYER

Stanislaw Ostoja Starzewski, Novanano SAS, France

IAC-11.B4.5.8

SMALL SATELLITE APPROACH FOR A LARGE MISSION RESEARCH RETURN:FASTSAT

Daniel Schumacher, National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center, United States

IAC-11.B4.5.9

ACCESS TO SPACE ON NASA'S NEW HEAVY LIFT ROCKET

Mark Lupisella, National Aeronautics and Space Administration (NASA), United States

B4.6A. Generic Technologies for Small/Micro Platforms

October 6 2011, 10:00 — TS-10

Chair: *Nicholas Waltham (Rutherford Appleton Laboratory, United Kingdom); Philip Davies (Surrey Satellite Technology Ltd, United Kingdom);*

IAC-11.B4.6A.1

FLIGHT RESULT OF SDS-1 AND DEVELOPMENT OF SDS-4 IN JAXA

Yosuke Nakamura, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B4.6A.2

A DISTRIBUTED MULTISPECTRAL IMAGING SYSTEM FOR THE NEXT GENERATION OF DISASTER RELIEF SPACE SYSTEMS.

Richard Long, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.6A.3

DEVELOPMENT OF A MINIATURIZED ELECTRIC PROPULSION SYSTEM FOR THE E-SAIL PROJECT

Salvo Marcuccio, Alta S.p.A., Italy

IAC-11.B4.6A.4

A LOW-MASS SOLAR PANEL WITH INTEGRATED POWER AND SIGNAL PROCESSING CAPABILITIES

Leonardo M. Reyneri, Politecnico di Torino, Italy

IAC-11.B4.6A.5

MUREM: A MICRO RADIATION ENVIRONMENT AND EFFECTS MONITOR FOR SMALL SATELLITES

Craig Underwood, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.B4.6A.6

FLYING WITH WIRELESS: THE IMPLEMENTATION OF A BLUETOOTH SPACECRAFT DATA BUS ON MICRO-SATELLITE

Yunlong Lin, York University, Canada

IAC-11.B4.6A.7

MIT CASTOR SATELLITE: DESIGN, IMPLEMENTATION, AND TESTING OF THE COMMUNICATION SYSTEM.

Alessandra Babuscia, Massachussetts Institute of Technology (MIT), United States

IAC-11.B4.6A.8

CONCEPT OF REASONABLY RELIABLE SYSTEMS ENGINEERING FOR MICRO-SATELLITES

Seiko Shirasaka, Keio University, Japan

IAC-11.B4.6A.9

DATA TRAFFIC SIMULATION IN MESH NETWORKS OF SMALL LEO SATELLITES

Aimal Siraj, void inc., Japan

IAC-11.B4.6A.10

HARDENING AGAINST RADIATION OF SOFTWARE CODE IN COTS PROCESSORS FOR LOW-COST NANOSATELLITES

Leonardo M. Reyneri, Politecnico di Torino, Italy

IAC-11.B4.6A.11

DEVELOPMENT OF HIGH ACCURACY MEMS RATE SENSOR FOR SMALL SATELLITES

Yuta Nakajima, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B4.6A.12

SMALL SATELLITE PLATFORM

Alexander Makarov, Yuzhnoye State Design Office, Ukraine

IAC-11.B4.6A.13

VARIABLE EMISSIVITY DEVICES FOR MICRO SATELLITE (poster)

Shengzhu Cao, China Academy of Space Technology (CAST), China

B4.6B. Generic Technologies for Nano/Pico Platforms

October 6 2011, 15:00 — TS-10

Chair: *Nicholas Waltham (Rutherford Appleton Laboratory, United Kingdom); Philip Davies (Surrey Satellite Technology Ltd, United Kingdom);*

Rapporteur: *Joost Elstak (ISIS - Innovative Solutions In Space B.V., The Netherlands);*

IAC-11.B4.6B.1

AISSAT-1: IN-ORBIT VERIFICATION OF THE GENERIC NANOSATELLITE BUS PLATFORM

Alexander Beattie, Space Flight Laboratory, University of Toronto, Canada

IAC-11.B4.6B.2

DESIGN STRATEGIES FOR SUCCESSFUL CUBESAT MISSION DEVELOPMENT

Jordi Puig-Suari, California Polytechnic State University, United States

IAC-11.B4.6B.3

INNOVATIVE MULTI-FUNCTIONAL SOLUTIONS HELP TO RELIEVE DESIGN LIMITATIONS IN NANOSATELLITES

Francois Visser, Cape Peninsula University of Technology, South Africa

IAC-11.B4.6B.4

FLEXIBLE SINGLE CHIP SOLUTIONS FOR HIGHLY INTEGRATED MINIATURIZED SPACECRAFT

Arash Noroozi, Delft University of Technology (TU Delft), The Netherlands

**IAC-11.B4.6B.5**

A PLUG-N-PLAY ATTITUDE DETERMINATION AND CONTROL SYSTEM, INCORPORATING CONTROL ALGORITHM, FOR CUBESATS

Craig Clark, Clyde Space Ltd., United Kingdom

IAC-11.B4.6B.6

ATTITUDE CONTROL ACTUATORS, SENSORS AND ALGORITHMS FOR A SOLAR SAIL CUBESAT

Willem Steyn, ESL, Inc., South Africa

IAC-11.B4.6B.7

NANOSATELLITE COMMUNICATION SYSTEM TRENDS

Stefano Speretta, ISIS - Innovative Solutions In Space B.V., The Netherlands

IAC-11.B4.6B.8

STRAND-1: USE OF A \$500 SMARTPHONE AS THE CENTRAL AVIONICS OF A NANOSATELLITE

Shaun Kenyon, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.6B.9

PHONESAT: A SMARTPHONE-BASED SPACECRAFT BUS

William Marshall, National Aeronautics and Space Administration (NASA) / Universities Space Research Association (USRA), United States

IAC-11.B4.6B.10

EVELOPMENT OF NANO-SATELLITE WITH RE-ENTRY CAPSULE

Domantas Brucas, Space Science and Technology Institute, Lithuania

IAC-11.B4.6B.11

CARBON NANOTUBES BASED THERMAL DISTRBUTION AND TRANSFER BUS SYSTEM FOR 1U CUBESATS

Ronnie Nader, Ecuadorian Civilian Space Agency (EXA), Ecuador

IAC-11.B4.6B.12

UNICUBESAT: A TEST FOR THE GRAVITY-GRADIENT SOLAR ARRAY BOOM

Chantal Cappelletti, Scuola di Ingegneria Aerospaziale, Italy

B4.7. Space Systems and Architectures**Featuring Cross-Platform Compatibility**

October 7 2011, 14:00 — TS-10

Chair: *Jaime Esper (National Aeronautics and Space Administration (NASA), United States); Marco D'Errico (Seconda Università' di Napoli, Italy);*

Rapporteur: *Peter Mendham (SciSys Ltd, United Kingdom);*

IAC-11.B4.7.1

MODULAR ARCHITECTURES FOR SATELLITE PRODUCT LINES: IMPLEMENTING PLUG-AND-PLAY TECHNOLOGIES FOR CROSS-PLATFORM INNOVATION

Bruce Chesley, Boeing Space and Intelligence Systems, United States

IAC-11.B4.7.2

RESULTS OF A REQUIREMENTS STUDY FOR MOBILE AD-HOC NETWORKS OF SMALL SATELLITES

Maximilian Dreitschew, Zentrum für Telematik, Germany

IAC-11.B4.7.3

SOFTWARE DEVELOPMENT AND VALIDATION: A COST-EFFECTIVE ENVIRONMENT AND APPROACH FOR LEON BASED SATELLITE AND PAYLOAD SUBSYSTEMS

Federico Cordero, VEGA Space GmbH, Germany

IAC-11.B4.7.4

THE SSTL-50 – A FLEXIBLE, HIGH PERFORMANCE PLATFORM

Doug Liddle, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.7.5

AISAT, VENTA-1 AND MAXVALIER NANOSATELLITES BASED ON QUADSAT PLATFORM

Indulis Kalnins, Germany

IAC-11.B4.7.6

A MODULAR TILE FOR MODULAR NANOSATELLITES

Danilo Roascio, Politecnico di Torino, Italy

IAC-11.B4.7.7

THE TREND IN SFL NANOSATELLITE PERFORMANCE

Freddy Pranajaya, University of Toronto, Canada

IAC-11.B4.7.8

SYSTEMS CONCURRENT ENGINEERING PICO-SATELLITES

Geilson Loureiro, Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

IAC-11.B4.7.9

ASTRIUM SATELLITES PRODUCT LINES FAMILY FOR EARTH OBSERVATION

Jean Cheganças, EADS Astrium, France

B4.8. Hitchhiking to the Moon

October 7 2011, 09:00 — TS-10

Chair: *Leon Alkalai (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States); Rene Laufer (Baylor University, United States);*

Rapporteur: *Adam Baker (Rocket Engineering Ltd., United Kingdom);*

IAC-11.B4.8.1

THE GOOGLE LUNAR X PRIZE

Nicole Jordan, X PRIZE Foundation, United States

IAC-11.B4.8.2

AMALIA MISSION: THE ITALIAN ANSWER TO THE GOOGLE LUNAR X PRIZE CHALLENGE

Michèle Lavagna, Politecnico di Milano, Italy

IAC-11.B4.8.3

TEAM ROCKET CITY SPACE PIONEERS – AN INDUSTRIAL APPROACH TO THE GOOGLE LUNAR X PRIZE COMPETITION

Steve Cook, Dynetics, United States

IAC-11.B4.8.4

HITCHHIKING TO THE MOON: THE EUROPEAN STUDENT MOON ORBITER MISSION

Susan Jason, Surrey Satellite Technology Ltd, United Kingdom

IAC-11.B4.8.5

CONTINGENCY AND RECOVERY OPTIONS FOR THE EUROPEAN STUDENT MOON ORBITER

Massimiliano Vasile, University of Strathclyde, United Kingdom

IAC-11.B4.8.6

APPLICATIONS OF NON-LINEAR PROGRAMMING FOR LUNAR MISSION BW-1 TRAJECTORY OPTIMISATION TO FURTHER MISSIONS

Rogan Shimmin, University of Adelaide, Australia

IAC-11.B4.8.7

INTRODUCING MINAS ITHIL: AN ITALIAN MICRO AND NANOSATELLITES MISSION TO THE MOON

Claudia A. M. Fiorentino, Italian Space Agency (ASI), Italy

IAC-11.B4.8.8

JULES VERNE: AN ACADEMY DEVELOPED NANOSPACECRAFT LUNAR ORBITER

Lorenzo Zago, Western Switzerland University of Applied Sciences - HEIG-VD, Switzerland

IAC-11.B4.8.9

LUNETTE AS A FAMILY OF SMALL LUNAR LANDERS

John Elliott, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.B4.8.10

ARMADILLO – A DEMONSTRATION FOR A CIS-LUNAR EXPLORATION MISSION TO THE KORDYLEWSKI CLOUDS

Rene Laufer, Baylor University, United States

IAC-11.B4.8.11

IRIS: STUDENT COLLABORATION PROJECT FOR THE PROPOSED MOONRISE SAMPLE RETURN MISSION

Ryan N. Clegg, Washington University in St. Louis, United States

IAC-11.B4.8.12

THE PROPOSAL OF AUTONOMOUS MOVEMENT AND EXPLORING ON THE MOON SURFACE BY COOPERATION OF BUDDY ROVER USING IMAGE PROCESSING

Kiyohiko Hattori, University of Electro-Communications, Japan

IAC-11.B4.8.13

TINY TIME TRAVELERS: A DISTRIBUTED MICRO-ARCHIVE ON THE MOON

James Burke, The Planetary Society, United States

B5. SYMPOSIUM ON INTEGRATED APPLICATIONS

Coordinator: Amnon Ginati (European Space Agency (ESA), The Netherlands); Larry Paxton (The John Hopkins University Applied Physics Laboratory, United States);

B5.1. Integrated Applications End-to-End Solutions

October 5 2011, 15:00 — TS-05

Chair: *David Y. Kusnierkiewicz (The John Hopkins University, United States); Amnon Ginati (European Space Agency (ESA), The Netherlands);*

Rapporteur: *Boris Penné (OHB-System AG, Germany);*

IAC-11.B5.1.1

GRAPELOOK: SPACE BASED SERVICES TO IMPROVE WATER USE EFFICIENCY OF VINEYARDS IN SOUTH AFRICA

Annemarie Klaasse, Waterwatch, The Netherlands

IAC-11.B5.1.2

AN AFFORDABLE SOLUTION TO THE SAT-AIS ESA INITIATIVE FOR MARITIME SURVEILLANCE

Charles Koeck, EADS Astrium, France

IAC-11.B5.1.3

PREDICT – PREVENTION AND RESPONSE TO EPIDEMICS WITH DEMONSTRATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES

César Bastón Canosa, European Space Agency (ESA), The Netherlands

IAC-11.B5.1.4

SPACE INTEGRATED INTO CIVIL PROTECTION TOOLBOX. IDENTIFYING WAY FORWARD

Jakub Ryzenko, PIAP & Warsaw University, Poland

IAC-11.B5.1.5

USING SPACE INFRASTRUCTURE FOR TELEMATIC CITY SERVICES IN RURAL AREAS

Sias Mostert, Space Commercial Services Holdings (Pty) Ltd, South Africa

IAC-11.B5.1.6

EXPLORING GNSS TECHNOLOGY FOR DISASTER MANAGEMENT IN DEVELOPING COUNTRIES

Stephanie Wan, Space Generation Advisory Council (SGAC), United States

IAC-11.B5.1.7

SPACE ASSETS FOR PIPELINE INTEGRITY MANAGEMENT (PIMS)

Michiel Kruijff, European Space Agency (ESA), The Netherlands

IAC-11.B5.1.8

MULTIMISSION RAPID RESPONSE SERVICES

Marte Indregard, Kongsberg Satellite Services AS, Norway

IAC-11.B5.1.9

SPACE ASSETS FOR DEMINING ASSISTANCE

Michiel Kruijff, European Space Agency (ESA), The Netherlands

IAC-11.B5.1.10

MAPPING HABITATS FOR VECTORS OF INFECTIOUS DISEASE: VECMAP

Michiel Kruijff, European Space Agency (ESA), The Netherlands

IAC-11.B5.1.11

OPERATIONALLY RESPONSIVE SPACE-GROUND INTEGRATION SYSTEM FOR DISASTER MONITORING AND MITIGATION

Zhifu Bai, China Academy of Launch Vehicle Technology, China

IAC-11.B5.1.12

SPACE SERVICES BENEFITS IN AVIATION SYSTEM

Marco Giancarli, Technosky, Italy

B5.2. Tools and Technology in Support of Integrated Applications

October 7 2011, 14:00 — TS-05

Chair: *Larry Paxton (The John Hopkins University Applied Physics Laboratory, United States); Carsten Tobehn (European Space Agency (ESA), The Netherlands);*

Rapporteur: *David Y. Kusnierkiewicz (The John Hopkins University, United States);*

IAC-11.B5.2.1

GAIA- GLOBAL ASSIMILATION OF INFORMATION FOR ACTION

Larry Paxton, The John Hopkins University Applied Physics Laboratory, United States

IAC-11.B5.2.2

DESIGN OF AN EXTENSIBLE SHIP DETECTION AND IDENTIFICATION SYSTEM

Edward Ross, Gemini Innovations, Canada

IAC-11.B5.2.3

DEVELOPMENT OF A CUSTOMIZED APPLICATION FOR MINERAL RESOURCE MANAGEMENT IN NIGERIA

Olufemi Shonubi, Obafemi Awolowo University, Nigeria

IAC-11.B5.2.4

MARITIME SURVEILLANCE BY MEANS OF SYNTHETIC APERTURE RADAR IMAGING COMPLEMENTED WITH AIS INFORMATION

Marco D'Errico, Seconda Università' di Napoli, Italy

IAC-11.B5.2.5

PROJECT CATCH, A SPACE BASED SOLUTION TO COMBAT ILLEGAL, UNREPORTED AND UNREGULATED FISHING. PART I: VESSEL MONITORING SYSTEM.

Emmanouil Detsis, International Space University (ISU), France

IAC-11.B5.2.6

SATELLITE-ENHANCED TELEMEDICINE AND EHEALTH FOR SUB-SAHARAN AFRICA: A DEVELOPMENT OPPORTUNITY

Gonzalo Martin-de-Mercado, European Space Agency (ESA), The Netherlands

IAC-11.B5.2.7

TITAN, A SYSTEM FOR INTELLIGENT RAILWAYS VIA INTEGRATED SATELLITE SERVICES (IRISS)

Michiel Kruijff, European Space Agency (ESA), The Netherlands

**IAC-11.B5.2.9**

USING THE DSST SEMI-ANALYTICAL ORBIT PROPAGATOR PACKAGE VIA THE NONDYWEBTOOLS/ASTRODYWEBTOOLS OPEN SCIENCE ENVIRONMENT

Juan Félix San-Juan, Universidad de La Rioja, Spain

B6. SPACE OPERATIONS SYMPOSIUM

Coordinator: H. Neal Hammond (Space Bridges, LLC, United States); Manfred Warhaut (European Space Agency (ESA), Germany);

B6.1. Human Spaceflight Operations Concepts

October 4 2011, 10:00 — TS-07

Chair: *Michael McKay (European Space Agency (ESA), Germany); Mario Cardano (Thales Alenia Space France, Italy);*

Rapporteur: *Helmut Luttmann (Orbital, Germany);*

IAC-11.B6.1.1

SPECIFIC FEATURES OF TRANSPORT OPERATIONS PLANNING IN CASE OF INCREASING NUMBER OF TRANSPORT VEHICLES

Tatiana Matveeva, RSC Energia, Russia

IAC-11.B6.1.2

HTV FLIGHT OPERATION RESULTS

Koji Yamanaka, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B6.1.3

EVALUATION RESULTS OF THE HTV ATMOSPHERIC REENTRY TRAJECTORY

Keiichi Wada, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B6.1.4

FROM ATV JULES VERNE TO JOHANNES KEPLER – EUROPEANS MASTERING OF SPACE RENDEZVOUS OPERATIONS

Alberto Novelli, European Space Agency (ESA), The Netherlands

IAC-11.B6.1.5

ATV-2 JOHANNES KEPLER MISSION AND RECURRENT FLIGHTS

Patrice Benarroche, Centre National d'Etudes Spatiales (CNES), France

IAC-11.B6.1.6

ATV-2 CARGO INTEGRATION

Gastaldi, Thales Alenia Space Italia, Italy

IAC-11.B6.1.7

SPACE STATION OVERALL MISSION PLANNING: PLANNING MODEL, SIMULATION FRAMEWORK AND PRELIMINARY RESULTS

Lin Kunpeng, National University of Defense Technology, China

IAC-11.B6.1.8

EVOLUTION OF KIBO(JEM)-RMS – CHALLENGE FOR GROUND CONTROL

Shitoshi Hasegawa, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B6.1.9

OPTIMAL SIMULATOR USE OVER THE HUMAN SPACE MISSION LIFE CYCLE

Graham O'Neil, USA Space Operations LLC, United States

IAC-11.B6.1.10

VISION-BASED RELATIVE ATTITUDE AND POSITION DETERMINATION AND CONTROL TECHNOLOGY (poster)

Yongqiang Jin, China

IAC-11.B6.1.11

HUMAN SPACE FLIGHT SOFTWARE EVOLUTION (poster)

Graham O'Neil, USA Space Operations LLC, United States

B6.2. New Operations Concepts

October 6 2011, 15:00 — TS-07

Chair: *Geneviève Campan (Centre National d'Etudes Spatiales (CNES), France); Thomas Kuch (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);*

Rapporteur: *Akira Tsuchida (Japan Aerospace Exploration Agency (JAXA), Japan);*

IAC-11.B6.2.1

GAIA MISSION OPERATIONS CONCEPT AND GROUND SEGMENT DESIGN - THE CHALLENGES AND CURRENT STATUS

Andreas Rudolph, European Space Agency (ESA), Germany

IAC-11.B6.2.2

WEB-ENABLED RESPONSIVE SPACE OPERATIONS

Joel Hicks, Naval Research Laboratory, United States

IAC-11.B6.2.3

SAR/GALILEO DISTRIBUTED OPERATIONS

Xavier Maufroid, European Commission - DG Enterprise, Belgium

IAC-11.B6.2.4

THE EUROPEAN DATA RELAY SYSTEM (EDRS): OPERATIONAL CHALLENGES

Frank Wallrapp, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B6.2.5

EMERGENCY END OF LIFE OPERATIONS FOR CNES REMOTE SENSING SATELLITES – MANAGEMENT AND OPERATIONAL PROCESS

Régis Bertrand, Centre National d'Etudes Spatiales (CNES), France

IAC-11.B6.2.6

LATENCY AS A DRIVER FOR GROUND STATION ARCHITECTURE

Petrus Hyvönen, Swedish Space Corporation, Sweden

IAC-11.B6.2.7

MISSION OPERATIONS CONCEPTS FOR ROBOTIC MISSIONS

Florian Sellmaier, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B6.2.8

EFFECTIVENESS AND CASE STUDIES FOR MULTI PURPOSE REMOTE CONTROL CENTERS

Ivano Musso, ALTEC, Italy

IAC-11.B6.2.9

A CORE CONTROL SEGMENT FOR EARTH OBSERVATION MISSIONS

Marc Niezette, VEGA, Germany

IAC-11.B6.2.10

NEW PARAMETERS FOR AUTOMATIC END-TO-END COSMO-SKYMED SYSTEM PERFORMANCES MONITORING

Manfredi Porfilio, Italian Space Agency (ASI), Italy

IAC-11.B6.2.11

INTEGRAL - RENAISSANCE OF OCCULTATION TECHNIQUES USING THE EARTH

Carmen Lozano, VEGA Space GmbH, Germany

IAC-11.B6.2.12

RESEARCH ON RANDOMIZATION-BASED ACCURATE MOTION PLANNING FOR AUTONOMOUS SERVICING SPACECRAFT ON NON-PARABOLIC ORBIT (poster)

Ping Wang, China Academy of Space Technology (CAST), China

B6.3. Training Relevant for Operations Including Human Spaceflight

October 7 2011, 09:00 — TS-07

Chair: *Paolo Ferri (European Space Agency (ESA), Germany);*

John Auburn (VEGA Group, United Kingdom);

Rapporteur: *Adam Williams (European Space Agency (ESA), France);*

IAC-11.B6.3.1

REDESIGN TRAINING TO REDESIGN WORK: TRAIN TO MINIMIZE HUMAN ERROR DURING THE OPERATION OF HUMAN RATED SYSTEMS

Hunt Culver, United Space Alliance, United States

IAC-11.B6.3.2

EUROPEAN PAYLOAD TRAINING FOR ISS ASTRONAUTS. A COMPREHENSIVE INSIGHT:

Frank Salmen, VEGA Space GmbH, Germany

IAC-11.B6.3.3

COLUMBUS FLIGHT CONTROL TEAM: TRAINING AND OPERATIONAL EVOLUTION

Prashant Shukla, Telespazio, Germany

IAC-11.B6.3.4

MEETING THE CHALLENGES OF OPERATIONS TRAINING IN AN INTERNATIONAL ENVIRONMENT

Adam Williams, European Space Agency (ESA), France

IAC-11.B6.3.5

ON-BOARD TRAINING TOOLS UTILIZATION TO ENHANCE OPERATIONS

Liliana Ravagnolo, Altec S.p.A., Italy

IAC-11.B6.3.6

HARDWARE IN THE LOOP SATELLITE ENGINEERING AND OPERATIONS TRAINING.

Jan du Plessis, SunSpace, South Africa

IAC-11.B6.3.7

AN IMMERSIVE VIRTUAL OPERATION AND VIRTUAL MAINTENANCE SYSTEM FOR SPACECRAFT

Bo Zhao, Beijing Institute of Astronautical Systems Engineering, China

IAC-11.B.6.3.8

TRAINING CONCEPT OF THE COLUMBUS FLIGHT CONTROL TEAM

Thomas Uhlig, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

B6.6. - B3.4. Sustainable Operations of the ISS - Joint Session of the Human Space Endeavours and Space Operations Symposia

October 5 2011, 15:00 — TS-03

Chair: *Maria Stella Lavitola (Thales Alenia Space Italia, Italy);*

Bob Chesson (European Space Agency (ESA), The Netherlands);

Rapporteur: *Rachid Amekrane (Astrium GmbH, Germany);*

IAC-11.B3.4.-B6.6.1

UNPRECEDENTED PROSPECTS FOR ISS UTILIZATION

Ulrich Kuebler, Astrium GmbH, Germany

IAC-11.B3.4.-B6.6.2

CHANGES IN COLUMBUS OPERATIONS AND OUTLOOK TO LONG-TERM OPERATION PHASE

Dieter Sabath, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B3.4.-B6.6.3

INTERFACE IMPROVEMENT IN A COMPLEX DECENTRALIZED OPERATIONS ENVIRONMENT

Berti Brigitte Meisinger, European Space Agency (ESA), Germany

IAC-11.B3.4.-B6.6.4

THE COLUMBUS GROUND SEGMENT – A PRECURSOR FOR FUTURE MANNED MISSIONS

Thomas Mueller, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.B3.4.-B6.6.5

3-YEAR OF INDUSTRIAL TO THE ISS OPERATIONS OF THE ESA ELEMENTS

Massimo Salussolia, Thales Alenia Space Italia, Italy

IAC-11.B3.4.-B6.6.6

RELIEVING CREW STRESS FROM STOWAGE ISSUE AND REDUCING VOLUME OF ON-ORBIT SPARES ON ISS

Junichi Sakai, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.B3.4.-B6.6.7

ADVANCED TOILET RESEARCH ON ISS IN PREPARATION FOR LONG-DURATION SPACEFLIGHT AND IN SUPPORT OF EFFICIENT WASTE MANAGEMENT ON EARTH

Akira Tsuchida, Earth-Track Corporation, Japan

IAC-11.B3.4.-B6.6.8

EXTENDING THE CAPABILITIES OF THE ISS MSS ROBOTICS

Herbert Goettmann, MDA Space Missions, Canada

IAC-11.B3.4.-B6.6.9

THE EVOLUTION OF TELE-ROBOTICS ON ISS AND ENABLING OF UNMANNED ON-ORBIT SERVICES

Richard Rembala, MDA, Canada

IAC-11.B3.4.-B6.6.10

RELAXING USOS SOLAR ARRAY CONSTRAINTS FOR RUSSIAN VEHICLE UNDOCKING

Evgeny Menkin, ARES Aerospace, United States

C1. ASTRODYNAMICS SYMPOSIUM

Chair: *Erick Lansard (Thales Research & Technology, France); Uwe Feucht (European Space Agency (ESA), Germany);*

C1.1. Mission Design, Operations and Optimization - Part 1

October 3 2011, 15:00 — TS-04

Chair: *Nicolas Bérend (Office National d'Etudes et de Recherches Aérospatiales (ONERA), France); Yury Razoumny (Bauman Moscow State Technical University, Russia);*

Rapporteur: *Johannes Schoenmaekers (European Space Agency (ESA), Germany);*

IAC-11.C1.1.1

TRAJECTORY TOUR OF THE TROJAN ASTEROIDS GENERATED VIA AN OPTIMAL LOW-THRUST ALGORITHM

Jeffrey Stuart, Purdue University, United States

IAC-11.C1.1.2

OPTIMUM DESIGN OF POWER-LIMITED PROPULSION SYSTEMS WITH APPLICATION TO FAST EARTH-TO-MARS TRANSFER

Nicolas Bérend, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France

IAC-11.C1.1.3

A STUDY OF THE ACCESSIBILITY TO ASTEROIDS FOR IKAROS MISSION AFTER VENUS FLYBY

Masaki Nakamiya, ISAS/JAXA, Japan

IAC-11.C1.1.4

NONLINEAR OPTIMIZATION IN SPACE APPLICATIONS WITH WORHP

Tim Nikolayzik, University of Bremen, Germany

**IAC-11.C1.1.5**

FUEL-OPTIMAL LOW-THRUST TRAJECTORY OPTIMIZATION OF MULTIPLE ASTEROID EXPLORATION MISSIONS

Yang Chen, Tsinghua University, China

IAC-11.C1.1.6

TRAJECTORY OPTIMIZATION OF AIR-LAUNCHED ROCKETS VIA DIRECT COLLOCATION METHOD

Mauro Pontani, University of Rome "La Sapienza", Italy

IAC-11.C1.1.7

MISSION ANALYSIS OF ROBOTIC, LOW-THRUST MISSIONS TO THE MARTIAN MOONS DEIMOS AND PHOBOS

Uwe Derz, EADS Astrium Space Transportation GmbH, Germany

IAC-11.C1.1.8

TRAJECTORY DESIGN IN PROXIMITY OF MARS FOR ROUND-TRIP MISSIONS

Cyrus Foster, National Aeronautics and Space Administration (NASA), United States

IAC-11.C1.1.9

MISSION DESIGN AND ANALYSIS FOR A LASER OCCULTATION DEMONSTRATION MISSION

Matthias Renard, Deimos Space S.L., Spain

IAC-11.C1.1.10

CONTINUOUS LOW-THRUST TRAJECTORY OPTIMIZATION BASED ON A SYMPLECTIC CONSERVATIVE PERTURBATION METHOD

Liu Luhua, National University of Defense Technology, China

IAC-11.C1.1.11

DESIGN OF OPTIMAL EARTH POLE-SITTER TRANSFERS USING LOW-THRUST PROPULSION

Jeannette Heiligers, University of Strathclyde, United Kingdom

IAC-11.C1.1.12

OPTIMAL BI-IMPULSIVE EARTH-MOON TRANSFERS

Francesco Toppato, Politecnico di Milano, Italy

C1.2. Mission Design, Operations and Optimization - Part 2

October 4 2011, 10:00 — TS-04

Chair: *David B. Spencer (The Pennsylvania State University, United States); Michèle Lavagna (Politecnico di Milano, Italy);*

Rapporteur: *James O'Donnell (National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States);*

IAC-11.C1.2.1

TRAJECTORY OPTIONS FOR THE AKATSUKI RECOVERY

Stefano Campagnola, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C1.2.2

MISSION DESIGN AND ANALYSIS OF EUROPEAN ASTROPHYSICS MISSIONS

Markus Landgraf, European Space Agency (ESA), Germany

IAC-11.C1.2.3

EVOLUTION OF THE OUT-OF-PLANE AMPLITUDE FOR QUASI-PERIODIC TRAJECTORIES IN THE EARTH-MOON SYSTEM

Thomas Pavlak, Purdue University, United States

IAC-11.C1.2.4

DESATURATION MANEUVERS AND PRECISE ORBIT DETERMINATION FOR THE BEPICOLOMBO MISSION

Elisa Maria Alessi, University of Pisa, Italy

IAC-11.C1.2.5

TRAJECTORY OPTIMIZATION OF LIFTING-TYPE REENTRY VEHICLE VIA GAUSS PSEUDOSPECTRAL METHOD

En-mi Yong, Computational Aerodynamics Institute, China Aerodynamics Research&Development Center, China

IAC-11.C1.2.6

SKY COVERAGE ANALYSIS FOR A LIBRATION POINT OBSERVATORY WITH HIGH THERMAL STABILITY

Florian Renk, European Space Agency (ESA), Germany

IAC-11.C1.2.7

INTEGRATED APPROACH TO OPTIMIZING SPACECRAFT VEHICLES AND OPERATIONS

Sara Spangelo, University of Michigan, United States

IAC-11.C1.2.8

RADIATION MITIGATION STRATEGIES FOR THE LISA PATHFINDER LAUNCH AND EARLY ORBIT PHASE

Marcel Duering, University of Stuttgart, Germany

IAC-11.C1.2.9

A STUDY OF THE STATION KEEPING FOR SPICA MISSION USING DYNAMICAL SYSTEM THEORY

Masaki Nakamiya, ISAS/JAXA, Japan

IAC-11.C1.2.10

NON-COPLANAR LEO-LEO AEROCUISE ORBITAL TRANSFER TRAJECTORY OPTIMIZATION

Chen Hongbo, The Aerospace Corporation, China

IAC-11.C1.2.11

OPTIMIZATION OF SPACE OBSERVATION SYSTEMS CONSTELLATIONS ON THE BASIS OF OPERATIVE PLANNING OF THEIR TARGET FUNCTIONING

Valeriy V. Darnopykh, Moscow Aviation Institute (State University of Aerospace Technologies), Russia

IAC-11.C1.2.12

APPLICATION OF A MULTIPLE HYPOTHESIS FILTER TO NEAR GEO HIGH AREA-TO-MASS RATIO SPACE OBJECTS STATE ESTIMATION

Thomas Kelecý, Boeing Integrated Defense Systems, United States

C1.3. Orbital Dynamics - Part 1

October 4 2011, 15:00 — TS-04

Chair: *Rock Jeng-Shing Chern (University of Science & Technology, Taiwan, China); Filippo Graziani (University of Rome "La Sapienza", Italy);*

Rapporteur: *Josep J. Masdemont (Universitat Politècnica de Catalunya (UPC), Spain);*

IAC-11.C1.3.1

EFFECT OF A DRAG FORCE DUE TO ABSORPTION OF SOLAR RADIATION ON SOLAR SAIL ORBITAL DYNAMICS

Roman Ya. Kezerashvili, New York City College of Technology, United States

IAC-11.C1.3.2

ANALYTICAL SOLUTIONS OF THE RELATIVE MOTION ABOUT A KEPLERIAN ELLIPTIC ORBIT

Gerard Gomez, University of Barcelona, Spain

IAC-11.C1.3.3

POST-AEROCAPTURE ORBIT SELECTION AND MAINTENANCE FOR THE AEROFEST MISSION TO MARS

Mauro Pontani, University of Rome "La Sapienza", Italy

IAC-11.C1.3.4

AN EXTENDED DISCUSSION ON THE DOUBLESTAR ORBITS

Jingshi Tang, Nanjing University, China

IAC-11.C1.3.5

STATION KEEPING OF A SOLAR SAIL IN THE SOLAR SYSTEM

Ariadna Farrés, Observatoire de Paris, France

IAC-11.C1.3.6

INDIA'S FIRST MARS MISSION ORBIT DETERMINATION SYSTEM

Narayanasetti Venkata Vighnesam, Indian Space Research Organization (ISRO), India

IAC-11.C1.3.7

OPTIMAL IMPULSIVE ORBITAL MANEUVER BETWEEN NONCOPLANAR NONCOAXIAL ORBITS WITH OR WITHOUT TIME CONSTRAINT

M. Sanatifar, Shahid Beheshti University, G.C., Iran

IAC-11.C1.3.8

NATURAL PERIODIC RELATIVE ORBIT SOLVING USING FOURIER SERIES

Jing Cao, College of Astronautics, Northwestern Polytechnical University, China

IAC-11.C1.3.9

LONG-TERM EVOLUTION OF GALILEO OPERATIONAL ORBITS BY CANONICAL PERTURBATION THEORY

Martin Lara, Real Observatorio de la Armada, Spain

IAC-11.C1.3.10

SIMULATION OF ORBIT AND GUIDANCE DESIGN FOR TSLV

Rock Jeng-Shing Chern, University of Science & Technology, Taiwan, China

IAC-11.C1.3.11

STABILITY ANALYSIS OF A HIGHLY ECCENTRIC ORBIT AROUND MARS

Bannihatti Parameshwarappa Dakshayani, ISRO Satellite Centre (ISAC), India

IAC-11.C1.3.12

MARS-PHOBOS LOW ENERGY TRANSFER IN THE RESTRICTED THREE BODY PROBLEM

Dong Qiao, Beijing Institute of technology, China

C1.4. Orbital Dynamics - Part 2

October 5 2011, 10:00 — TS-04

Chair: *Gianmarco Radice (University of Glasgow, United Kingdom); Jean-Paul Berthias (Centre National d'Etudes Spatiales (CNES), France);*

Rapporteur: *Kathleen Howell (Purdue University, United States);*

IAC-11.C1.4.1

BREAKWELL LECTURE: ORBITAL MECHANICS ABOUT SMALL BODIES

Daniel Scheeres, University of Colorado, United States

IAC-11.C1.4.2

TRAJECTORY DESIGN FOR THE MOON DEPARTURE LIBRATION POINT MISSIONS IN FULL EPHEMERIS MODEL

Yang Chen, Tsinghua University, China

IAC-11.C1.4.3

IMPULSIVE CONTROL STRATEGY FOR FORMATION FLIGHT IN THE VICINITY OF THE LIBRATION POINTS

Rui Qi, Beihang University, China

IAC-11.C1.4.4

A SIMPLIFIED MODEL FOR MOTIONS AROUND THE COLLINEAR LIBRATION POINTS IN THE EARTH-MOON SYSTEM

Hou Xiyun, Nanjing University, China

IAC-11.C1.4.5

CLOSED-FORM SOLUTIONS FOR THE AVERAGED DYNAMICS OF HAMR OBJECTS

Daniel Scheeres, University of Colorado, United States

IAC-11.C1.4.6

ON THE CONTROLLED BALLISTIC CAPTURE OF ASTEROIDS FOR RESOURCE UTILISATION

Joan Pau Sanchez Cuartiellas, University of Strathclyde/Advanced Space Concept Laboratory, United Kingdom

IAC-11.C1.4.7

INFLUENCE OF NONSPHERICITY OF PLANETARY SATELLITES AND PERTURBATION OF THE THIRD-BODY ON THE ARTIFICIAL SATELLITES MOTION

Rodolpho Vilhena de Moraes, Universidade Federal de São Paulo, Brazil

IAC-11.C1.4.8

ORBITAL DYNAMICS OF HIGH AREA-TO-MASS RATIO SPACECRAFT UNDER THE INFLUENCE OF J₂, SOLAR RADIATION PRESSURE AND DRAG

Camilla Colombo, University of Strathclyde, United Kingdom

IAC-11.C1.4.9

NONLINEARLY STABLE EQUILIBRIA IN THE SUN-JUPITER-TROJAN-SPACECRAFT FOUR BODY PROBLEM.

Marta Ceccaroni, University of Strathclyde, United Kingdom

IAC-11.C1.4.10

OPTIMAL LOW-THRUST TRANSFER TO L₄ AND L₅ LAGRANGIAN POINTS

Francisco Salazar, National Institute for Space Research - INPE, Brazil

IAC-11.C1.4.11

EARTH-TO-MOON LOW ENERGY TRANSFER USING TIME-DEPENDENT INVARIANT MANIFOLDS

Rui Qi, Beihang University, China

C1.5. Attitude Dynamics - Part 1

October 5 2011, 15:00 — TS-04

Chair: *Kazuya Yoshida (Tohoku University, Japan); Hyochoong Bang (Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of);*

Rapporteur: *Arun Misra (McGill University, Canada);*

IAC-11.C1.5.1

RESEARCH ON COUPLED DYNAMICS OF LARGE AMPLITUDE LIQUID SLOSHING WITH SPACECRAFT BASED ON 3D CONSTRAINT SURFACE MODEL

Lei Yang, China Academy of Space Technology (CAST), China

IAC-11.C1.5.2

A NOVEL ACTIVE CONTROLLER FOR SPIN STABILIZED SATELLITES USING FLUID RINGS

Arun Misra, McGill University, Canada

IAC-11.C1.5.3

SWITCHED ATTITUDE CONTROL OF AN UNDERACTUATED RIGID SATELLITE

Lawrence Inumoh, University of Surrey, United Kingdom

IAC-11.C1.5.4

DYNAMICS OF A RIGID MULTIBODY SYSTEM WITH LOOP CONSTRAINTS USING ONLY INDEPENDENT MOTION VARIABLES

Yinghong Jia, Beihang University, China

IAC-11.C1.5.5

PRECISE ATTITUDE ESTIMATION OF SOLAR SAIL SPACECRAFT UTILIZING COUPLING BETWEEN ATTITUDE AND ORBITAL DYNAMICS

Kenji Kitamura, Tokyo University, Japan

IAC-11.C1.5.6

ANALYTICAL STUDY OF A THREE-STAGE MAGNETIC ATTITUDE CONTROL TO CHANGE A SINGLE-AXIS ORIENTATION

Michael Yu. Ovchinnikov, Keldysh Institute of Applied Mathematics, RAS, Russia

IAC-11.C1.5.7

A NEW COMPUTER-ORIENTED APPROACH WITH EFFICIENT VARIABLES FOR MULTIBODY DYNAMICS WITH MOTION CONSTRAINTS

Quan Hu, Beihang University, China

**IAC-11.C1.5.8**

ANALYSIS ON THE ATTITUDE INFLUENCE OF MOTIONS OF FLEXIBLE ANTENNAS AND ATTITUDE CONTROL FOR CHINESE TDRS

Xiaodong Han, China Academy of Space Technology (CAST), China

IAC-11.C1.5.9

INERTIA-FREE ATTITUDE CONTROL OF SPACECRAFT WITH UNKNOWN TIME-VARYING MASS PROPERTIES

Avishai Weiss, University of Michigan, United States

IAC-11.C1.5.10

SATELLITE ATTITUDE ESTIMATION BY MEANS OF TEMPERATURE MEASUREMENTS. NUMERICAL APPROACH

Maurizio Parisse, University of Rome "La Sapienza", Italy

IAC-11.C1.5.11

FEM-BASED EVALUATION OF SOLAR RADIATION PRESSURE EFFECT FOR SPINNING SPACECRAFT

Okano Yoshinobu, Tokyo Metropolitan University, Japan

IAC-11.C1.5.12

ROBUST AND ADAPTIVE COMPOSITE CONTROL OF SPACE FLEXIBLE MANIPULATOR WITH BOUNDED TORQUE INPUTS BASED ON THE SINGULAR PERTURBATION APPROACH

Limin Xie, Fuzhou University, China

C1.6. Attitude Dynamics - Part 2

October 6 2011, 10:00 — TS-04

Chair: Anna Guerman (University of Beira Interior, Portugal);

Gerard Gomez (University of Barcelona, Spain);

Rapporteur: Amalia Ercoli Finzi (Politecnico di Milano, Italy);

IAC-11.C1.6.1

MODULAR SIMULATION AND VISUALISATION APPLICATION FOR SATELLITE ATTITUDE CONTROL

Lourens Visagie, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.C1.6.2

TESTING STRATEGIES FOR VERIFYING THE SLEW RATE TOLERANCE IN STAR TRACKERS

Thomas Dzamba, Ryerson University, Canada

IAC-11.C1.6.3

SPACE STATION ATTITUDE CONTROL/MOMENTUM MANAGEMENT CONTROLLER DESIGN BASED ON THETA-D TECHNIQUE

Mengping Zhu, Beihang University, China

IAC-11.C1.6.4

NOVEL STRATEGIES TO INCREASE ROBUSTNESS IN THE REACTION CONTROL OF SPACE MANIPULATORS: THEORY AND SIMULATED MICROGRAVITY TESTS

Stefano Rossi, University of Padova, Italy

IAC-11.C1.6.5

SINGULAR PERTURBATION AND FUZZY VARIABLE STRUCTURE SLIDING MODE CONTROL OF SPACE ROBOT SYSTEM WITH FLEXIBLE JOINT IN INERTIAL SPACE

Limin Xie, Fuzhou University, China

IAC-11.C1.6.6

COMMAND SHAPING FOR NONLINEARITY COMPENSATION OF REACTION WHEELS IN SPACECRAFTS

Seon-Ho Lee, Korea Aerospace Research Institute, Korea, Republic of

IAC-11.C1.6.7

A NOVEL APS STAR TRACKER FOR PICO- AND NANO-SATELLITES

Harald Wojtkowiak, University of Wuerzburg, Germany

IAC-11.C1.6.8

COMPUTATIONALLY LIGHT ATTITUDE CONTROLS FOR RESOURCE LIMITED NANO-SPACECRAFT

Craig Maclean, University of Strathclyde/Advanced Space Concept Laboratory, United Kingdom

IAC-11.C1.6.9

ESTIMATION OF ATTITUDE AND MODAL COORDINATES FOR SPACECRAFT ATTITUDE CONTROL WITH NON-COLLOCATED SENSORS AND ACTUATORS

Heng Shi, Beijing University of Aeronautics and Astronautics, China

IAC-11.C1.6.10

HARDWARE-IN-THE-LOOP TESTING OF A REACTION WHEEL VIA SLIDING MODE SPEED CONTROLLER

Mohammad Hossein Beheshti, K. N. Toosi University of Technology, Iran

IAC-11.C1.6.11

SOLAR SAIL ATTITUDE CONTROL USING CENTRE OF MASS/ CENTRE OF PRESSURE OFFSET TECHNIQUES

Theodoros Theodorou, Surrey Space Centre, University of Surrey, United Kingdom

C1.7. Guidance, Navigation and Control - Part 1

October 6 2011, 15:00 — TS-04

Chair: Eberhard Gill (Delft University of Technology (TU Delft), The Netherlands); Alfred Ng (Canadian Space Agency, Canada);

Rapporteur: Fuyuto Terui (Japan Aerospace Exploration Agency (JAXA), Japan);

IAC-11.C1.7.1

REDUCING THE UNCERTAINTY OF HAYABUSA'S LANDING POSITION ON ITOKAWA

Andrew Klesh, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.C1.7.2

THE GNC EXPERIMENTS ON THE PRISMA FORMATION FLYING MISSION: SUMMARY OF RESULTS FROM THE NOMINAL MISSION

Per Bodin, Swedish Space Corporation, Sweden

IAC-11.C1.7.3

RELATIVE ORBIT DETERMINATION FOR FRACTIONATED SPACECRAFT BASED ON EXTENDED KALMAN-PARTICLE FILTERING

Min Hu, Academy of Equipment Command and Technology, China

IAC-11.C1.7.4

DESIGN, TEST AND ON-ORBIT RESULTS OF RELATIVE GPS NAVIGATION FOR H-II TRANSFER VEHICLE

Shoji Yoshikawa, Mitsubishi Electric Corporation, Japan

IAC-11.C1.7.5

AUTONOMOUS POSITIONING AND ORIENTATING FOR LUNAR LAUNCH

Ji Li, Beijing Institute of Control Engineering, China

IAC-11.C1.7.6

DETAILED DESIGN OF THE PROBA-3 FORMATION FLYING GUIDANCE

Thomas Vincent Peters, GMV, Spain

IAC-11.C1.7.7

TRACKING CONTROLLERS FOR POSITION AND ATTITUDE ON THE CHASER SPACECRAFT TO RENDEZVOUS AND DOCK/BERTH WITH A NON-COOPERATIVE SPACECRAFT.

Ananth S. Komanduri, ZARM - University of Bremen, Germany

IAC-11.C1.7.8

A NEW METHOD OF 3D POSITION AND ATTITUDE ESTIMATION FOR PINPOINT LUNAR LANDING

Lina Wang, National Key Laboratory of Science and Technology on Aerospace Intelligence Control, Beijing Aerospace Automatic Control Institute, China

IAC-11.C1.7.9

CONTROLLABILITY RESEARCH OF AN UNDERACTUATED SPACECRAFT WITH THRUSTER UNDER DISTURBANCE

Dongxia Wang, Beihang University, China

IAC-11.C1.7.10

TETHER BASED ASTRONAUT SUPPORT ROBOT EXPERIMENT, REX-J TO BE CONDUCTED ON THE ISS/JEM

Mitsushige Oda, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C1.7.11

OPTIMAL TRAJECTORY FOR GEO SATELLITE PROXIMITY INSPECTION BASED ON HP-ADAPTIVE PSEUDOSPECTRAL METHOD

Ren Xianhai, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C1.7.12

ELECTRIC PROPULSION ESTIMATION FOR INDIA'S ADVANCED COMMUNICATION SATELLITE

Narayanasetti Venkata Vighnesam, Indian Space Research Organization (ISRO), India

C1.8. Guidance, Navigation and Control - Part 2

October 7 2011, 09:00 — TS-04

Chair: Othon Winter (Univ. Estadual Paulista - UNESP, Brazil);

Johannes Schoenmaekers (European Space Agency (ESA), Germany);

Rapporteur: Benedicte Escudier (SUPAERO- Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, France);

IAC-11.C1.8.1

AUTONOMOUS OPTICAL NAVIGATION FOR ORBITS AROUND EARTH-MOON COLLINEAR LIBRATION POINTS

Josep Virgili Llop, Universitat Politecnica de Catalunya (UPC), Spain

IAC-11.C1.8.2

A NONLINEAR ADAPTIVE ATTITUDE OBSERVER FOR SPACECRAFT WITH GYROS SUBJECT TO THERMALLY-VARYING BIASES

Joseph Galante, University of Maryland and NASA Goddard Space Flight Center, United States

IAC-11.C1.8.3

STUDY ON THE RESONATOR FIBER-OPTIC GYROSCOPE WITH DOUBLE NON-RECIPROCAL RINGS

Shuguang Zhu, Beijing Special Engineering Design and Research Institute, China

IAC-11.C1.8.4

ADAPTIVE AND ROBUST ALGORITHMS AND TESTS FOR VISUAL-BASED NAVIGATION OF A SPACE ROBOTIC MANIPULATOR

Marco Sabatini, Università di Roma "La Sapienza", Italy

IAC-11.C1.8.5

VISION BASED NAVIGATION FOR FUTURE ON-ORBIT SERVICING MISSIONS

Clemens Kaiser, Kayser-Threde GmbH, Germany

IAC-11.C1.8.6

DYNAMIC COORDINATION OF A MULTI-MANIPULATOR PLATFORM

Silvio Cocuzza, CISAS – "G. Colombo" Center of Studies and Activities for Space, University of Padova, Italy

IAC-11.C1.8.7

DYNAMIC DEVELOPMENT AND JITTER CONTROL FOR SATELLITES WITH MAGNETIC SUSPENDED VARIABLE SPEED SINGLE GIMBAL CONTROL MOMENT GYROS

Tang Liang, Beijing Institute of Control Engineering, China

IAC-11.C1.8.8

ANALYSIS OF AN ALL ELECTRICAL PROPULSION ACTUATED ATTITUDE AND ORBIT CONTROL SYSTEM FOR GEOSYNCHRONOUS ORBIT

Emil Vinterhav, Swedish Space Corporation, Sweden

IAC-11.C1.8.9

AOCS DESIGN AND EM AOCS TEST CAMPAIGN FOR THE SMALL GEO TELECOM SATELLITE

Camille Chasset, Swedish Space Corporation, Sweden

IAC-11.C1.8.10

LUNAR SOFT-LANDING TRAJECTORY OPTIMIZATION IN A 6DOF DYNAMICAL MODEL

Dario Dowlat Abadi Farahani, Politecnico di Milano, Italy

IAC-11.C1.8.11

STUDY ON OPTIMIZATION STATION-KEEPING STRATEGIES FOR BIASED MOMENTUM SATELLITE

Hong Chen, China

C1.9. Guidance, Navigation and Control - Part 3

October 7 2011, 14:00 — TS-04

Chair: Weihua Zhang (National University of Defense Technology, China); Saburo Matunaga (Tokyo Institute of Technology, Japan);

Rapporteur: B. Lübke-Ossenbeck (OHB-System AG, Germany);

IAC-11.C1.9.1

GUIDANCE, NAVIGATION, AND CONTROL SYSTEM DESIGN OF HTV AND EVALUATION OF ON-ORBIT RESULTS

Shoji Yoshikawa, Mitsubishi Electric Corporation, Japan

IAC-11.C1.9.2

RENDEZVOUS TECHNIQUE OF HTV AND EVALUATION OF ON-ORBIT RESULTS

Shoji Yoshikawa, Mitsubishi Electric Corporation, Japan

IAC-11.C1.9.3

AN ON-ORBIT MASS PROPERTIES IDENTIFICATION ALGORITHM FOR LARGE SPACE STRUCTURES

Ling Jiang, Beihang University, China

IAC-11.C1.9.4

SPACECRAFT ACTUATOR ALIGNMENT DETERMINATION THROUGH NULL MOTION EXCITATION

Frederick Leve, Air Force Research Laboratory (AFRL), United States

IAC-11.C1.9.5

GLOBAL AND LOCAL OPTIMIZATION APPROACHES FOR LAUNCH VEHICLES ASCENT TRAJECTORY DESIGN

Annalisa Riccardi, University of Bremen, Germany

IAC-11.C1.9.6

A NOVEL NAVIGATION SOLUTION OF REUSABLE LAUNCH VEHICLE BASED ON MULTI-SOURCE GEOSPATIAL INFORMATION FUSION

Nie Qi, Beijing Aerospace Automatic Control Institute, China

IAC-11.C1.9.7

A NOVEL APPROACH TO HYBRID PROPULSION TRANSFERS

Steven Owens, University of Strathclyde/Advanced Space Concept Laboratory, United Kingdom

IAC-11.C1.9.8

MATHEMATICAL MODEL FOR ATTITUDE CONTROL OF SMALL SATELLITES USING ROTATION ANGLES

Teodor-Viorel CHELARU, Politechnic University of Bucharest, Romania



**IAC-11.C1.9.9**

IN-ORBIT IDENTIFICATION OF MOMENT OF INERTIA MATRIX FOR HIGH POINTING SATELLITES

Shubha Kapoor, Indian Space Research Organization (ISRO), India

IAC-11.C1.9.10

NEURAL NETWORK BASED PREDICTOR-CORRECTOR ENTRY GUIDANCE FOR HIGH LIFTING VEHICLES

Mingliang Xu, National University of Defense Technology, China

IAC-11.C1.9.11

DERIVATION OF A COMPLETE SET OF EQUATIONS OF MOTION FOR COUPLED SLOSH-VEHICLE DYNAMICS

Mohammad Ebrahimi, Aerospace Research Institute, Iran

C2. MATERIALS AND STRUCTURES SYMPOSIUM

Coordinator: Constantinos P. Stavrinidis (European Space Agency (ESA), The Netherlands); Pavel M. Trivailo (Royal Melbourne Institute of Technology (RMIT), Australia);

C2.1. Space Structures I - Development and Verification (Space Vehicles and Components)

October 3 2011, 15:00 – TS-17

Chair: Alwin Eisenmann (MT Aerospace AG, Germany); Andreas Rittweger (Astrium Space Transportation, France);

Rapporteur: Jean-Alain Massoni (Thales Alenia Space France, France);

IAC-11.C2.1.1

STRENGTH AND DIMENSION STABILITY OF COMPOSITE SANDWICH SKINS

Cheol Won Kong, Korea Aerospace Research Institute, Korea, Republic of

IAC-11.C2.1.2

A CONSISTENT APPROACH OF DAMPING TREATMENT IN COUPLED DYNAMIC ANALYSIS AND TEST

Jochen Albus, Astrium GmbH, Germany

IAC-11.C2.1.3

DEVELOPMENT AND QUALIFICATION OF ADVANCED COMPOSITE SANDWICH STRUCTURES

Jesús Gómez García, Astrium GmbH, Germany

IAC-11.C2.1.4

STRUCTURAL INTEGRITY ASSESSMENT OF THE 3.2 M DIAMETER LONGEST SOLID ROCKET MOTOR HARDWARE

Paulmurugan J, Indian Space Research Organization (ISRO), India

IAC-11.C2.1.5

MECHANICAL STRUCTURAL DEVELOPMENT OF SUMBANDILASAT, SA'S FIRST NATIONAL SATELLITE

Johannes Steyn, Sun Space and Information Systems, South Africa

IAC-11.C2.1.6

MECHANICAL THERMAL DEVELOPMENT OF SUMBANDILASAT, SA'S FIRST NATIONAL SATELLITE

Johannes Steyn, Sun Space and Information Systems, South Africa

IAC-11.C2.1.7

CAPABILITIES, DESIGN, CONSTRUCTION AND COMMISSIONING OF NEW VIBRATION, ACOUSTIC AND ELECTROMAGNETIC CAPABILITIES ADDED TO THE WORLDS LARGEST THERMAL VACUUM CHAMBER AT NASA'S SPACE POWER FACILITY

Harry A. Cikane, National Aeronautics and Space Administration (NASA), United States

IAC-11.C2.1.8

LARES SYSTEM DESIGN, DEVELOPMENT AND QUALIFICATION

Elio Mangraviti, Carlo Gavazzi Space, Italy

IAC-11.C2.1.9

RECENT ADVANCE ON DESIGN AND MANUFACTURING OF COMPOSITE ANISOGRID STRUCTURES FOR SPACE LAUNCHERS

Felice De Nicola, CIRA Italian Aerospace Research Centre, Italy

IAC-11.C2.1.10

INVESTIGATION OF AERODYNAMIC LOADING OF SPACE VEHICLES AT REENTRY TRAJECTORY IN WIND TUNNELS AND ARC-HEATER FACILITIES

Vyacheslav Lagutin, Central Research Institute of Machine Building (FSUE/TSNIIMASH), Russia

IAC-11.C2.1.11

INVESTIGATION ON STRUCTURAL PARAMETER SENSITIVITY FOR SRM GRAIN (poster)

Yao Dong, CASC, China

IAC-11.C2.1.12

ACOUSTIC LOAD MITIGATION BY NON-POROUS ABSORBERS IN SPACE LAUNCH VEHICLE (poster)

Soon-Hong Park, Korea Aerospace Research Institute, Korea, Republic of

C2.2. Space Structures II - Development and Verification (Deployable and Dimensionally Stable Structures)

October 4 2011, 10:00 – TS-17

Chair: Paolo Gasbarri (Università di Roma «La Sapienza», Italy); Jean-Alain Massoni (Thales Alenia Space France, France);

Rapporteur: Pierre Rochus (CSL, Université de Liège, Belgium);

IAC-11.C2.2.1

A STUDY INTO THE DEPLOYMENT VARIABILITY OF BUILT UP, TAPE SPRING BASED, SPACE DEPLOYABLE STRUCTURES

Guglielmo Aglietti, University of Southampton, United Kingdom

IAC-11.C2.2.2

COMPARATIVE DEVELOPMENT OF DIMENSIONALLY STABLE STRUCTURES FOR THE DEPLOYABLE SUNSHIELD ASSEMBLY OF GAIA AND COMPOSITE TUBE ASSEMBLY OF SWARM

Carlos Pereira, RUAG Space, Switzerland

IAC-11.C2.2.3

DEPLOYABLE SPACE MANIPULATOR COMMANDED BY MEANS OF VISUAL-BASED GUIDANCE AND NAVIGATION

Marco Sabatini, Università di Roma "La Sapienza", Italy

IAC-11.C2.2.4

DEPLOYMENT MOTION CONTROL RESEARCH OF DEPLOYABLE TRUSS ANTENNA

XU Yan, Zhejiang University, China

IAC-11.C2.2.5

HIGH FLUX (13 SC) SOLAR SIMULATOR DEVELOPMENTS FOR SOLAR ORBITER SUN SENSOR AND EUI INSTRUMENTS

Tanguy THIBERT, Centre Spatial de Liège, Belgium

IAC-11.C2.2.6

DEPLOYMENT DYNAMICS RESEARCH FOR SPACE MEMBRANE STRUCTURE

Xiao Xiao, University of South China, China

IAC-11.C2.2.7

DYNAMICS ANALYSIS AND DESIGN OF COILABLE MAST

Zhang Wei, China Academy of Space Technology (CAST), China

IAC-11.C2.2.8

ESTIMATION OF THE MEMBRANE SHAPE OF IKAROS BASED ON EXPERIMENT AND IMAGE BRIGHTNESS ANALYSIS

Yoshikazu Chishiki, The University of TOKYO, Graduate school, Japan

IAC-11.C2.2.9

COMPARISON OF DIFFERENT APPROACHES TO ANALYZE RESPONSES OF STACKED SOLAR ARRAYS IN A REVERBERANT ACOUSTIC FIELD

Yuanjie Zou, China Academy of Space Technology (CAST), China

IAC-11.C2.2.10

DEPLOYMENT SIMULATION OF VERY LARGE INFLATABLE TENSEGRITY REFLECTORS

Thomas Sinn, University of Strathclyde/Advanced Space Concept Laboratory, United Kingdom

IAC-11.C2.2.11

BASE REACTION CONTROL OF HYPER-REDUNDANT SPACE MANIPULATORS

Silvio Cocuzza, CISAS – "G. Colombo" Center of Studies and Activities for Space, University of Padova, Italy

IAC-11.C2.2.12

DYNAMIC DEPLOYMENT AND ATTITUDE CONTROL MOTION OF SPINNING SOLAR SAIL "IKAROS"

Osamu Mori, Japan Aerospace Exploration Agency (JAXA), Japan

C2.3. Space Structures - Dynamics and Microdynamics

October 4 2011, 15:00 – TS-17

Chair: Peter M. Bainum (Howard University, United States); Ijar M. Da Fonseca (Instituto Nacional de Pesquisas Espaciais (INPE), Brazil);

Rapporteur: Harijono Djojodihardjo (Universitas Al Azhar Indonesia, Indonesia);

IAC-11.C2.3.1

SANTINI MEMORIAL LECTURE: SPACE CHALLENGES AND OPPORTUNITIES FOR HUMAN BENEFIT

Michael Yarymovych, United States

IAC-11.C2.3.2

CONTROL-ORIENTED MODELIZATION OF A SATELLITE WITH LARGE FLEXIBLE APPENDAGES AND USE OF WORST-CASE ANALYSIS TO VERIFY ROBUSTNESS TO MODEL UNCERTAINTIES OF ATTITUDE CONTROL

Paolo Gasbarri, Università di Roma "La Sapienza", Italy

IAC-11.C2.3.3

CSI INTERACTION DUE TO A STEPPER MOTOR ACTUATION ON A LEO LSS SOLAR PANEL

Ijar M. Da Fonseca, Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

IAC-11.C2.3.4

EVALUATION OF FIRST STAGE DEPLOYMENT OF MEMBRANE OF IKAROS BASED ON FLIGHT RESULTS AND SIMULATION

Yoji Shirasawa, University of Tokyo, Japan

IAC-11.C2.3.5

PARAMETERS DESIGN OF VIBRATION ISOLATION PLATFORM FOR CONTROL MOMENT GYROSCOPES

Yao Zhang, Beihang University, China

IAC-11.C2.3.6

SHAPE CONTROL OF LARGE REFLECTING STRUCTURES IN SPACE

Anatoliy Alpatov, Institute of Technical Mechanics of the National Academy of Science and National Space Agency of Ukraine, Ukraine

IAC-11.C2.3.7

STUDY ON DYNAMIC MODELING AND NEURAL NETWORK CONTROL FOR FREE-FLOATING SPACE FLEXIBLE-JOINT ROBOT TO TRACK DESIRED TRAJECTORY IN JOINT SPACE

Jie Liang, China

IAC-11.C2.3.8

THE NEW APPROACH FOR DAMPING MODELLING IN THE COUPLED DYNAMIC LOAD ANALYSIS FOR THE ARIANE 5 ACOUSTIC BOOSTER MODE LOAD CASES

Andreas Rittweger, Astrium Space Transportation, France

IAC-11.C2.3.9

FAST MULTIPOLE BOUNDARY ELEMENT SCHEME DEVELOPMENT AND INTEGRATION TO BE-FE ACOUSTIC-STRUCTURAL COUPLING

Harijono Djojodihardjo, Universitas Al Azhar Indonesia, Indonesia

IAC-11.C2.3.10

MODELING MICROVIBRATIONS TRANSMISSION IN SPACECRAFT STRUCTURES

Marcello Remedia, University of Southampton, United Kingdom

IAC-11.C2.3.11

APPLICATION OF INPUT SHAPING TECHNIQUE ON PROPELLANT SLOSHING SUPPRESSION (poster)

Kai Dong, Beijing Institute of Astronautical Systems Engineering, China

IAC-11.C2.3.12

NONLINEAR RANDOM VIBRATION ANALYSIS ON FREE STANDING GRAIN OF SRM (poster)

Kuai He, Shanghai Academy of Spaceflight Technology, China

IAC-11.C2.3.13

LAUNCH VEHICLE DYNAMIC MODELING AND MODE SHAPE SLOPE PREDICTION TECHNOLOGY (poster)

Zhongwen Pan, Beijing Institute of Astronautical Systems Engineering, China

C2.4. New Materials and Structural Concepts

October 5 2011, 10:00 – TS-17

Chair: Marc Lacoste (Snecma Propulsion Solide, France); Yuriy Moshnenko (Yuzhnoye State Design Office, Ukraine);

Rapporteur: Luigi Scatteia (CIRA Italian Aerospace Research Centre, Italy);

IAC-11.C2.4.1

DIMENSIONALLY STABLE PRECISION STRUCTURES OF SPACE APPLICATION WITH LONG SERVICE LIFE: ASPECTS OF MATERIAL SCIENCE, TECHNOLOGY, AND MANUFACTURE. PROSPECTS OF MANUFACTURE IN UKRAINE

Oleksandr Potapov, Yuzhnoye State Design Office, Ukraine

IAC-11.C2.4.2

BASIC PARAMETERS' OPTIMIZATION CONCEPT FOR COMPOSITE NOSE FAIRINGS OF LAUNCHERS

Volodymyr Slyvynskiy, "Ukrainian Research Institute of Engineering Technique" OJSC, Ukraine

IAC-11.C2.4.3

DEVELOPMENT OF AN INNOVATIVE SANDWICH COMMON BULKHEAD FOR CRYOGENIC UPPER STAGE PROPELLANT TANK

Bernd Szelinski, MT Aerospace AG, Germany

IAC-11.C2.4.4

MATERIAL SELECTION AND DESIGN OF FLEXIBLE RING BAFFLES FOR DAMPING LIQUID OSCILLATIONS IN LARGE-SCALE OXYGEN TANKS

Xiaohan Tang, China Academy of Launch Vehicle Technology, China

**IAC-11.C2.4.5**

INNOVATIVE SHAPE DEFORMABLE VEHICLES FOR SPACE EXPLORATION USING DIELECTRIC ELASTOMER ACTUATORS
Marco Chiaradia, Università degli Studi di Padova, Italy

IAC-11.C2.4.6

EFFECTS OF STIFFENER PARAMETERS ON BUCKLING LOAD OF ADVANCED GRID STIFFENED COMPOSITE PANELS
MUHAMMAD ASIF, SUPARCO, Pakistan

IAC-11.C2.4.7

FRACTOGRAPHIC ANALYSIS OF A FLYING TEST BED UHTC NOSE TIP
Guido Saccone, CIRA Italian Aerospace Research Centre, Italy

IAC-11.C2.4.8

COMPUTATIONAL MODELING OF TEMPERATURE DISTRIBUTION IN A NEWLY DEVELOPED ENCAPSULATED AND BRAIDED ANNEALED GRAPHITE EPOXY COMPOSITE RADIATOR IN A SPACECRAFT
Michael Kio, National Space Research and Development Agency, Abuja, Nigeria, Nigeria

IAC-11.C2.4.9

PREPARATION OF MESOPHASE PITCH-BASED CARBON FIBERS WITH RIBBON SHAPE AND HIGH THERMAL CONDUCTIVE CARBON/CARBON COMPOSITES
Zhang Zhongwei, Aerospace, China

IAC-11.C2.4.10

MICROSTRUCTURE AND MECHANICAL PROPERTIES OF LASER BEAM WELDED T JOINT ALUMINUM ALLOYS
Hongbing Liu, Shanghai Aircraft Manufacturing Co.,Ltd., China

IAC-11.C2.4.11

IN ORBIT RIGIDIZABLE STRUCTURES AS ENHANCEMENT OF SOLAR SAIL AND GENERAL SPACE TRANSFORMABLE STRUCTURES - OUTCOMES OF THE FOCUS EXPERIMENT (poster)
Elias Breunig, Technische Universität München, Max-Planck-Institut für extraterrestrische Physik (MPE), Germany

C2.5. Smart Materials and Adaptive Structures

October 5 2011, 15:00 — TS-17

Chair: *Michael J. Eiden (, The Netherlands); Junjiro Onoda*

(Japan Aerospace Exploration Agency (JAXA), Japan);

Rapporteur: *Paolo Gaudenzi (University of Rome “La Sapienza”, Italy);*

IAC-11.C2.5.1

APPLICATIONS OF ACTIVE OPTICS IN LARGE SPACE MIRRORS
Brij Agrawal, Naval Postgraduate School, United States

IAC-11.C2.5.2

CONTROL OF MULTI MODAL STRUCTURAL VIBRATION USING DIGITAL SELF-POWERED DEVICE
Shigeru Shimose, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C2.5.3

DETECTION AND LOCALIZATION OF DEBONDING IN SANDWICHED ALUMINUM HONEYCOMB COMPOSITES WITH ULTRASONIC GUIDED WAVES
James S. Hall, Georgia Institute of Technology, United States

IAC-11.C2.5.4

DYNAMIC FIBRE BRAGG GRATING SYSTEM FOR THE DAMAGE DETECTION OF COMPOSITE REFLECTOR ANTENNA
Aikaterini Panopoulou, University of Patras, Greece

IAC-11.C2.5.5

ROLLING DYNAMICS IN ROVERS ACTUATED BY MEANS OF DIELECTRIC ELASTOMERS
Silvio Cocuzza, CISAS – “G. Colombo” Center of Studies and Activities for Space, University of Padova, Italy

IAC-11.C2.5.6

SELF ADAPTIVE DEFORMABLE FLIGHT VEHICLE TECHNOLOGY RESEARCH
Shiyong Huang, China Academy of Launch Vehicle Technology, China

IAC-11.C2.5.7

STUDY ON PROPERTIES OF SILICON OXYCARBIDE THIN FILMS PREPARED BY RF MAGNETRON SPUTTERING TECHNOLOGY
Tao Chen, Science and Technology on Surface Engineering Laboratory, Lanzhou Institute of Physics, China

IAC-11.C2.5.8

THERMAL CONTROL FOR SPACE MICROELECTRONIC EQUIPMENT VIA PYROELECTRIC MATERIAL: DESIGN, CHARACTERISATION AND EXPERIMENTAL CAMPAIGN.
Riccardo Monti, University of Rome “La Sapienza”, Italy

IAC-11.C2.5.9

THERMOCHROMIC BASED SMART COATING FOR THERMAL REGULATIONS AND HEAT MANAGEMENT IN SPACECRAFT/ SATELLITE UNITS
Maaza Malik, National Research Foundation (NRF), South Africa

IAC-11.C2.5.10

SMART SPACE: AUSTRALIA’S ROLE IN SMART STRUCTURES AND MATERIALS IN SPACE
Crystal Forrester, International Space University (ISU), Australia

IAC-11.C2.5.11

POTENTIAL USAGE OF THERMOELECTRIC GENERATORS IN THERMAL PROTECTION SYSTEM FOR REUSABLE LAUNCH VEHICLES (RLV)
Siwei Dong, College of Aerospace and Materials Engineering, National University of Defense Technology, China

C2.6. Space Environmental Effects and Spacecraft Protection

October 6 2011, 10:00 — TS-17

Chair: *Minoo Dastoor (National Aeronautics and Space Administration (NASA), United States); Akira Meguro (Tokyo City University, Japan);*

Rapporteur: *Giuliano Marino (CIRA Italian Aerospace Research Centre, Italy);*

IAC-11.C2.6.1

ACTIVE OXIDATION OF A UHTC-BASED CMC
David Glass, National Aeronautics and Space Administration (NASA), United States

IAC-11.C2.6.2

DEVELOPMENT OF A POLYSILAZANE PROTECTION COATINGS AGAINST ATOMIC OXYGEN
Jingyu Tong, Beijing institute of satellite environment engineering, China

IAC-11.C2.6.3

ACCURACY OF KAPTON-EQUIVALENT ATOMIC OXYGEN FLUENCE IN A GROUND-BASED ATOMIC OXYGEN EXPERIMENTS
Kumiko Yokota, Kobe University, Japan

IAC-11.C2.6.4

MICROMETEOROID AND SPACE DEBRIS
Kautuk Sinha, Manipal Institute of Technology, India

IAC-11.C2.6.5

EXPERIMENTAL INVESTIGATION OF ARC JET HYPERSONIC PLASMA FLOWS THROUGH OPTICAL EMISSION TECHNIQUES
Alessio Cipullo, Second University of Naples, Italy

IAC-11.C2.6.6

MECHANICAL TESTING OF HYDROGEN CHARGED TI-6AL-4V ALLOY
Alison O’ Connor, Ireland

IAC-11.C2.6.7

AGENCY ELECTRONICS, ELECTRICAL, AND ELECTRO-MECHANICAL (EEE) PARTS SYSTEM
G. S. Krishnan, National Aeronautics and Space Administration (NASA), United States

IAC-11.C2.6.8

LUNAR DUST MITIGATION BY TRAVELLING ELECTROSTATIC WAVES
Nima Gharib, McGill University, Canada

IAC-11.C2.6.9

A CRYOPUMP DESIGN WITH TOTAL CHAMBER PUMPING CONCEPT AND PRO-COOLING PROCESS ANALYSIS
Wenlong Wang, Beijing University of Aeronautics and Astronautics, China

C2.7. Space Vehicles – Mechanical/Thermal/Fluidic Systems

October 6 2011, 15:00 — TS-17

Chair: *Oleg Alifanov (Moscow Aviation Institute, Russia); Brij Agrawal (Naval Postgraduate School, United States);*

Rapporteur: *Guoliang Mao (Beijing Institute of Aerodynamics, China);*

IAC-11.C2.7.1

A NEW METHODOLOGY FOR ESTIMATING SURFACE HEAT FLUX FROM IN-DEPTH SENSORS
Jay Frankel, University of Tennessee, United States

IAC-11.C2.7.2

CARBON/CARBON COMPARATIVE OPTIMIZATION METHOD FOR HOT STRUCTURES APPLICATIONS IN RE-ENTRY ENVIRONMENT CONDITIONS
Marta Albano, University of Rome “La Sapienza”, Italy

IAC-11.C2.7.3

ACTIVE THERMAL CONTROL SYSTEM FOR PERSPECTIVE VENUSIAN LANDER
Anton Burdanov, Central Research Institute of Machine Building (FSUE/TSNIIMASH), Russia

IAC-11.C2.7.4

A THERMAL MODEL FOR ANALYSIS AND CONTROL OF DRILLING IN ICY FORMATIONS ON MARS
Timothy Szwarc, Stanford University, United States

IAC-11.C2.7.5

EGSE IN SPACECRAFT THERMAL VACUUM TESTS FOR ACCURATE POWER MEASUREMENTS AND MINIMIZATION OF POWER SUPPLIES
Durval Zandonadi Jr., Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

IAC-11.C2.7.6

APPLICATION OF INERTIA RELIEF IN STRUCTURAL STRENGTH ANALYSIS OF REUSABLE LAUNCH VEHICLE
Ma Tingting, China Academy of Launch Vehicle Technology, China

IAC-11.C2.7.7

RE-USE OF EXOMARS ROVER ON ICY MOONS OF JUPITER
Abrar-UI-Haq Khan Baluch, Korea Advanced Institute of Science and Technology (KAIST), Korea, Republic of

IAC-11.C2.7.8

VERSIONS OF ORBITERS’ FLIGHT SYSTEMS FOR NONNUCLEAR ACTION ON ASTEROID APOPHIS
Mykola M. Slyunyaev, Yuzhnoye State Design Office, Ukraine

IAC-11.C2.7.9

SPACECRAFT AERODYNAMICS AND HEAT SHIELD CHARACTERISTICS IMPACT ON OPTIMAL AEROASSISTED COPLANAR ORBITAL TRANSFER
Antonio Mazzaracchio, Sapienza Università di Roma, Italy

IAC-11.C2.7.10

THERMAL BUCKLING OF SIMPLY SUPPORTED MODERATELY THICK FUNCTIONALLY GRADED PLATES
Yang Lihong, China

IAC-11.C2.7.11

RESEARCH ON FLIGHT EXPERIMENT TECHNIQUE TO VERIFICATION THERMAL PROTECTION MATERIALS AND INSULATION MATERIALS
Yu Yubin, China Academy of Launch Vehicle Technology, China

IAC-11.C2.7.12

APPLICATION OF STRUCTURED SINGULAR VALUE METHOD TO AEROSERVOELASTIC ROBUSTIC STABILITY ANALYSIS FOR REUSABLE LAUNCH VEHICLE
Junpeng Hui, China Academy of Launch Vehicle Technology, China

IAC-11.C2.7.13

FLOW-STRUCTURE-THERMAL INVESTIGATION OF BLUNT BODY IN HIGH-ENTROPY FLOWS
Jing Yang, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C2.7.14

TOPOLOGICAL STRUCTURES AND AERODYNAMIC CHARACTERISTIC ANALYSIS OF HYPERSONIC FLOW OVER HTV-TYPE AIRCRAFT (poster)
Feng Liu, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C2.7.15

ESTIMATION OF CRACK GROWTH BEHAVIOR IN WELDED SPACE VEHICLES STRUCTURAL COMPONENTS (poster)
Fengxiang Zhang, China Xichang Satellite Launch Center, China

IAC-11.C2.7.16

NUMERICAL SOLUTION OF STEADY VISCOUS FLOW AND HEAT TRANSFER PAST GAS BUBBLES IN A SPACECRAFT HEATPIPE (poster)
Michael Kio, National Space Research and Development Agency, Abuja, Nigeria, Nigeria

IAC-11.C2.7.17

AEROTHERMAL COMPUTATION RESEARCH FOR RE-ENTRY VEHICLES IN REAL GAS EFFECT (poster)
Pan Sha, National University of Defense Technology, China

IAC-11.C2.7.18

RESEARCH ON 3D CAVITY FLOW AND ITS AERO-OPTICS PHENOMENA (poster)
Dinghua Feng, Xi’an Satellite Control Center, China

IAC-11.C2.7.19

THE NUMERICAL STUDY OF CONE-DERIVED WAVERIDER WITH NONUNIFORM BLUNT RADIUS (poster)
Jian-xia LIU, National University of Defense Technology, China

IAC-11.C2.7.20

CORK FILLED ETHYLENE-PROPYLENE-DIENE MONOMER BASED THERMAL INSULATION FOR SPACE VEHICLES (poster)
Jamal Gul, SUPARCO, Pakistan

IAC-11.C2.7.21

HYPERSONIC SURFACE HEATING COMPUTATION ON BLUNT BODIES (poster)
Guo-hao DING, National University of Defense Technology, China



**IAC-11.C2.7.22**

EFFECT OF EPOXY ADHESIVE ON SOLDER JOINT RELIABILITY OF 3D PLUS SRAM UNDER THERMAL CYCLING (poster)

Dai Feng, CAST, China

C2.8. Specialized Technologies Including Nanotechnology

October 7 2011, 09:00 — TS-17

Chair: *Mario Marchetti (University of Rome “La Sapienza”, Italy); Pierre Rochus (CSL, Université de Liège, Belgium);*

Rapporteur: *Pavel M. Trivailo (Royal Melbourne Institute of Technology (RMIT), Australia);*

IAC-11.C2.8.1

PHASE CHANGE MATERIAL DEVICE FOR SPACECRAFT THERMAL CONTROL

Jean-Paul Collette, Belgium

IAC-11.C2.8.2

ULTRATHIN EUV FILTERS TESTING AND CHARACTERIZATION UNDER HIGH FLUX (13 SC) FOR SOLAR ORBITER EUI INSTRUMENT

Lionel JACQUES, CSL, Université de Liège, Belgium

IAC-11.C2.8.3

SINGE WALL CARBON NANOTUBE SENSORS FOR GAS DETECTION AT ROOM TEMPERATURE

Enid Contes-de Jesus, University of Puerto Rico, Puerto Rico

IAC-11.C2.8.4

GR712RC – A DUAL-CORE PROCESSOR FOR DEMANDING SPACE APPLICATIONS

Sandi Habinc, Aeroflex Gaisler, Sweden

IAC-11.C2.8.5

QUALIFICATION OF A GPS ANTENNA AND LOW NOISE AMPLIFIER SETUP FOR TEMPERATURES UP TO 120 °C

Ulrich Beyermann, University of Stuttgart, Germany

IAC-11.C2.8.6

USE OF A POLYMERIC SURFACE FOR DEPLOYMENT SYSTEMS TIMING

Riccardo Di Lauro, Scuola di Ingegneria Aerospaziale, Italy

IAC-11.C2.8.7

APPLICATION OF A TWO STEP DIGITAL IMAGE CORRELATION ALGORITHM IN DETERMINING POISSON’S RATIO OF METALS AND COMPOSITES

Muhammad Zeeshan Siddiqui, Pakistan Space and Upper Atmosphere Research Commission, Pakistan

IAC-11.C2.8.8

AN APPROACH OF COMPACTION ANALYSIS AND DESIGN FOR MODULAR SATELLITE

Xinfeng Yang, China Academy of Space Technology (CAST), China

IAC-11.C2.8.9

DEVELOPMENT OF SPACE ENVIRONMENTAL MONITORS ON CHINESE MANNED SPACECRAFT

XU YING, Chinese Academy of Sciences, China

IAC-11.C2.8.10

A MULTI-PHYSICS COMPUTATIONAL FRAMEWORK TO PREDICT WEAR CAUSED BY LUNAR DUST PARTICLES

Jeremiah Mpagazehe, Carnegie Mellon University, United States

IAC-11.C2.8.11

COMPRESSIVE MEMBERS FOR A SPACE ELEVATOR TO LEO

Andrew Meulenberg, HiPi Consulting, United States

C2.9. Advancements in Materials Applications and Rapid Prototyping

October 7 2011, 14:00 — TS-17

Chair: *Thierry Romeuf (EADS Astrium, France); Franz-Josef Kahlen (University of Cape Town, South Africa);*

Rapporteur: *Yeong-Moo Yi (Korea Aerospace Research Institute, Korea, Republic of);*

IAC-11.C2.9.1

HIGH SPEED LASER BASED ADDITIVE MANUFACTURING AND REFURBISHMENT

Francois Prinsloo, CSIR National Laser Centre, South Africa

IAC-11.C2.9.2

SIMULATION AND EXPERIMENTAL STUDY OF OPTICAL PROPERTIES OF SPATIAL TARGETS

Shen Wentao, Beijing University of Aeronautics and Astronautics, China

IAC-11.C2.9.3

HIGH DENSITY ABLATIVE THERMAL PROTECTION SYSTEMS FOR REUSABLE LAUNCH VEHICLES: PROCESSING, PROPERTIES AND THERMAL RESPONSE EVALUATION

Rajeev RS, Vikram Sarabhai Space Centre (VSSC), India

IAC-11.C2.9.4

PRESSURE WAVE ATTENUATION IN GAS-LIQUID BUBBLY FLOW FOR LIQUID OXYGEN FEED PIPE BETWEEN PUMPS

Bing Sun, Beijing University of Aeronautics and Astronautics, China

IAC-11.C2.9.5

DENDRITE ORIENTATION SELECTION IN MAGNESIUM-BASED ALLOYS

MORTEZA AMOOREZAEI, McMaster University, Canada

IAC-11.C2.9.6

NOVEL ROLLING ROVERS ACTUATED BY MEANS OF ELECTROACTIVE POLYMERS

Stefano Rossi, University of Padova, Italy

IAC-11.C2.9.7

ANALYSIS AND FINITE ELEMENT ANALYSIS OF IMPACT LOADING ON ELASTIC PANEL STRUCTURE

Harijono Djojodihardjo, Universitas Al Azhar Indonesia, Indonesia

IAC-11.C2.9.8

YIELD CRITERION AND CRACK TIP PLASTIC ZONE OF NICKEL-BASED SINGLE CRYSTAL (poster)

Yang Lihong, China

C3. SPACE POWER SYMPOSIUM

Coordinator: Leopold Summerer (European Space Agency (ESA), The Netherlands);

C3.1. Space-Based Solar Power Architectures – New Governmental and Commercial Concepts and Ventures

October 3 2011, 15:00 — TS-08

Chair: *Nobuyuki Kaya (Kobe University, Japan); John C. Mankins (ARTEMIS Innovation Management Solutions, LLC, United States);*

Rapporteur: *Leopold Summerer (European Space Agency (ESA), The Netherlands); Joe T. Howell (National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center, United States);*

IAC-11.C3.1.1

FREE ACCESS TO ENERGY: AN INTEGRATED VISION FOR ENERGY IN THE 21ST CENTURY: THE PETER GLASER KEY NOTE LECTURE FOR 2011

John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States

IAC-11.C3.1.2

THE FIRST INTERNATIONAL ASSESSMENT OF SPACE SOLAR POWER: RESULTS OF THE INTERNATIONAL ACADEMY OF ASTRONAUTICS STUDY

John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States

IAC-11.C3.1.3

PROSPECTS FOR SPACE SOLAR POWER IN EUROPE

Leopold Summerer, European Space Agency (ESA), The Netherlands

IAC-11.C3.1.4

UPDATED TECHNOLOGY ROAD MAP FOR SOLAR ENERGY FROM SPACE

Susumu Sasaki, Japan Aerospace Exploration Agency (JAXA)/ISAS, Japan

IAC-11.C3.1.5

ORBITER DEMONSTRATION PLAN FOR SOLAR POWER SATELLITE OF SANDWICH TYPE

Nobuyuki Kaya, Kobe University, Japan

IAC-11.C3.1.6

CONCEPT STUDY ON SPACE SOLAR POWER SYSTEM

Nobuhiko Fukuda, Mitsubishi Heavy Industries, Ltd., Japan

IAC-11.C3.1.7

OVERVIEW OF STUDIES ON LARGE STRUCTURE FOR SPACE SOLAR POWER SYSTEMS (SSPS)

Daisuke Joudoi, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C3.1.8

ANALYSIS AND COMPARISON OF VARIOUS SPS CONCEPTS

Xinbin Hou, CAST, China

C3.2. Technologies and Experiments Related to Wireless Power Transmission

October 4 2011, 10:00 — TS-08

Chair: *Henry W. Brandhorst (Auburn University, United States); Massimiliano Vasile (University of Strathclyde, United Kingdom);*

Rapporteur: *Frank Steinsiek (EADS Astrium Space Transportation GmbH, Germany); Ivan Bekey (Bekey Designs, Inc., United States);*

IAC-11.C3.2.1

CONCEPT STUDY ON SSPS ON-ORBIT EXPERIMENT USING ISS (EUROPE/JAPAN INTERNATIONAL MISSION)

Frank Steinsiek, EADS Astrium Space Transportation GmbH, Germany

IAC-11.C3.2.2

DEVELOPMENT OF THE BEAM STEERING CONTROLLERS FOR MICROWAVE POWER TRANSMISSION GROUND EXPERIMENT

Takehiro Miyakawa, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C3.2.3

GROUND DEMONSTRATION EXPERIMENT AND ELEMENTAL TECHNOLOGY DEVELOPMENT OF LASER BASED SPACE SOLAR POWER SYSTEM

Hiroaki Suzuki, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C3.2.4

MICROWAVE WIRELESS POWER TRANSMISSION DEMONSTRATION ON GROUND FOR SSPS

Shoichiro Mihara, Institute for Unmanned Space Experiment Free Flyer (USEF), Japan

IAC-11.C3.2.5

FIRST EXPERIMENTAL RESULTS OF A LASER POWER TRANSMISSION AT AN EYE-SAFE WAVELENGTH USING DEDICATED PHOTOVOLTAIC CELLS

Frank Steinsiek, EADS Astrium Space Transportation GmbH, Germany

IAC-11.C3.2.6

LESSONS ON WIRELESS POWER TRANSMISSION FROM A STUDENT SPACE ELEVATOR

Adam Vigneron, University of Saskatchewan, Canada

IAC-11.C3.2.7

ASSESSMENT OF NEAR FIELD WIRELESS POWER TRANSMISSION FOR FRACTIONATED SPACECRAFT APPLICATIONS

Leopold Summerer, European Space Agency (ESA), The Netherlands

IAC-11.C3.2.8

WIRELESS POWER TRANSMISSION: OPPORTUNITIES AND CHALLENGES

Frank Little, Texas A&M University, United States

C3.3. Advanced Space Power Technologies and Concepts: Part 1

October 4 2011, 15:00 — TS-08

Chair: *Joe T. Howell (National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center, United States); Leopold Summerer (European Space Agency (ESA), The Netherlands);*

Rapporteur: *John C. Mankins (ARTEMIS Innovation Management Solutions, LLC, United States);*

IAC-11.C3.3.1

WIND POWER-ENABLED MISSIONS FOR SURFACE AND ATMOSPHERIC EXPLORATION OF TITAN

Ted Steiner, Massachussets Institute of Technology (MIT), United States

IAC-11.C3.3.2

DEVELOPING AN EFFICIENT POWER BUS TECHNOLOGY FOR A NANOSATELLITE

Bernard Adjei-Frimpong, South Africa

IAC-11.C3.3.3

ON THE FEASIBILITY OF FUEL CELL POWERED SENSOR MODULES FOR DEPLOYMENT AT THE LUNAR POLES

Kavya K. Manyapu, Massachussets Institute of Technology (MIT), United States

IAC-11.C3.3.4

SUPER-CAPACITOR ENERGY STORAGE FOR MICRO-SATELLITES: DEVELOPMENT AND POTENTIAL MISSION APPLICATIONS

Tatsuo Shimizu, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.C3.3.5

OPTIMAL POWER HARNESS ROUTING FOR SMALL-SCALE SATELLITES

Eirini Komninou, University of Strathclyde, United Kingdom

IAC-11.C3.3.6

SULFUR ASSITED-CARBON NANOTUBES GROWTH AS BINDER FREE ELECTRODES FOR LITHIUM-ION BATTERY ANODES

Dionne Hernandez-Lugo, NASA Harriet Jenkins Pre-Doctoral Fellowship, University of Puerto Rico, Puerto Rico

IAC-11.C3.3.7

DESIGN, DEVELOPMENT, ASSEMBLY, INTEGRATION AND TESTING PROCESS OF FLIGHT QUALITY SOLAR PANEL FOR LEO SATELLITE

Mohd Amir Iskandar Mazlan, Astronautic Technology SDN BHD, Malaysia

**IAC-11.C3.3.8**

THE RESEARCH ON SEQUENTIAL SWITCHING SHUNT REGULATOR BASED ON SMALL SIGNAL MODEL (poster)

Yonggang Chen, CAST, China

C3.5. - C4.7. Joint Session on Nuclear Propulsion and Power

October 7 2011, 09:00 — TS-06

Chair: Richard Blott (Space Enterprise Partnerships Limited, United Kingdom); Harvey J. Willenberg (American Aerospace Advisors, Inc., United States);

Rapporteur: Paul A. Czysz (Hypertech, United States);

IAC-11.C4.7.-C3.5.1

USAGE OF NUCLEAR POWER AS A POWERFUL SOURCE FOR SPACE STATIONS AND FOR SPACE DEVELOPMENT MISSIONS

Gurunadh Velidi, India

IAC-11.C4.7.-C3.5.2

NUCLEAR SYSTEMS FOR SPACE POWER AND PROPULSION

George Schmidt, National Aeronautics and Space Administration (NASA)/Glenn Research Center, United States

IAC-11.C4.7.-C3.5.3

STIRLING ENGINE RADIOISOTOPIC POWER SYSTEM FOR SPACE APPLICATIONS

Bill Johnson, Systems Engineering & Assessment Ltd, United Kingdom

IAC-11.C4.7.-C3.5.4

PROJECT ICARUS: ANALYSIS OF PLASMA JET DRIVEN MAGNETO-INERTIAL FUSION AS POTENTIAL PRIMARY PROPULSION DRIVER FOR PROJECT ICARUS

Milos Stanic, Propulsion Research Center, University of Alabama in Huntsville, United States

IAC-11.C4.7.-C3.5.5

HIPER: A EUROPEAN PROGRAMME TO DEVELOP HIGH POWER ELECTRIC PROPULSION TECHNOLOGIES FOR FUTURE SPACE EXPLORATION.

Cosmo Casaregola, Alta S.p.A., Italy

IAC-11.C4.7.-C3.5.6

CFD ANALYSIS OF HYDROGEN DISSOCIATION STRATEGY FOR NTR

Douglass Casey, Propulsion Research Center, University of Alabama in Huntsville, United States

IAC-11.C4.7.-C3.5.7

CERAMIC FOAMS FOR NUCLEAR FUEL ELEMENTS: AN INVESTIGATION OF NEUTRONIC PROPERTIES

Eric Faierson, National Institute of Aerospace/Virginia Tech, United States

IAC-11.C4.7.-C3.5.8

PROPULSION OPTIONS FOR COSMOLOGICAL MAPPING MISSION

Roger X. Lenard, LPS, United States

IAC-11.C4.7.-C3.5.9

IMPACT OF ADVANCED TECHNOLOGIES ON NUCLEAR POWER AND PROPULSION SYSTEMS

Roger X. Lenard, LPS, United States

C4. SPACE PROPULSION SYMPOSIUM

Coordinator: Giorgio Saccoccia (European Space Agency (ESA), The Netherlands); Richard Blott (Space Enterprise Partnerships Limited, United Kingdom);

C4.1. Propulsion Systems I

October 3 2011, 15:00 — TS-06

Chair: Max Calabro (The Inner Arch, France); Christophe Bonhomme (Centre National d'Etudes Spatiales (CNES), France);

Rapporteur: Walter Zinner (Astrium GmbH, Germany);

IAC-11.C4.1.1

A PREVIEW OF LAUNCH VEHICLE ARCHITECTURES AND PROPULSION SYSTEMS FOR HEAVY LIFT LV IN CHINA

Ping Li, College of Astronautics, Northwestern Polytechnical University, China

IAC-11.C4.1.2

PROGRESS ON THE LE-X CRYOGENIC BOOSTER ENGINE

Akihide Kurosu, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C4.1.3

PROGRESS OF THE VINCI ENGINE SYSTEM DEVELOPMENT

Patrick DANOUS, Snecma, France

IAC-11.C4.1.4

DEVELOPMENT PROGRESS OF THE MAS-10K REGENERATIVELY COOLED SUB-SCALE PROPULSION TECHNOLOGY DEMONSTRATOR

MARK COMNINOS, South Africa

IAC-11.C4.1.5

LIQUID OXYGEN / LIQUID METHANE PROPULSION AND CRYOGENIC ADVANCED DEVELOPMENT

Harry A. Cikanek, National Aeronautics and Space Administration (NASA), United States

IAC-11.C4.1.6

GRASP – ANALYSIS OF GREEN PROPELLANT CANDIDATES

Carsten Scharlemann, University of Applied Science Wiener Neustadt, Austria

IAC-11.C4.1.7

DEVELOPMENT OF A LARGE LIQUID CORE STAGE L110 FOR GSLV MK-III - TECHNOLOGICAL CHALLENGES

G. Ayyappan, Indian Space Research Organization (ISRO), India

IAC-11.C4.1.8

VULCAIN X TECHNOLOGICAL DEMONSTRATION RESULTS AND PERSPECTIVES

Parick Danous, Snecma, France

IAC-11.C4.1.9

SPACE LIQUID ROCKET ENGINES WITH MULTIPLE IN-FLIGHT RESTARTS AND THRUST REGULATION

Vladimir Shnyakin, Yuzhnoye State Design Office, Ukraine

IAC-11.C4.1.10

600KN LOX/METHANE ROCKET ENGINE DEVELOPMENT

Jiguo Sun, Beijing Aerospace Propulsion Institute, China

IAC-11.C4.1.11

SYSTEM ENGINEERING PRESENTATION OF THE EUROPEAN STAGED COMBUSTION DEMONSTRATOR SCORE-D

Patrick DANOUS, Snecma, France

IAC-11.C4.1.12

DEVELOPMENT OF A PROGRAM FOR THE CONCEPTUAL DESIGN AND PRELIMINARY SIZING OF LIQUID PROPELLANT ROCKET ENGINES USED IN AEROSPACE VEHICLES (poster)

Seyed Ali Nasser, University of Toronto Institute for Aerospace Studies, Canada

IAC-11.C4.1.13

COMPARISON OF BOOSTER STAGE ENGINE CYCLE (poster)

Hideo Sunakawa, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C4.1.14

INVESTIGATION OF ORGANIC-GELLANT DROPLETS EVAPORATION CHARACTERISTICS IN THE STATIC ENVIRONMENT (poster)

Zejun Liu, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.1.15

THE DEVELOPMENT AND FLIGHT HISTORY OF THE FIRST GENERATION 490N LIQUID APOGEE ENGINE (poster)

CHANGGUO LIU, China

IAC-11.C4.1.16

FLOW FIELD IN PRESSURE-SWIRL INJECTOR BASED ON VOF INTERFACE TRACKING METHOD AND EXPERIMENTAL INESTIGATION (poster)

Liu Juan, College of Aerospace and Materials Engineering, National University of Defense Technology, China

C4.2. Propulsion Systems II

October 4 2011, 10:00 — TS-06

Chair: Jean-François Guery (Safran SME, France); I-Shih Chang (The Aerospace Corporation, United States);

Rapporteur: Toru Shimada (Japan Aerospace Exploration Agency (JAXA), Japan);

IAC-11.C4.2.1

SPACE LAUNCHER SRM MARKET ANALYSIS

Didier Boury, Snecma Propulsion Solide, France

IAC-11.C4.2.2

ZEFIRO 9A STATIC FIRING TESTS: AN INVESTIGATION ON DATA DISPERSIONS

Enrico Cavallini, Sapienza Università di Roma, Italy

IAC-11.C4.2.3

STUDY ON THE LOW COST GAS-GENERATOR SOLID PROPELLANT (GGP) FOR THE LAUNCH VEHICLE SIDE JET

Hiroto Habu, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C4.2.4

DEMONSTRATIONS TECHNOLOGIES ACTIVITIES FOR NEW GENERATION LAUNCHER SOLID FIRST STAGE

Philippe CLOUTET, Safran SME, France

IAC-11.C4.2.5

DEVELOPMENT OF A NEW-GENERATION AMMONIUM NITRATE-ALUMINUM PROPELLANT FOR THE STRATOS II ROCKET

Hein Olthof, Delft University of Technology (TU Delft), The Netherlands

IAC-11.C4.2.6

COLD FLOW SIMULATION OF VORTEX SHEDDING IN A SEGMENTED SOLID ROCKET MOTOR

RASHEED DUROJAYE, NASRDA, Nigeria

IAC-11.C4.2.7

NUMERICAL SIMULATION OF IGNITION TRANSIENT IN SOLID ROCKET MOTORS

Jayaprakash Janardhanan Nair, Indian Space Research Organization (ISRO), India

IAC-11.C4.2.8

VISUALIZATION OF THE LIQUID LAYER COMBUSTION OF PARAFFIN FUEL

Ashley Chandler, Stanford University, United States

IAC-11.C4.2.9

UNCERTAINTY ANALYSIS AND ROBUSTNESS-RELIABILITY-BASED DESIGN OPTIMIZATION OF HYBRID ROCKET MOTOR

Zhu Hao, Beijing University of Aeronautics and Astronautics, China

IAC-11.C4.2.10

DEVELOPMENT OF A HYBRID ROCKET ENGINE FOR THE STRATOS II ROCKET

Arjan Fraters, Delft University of Technology (TU Delft), The Netherlands

IAC-11.C4.2.11

NUMERICAL SIMULATION OF THE TRANSITION PROCESS IN A HYBRID ROCKET MOTOR

JIA YU, Beihang University, China

IAC-11.C4.2.12

MATHEMATICAL MODEL AND EXPERIMENTAL RESULTS FOR HYBRID ROCKET ENGINE, TYPES OF INJECTORS, SCRATCHES DESIGN, THRUST CONTROL

Teodor-Viorel CHELARU, Politechnic University of Bucharest, Romania

IAC-11.C4.2.13

AIR-LAUNCHED, AIR-AUGMENTED HYBRID ROCKET

Paolo Gessini, Universidade de Brasília, Brazil

IAC-11.C4.2.14

NUMERICAL SIMULATION OF ACOUSTIC-VORTEX INTERACTIONS IN A LARGE SOLID PROPELLANT ROCKET MOTOR (poster)

Xiang-yu Zhang, College of Astronautics, Northwestern Polytechnical University, China

IAC-11.C4.2.15

FLOW SEPARATION IN ROCKET MOTORS DURING SEA LEVEL STATIC TEST (poster)

Jayaprakash Janardhanan Nair, Indian Space Research Organization (ISRO), India

IAC-11.C4.2.16

ENSURING LIQUID AND SOLID PROPELLANT AVAILABILITY TO SPACECRAFT AND LAUNCHERS UNDER EVOLVING INTERNATIONAL REGULATIONS (poster)

Chambras Lafuente Laure, SNPE Propulsion, France

C4.3. Propulsion Technology

October 5 2011, 10:00 — TS-06

Chair: John Harlow (, United Kingdom); James Free (National Aeronautics and Space Administration (NASA), United States);

Rapporteur: Didier Boury (Snecma Propulsion Solide, France);

IAC-11.C4.3

METHANE BASED HYBRID ROCKET MOTOR. OXIDIZER DOPING MODEL

Florin Mingireanu, Romanian Space Agency (ROSA), Romania

IAC-11.C4.3.1

A NEW FABRICATION ROUTE FOR CERAMIC MEMS-BASED MICROPROPULSION SYSTEM - SOFT MOLDING TECHNIQUE USING SUBMICRON ALUMINA PARTICLES AND PRECERAMIC POLYMER

Kean How Cheah, University of Nottingham Malaysia Campus, Malaysia

IAC-11.C4.3.2

A SILICON-BASED MEMS RESISTOJET FOR PROPELLING CUBESATS

Tittu Varghese Mathew, Delft University of Technology (TU Delft), The Netherlands

IAC-11.C4.3.3

DEVELOPMENT OF A NITROUS OXIDE MONOPROPELLANT MICRO-THRUSTER AT BUAA: 2010

Guobiao Cai, Beijing University of Aeronautics and Astronautics, China

**IAC-11.C4.3.4**

SAFETY EVALUATION OF HYDROXYL AMMONIUM NITRATE(HAN) BASED MONOPROPELLANTS FOR THRUSTERS
Nobuyuki Azuma, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C4.3.5

LASER IGNITION OF ROCKET PROPELLANTS
Sergey Rebrov, Keldysh Research Centre, Russia

IAC-11.C4.3.6

PARIFFIN-BASED HYBRID ROCKET TESTING AT THE BUTTE AEROTEC FACILITY

David Micheletti, United States

IAC-11.C4.3.7

HOT TESTING OF LASER WELDED CHANNEL WALL NOZZLES ON VULCAIN 2 ENGINE AND SUBSCALE STAGE COMBUSTION DEMO
Lise Brox, Volvo Aero Corporation, Sweden

IAC-11.C4.3.8

ANALYSIS OF THRUSTER EXHAUST PLUME IMPINGEMENT ON FLEXIBLE MEMBRANE OF SOLAR SAIL “IKAROS”
Norizumi Motooka, University of Tokyo, Japan

IAC-11.C4.3.9

RESEARCH ON THE RADIAL TURBINE USED IN THE LOX/ HYDROGEN ROCKET ENGINE
ZhongXiang Liu, Beijing Aerospace Propulsion Institute, China

IAC-11.C4.3.10

EXPERIMENTAL AND ANALYTICAL CHARACTERIZATION OF SHEAR COAXIAL GO₂/GCH₄ INJECTOR COMBUSTION FLOWFIELD
Yushan Gao, Beijing University of Aeronautics and Astronautics, China

IAC-11.C4.3.11

EFFECTIVE STABILITY ANALYSIS OF LIQUID ROCKET COMBUSTION CHAMBERS: EXPERIMENTAL INVESTIGATION OF DAMPED ADMITTANCES
Thomas Fiala, Technische Universität München, Germany

IAC-11.C4.3.12

RESERCH OF FAULT DETECTION AND ISOLATION ALGORITHMS FOR LRE BASE ON FUZZY GRANULATION (poster)
Yan jun Li, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.3.13

STUDY ON THE SIMULATION TECHNIQUE OF THE VIRTUAL VIBRATION TEST FOR LIQUID ROCKET ENGINE (poster)
DENG Changhua, Xi'an Aerospace Propulsion Institute, China

IAC-11.C4.3.14

DEVELOPMENT OF A NEW-STYLE PROPELLANT TANK WITH CORRUGATED DIAPHRAGM FOR AEROSPACE APPLICATION (poster)
Jian Yu, Shanghai Institute of Space Propulsion, China

IAC-11.C4.3.15

DESIGNING VALVE CORES OF THRUST REGULATORS WITH SIMULATION AND NUMERICAL APPROXIMATION (poster)
Kan Sun, Beijing Aerospace Propulsion Institute, China

IAC-11.C4.3.16

APPLICATION POTENTIAL OF COMBINED FIBRE REINFORCED STRUCTURE TECHNOLOGIES IN ROCKET THRUST CHAMBERS (poster)
Markus Ortelt, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.C4.3.17

NUMERICAL SIMULATION FOR THE FRACTURED PROCESS OF PSD IN DOUBLE PULSE MOTOR (poster)
CHUN-GUANG WANG, College of Astronautics, Northwestern Polytechnical University, China

IAC-11.C4.3.18

WATER HAMMER TEST LABORATORY BREMEN – IMPULSE LOAD AND PRESSURE CYCLE INVESTIGATIONS ON CRITICAL SUBSYSTEMS AND COMPONENTS FOR AIRCRAFT, SPACECRAFT AND LAUNCH VEHICLE PROPULSION SYSTEMS (poster)
Torsten Bolik, machttechnik.de AG, Germany

IAC-11.C4.3.19

SIME-QUALITATIVE METHOD FOR THE ONBOARD FAULT DIAGNOSIS OF SPACECRAFT PROPULSION SYSTEMS (poster)
Zheng Yan, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.3.20

PROGRESS OF THE IN-SPACE PROPULSION-1 PROJECT (poster)
Michel Muszynski, Snecma, France

IAC-11.C4.3.21

CONTROL TECHNIQUES OF HIGH FREQUENCY COMBUSTION INSTABILITY FOR HIGH THRUST LOX/KEROSENE STAGED COMBUSTION CYCLE ENGINE (poster)
Li Longfei, Xi'an Aerospace Propulsion Institute, China

IAC-11.C4.3.22

SHEAR-COMPRESSION TEST ON RUBBER MATERIAL OF FLEXIBLE JOINT AND NUMERICAL SIMULATION (poster)
CHUN-GUANG WANG, College of Astronautics, Northwestern Polytechnical University, China

IAC-11.C4.3.23

RESEARCH ON FRACTURE PRESSURE FOR PREFAB NOTCH OF PSD IN DOUBLE PULSE MOTOR (poster)
DE-MIN YANG, The 41st Institute of the Fourth Academy of CASC, China

C4.4. Electric Propulsion

October 5 2011, 15:00 — TS-06

Chair: *Garri A. Popov (RIAME, Russia); William W. Smith (Aerojet-General Corporation, United States);*

Rapporteur: *Rafael Spears (L-3 Communications, United States);*

IAC-11.C4.4

EMPTY

Vladimir Kalinin, Ireland

IAC-11.C4.4.1

MINIATURIZATION OF ION PROPULSION THROUGH IONIZATION/ ACCELERATION COUPLING - THE CORONA MODEL
Philippe Ferrer, University of the Witwatersrand, South Africa

IAC-11.C4.4.2

PLASMA PROPULSION SYSTEM FOR ORBITAL MANEUVERS OF SATELLITES.
Shrrirup Nambiar, SARDAR VALLBHBHAI PATEL INSTITUTE OF TECHNOLOGY, GUJARAT TECHNOLOGICAL UNIVERSITY, India

IAC-11.C4.4.3

DEVELOPMENT OF NANOSATELLITE PROPULSION SYSTEMS
Carsten Scharlemann, University of Applied Science Wiener Neustadt, Austria

IAC-11.C4.4.4

PARTICLE SIMULATIONS OF ION DETACHMENT IN THRUSTER MAGNETIC NOZZLE
Gennady Markelov, AOES Group BV, The Netherlands

IAC-11.C4.4.5

INVESTIGATION OF STATIONARY PLASMA THRUSTER (SPT) PLUME CHARACTERISTICS UNDER INCREASED DISCHARGE VOLTAGES
Alexey Arkhipov, RIAME, Russia

IAC-11.C4.4.6

EFFECTS OF SECONDARY ELECTRON EMISSION ON THE SHEATH OF STATIONARY PLASMA THRUSTER NEAR THE ACCELERATION CHANNEL
Li-Cheng Tian, Lanzhou Institute of Physics, China

IAC-11.C4.4.7

INVESTIGATION OF THE POSSIBILITY TO CREATE THE STATIONARY PLASMA THRUSTERS (SPT) WITH HIGH SPECIFIC IMPULSE
Garri A. Popov, RIAME, Russia

IAC-11.C4.4.8

OFF-THE-SHELF ELECTRIC PROPULSION SYSTEM FOR NANOSATELLITES
Craig Clark, Clyde Space Ltd., United Kingdom

IAC-11.C4.4.9

THE DEVELOPMENT OF LANTHANUM HEXABORIDE (LAB₆) HOLLOW CATHODES FOR ION THRUSTER IN CHINA
Ning GUO, Lanzhou Institute of Physics, China

IAC-11.C4.4.10

PREDICTIVE CONTROL OF PLASMA KINETICS: TIME-RESOLVED MEASUREMENTS OF INERT GAS MIXING IN A HOLLOW CATHODE DISCHARGE
Kimberly Trent, University of Michigan, United States

IAC-11.C4.4.11

STUDY ON THE SECONDARY ELECTRON EMISSION COEFFICIENT IN HALL THRUSTERS (poster)
Jian-Fei Long, Lanzhou Institute of Physics, China

IAC-11.C4.4.13

DESIGN AND PERFORMANCE STUDY OF AN ABLATIVE PULSED PLASMA THRUSTER (poster)
Rui Zhang, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.4.14

STUDY ON THE SECONDARY ELECTRON EMISSION OF METAL-CURVED SURFACES IN LOW-OCTANE PRIMACY ELECTRONS (poster)
Jian-Fei Long, Lanzhou Institute of Physics, China

IAC-11.C4.4.15

THE DESIGN OF A LOAD SIMULATOR FOR 20CM ION THRUSTER (poster)
Kai LIANG, Lanzhou Institute of Physics, China

C4.5. Hypersonic and Combined Cycle Propulsion

October 6 2011, 10:00 — TS-06

Chair: *Shigeru Aso (Kyushu University, Japan); Norbert Puettmann (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);*

Rapporteur: *Salvatore Borrelli (CIRA Italian Aerospace Research Centre, Italy);*

IAC-11.C4.5.1

DEVELOPMENT STATUS OF THE HYPERSONIC TURBOJET ENGINE FOR MACH 5 FLIGHT IN JAXA
Hiroaki Kobayashi, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.C4.5.2

CRYOGENIC FUEL MANAGEMENT ON THE PRECOOLED TURBO JET ENGINE
Tetsuya Sato, Waseda University, Japan

IAC-11.C4.5.3

EVALUATING HEAT RELEASE EFFECTS IN A SUPRSONIC REACTING MIXING LAYER WITH DENSITY FLUCTUATION MULTIREOLUTION ANALYSIS
Wu Jiping, College of Aerospace and Material Engineering, National Univ. of Defense Technology, China

IAC-11.C4.5.4

CHARACTERISTICS OF EDGE FLAME PROPAGATION IN A SUBSONIC CROSSFLOW
Xi Wenxiong, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.5.5

OPERATIONAL SENSITIVITIES OF AN INTEGRATED AERODYNAMIC-RAMP-INJECTOR/GAS-PORTFIRE FLAMEHOLDER IN A SUPERSONIC COMBUSTOR
Baoxi Wei, Beihang University, China

IAC-11.C4.5.6

AN UNSTRUCTURED RANS/FLAMELET CFD SOLVER FOR NUMERICAL SIMULATION OF THE SUPERSONIC COMBUSTION IN AN INTEGRATED ARI/GP SCRAMJET COMBUSTOR
Bing Chen, Beijing University of Aeronautics and Astronautics, China

IAC-11.C4.5.7

THE STUDY OF FUEL INJECTOR ARRAYS FOR SCRAMJET COMBUSTION
Haiyan WU, China

IAC-11.C4.5.8

DESIGN AND OPITMIZAITON OF HYDROCARBON-FUELED SCRAMJET STAR-UP SCHEME WITH EXPANSION CYCLE
Zhang Hua, College of Aerospace and Material Engineering, National Univ. of Defense Technology, China

IAC-11.C4.5.9

SUBASSEMBLY MATCHING RESEARCH AND SYSTEM DEMONSTRATION TESTS OF AIR TURBO ROCKET
Ping Li, College of Astronautics, Northwestern Polytechnical University, China

IAC-11.C4.5.10

NUMERICAL SIMULATION OF A MACH 6 AIRBREATHING HYPERSONIC FLIGHT TEST VEHICLE POWERED BY TRIPLE-MODULE SCRAMJETS
Liang Jin, China

IAC-11.C4.5.11

THE ROLE OF EXERGY ANALYSIS IN SCRAMJET ENGINE PERFORMANCE ANALYSIS AND OPTIMATION
Siwei Dong, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.5.12

THE MULTI-OBJECTIVE OPTIMIZATION DESIGN FOR TWO-DIMENSIONAL VARIABLE SCRAMJET ENGINE COWL
Wang Qing, College of Astronautics, Northwestern Polytechnical University, China

C4.6. Missions Enabled by New Propulsion Technology and Systems

October 6 2011, 15:00 — TS-06

Chair: *Giorgio Saccoccia (European Space Agency (ESA), The Netherlands); David Micheletti (Universal Technical Resource Services, United States);*

Rapporteur: *Mariano Andreucci (Alta S.p.A., Italy);*

IAC-11.C4.6.1

SAILING WITH E-SAIL TO THE OUTER PLANETS (poster)
Sini Merikallio, Finnish Meteorological Institute, FMI, Finland

**IAC-11.C4.6.2**

TECHNOLOGY DEMO MISSIONS FOR SPECE EXPLORATION: PROPULSION SOLUTIONS

Davina Di Cara, European Space Agency (ESA), The Netherlands

IAC-11.C4.6.3

MINI RF-HELICON-DOUBLE-LAYER PLASMA THRUSTER REQUIREMENTS FOR NEW SPACE MISSIONS

Fabrizio Piergentili, University of Bologna, Italy

IAC-11.C4.6.4

A MICRO PPT FOR THE UKUBE 1 MISSION

Michele Coletti, University of Southampton, United Kingdom

IAC-11.C4.6.5

ELECTRIC PROPULSION OPTIONS FOR CUBESATS

Salvo Marcuccio, Alta S.p.A., Italy

IAC-11.C4.6.6

THE DESIGN OF ELECTRICAL TETHER FOR THE ORBITAL CONTROL OF A CUBESAT PAIR

Yunlong Lin, York University, Canada

IAC-11.C4.6.7

ELECTRIC PROPULSION FOR THE EUROLUNA NANOSATELLITE

Carsten Scharlemann, University of Applied Science Wiener Neustadt, Austria

IAC-11.C4.6.8

TECHNICAL FINDINGS ASSOCIATED WITH DYNAMIC CHARACTERISTICS OF HTV PROPULSION SYSTEM

Shunichiro Nakai, IHI Aerospace Co, Ltd., Japan

IAC-11.C4.6.9

CREW WASTE WATER ELECTRIC PROPULSION SYSTEM DEVELOPMENT PLAN

Yuichiro Nogawa, Earth-Track Corporation, Japan

IAC-11.C4.6.10

ONE VERSION OF A SPACE TRANSPORT SYSTEM FOR RESEARCH OF THE SUN

Mikhail S. Konstantinov, Moscow Aviation Institute, Russia

IAC-11.C4.6.11

THE EVOLUTION OF MONO PROPELLANT & ELECTRICAL PROPULSION SYSTEMS SUPPORTS THE DEVELOPING “PLUG & PLAY” NEEDS, WHILE CREATING A NEW BUSINESS CASE BY: ZVIKA ZUCKERMAN (ZUCKI), SHIMSON ADLER, GILLON SHEAR Zvika Zuckerman, RAFAEL Advanced Defence Systems Ltd., Israel

C4.7.-C3.5. Joint Session on Nuclear Propulsion and Power

October 7 2011, 09:00 — TS-06

Chair: Richard Blott (*Space Enterprise Partnerships Limited, United Kingdom*); Harvey J. Willenberg (*American Aerospace Advisors, Inc., United States*);

Rapporteur: Paul A. Czyst (*Hypertech, United States*);

IAC-11.C4.7.-C3.5.1

USAGE OF NUCLEAR POWER AS A POWERFUL SOURCE FOR SPACE STATIONS AND FOR SPACE DEVELOPMENT MISSIONS

Gurunadh Velidi, India

IAC-11.C4.7.-C3.5.2

NUCLEAR SYSTEMS FOR SPACE POWER AND PROPULSION
George Schmidt, National Aeronautics and Space Administration (NASA)/Glenn Research Center, United States

IAC-11.C4.7.-C3.5.3

STIRLING ENGINE RADIOISOTOPIC POWER SYSTEM FOR SPACE APPLICATIONS

Bill Johnson, Systems Engineering & Assessment Ltd, United Kingdom

IAC-11.C4.7.-C3.5.4

PROJECT ICARUS: ANALYSIS OF PLASMA JET DRIVEN MAGNETO-INERTIAL FUSION AS POTENTIAL PRIMARY PROPULSION DRIVER FOR PROJECT ICARUS

Milos Stanic, Propulsion Research Center, University of Alabama in Huntsville, United States

IAC-11.C4.7.-C3.5.5

HIPER: A EUROPEAN PROGRAMME TO DEVELOP HIGH POWER ELECTRIC PROPULSION TECHNOLOGIES FOR FUTURE SPACE EXPLORATION.

Cosmo Casaregola, Alta S.p.A., Italy

IAC-11.C4.7.-C3.5.6

CFD ANALYSIS OF HYDROGEN DISSOCIATION STRATEGY FOR NTR

Douglass Casey, Propulsion Research Center, University of Alabama in Huntsville, United States

IAC-11.C4.7.-C3.5.7

CERAMIC FOAMS FOR NUCLEAR FUEL ELEMENTS: AN INVESTIGATION OF NEUTRONIC PROPERTIES

Eric Faieron, National Institute of Aerospace/Virginia Tech, United States

IAC-11.C4.7.-C3.5.8

PROPULSION OPTIONS FOR COSMOLOGICAL MAPPING MISSION

Roger X. Lenard, LPS, United States

IAC-11.C4.7.-C3.5.9

IMPACT OF ADVANCED TECHNOLOGIES ON NUCLEAR POWER AND PROPULSION SYSTEMS

Roger X. Lenard, LPS, United States

C4.8. Advanced Propulsion: «Non Electric Non Chemical”

October 7 2011, 14:00 — TS-06

Chair: Claudio Bruno (*University of Rome “La Sapienza”, Italy*);

Jacques Gigou (European Space Agency (ESA), France);

Rapporteur: Davina Di Cara (*European Space Agency (ESA), The Netherlands*);

IAC-11.C4.8.1

CONCEPT FOR A MODULAR SOLAR SAIL

Bernard Krummenacher, U3P (Union pour la Promotion de la Propulsion Photonique), Switzerland

IAC-11.C4.8.2

BEAMED ENERGY FOR ABLATIVE PROPULSION IN NEAR EARTH SPACE

Grant Bergstue, University of Alabama in Huntsville, United States

IAC-11.C4.8.3

NUMERICAL INVESTIGATE ON THE EFFECTS OF THE LENGTH OF THE FLAT-ROOFED PARABOLIC NOZZLE ON THE MULTI-PULSES LASER PROPULSION

Junling Song, Academy of Equipment Command and Technology, China

IAC-11.C4.8.4

TRAJECTORY OPTIMIZATION OF GROUND BASED LASER LAUNCH FOR TWO LAUNCH SCHEMES

Zhen He, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.8.5

DESIGN OF A NEW VEHICLE PROPELLED BY MULTI-GBLS AND IT’S LAUNCH SCHEMES

Zhen He, College of Aerospace and Materials Engineering, National University of Defense Technology, China

IAC-11.C4.8.6

NANOSECOND PULSED LASER ABLATION OF POLYTETRAFLUOROETHYLENE BASED PROPELLANTS: NUMERICAL ANALYSIS OF THERMAL AND MECHANICAL EVENTS

Daixian Zhang, College of Aerospace and Materials Engineering, National University of Defense Technology, China

D1. SPACE SYSTEMS SYMPOSIUM

Coordinator: Tibor S. Balint (National Aeronautics and Space Administration (NASA), United States); Marco Guglielmi (European Space Agency (ESA), The Netherlands);

D1.1. Innovative and Visionary Space Systems Concepts

October 3 2011, 15:00 — TS-18

Chair: Mauricio Moshe Guelman (*Asher Space Research Institute, Technion, I.I.T., Israel*); Robert L. Henderson (*The John Hopkins University Applied Physics Laboratory, United States*);

Rapporteur: Peter Dieleman (*National Aerospace Laboratory (NLR), The Netherlands*);

IAC-11.D1.1.1

INCREASED PERFORMANCE REACTION CONTROL OF MULTI DEGREES OF FREEDOM SPACE MANIPULATORS

Marco Chiaradia, Università degli Studi di Padova, Italy

IAC-11.D1.1.2

ROBOTIC AUTONOMY IN SPACE: CHALLENGES, BENEFITS AND COMPLICATIONS LEARNED FROM DESIGNING AND IMPLEMENTING AN AUTONOMOUS ROBOTIC MANIPULATOR FOR SATELLITE CAPTURE

Benoit Larouche, York University, Canada

IAC-11.D1.1.3

DEOS – GERMAN’S ROBOTIC AGENT CONCEPT TO SERVICE, SECURE AND DE-ORBIT MALFUNCTIONED SATELLITES FROM ORBIT

Detlef Reintsema, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D1.1.4

RESEARCH ON STRUCTURE DYNAMICS OF VARIABLE TOPOLOGY-TRANSFORMABLE SPACECRAFT

Xin Ning, Northwestern Polytechnical University, China

IAC-11.D1.1.5

THE CONCURRENT ENGINEERING APPROACH APPLIED ON THE SOLAR MAGNETISM EXPLORER (SOLMEX) CONCEPT

Dominik Quantius, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D1.1.6

EMERGING ECO-SYSTEM: NANO-SATELLITE SWARMS AND LARGE SATELLITES

Arash Noroozi, Delft University of Technology (TU Delft), The Netherlands

IAC-11.D1.1.7

MISSION, SYSTEM AND ARCHITECTURE DESIGN OF A GENERIC ASTEROID DEFLECTION SYSTEM

Uwe Derz, EADS Astrium Space Transportation GmbH, Germany

IAC-11.D1.1.8

THE SPACE WEATHER OBSERVATION NETWORK (SWON) CONCEPT – INAUGURATION OF THE DLR ADVANCED STUDY GROUP

Volker Maiwald, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D1.1.9

SPACE BASED GEOENGINEERING USING STABLE EARTH BOUND ELLIPTICAL ORBITS WITH FROZEN SUN-FACING APOGEE

Russell Bewick, University of Strathclyde, United Kingdom

IAC-11.D1.1.10

ARYAVARTA – A NOVEL APPROACH TOWARDS INNOVATIVE AND EFFICIENT SPACE TRANSPORTATION SYSTEMS

Rushi Ghadawala, Aryavarta Space Organization, India

D1.2. Enabling Technologies for Space Systems

October 4 2011, 10:00 — TS-18

Chair: Xavier Roser (*Thales Alenia Space France, France*); Jean-Paul Aguttes (*Centre National d’Etudes Spatiales (CNES), France*);

Rapporteur: Eiichi Tomita (*Japan Aerospace Exploration Agency (JAXA), Japan*);

IAC-11.D1.2.1

INNOVATIVE TECHNOLOGIES FOR HUMAN EXPLORATION: OPPORTUNITIES FOR PARTNERSHIPS AND LEVERAGING NOVEL TECHNOLOGIES EXTERNAL TO NASA

Jason Hay, The Tauri Group, United States

IAC-11.D1.2.2

ROBOTIC SPACE SUITS: A TECHNOLOGY TO ENABLE LEGGED ROBOTS DEVELOPED FOR EARTH’S ENVIRONMENT TO BE USED FOR EXPLORATION PURPOSES

André Weiß, Institute of Aerospace Systems, Germany

IAC-11.D1.2.3

CRYOGENIC THERMAL MANAGEMENT OF AN ORBITAL PROPELLANT DEPOT

Patrick R. Chai, National Institute of Aerospace/Georgia Institute of Technology, United States

IAC-11.D1.2.4

THE HYDROGEN VALUE CHAIN: APPLYING THE AUTOMOTIVE ROLE MODEL OF THE HYDROGEN ECONOMY IN THE AEROSPACE SECTOR TO INCREASE PERFORMANCE AND REDUCE COSTS

Norbert Frischauf, QASAR Technologie(s) GmbH, Austria

IAC-11.D1.2.5

UNDERSTANDING THE SPACE ENVIRONMENTAL ISSUES FOR THE FLYING BY WIRELESS

Yunlong Lin, York University, Canada

IAC-11.D1.2.6

NOVEL KINEMATIC CONTROL TECHNIQUE FOR ELECTROACTIVE POLYMER ROLLING ROVERS

Silvio Cocuzza, CISAS – “G. Colombo” Center of Studies and Activities for Space, University of Padova, Italy

IAC-11.D1.2.7

A NOVEL DESIGN APPROACH BASED ON BUILDING BLOCKS FOR SERVICABLE SATELLITES ENABLING ON-ORBIT-SERVICING

Jana Weise, Technical University of Berlin, Germany

IAC-11.D1.2.8

AUTOCALIBRATED OPTRONIC SAR PROCESSOR FOR ONBOARD LIVE PLANET OBSERVATION

Alain Bergeron, INO, Canada

IAC-11.D1.2.9

FIBER OPTICS: AN ENABLING TEHNOLOGY IN SPACECRAFT ENGINEERING

Nikos Karafolas, European Space Agency (ESA), The Netherlands

IAC-11.D1.2.10

THE SERVIS PROJECT

Noriaki Oka, Institute for Unmanned Space Experiment Free Flyer (USEF), Japan



**IAC-11.D1.2.11**

HANDS-ON EDUCATION FOR INNOVATIVE RESEARCH FIELDS: A CUBESAT MANUFACTURED WITH RAPID PROTOTYPING TECHNIQUE
Antonio Spadanuda, University of Bologna, Italy

D1.3. System Engineering Tools, Processes & Training (I)

October 4 2011, 15:00 — TS-18

Chair: *Geilson Loureiro (Instituto Nacional de Pesquisas Espaciais (INPE), Brazil); Xavier Roser (Thales Alenia Space France, France);*

Rapporteur: *Ming Li (China Academy of Space Technology (CAST), China);*

IAC-11.D1.3.2

LARES: THE CHALLENGING DEVELOPMENT OF THE FIRST PAYLOAD FOR VEGA LAUNCHER MAIDEN FLIGHT
Simone Pirrotta, Italian Space Agency (ASI), Italy

IAC-11.D1.3.3

FAST EVIDENCE-BASED SPACE SYSTEM ENGINEERING
Massimiliano Vasile, University of Strathclyde, United Kingdom

IAC-11.D1.3.4

THE PROCESS CONTROL IN THE CONCURRENT ENGINEERING ENVIRONMENT FOR UNIVERSITY CLASS SMALL SATELLITE MISSION DESIGN
Yunlong Lin, York University, Canada

IAC-11.D1.3.5

A COMMON MISSION CONTROL SYSTEM FOR THE ESA EARTH OBSERVATION MISSIONS
Damiano Guerrucci, European Space Agency (ESA), Germany

IAC-11.D1.3.6

A COMMAND SEQUENCING ASSISTANT TOOL FOR SPACECRAFT RENDEZVOUS AND DOCKING PLAN DESIGN
Jin Zhang, National University of Defense Technology, China

IAC-11.D1.3.7

MAKING SPACE SYSTEMS MORE DEPENDABLE: A PARADIGM CHANGE FOR VERIFICATION AND VALIDATION
Miriam Alves, IAE - Institute for Aeronautics and Space, Brazil

IAC-11.D1.3.8

SIMULATION TECHNOLOGY, APPLIED TO INTEGRATION AND VALIDATION OF A MAJOR SPACE SYSTEM.
Richard Lowe, VEGA, United Kingdom

IAC-11.D1.3.9

INTELLIGENT DIAGNOSTICS BASED ON THE MAHALANOBIS TAGUCHI METHOD FOR SPACE SYSTEMS
Yoshitaka Yoneda, The Graduate University of Advanced Studies, Japan

IAC-11.D1.3.10

AN INTEGRATED APPROACH TO FUNCTIONAL ENGINEERING: AN ENGINEERING DATABASE FOR HARNESS AVIONICS AND SOFTWARE
Annamaria Piras, Thales Alenia Space Italia, Italy

IAC-11.D1.3.11

RISK MATRICES AND MEGA PROJECT
Thomas Mazzuchi, George Washington University, United States

IAC-11.D1.3.12

STANDARDIZATION OF THE TECHNICAL READINESS LEVELS (TRL)
Franck Durand-Carrier, Centre National d'Etudes Spatiales (CNES), France

D1.4. Space Systems Architectures

October 5 2011, 10:00 — TS-18

Chair: *Peter Dieleman (National Aerospace Laboratory (NLR), The Netherlands); Reinhold Bertrand (European Space Agency (ESA), Germany);*

Rapporteur: *Franck Durand-Carrier (Centre National d'Etudes Spatiales (CNES), France);*

IAC-11.D1.4.1

OLFA: ADAPTIVE TOPOLOGY FOR SATELLITE SWARMS
Alex Budianu, University of Twente, The Netherlands

IAC-11.D1.4.2

CONSTELLATION OF CUBESATS: 3-STAR IN THE HUMSAT/GEIOD MISSION
Sabrina Corpino, Politecnico di Torino, Italy

IAC-11.D1.4.3

THE ISIS AIS CONSTELLATION
Joost Elstak, ISIS - Innovative Solutions In Space B.V., The Netherlands

IAC-11.D1.4.4

AN ARCHITECTURE OF ON-BOARD AUTONOMY FOR CLUSTER FLIGHT OF FRACTIONATED SPACECRAFT MODULES
Jing Chu, Delft University of Technology (TU Delft), The Netherlands

IAC-11.D1.4.5

UWE: A ROADMAP TO PICO-SATELLITE FORMATION FLYING
Klaus Schilling, Germany

IAC-11.D1.4.6

OPTIMISING FRACTIONATED ARCHITECTURES
Benjamin S Schwarz, University of Southampton, United Kingdom

IAC-11.D1.4.7

DISTRIBUTED SYSTEM ARCHITECTURE FOR ONBOARD AUTONOMY OF ASTEROID EXPLORER
Rui Xu, Beijing Institute of technology, China

IAC-11.D1.4.8

THE USE OF THE LUA SCRIPTING ENVIRONMENT FOR RAPID GROUND TESTING AND FLIGHT ACTIVITY DEVELOPMENT IN A CAN BUS BASED SATELLITE.
Nicolaas Steenkamp, Sun Space and Information Systems, South Africa

IAC-11.D1.4.9

CHALLENGES IN MODEL-BASED SPACE SYSTEMS ENGINEERING – CONSISTENCY
Sebastian Johannes Ingo Herzig, Technische Universität München, Germany

IAC-11.D1.4.10

SYSTEMS CONCURRENT ENGINEERING FOR THE CONCEPTION OF A ATTITUDE AND ORBIT CONTROL SYSTEM
Leonardo Oliva, The Brazilian Institute for Space Research, Brazil

IAC-11.D1.4.11

A FRACTALLY FRACTIONATED SPACECRAFT
Giuliano Punzo, University of Strathclyde, United Kingdom

D1.5. Lessons Learned in Space Systems

October 5 2011, 15:00 — TS-18

Chair: *Anne Bondiou-Clergerie (GIFAS, France); Klaus Schilling (University of Wuerzburg, Germany);*

Rapporteur: *Takashi Hamazaki (Japan Aerospace Exploration Agency (JAXA), Japan);*

IAC-11.D1.5.1

AUTONOMY AND FAILURE DETECTION ISOLATION AND RECOVERY FOR A FORMATION FLYING MISSION: LESSONS LEARNED OF THE PRISMA MISSION
Sytze Veldman, Swedish Space Corporation, Sweden

IAC-11.D1.5.2

SECONDARY ANALYSIS ON ON - ORBIT FAILURES OF SATELLITES
Hirobumi Saito, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.D1.5.3

PERSPECTIVES ON RISK ASSESSMENT AND MANAGEMENT AT NASA
Thomas Mazzuchi, George Washington University, United States

IAC-11.D1.5.4

OPTIMIZATION OF SPACE SYSTEM DEVELOPMENT RESOURCES
William Kosmann, Orbital Sciences Corporation, United States

IAC-11.D1.5.5

THE SUMBANDILA SATELLITE EXPERIMENTS PAYLOAD - TAKING THE STEP TO SPACE
Arno Barnard, Stellenbosch University, South Africa

IAC-11.D1.5.6

TET-1 SATELLITE OPERATIONS LESSONS LEARNED: PREPARATION OF MISSION, LEOP AND ROUTINE OPERATIONS OF 11 DIFFERENT EXPERIMENTS
Robert Axmann, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D1.5.7

FROM VAX TO IPHONE: 20 YEARS OF CLUSTER MISSION GROUND SEGMENT EVOLUTION
Ignacio Clerigo, LSE Space AG, Germany

IAC-11.D1.5.8

LESSONS LEARNED FROM THE DEFICIENCIES IN THE DESIGN OF THE TT&C TRANSPONDER FOR THE SMALL SATELLITE FOR REMOTE SENSING EGYPTSAT-1
Ahmed Maghawry, National Authority for Remote Sensing and Space Sciences (NARSS), Egypt

D1.6. System Engineering Tools, Processes and Training (2)

October 6 2011, 10:00 — TS-18

Chair: *Takashi Hamazaki (Japan Aerospace Exploration Agency (JAXA), Japan); Franck Durand-Carrier (Centre National d'Etudes Spatiales (CNES), France);*

Rapporteur: *Reinhold Bertrand (European Space Agency (ESA), Germany);*

IAC-11.D1.6.1

MISSION / SYSTEM EARLY PHASE DESIGN PROCESS
Claude FRATTER, Centre National d'Etudes Spatiales (CNES), France

IAC-11.D1.6.2

LAUNCH VEHICLES MULTIDISCIPLINARY OPTIMIZATION, A STEP FROM CONCEPTUAL TO EARLY PRELIMINARY DESIGN
Francesco Castellini, Politecnico di Milano, Italy

IAC-11.D1.6.3

ARCHITECTING METHOD TO ASSESS CONCEPTUAL DESIGN OF PLATFORM BASED SATELLITES
Otavio L. Bogossian, Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

IAC-11.D1.6.4

SYSTEM OF SYSTEMS ENGINEERING WITH THE ESA ARCHITECTURAL FRAMEWORK
Anthony Walsh, VEGA Space GmbH, Germany

IAC-11.D1.6.5

INTEGRATION OF DIFFERENT VISUALIZATIONS TO REDUCE COMPLEXITY ON THE DESIGN OF SPACE SYSTEMS
Ivo Ferreira, Instituto Superior Técnico, Portugal

IAC-11.D1.6.6

SYSTEMS CONCURRENT ENGINEERING OF SPACE PAYLOAD AQUARIUS INSTRUMENT
Paulo Vinicius Jeronimo, Instituto Nacional de Pesquisas Espaciais (INPE), Brazil

IAC-11.D1.6.7

EXPERIENCES GAINED FROM USING SYSML FOR THE DESIGN OF SATELLITES
Sebastian Johannes Ingo Herzig, Technische Universität München, Germany

IAC-11.D1.6.8

SYSML BASED SYSTEM ENGINEERING: A CASE STUDY FOR SPACE ROBOTIC SYSTEMS
Savan Chhaniyara, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.D1.6.9

MODELLING AND SIMULATION OF A COMPLEX PAYLOAD SYSTEM USING SYSML AND A MODEL BASED DESIGN APPROACH
Thomas Krueger, European Space Agency (ESA), The Netherlands

IAC-11.D1.6.10

INCORPORATING UNCERTAINTY IN MODEL-BASED SYSTEMS ENGINEERING OF SPACE SYSTEMS
Jian Guo, Delft University of Technology (TU Delft), The Netherlands

IAC-11.D1.6.11

A TEMPORAL LOGICAL METHODOLOGY FOR PROBABILISTIC VULNERABILITY ANALYSIS OF SPACE MISSIONS: APPLICATION TO VULNERABILITY ANALYSIS OF AN EARTH OBSERVATION MISSION DUE TO CATALOGUED SPACE DEBRIS
Sylvain Bertrand, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France

IAC-11.D1.6.12

DECISION-BASED SYSTEM ARCHITECTING FOR HUMAN NEO MISSIONS
Arthur Guest, Massachusetts Institute of Technology (MIT), United States

D2. SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM

Coordinator: Richard Tyson (National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center, United States); Christophe Bonnal (Centre National d'Etudes Spatiales (CNES), France);

Secretary: John M. Horack (University of Alabama in Huntsville, United States);

D2.1. Launch Vehicles in Service or in Development

October 3 2011, 15:00 — TS-02

Chair: *Christian Dujarric (European Space Agency (ESA), France); Paulo Moraes Jr. (Instituto de Aeronáutica e Espaço (IAE), Brazil);*

Rapporteur: *Ray F. Johnson (The Aerospace Corporation, United States);*

IAC-11.D2.1.1

VEGA LAUNCHER: STATUS OF DEVELOPMENT AND PREPARATION FOR THE QUALIFICATION FLIGHT.
Stefano Bianchi, European Space Agency (ESA), Italy

**IAC-11.D2.1.2**

UNITED LAUNCH ALLIANCE – HISTORIC LAUNCH OF THE FIRST DELTA IV HEAVY FROM THE WEST COAST

Michael Berglund, United Launch Alliance, United States

IAC-11.D2.1.3

ARIANE 5 PROGRAM STATUS

Denis Schmitt, Arianespace, France

IAC-11.D2.1.4

ARIANE 5 ECA PERFORMANCE IMPROVEMENT PLAN STATUS

Daniel de Chambure, European Space Agency (ESA), France

IAC-11.D2.1.5

A5ME: THE MULTI-MISSION HEAVY LIFT VERSION NEEDED FOR THE END OF THE DECADE

Catherine Poincheval, Astrium Space Transportation, France

IAC-11.D2.1.6

DEVELOPMENT STATUS OF JAPAN'S EPSILON SOLID ROCKET LAUNCHER AND ITS EVOLUTION

Yasuhiro Morita, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.D2.1.7

H-IIA UPGRADE AND H-III – EVOLVING PLAN OF JAPANESE PRIMARY LAUNCH SYSTEM

Shinya Ohkubo, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.D2.1.8

LIBERTY™ LAUNCH SERVICE, AN INTERNATIONAL VENTURE

Donald Sauvageau, ATK Launch Systems, United States

IAC-11.D2.1.9

SPACE EXPLORATION TECHNOLOGIES: WORKING TO REVOLUTIONIZE ACCESS TO SPACE

Brian Bjelde, SpaceX, United States

D2.2. Launch Services, Missions, Operations and Facilities

October 4 2011, 10:00 – TS-02

Chair: *Patrick M. McKenzie (Ball Aerospace & Technologies Corp., United States); Ulf Palmnäs (Volvo Aero Corporation, Sweden);*

Rapporteur: *Yves Gérard (Astrium Space Transportation, France);*

IAC-11.D2.2.1

EVOLUTION OF THE FLORIDA LAUNCH SITE ARCHITECTURE EMBRACING MULTIPLE CUSTOMERS, ENHANCING LAUNCH OPPORTUNITIES

James Gray, NASA, United States

IAC-11.D2.2.2

SOYUZ, THE MYTHIC RUSSIAN LAUNCH SYSTEM, ADAPTED TO EUROPEAN STANDARD AND OPERATING RULES, WILL BE LAUNCHED IN THIRD QUARTER 2011.

Didier Coulon, European Space Agency (ESA), France

IAC-11.D2.2.3

“POLET AIRLINES” COMPANY’S EXPERIENCE OF PAYLOAD TRANSPORTATION TO LAUNCH SPOTS

Anatoly Karpov, Air Launch Aerospace Corporation, Russia

IAC-11.D2.2.4

TAURUS II LAUNCH VEHICLE CONCEPT OF OPERATIONS AND INFRASTRUCTURE DEVELOPMENT

Leslie Kovacs, Orbital, United States Minor Outlying Islands

IAC-11.D2.2.5

ARIANE 5 ES ATV-2 JOHANNES KEPLER MISSION FIRST FLIGHT RESULTS IN COMPARISON TO ATV-1 JULES VERNE LAUNCH

Markus Jäger, Astrium Space Transportation, Germany

IAC-11.D2.2.6

PAYLOAD LAUNCH ENVIRONMENT ENVELOPES AND SPACE SYSTEMS INTEROPERABILITY

Kay Sullivan, Pardee RAND Graduate School, United States

IAC-11.D2.2.7

VEGA LAUNCH SERVICES FOR SMALL SATELLITE PROGRAMS

Caroline Arnoux, Arianespace, France

IAC-11.D2.2.8

A SHARED GLOBAL GROUND NETWORK

Borre Pedersen, Kongsberg Satellite Services AS, Norway

IAC-11.D2.2.9

ARIANE 5-ME LAUNCH FACILITIES DEVELOPMENT AND QUALIFICATION: MANAGING THE TRANSITION PHASE

Pier Michele Roviera, European Space Agency (ESA), France

IAC-11.D2.2.10

AIRLAUNCH - AN ANTONOW 124-BASED LAUNCH VEHICLE CONCEPT FOR LEO AND GTO PAYLOADS

Anatoly Karpov, Air Launch Aerospace Corporation, Russia

D2.3. Upper Stages, Space Transfer, Entry and Landing Systems

October 4 2011, 15:00 – TS-02

Chair: *Luigi Bussolino (Bussolino and Associates, Italy); Harry A. Cikanek (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *Kenneth Bruce Morris (National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center, United States);*

IAC-11.D2.3.1

FREGAT UPPER STAGE UPGRADES DEVELOPMENT STATUS

François BARREAU, Arianespace, France

IAC-11.D2.3.2

ARES I UPPER STAGE SUBSYSTEMS DESIGN AND DEVELOPMENT

Harry A. Cikanek, National Aeronautics and Space Administration (NASA), United States

IAC-11.D2.3.3

3RD STAGE SYSTEM FOR H-III LAUNCH VEHICLE: CONCEPT AND EVALUATION

Tetsuo Hiraiwa, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.D2.3.4

VENUS - CONCEPTUAL DESIGN FOR VEGA NEW UPPER STAGE

Menko Wisse, EADS Astrium Space Transportation, Germany

IAC-11.D2.3.5

CONCEPT DESIGN OF HIGH POWER SOLAR ELECTRIC PROPULSION VEHICLES FOR HUMAN EXPLORATION

Harry A. Cikanek, National Aeronautics and Space Administration (NASA), United States

IAC-11.D2.3.6

CONCEPT STUDY ON ADDING RETURN CAPABILITY TO HTV

Hiroshi Kawato, Mitsubishi Heavy Industries, Ltd., Japan

IAC-11.D2.3.7

A PERSONAL AIRBAG SYSTEM FOR THE ORION CREW EXPLORATION VEHICLE

Sydney Do, Massachusetts Institute of Technology (MIT), United States

IAC-11.D2.3.8

USING MONTE CARLO SIMULATION FOR DESIGN ROBUSTNESS ASSESSMENTS OF WINGED RE-ENTRY VEHICLES.

Farid Gamgami, OHB-System AG, Germany

IAC-11.D2.3.9

OUTLINE OF THE CONTROLLED RE-ENTRY SYSTEM OF THE H-IIB UPPER STAGE

Kenji Egawa, Mitsubishi Heavy Industries, Ltd., Japan

D2.4. Future Space Transportation Systems

October 5 2011, 10:00 – TS-02

Chair: *Sundaram Ramakrishnan (Vikram Sarabhai Space Centre (VSSC), India); Walter Faulconer (Strategic Space Solutions, LLC, United States);*

Rapporteur: *Norbert Puettmann (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);*

IAC-11.D2.4.1

ARIANE 6 MATURATION ACTIVITIES FOR A FUTURE LAUNCHER

Sylvain Guédron, Centre National d'Etudes Spatiales (CNES), France

IAC-11.D2.4.2

PROGRESS ON THE SKYLON AND SABRE DEVELOPMENT PROGRAMME

Mark Hemsell, Reaction Engines Ltd., United Kingdom

IAC-11.D2.4.3

THE ADVANCED RE-ENTRY VEHICLE – A VERSATILE VEHICLE TO SUPPORT ISS AND EXPLORATION

Philippe Berthe, European Space Agency (ESA), The Netherlands

IAC-11.D2.4.4

RE-USABLE SPACE-ROCKET SYSTEM. INNOVATIONS ON DEVELOPMENT OF RUSSIAN MEANS OF ACCESS TO OUTER SPACE.

Anatoly Kuzin, Khrunichev State Research & Production Space Center, Russia

IAC-11.D2.4.5

A NEW COMMERCIAL AIR LAUNCH SOLUTION FOR MEDIUM LIFT CARGO MISSIONS

Steve Cook, Dynetics, United States

IAC-11.D2.4.6

THE ALTERNATIVE CONCEPT OF USE OF LAUNCH VEHICLES WITH RECOVERABLE WINGED BOOSTERS

Alexander S. Filatyev, Central Aero-HydroDynamic Institute, Russia

IAC-11.D2.4.7

STUDY RESULTS ON A SOLAR ELECTRIC POWER SYSTEM FOR HIGH POWER ELECTRIC PROPULSION (HIPER) APPLICATIONS

Emanuele Ferrando, Selex Galileo, Italy

IAC-11.D2.4.8

INVESTIGATIONS OF FUTURE EXPENDABLE LAUNCHER OPTIONS

Martin Sippel, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D2.4.9

LAUNCH VEHICLE OF THE FUTURE

Mayur Misra, SRM University Chennai, India

IAC-11.D2.4.10

PRELIMINARY DESIGN ANALYSIS OF A FLY-BACK FIRST STAGE FOR COST EFFECTIVE SPACE LAUNCH

MARK COMNINOS, South Africa

IAC-11.D2.4.11

SYSTEM ANALYSIS AND APPLY STUDY FOR LONG-TERM LAUNCHER AND SPACE VEHICLE ROCKET ENGINES.

Yuri Gusev, TSNIMASH, Russia

D2.5. Future Space Transportation Systems Technologies

October 5 2011, 15:00 – TS-02

Chair: *Yushifumi Inatani (Japan Aerospace Exploration Agency (JAXA), Japan); Sylvain Guédron (Centre National d'Etudes Spatiales (CNES), France);*

Rapporteur: *William R. Claybaugh II (Orbital Sciences Corporation, United States);*

IAC-11.D2.5.1

TECHNOLOGIES MATURATION PROGRAM H-X RESULTS

Sébastien Bianchi, Air Liquide, France

IAC-11.D2.5.2

THE ANTI-WETTING DEVICE : A NEW PMD CONCEPT FOR FUTURE CRYOGENIC UPPER TANKS

Jerome Lacapere, Air Liquide, France

IAC-11.D2.5.3

MT AEROSPACE’S CONTRIBUTION TO A5 ME UPPER STAGE TANK DEVELOPMENT

Eva Semmler, MT Aerospace AG, Germany

IAC-11.D2.5.4

THEROTICAL AND EXPERIMENTAL INVESTIGATION OF ACOUSTIC WAVE PROPAGATION AND SCATTERING FOR STRUCTURAL HEALTH MONITORING OF COMPOSITE SANDWICH PANELS

Vadim Smelyanskiy, NASA Ames Research Center, United States

IAC-11.D2.5.5

TURNOVER MANEUVER CONTROL AND GUIDANCE FOR VERTICAL LANDING OF REENTRY VEHICLE

Takayuki Yamamoto, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.D2.5.6

ANALYSIS OF MAGLEV LAUNCH ASSIST VERSUS CONVENTIONAL ROCKET DESIGN

Cristina Poleacovschi, University of Alabama in Huntsville, United States

D2.6. Future Space Transportation Systems Verification and In-Flight Experimentation

October 6 2011, 10:00 – TS-02

Chair: *Giorgio Tumino (European Space Agency (ESA), France); Charles Cockrell (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *Michael L. Burris (National Aeronautics and Space Administration (NASA), United States);*

IAC-11.D2.6.1

OVERVIEW OF THE ORION PAD ABORT 1 LAUNCH ABORT SYSTEM

David McGowan, National Aeronautics and Space Administration (NASA), United States

IAC-11.D2.6.2

NASA ORION PAD ABORT 1 FLIGHT TEST PROJECT OVERVIEW, RESULTS AND LESSONS LEARNED.

Catherine Bahm, National Aeronautics and Space Administration (NASA), United States

IAC-11.D2.6.3

CRITICAL ADVANCES AND FUTURE MISSION APPLICATIONS IN RELATIVE NAVIGATION SYSTEMS

Kevin Miller, Ball Aerospace & Technologies Corp., United States

IAC-11.D2.6.4

LARES SYSTEM, VEGA MAIDEN FLIGHT P/L SUPPORTING THE LAUNCHER QUALIFICATION

Elio Mangraviti, Carlo Gavazzi Space, Italy



**IAC-11.D2.6.5**

EXPERT: THE ESA EXPERIMENTAL RE-ENTRY TEST-BED
Gavira Jose , *European Space Agency (ESA), The Netherlands*

IAC-11.D2.6.6

THE IXV PROGRAMME START OF MANUFACTURING AND QUALIFICATION

Giorgio Tumino, *European Space Agency (ESA), France*

IAC-11.D2.6.7

DEVELOPMENT AND TESTING OF CERAMIC MATRIX COMPOSITE (CMC) THERMAL PROTECTION SYSTEM FOR THE IXV EUROPEAN ATMOSPHERIC RE-ENTRY DEMONSTRATOR

Thierry Pichon, *Snecma Propulsion Solide, France*

IAC-11.D2.6.8

THE USE OF INFRARED THERMOGRAPHY TO MEASURE IN-FLIGHT PERFORMANCE OF CONTROL SURFACES.

Carlos Pereira, *RUAG Space, Switzerland*

D2.7. Small Launchers: Concepts and Operations

October 6 2011, 15:00 — TS-02

Chair: Nicolas Bérend (*Office National d'Etudes et de Recherches Aéropatiales (ONERA), France*); Shayne Swint (*National Aeronautics and Space Administration (NASA)/Marshall Space Flight Center, United States*);

Rapporteur: Markus Jäger (*Astrium Space Transportation, Germany*);

IAC-11.D2.7.1

XCOR'S NANO-SATELLITE LAUNCHER USING THE LYNX REUSABLE SUBORBITAL VEHICLE

Andrew Nelson, *XCOR Aerospace, United States*

IAC-11.D2.7.2

OUTLOOK AND FUTURE PROJECTION ON THE USE OF SMALL LAUNCH VEHICLE CONCEPTS

Yunus Emre ARSLANTAS, *Tübitak, The Scientific and Technological Research Council of Turkey, Turkey*

IAC-11.D2.7.3

RECENT ADVANCES IN SOUTH AFRICA'S PHOENIX HYBRID SOUNDING ROCKET PROGRAMME

Jean-Francois Pitot de la Beaujardiere, *University of KwaZulu-Natal, South Africa*

IAC-11.D2.7.4

PLASMA BUOYANCY AND ITS FUTURE IMPLICATIONS FOR SMALL SATELLITE LAUNCHERS

Andrew Bacon, *Systems Engineering & Assessment Ltd, United Kingdom*

IAC-11.D2.7.5

NEW OPPORTUNITIES FOR SMALL SATELLITE LAUNCH VEHICLES

Joost Elstak, *ISIS - Innovative Solutions In Space B.V., The Netherlands*

IAC-11.D2.7.6

FLETTNER BOOSTERS – A TECHNOLOGY TO UTILIZE THE MAGNUS EFFECT FOR SUBSONIC ROCKET PROPULSION

Anja Nicolai, *Astro- und Feinwerktechnik Adlershof GmbH, Germany*

IAC-11.D2.7.7

STEERING MECHANISM FOR THE NERVA ORBITAL SECOND STAGE

Radu Rugescu, *Politechnic University of Bucharest, Romania*

IAC-11.D2.7.8

VEMS - A VIDEO AND ENVIRONMENTAL MONITORING SYSTEM FOR THE VEGA QUALIFICATION FLIGHT

Clemens Kaiser, *Kayser-Threde GmbH, Germany*

IAC-11.D2.7.9

RESEARCH ON IMPROVING THE RESPONSIVENESS FOR SOLID-FUEL LAUNCH VEHICLE

Qiang Wu, *China Academy of Launch Vehicle Technology, China*

D2.8. Heavy Lift Launchers Capabilities and New Missions

October 7 2011, 09:00 — TS-02

Chair: Martin Sippel (*Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*); Daniel L. Dumbacher (*National Aeronautics and Space Administration (NASA), United States*);

Rapporteur: Oleg Ventskovsky (*Yuzhnoye SDO European Representation, Belgium*);

IAC-11.D2.8.1

A HEAVY LIFT LAUNCH VEHICLE CAPABILITY PROGRESSION TO ACHIEVE AN AFFORDABLE AND SUSTAINABLE PROGRAM FOR BEYOND EARTH DESTINATIONS

Jeffrey S. Osterlund, *United Space Alliance, United States*

IAC-11.D2.8.2

ZENIT-BASED MODULAR HEAVY AND SUPERHEAVY CAPACITY ROCKETS

Alexander Degtyarev, *Yuzhnoye State Design Office, Ukraine*

IAC-11.D2.8.3

HEAVY LIFT LAUNCH VEHICLE SYSTEMS ARCHITECTING

Alessandro Aliakbargolkar, *Massachusetts Institute of Technology (MIT), United States*

IAC-11.D2.8.4

SUSTAINABLE HEAVY LIFT VEHICLE DEVELOPMENT OPTIONS

Martin McLaughlin, *Northrop Grumman Corporation, United States*

IAC-11.D2.8.5

SPACE LAUNCH SYSTEM HLLV APPLICATION TO FUTURE MISSIONS, INCLUDING JUPITER/EUROPA ORBITER

Steve Creech, *National Aeronautics and Space Administration (NASA), United States*

IAC-11.D2.8.6

LARGE SCALE TESTING FOR THE SPACE LAUNCH SYSTEM

R. Marshall Smith, *National Aeronautics and Space Administration (NASA)/Langley Research Center, United States*

IAC-11.D2.8.7

PROSPECTS IN DEVELOPMENT OF HEAVY-LIFT LAUNCH VEHICLE ORBITERS FOR DISTANT SPACE MISSIONS

Alexander Degtyarev, *Yuzhnoye State Design Office, Ukraine*

D2.9. Private Human Access to Space: Sub-Orbital and Orbital Missions: Joint Session D2 with Commercial Spaceflight Safety Commission D6

October 7 2011, 14:00 — TS-02

Chair: Douglas O. Stanley (*Georgia Institute of Technology, United States*); Jens Lassmann (*EADS Space, Germany*);

IAC-11.D2.9.1

XCOR LYNX SUBORBITAL SPACEPLANE - DEVELOPMENT STATUS, MARKET DEVELOPMENT, AND LEGAL / REGULATORY REVIEW

Andrew Nelson, *XCOR Aerospace, United States*

IAC-11.D2.9.2

STATUS OF THE ASTRIUM SUBORBITAL SPACEPLANE PROJECT

Christophe Chavagnac, *EADS Astrium, France*

IAC-11.D2.9.3

THE XP SPACEPLANE AS A MULTI-ROLE SUBORBITAL RESEARCH PLATFORM

Charles Lauer, *Rocketplane Global, Inc., United States*

IAC-11.D2.9.4

DEVELOPING AN EASA POLICY FOR SUB-ORBITAL AIRCRAFT (SOA)

Jean-Bruno Marciacq, *European Aviation Safety Agency (EASA), Germany*

IAC-11.D2.9.5

THE ROLE OF ICAO IN ENSURING HUMAN SPACEFLIGHT SAFETY

Ram S. Jakhu, *Institute of Air and Space Law, Canada*

IAC-11.D2.9.6

FAA VISION AND REGULATION OF THE GROWING COMMERCIAL SPACE TRANSPORTATION INDUSTRY

George Nield, *Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States*

IAC-11.D2.9.7

NASA'S COMMERCIAL CREW AND CARGO PROGRAM – STIMULATING THE DEVELOPMENT OF RELIABLE, COST-EFFECTIVE COMMERCIAL SPACE TRANSPORTATION SYSTEMS TO LEO

Alan Lindenmoyer, *National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States*

IAC-11.D2.9.8

ROUNDTABLE DISCUSSION OF PAPERS AND PANELISTS

Douglas O. Stanley, *Georgia Institute of Technology, United States*

D3. 9th SYMPOSIUM ON STEPPING STONES TO THE FUTURE: STRATEGIES, ARCHITECTURES, CONCEPTS AND TECHNOLOGIES

Coordinator: John C. Mankins (*ARTEMIS Innovation Management Solutions, LLC, United States*); Alain Pradier (*European Space Agency (ESA), The Netherlands*);

D3.1. Strategies and Architectures to Establish a “Stepping Stone” Approach to our Future in Space

October 3 2011, 15:00 — TS-11

Chair: John C. Mankins (*ARTEMIS Innovation Management Solutions, LLC, United States*); Maria Antonietta Perino (*Thales Alenia Space Italia, Italy*);

Rapporteur: William H. Siegfried (*The Boeing Company, United States*);

IAC-11.D3.1.1

BUILDING BLOCKS FOR DEVELOPMENT AND DISCOVERY IN SPACE

John C. Mankins, *ARTEMIS Innovation Management Solutions, LLC, United States*

IAC-11.D3.1.2

ISECG MISSION SCENARIOS AND THEIR ROLE IN INFORMING NEXT STEPS FOR HUMAN EXPLORATION BEYOND LEO

Chris Culbert, *National Aeronautics and Space Administration (NASA), United States*

IAC-11.D3.1.3

AUTOMATION AND ROBOTICS IN THE GERMAN SPACE PROGRAM - ORBITAL APPLICATIONS, THE EXPLORATION OF OUR SOLAR SYSTEM AND SPIN-OFFS INTO TERRESTRIAL APPLICATIONS -

Bernd Sommer, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.D3.1.4

HUMAN MISSIONS TO MARS AND VENUS ORBIT FEATURING TELEOPERATED SURFACE EXPLORATION

George Schmidt, *National Aeronautics and Space Administration (NASA)/Glenn Research Center, United States*

IAC-11.D3.1.5

POTENTIAL EUROPEAN CONTRIBUTIONS FOR HUMAN SPACE EXPLORATION

Maria Antonietta Perino, *Thales Alenia Space Italia, Italy*

IAC-11.D3.1.6

AN EVOLUTIONARY APPROACH TO A FLEXIBLE ARCHITECTURE FOR SPACE EXPLORATION

Cosmo Casaregola, *Alta S.p.A., Italy*

IAC-11.D3.1.7

INNOVATION DYNAMICS OF THE SPACE SECTOR

Egbert Jan van der Veen, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.D3.1.8

EXPLORATION COLONIZATION RESOURCE EXTRACTION AND UTILIZATION OF MOON AND MARS (ECROMM)

Siddharth Raval, *SARDAR VALLBHBHAI PATEL INSTITUTE OF TECHNOLOGY, GUJARAT TECHNOLOGICAL UNIVERSITY, India*

D3.2. Concepts, Technologies, Infrastructures and Systems for the Exploration and Utilisation of Space

October 5 2011, 10:00 — TS-11

Chair: William H. Siegfried (*The Boeing Company, United States*); Scott Hovland (*European Space Agency (ESA), The Netherlands*);

Rapporteur: Hiroshi Yamakawa (*Japan Aerospace Exploration Agency (JAXA), Japan*);

IAC-11.D3.2.1

A MOON AND DEEP-SPACE ACCESSIBILITY STUDY VIA SYSTEM-OF-SYSTEMS APPROACH

Diego Cardile, *Politecnico di Torino, Italy*

IAC-11.D3.2.2

STEPS PROJECT - TECHNOLOGIES AND SYSTEMS FOR SPACE EXPLORATION

Maria Antonietta Perino, *Thales Alenia Space Italia, Italy*

IAC-11.D3.2.3

CONCEPT FOR A RECONFIGURABLE MODULAR LUNAR LAB

Tim van Zoest, *Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany*

IAC-11.D3.2.4

HABITABLE MODULE FOR A DEEP SPACE EXPLORATION MISSION

Maria Antonietta Viscio, *Thales Alenia Space Italia, Italy*

IAC-11.D3.2.5

USE OF A MAGNETIC SHIELD FOR ACTIVE PROTECTION AGAINST SOLAR PARTICLE RADIATION

Thomas Schervan, *RWTH Aachen University, Germany*

IAC-11.D3.2.6

RESEARCH ON CRITICAL TECHNOLOGIES AND MISSION ROADMAP FOR ASTEROID MINING

Liu Yang, *Beijing Special Engineering Design and Research Institute, China*

IAC-11.D3.2.7

USE OF SPACE RESOURCES ON EARTH, FACT OR FICTION?

Dana Andrews, *Andrews Space, United States*



IAC-11.D3.2.8

RAPID PROTOTYPING OF ADVANCED EXPLORATION SYSTEMS
Christopher Moore, National Aeronautics and Space Administration (NASA), United States

IAC-11.D3.2.9

DEMOCRATIZING EXPLORATION USING 3D PRINTERS AND NOVEL ISRU
Connor Dickie, Queen's University, Canada

IAC-11.D3.2.10

THE POTENTIAL OF ALUMINIUM METAL POWDER AS A FUEL FOR SPACE PROPULSION SYSTEMS
Abdul Ismail, Kingston University, United Kingdom

D3.4. Space Technology and Systems Management Practices and Tools

October 7 2011, 14:00 — TS-11

Chair: Paivi Jukola (Helsinki University of Technology (TKK), Finland); Peter A. Swan (Teaching Science and Technology, Inc., United States);

Rapporteur: Christopher Moore (National Aeronautics and Space Administration (NASA), United States);

IAC-11.D3.4.1

TOWARD ENABLING NASA'S FUTURE INVESTMENTS IN TECHNOLOGY: A SET OF SPACE TECHNOLOGY ROADMAPS
Tibor S. Balint, National Aeronautics and Space Administration (NASA), United States

IAC-11.D3.4.2

RESEARCH AND TECHNOLOGY MANAGEMENT AT CNES
Cadiou Anne, Centre National d'Etudes Spatiales (CNES), France

IAC-11.D3.4.3

EVALUATING RESEARCH FOR DISRUPTIVE INNOVATION IN SPACE
Leopold Summerer, European Space Agency (ESA), The Netherlands

IAC-11.D3.4.4

INTEGRATED TECHNOLOGY AND RISK ASSESSMENT: RECENT EVENTS, METHODOLOGIES, TOOLS AND EXAMPLES
John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States

IAC-11.D3.4.5

ASSESSMENT OF EVALUATION METHODS FOR SPACE TECHNOLOGY CONCEPTS
Egbert Jan van der Veen, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D3.4.6

TECHNOLOGICAL ROADMAPING AT CNES
Franck Durand-Carrier, Centre National d'Etudes Spatiales (CNES), France

IAC-11.D3.4.7

PATTERNS OF INNOVATION AT NASA: EXPLAINING SWITCHBACKS IN MATURITY
Zoe Szajnfarder, George Washington University, United States

IAC-11.D3.4.8

MAKING THE CASE FOR GREEN VERSUS TOXIC PROPELLANT SELECTIONS: THE ROLE OF ENVIRONMENTAL LIFE CYCLE COSTS
Christyl Johnson, National Aeronautics and Space Administration (NASA), United States

IAC-11.D3.4.9

A NEW INTEGRATED DESIGN PROCESS BASED ON A DYNAMIC DESIGN STRUCTURE MATRIX APPLIED TO SPACE SYSTEMS
Ivo Ferreira, Instituto Superior Técnico, Portugal

IAC-11.D3.4.10

FROM PROTOTYPE TECHNOLOGY TO FLIGHT: INFUSING THE FRONTIER RADIO ON THE RADIATION BELT STORM PROBES MISSION
Dipak Srinivasan, The John Hopkins University Applied Physics Laboratory, United States

IAC-11.D3.4.11

SYSTEM ENGINEERING METHODS AND PRACTICE FOR AEROSPACE SOFTWARE DEVELOPMENT
Xinhua Zheng, China

D4. 9th SYMPOSIUM ON VISIONS AND STRATEGIES FOR FAR FUTURES

Coordinator: Giuseppe Reibaldi (European Space Agency (ESA), The Netherlands); Hans E.W. Hoffmann (ORBCOMM Inc, Germany);

D4.1. Human Exploration in Deep Space

October 4 2011, 15:00 — TS-11

Chair: Alain Dupas (European Bank for Reconstruction and Development, France); Paivi Jukola (Helsinki University of Technology (TKK), Finland);

Rapporteur: Kenol Jules (National Aeronautics and Space Administration (NASA), United States);

IAC-11.D4.1.1

FROM FAR TO NEAR FUTURE; PERSPECTIVES AND CHALLENGES - IAA AND IAF PAST AND PRESENT REFLECTIONS
Alain Dupas, European Bank for Reconstruction and Development, France

IAC-11.D4.1.2

IS HUMANKIND TRULY DESTINED TO VOYAGE TO THE STARS?
Seth Shostak, SETI Institute, United States

IAC-11.D4.1.3

VIRTUAL REALITY AS A STEPPING STONE TO RESEARCH AND TO EXPLORE
Paivi Jukola, Helsinki University of Technology (TKK), Finland

IAC-11.D4.1.4

RESEARCH ON TECHNICAL APPROACH FOR MANNED DEEP-SPACE EXPLORATION
Liu Yang, Beijing Special Engineering Design and Research Institute, China

IAC-11.D4.1.5

HUMAN EXPLORATION USING REAL-TIME ROBOTIC OPERATIONS (HERRO) - A SPACE EXPLORATION STRATEGY FOR THE 21ST CENTURY
George Schmidt, National Aeronautics and Space Administration (NASA)/Glenn Research Center, United States

IAC-11.D4.1.6

THERE AND BACK: PROPULSION SCHEMES FOR DEEP SPACE HUMAN EXPLORATION
Frank Little, Texas A&M University, United States

IAC-11.D4.1.7

INTERSTELLAR SPACEFLIGHT USING NUCLEAR PROPULSION AND ADVANCED TECHNIQUES
Seetesh Pande, Individual collaboration, India

IAC-11.D4.1.8

"ARTIFICIAL" GRAVITY FIELDS CREATED BY INTENSE ELECTROMAGNETIC FIELDS
Claudio Maccone, International Academy of Astronautics (IAA), Italy

IAC-11.D4.1.9

CONCEPTUAL DESIGN OF A HUMAN MISSION TO THE NEAR-EARTH ASTEROID 1999 AO10 IN 2025-2026
Andrea Messidoro, Politecnico di Torino, Italy

IAC-11.D4.1.11

KEYNOTE: FROM FAR TO NEAR FUTURE: PROSPECTIVES AND CHALLENGES - IAA/IAF PAST AND PRESENT REFLECTIONS
Alain Dupas, European Bank for Reconstruction and Development, France

D4.2 Public/Private Innovative Initiatives in Human Spaceflight Round Table

October 6 2011, 10:00 — TS-11

Chair: Horst Rauck (, Germany); Sundaram Ramakrishnan (Vikram Sarabhai Space Centre (VSSC), India);

Rapporteur: Dana Andrews (Andrews Space, United States);

IAC-11.D4.2.1

STRATEGIC EVALUATION OF COMMERCIAL CREW TO ORBIT TRANSPORTATION INDUSTRY STRUCTURE AND STATUS
Bradley Cheetham, University of Colorado, United States

IAC-11.D4.2.2

NATIONS THAT MAY PURCHASE COMMERCIAL HUMAN SPACEFLIGHT TRANSPORTATION SERVICES
Dustin Kaiser, Futron Corporation, United States

IAC-11.D4.2.3

AN INDICATION OF COMMERCIAL HUMAN SPACE FLIGHT IN JAPAN
Misuzu Onuki, Space Frontier Foundation, Japan

IAC-11.D4.2.4

THE DEVELOPMENT OF PRODUCTS IN A HIGHLY REGULATED ENVIRONMENT: THE AEROSPACE VERSUS MEDICAL DEVICE INDUSTRIES
Lourdes Medina, The Pennsylvania State University, United States

IAC-11.D4.2.5

LEARNING TO FOLLOW: EMBRACING COMMERCIAL TECHNOLOGIES AND OPEN SOURCE FOR SPACE MISSIONS
Christopher Boshuizen, National Aeronautics and Space Administration (NASA)/Ames Research Center, United States

IAC-11.D4.2.6

THE PROSPECTS OF THE SPACEPORT IN CATALONIA: STATUS, MODEL AND STEPS FORWARD TOWARDS A PRIVATE-PUBLIC COLLABORATION
Jorge Fuentes, A_Ventures, Spain

D4.4. Space Elevators and Tethers

October 7 2011, 09:00 — TS-11

Chair: Peter A. Swan (Teaching Science and Technology, Inc., United States); Robert E Penny (Cholla Space Systems, United States);

Rapporteur: David Raitt (, The Netherlands);

IAC-11.D4.4.1

SPACE ELEVATOR ROAD MAP 2011
Akira Tsuchida, Earth-Track Corporation, Japan

IAC-11.D4.4.2

SPACE ELEVATOR STAGE I
John Knapman, United Kingdom

IAC-11.D4.4.3

DEPLOYMENT DYNAMICS OF SPACE ELEVATOR RIBBON
Andre Mazzoleni, North Carolina State University, United States

IAC-11.D4.4.4

QUICK-LOOK OPERATIONS CONCEPT FOR A SPACE ELEVATOR
Peter A. Swan, Teaching Science and Technology, Inc., United States

IAC-11.D4.4.5

COORDINATED ATTITUDE CONTROL FOR ENHANCED SHAPE STABILITY OF A SPACE WEB
Marco Sabatini, Università di Roma «La Sapienza», Italy

IAC-11.D4.4.6

SLING ON A RING: MASS- AND MAN-TRANSPORT TO SPACE
Andrew Meulenbergh, HiPi Consulting, United States

IAC-11.D4.4.7

OSCILLATIONS OF A SPACECRAFT WITH TETHER
Vladimir Aslanov, Samara State Aerospace University, Russia

IAC-11.D4.4.8

DYNAMICS OF A PLANET-TETHERED SPACECRAFT
Anna Guerman, University of Beira Interior, Portugal

IAC-11.D4.4.9

ORBITAL PROPULSION OF SPINNING TETHER VIA ANGULAR MOMENTUM TRANSFER
Yang Yu, Tsinghua University, China

D5. 44th SYMPOSIUM ON SAFETY AND QUALITY IN SPACE ACTIVITIES

Coordinator: Jeanne Holm (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States);

D5.1. A Big Challenge : Safety in Aerospace Missions

October 3 2011, 15:00 — TS-15

Chair: Manola Romero (Office National d'Etudes et de Recherches Aérospatiales (ONERA), France); Alexander S. Filatyev (Central Aero-HydroDynamic Institute, Russia);

Rapporteur: Garrett Smith (Airbus SAS, France);

IAC-11.D5.1.1

ENERGY SUPPORT FOR MISSIONS IN NEAR EARTH SPACE
Luke Burgess, University of Alabama in Huntsville, United States

IAC-11.D5.1.2

DEMONSTRATION OF A PARTICLE IMPACT MONITORING SYSTEM FOR CREWED SPACE EXPLORATION MODULES
John Opiela, Jacobs Sverdrup, United States

IAC-11.D5.1.3

COUPLING SAFETY AND LIFE SCIENCES TO MITIGATE RISK DURING HUMAN SPACE MISSIONS
Jennifer Mindock, University of Colorado, United States

IAC-11.D5.1.4

"THE HUMAN FACTOR" IN TEAM INTERACTION, INFORMATION FLOW AND DECISION MAKING WITHIN ISS OPERATIONS
Andrea Guidi, HE Space, Germany

IAC-11.D5.1.5

RISK MANAGEMENT AT ESA: EXPECTING THE UNEXPECTED
Maria-Gabriella SARAH, European Space Agency (ESA), France

IAC-11.D5.1.6

USING MONTE CARLO SIMULATION FOR SAFETY AND RISK ASSESSMENTS OF WINGED RE-ENTRY PASSENGER VEHICLES
Farid Gamgami, OHB-System AG, Germany



IAC-11.D5.1.7

RESEARCH ON NUMERICAL CALCULATION METHOD FOR THE EXPLOSIVE FRAGMENTS IN INITIAL SEGMENT OF ROCKET LAUNCH

Liu Yang, Beijing Special Engineering Design and Research Institute, China

IAC-11.D5.1.8

QUANTITATIVE RISK ANALYSIS OF ROCKET TRAJECTORIES
Frank Engelen, Delft University of Technology (TU Delft), The Netherlands

IAC-11.D5.1.9

SAFETY AND PERFORMANCE ASPECTS OF THE NEW RUSSIAN RLV PROJECT WITH REUSABLE BOOSTERS

Olga Yanova, Central Aero-HydroDynamic Institute, Russia

IAC-11.D5.1.10

THE AUTHENTIC RELIABILITY OF A COMPLEX TECHNICAL SYSTEM CAN BE ONLY A POSTERIOR AND NO OTHER (THE TASKS OF ENSURING HIGH RELIABILITY OF GROUND LAUNCH COMPLEX OF SPACE SYSTEM)

Vadim Kadzhaev, Center for Ground Space Infrastructure Operation (TsENKI), Russia

D5.2. Knowledge Management and Collaboration in Space Activities

October 6 2011, 10:00 — TS-15

Chair: Jeanne Holm (National Aeronautics and Space Administration (NASA))/Jet Propulsion Laboratory, United States); Roberta Mugellesi-Dow (European Space Agency (ESA), Germany);

Rapporteur: Lionel Baize (Centre National d'Études Spatiales (CNES), France);

IAC-11.D5.2.1

TOWARDS AN ESA KNOWLEDGE MANAGEMENT STRATEGY
Roberta Mugellesi-Dow, European Space Agency (ESA), Germany

IAC-11.D5.2.2

THE TECHNICAL COMPETENCE CENTERS: FROM INNOVATION TO KNOWLEDGE MANAGEMENT

Lionel Baize, Centre National d'Études Spatiales (CNES), France

IAC-11.D5.2.3

ENABLING THE CAPTURE AND SHARING OF NASA TECHNICAL EXPERTISE THROUGH COMMUNITIES OF PRACTICE

Daria Topousis, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.D5.2.4

DRIVING INNOVATION IN ENGINEERING AT NASA

Jeanne Holm, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.D5.2.5

TEAM LEARNING IN SPACE PROJECTS - INSIGHTS FROM A SMALL SATELLITE INTEGRATOR

Hubert Anton Moser, LuxSpace Sarl, Luxembourg

IAC-11.D5.2.6

GLOBALIZED CRAFTS PROJECT MANAGEMENT

Franz-Josef Kahlen, University of Cape Town, South Africa

IAC-11.D5.2.7

ASSESSING THE RELATIONSHIP BETWEEN SYSTEMS ENGINEERING MPTS AND INTEGRATED PRODUCT TEAM PERFORMANCE

Andrea Kerby, University of Alabama in Huntsville, United States

IAC-11.D5.2.8

DATA AND INFORMATION MANAGEMENT OF ISS PAYLOAD AND EXPERIMENT DATA

Soeren Schwartz, Werum Software & Systems AG, Germany

IAC-11.D5.2.9

LONG TERM ASTROPHYSICAL MISSIONS, THEIR CHALLENGES AND (NEW) OPERATIONS STRATEGIES

Marcus G F Kirsch, European Space Agency (ESA), Germany

IAC-11.D5.2.10

SHARING KNOWLEDGE TO EMPOWER SPACE MISSIONS

Jeanne Holm, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.D5.2.11

IMPLEMENTATION ASPECTS FOR A KNOWLEDGE MANAGEMENT SYSTEM

Siegmar Pallaschke, Consultant, Germany

IAC-11.D5.2.12

“COORDINATION OF THE INFORMATION/ KNOWLEDGE FLOW CONCERNING PROJECT MANAGEMENT ISSUES WITHIN A PROCESS-ORIENTED ORGANIZATION” – A CASE STUDY OF THE GERMAN AEROSPACE CENTER DLR

Ruediger Süß, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

D5.3. Space Weather Prediction and Protection of Space Missions from Its Effects

October 6 2011, 15:00 — TS-15

Chair: Jean-Francois Roussel (Office National d'Études et de Recherches Aérospatiales (ONERA), France); Mengu Cho (Kyushu Institute of Technology, Japan);

IAC-11.D5.3.1

MICRO-SATELLITE NETWORK TO MEASURE THE INTERPLANETARY RADIATION ENVIRONMENT (IRENE)

Craig Underwood, Surrey Space Centre, University of Surrey, United Kingdom

IAC-11.D5.3.2

A MICRO-SATELLITE MISSION FOR THE STUDY OF IMPACT OF SPACE WEATHER EFFECTS IN THE AURORAL THERMOSPHERE (ISWEAT)

Yunlong Lin, York University, Canada

IAC-11.D5.3.3

COMBINING SOLAR SCIENCE AND ASTEROID SCIENCE WITH THE SPACE WEATHER OBSERVATION NETWORK (SWON)

Volker Maiwald, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.D5.3.4

THE RESEARCH SYSTEM OF RADIATION ENVIRONMENT IN JAXA

Nana Higashio, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.D5.3.5

SPACE WEATHER SERVICES FROM THE SOUTH AFRICAN NATIONAL SPACE AGENCY

Lee-Anne McKinnell, South African National Space Agency (SANSA), South Africa

IAC-11.D5.3.6

MODELLING THE ELECTRON RADIATION BELT DURING EXTREME EVENTS

Daniel Boscher, Office National d'Études et de Recherches Aérospatiales (ONERA), France

IAC-11.D5.3.7

COSMIC-RAY MODULATION MODELS: PREDICTING COSMIC-RAY INTENSITIES THROUGHOUT THE HELIOSPHERE

Renier Burger, North-West University, South Africa

IAC-11.D5.3.8

VARIATION OF TOTAL ELECTRON CONTENT AND THEIR EFFECT ON GNSS OVER AKURE, NIGERIA.

Oladosu Olakunle, Obafemi Awolowo University, Nigeria

IAC-11.D5.3.9

SAFETY AND EFFICIENCY OF SPACECRAFT ACTIVITIES IN PLASMA ENVIRONMENT

Ekaterina Tverdokhlebova, Central Research Institute of Machine Building (FSUE/TSNIIMASH), Russia

IAC-11.D5.3.10

DATA ANALYSIS OF THE POLAR PLASMA ENVIRONMENT FOR SPACECRAFT CHARGING ANALYSIS

Mengu Cho, Kyushu Institute of Technology, Japan

IAC-11.D5.3.11

SPACE RADIATION EFFECTS ON SOUTH AFRICA'S SUMBANDILASAT

Chijioke Cj Nwosa, National Research Foundation (NRF), South Africa

IAC-11.D5.3.12

ELECTRON-INDUCED DISPLACEMENT DAMAGE EFFECTS IN SI SOLAR CELLS

Sheng-Sheng Yang, Lanzhou Institute of Physics, China

D6. SYMPOSIUM ON COMMERCIAL SPACEFLIGHT SAFETY ISSUES

Coordinator: John Sloan (Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States); Mattias Abrahamsson (Spaceport Sweden, Sweden);

D6.1. Commercial Spaceflight Safety and Emerging Issues

October 4 2011, 10:00 — TS-03

Chair: John Sloan (Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States); Mattias Abrahamsson (Spaceport Sweden, Sweden);

Rapporteur: Julia Tizard (Virgin Galactic, United Kingdom);

IAC-11.D6.1.1

KEYBOTE: CONTINUAL IMPROVEMENT OF FAA COMMERCIAL SPACE TRANSPORTATION SAFETY REGULATIONS

George Nield, Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States

IAC-11.D6.1.2

RISK HAZARD ANALYSIS FOR COMMERCIAL SPACEFLIGHT ACTIVITIES USING RANGE SAFETY TEMPLATE TOOLKIT

Michael Brett, Aerospace Concepts Pty Ltd, Australia

IAC-11.D6.1.3

A TALE OF TWO FORA: A STUDY OF LIABILITY LIMITATION AND DAMAGES FOR SPACEFLIGHT PARTICIPANTS IN TWO JURISDICTIONS

Diane Howard, McGill University, United States

IAC-11.D6.1.4

SAFETY AND HUMAN SPACEFLIGHT: A COMPARISON OF VARIOUS APPROACHES TO ESTABLISHING SAFETY REQUIREMENTS

G. Ryan Faith, Space Foundation, United States

IAC-11.D6.1.5

MIXING US AND DUTCH APPROACHES: TOWARDS CURAÇAO'S LEGISLATION ON PRIVATE COMMERCIAL SPACEFLIGHT

Frans von der Dunk, University of Nebraska-Lincoln, The Netherlands

IAC-11.D6.1.6

THE FIRST FLIGHT DECISION FOR NEW HUMAN SPACEFLIGHT...

Dawn Schaible, NASA LaRC, United States

IAC-11.D6.1.7

A ROSE BY ANY OTHER NAME: DESPITE WHAT WE CALL BEST PRACTICES OR STANDARDS, THE GOAL IS THE SAME – TO FOSTER SAFETY AND LIMIT LIABILITY IN THE CONTEXT OF COMMERCIAL SPACE TRANSPORTATION

Diane Howard, McGill University, United States

IAC-11.D6.1.8

OPERABILITY INDEX DEVELOPMENT FOR HUMAN SPACECRAFT DESIGN (poster)

Christine Fanchiang, University of Colorado, United States

E1. SPACE EDUCATION AND OUTREACH SYMPOSIUM

Coordinator: Chris Welch (International Space University (ISU), France);

E1.1. Lift Off - Primary and Secondary Space Education

October 3 2011, 15:00 — TS-13

Chair: Kerrie Dougherty (Powerhouse Museum, Australia); Jeong-Won Lee (Korea Aerospace Research Institute, Korea, Republic of);

Rapporteur: Shamim Hartevelt-Velani (European Space Agency (ESA), The Netherlands);

IAC-11.E1.1.1

THE YOUNGER, THE BETTER: HUMAN CAPACITY DEVELOPMENT THROUGH SPACE EDUCATION IN PRIMARY SCHOOLS

Elmarie Biermann, French south african Institute of Tehnology(F'SATI), South Africa

IAC-11.E1.1.2

TAKE YOUR CLASSROOM INTO SPACE - CHILDREN AND ASTRONAUT IN "GREENHOUSE IN SPACE: PROJECT.

Shamim Hartevelt-Velani, European Space Agency (ESA), The Netherlands

IAC-11.E1.1.3

STRENGTHENING THE CONNECTION BETWEEN SPACE AND SOCIETY: A COMPARATIVE ANALYSIS OF SUPERNOVAE DISTRIBUTION IN THE ANDROMEDA GALAXY FOR SECONDARY SCHOOL STUDENTS

Kareen Borders, University of Washington, United States

IAC-11.E1.1.4

UNDERTAKE SOCIAL RESPONSIBILITY TO IMPROVE THE PUBLIC'S SCIENTIFIC QUALITY -HOPE-1 SMALL SATELLITE, A SPACE SCIENCE EXPERIENCING PROJECT FOR YOUTH

Jinyu Gong , Chinese Society of Astronautics, China

IAC-11.E1.1.5

ASSIMILATION RATE ASSESSMENT OF STUDENTS DURING OUTREACH PROGRAMMES AT THE CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION (CSSTE)

Funmilayo Erinfolami, African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria

IAC-11.E1.1.6

AEROSPACELAB: A PROJECT TO MOTIVATE STUDENTS TO FOLLOW A CAREER IN SPACE

Fabian Steinmetz, University of Stuttgart, Germany

IAC-11.E1.1.7

ROBOTIC MISSION TO MARS: HANDS-ON, MINDS-ON, WEB-BASED LEARNING

Naomi Mathers, Victorian Space Science Education Centre, Australia

**IAC-11.E1.1.8**

INTERNATIONAL EDUCATION PROGRAMS FOR EDUCATORS AND STUDENTS; INTERNATIONALISING THE SCOTTISH EXPERIENCE

Alex Blackwood, United Kingdom

IAC-11.E1.1.9

BRINGING SPACE EDUCATION TO THE RURAL COMMUNITIES IN NIGERIA THROUGH SPACE CLUBS

Olayinka Abiodun Fagbemi, African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria

E1.2. On Track - Undergraduate And Postgraduate Space Education

October 4 2011, 10:00 — TS-13

Chair: *Naomi Mathers (Victorian Space Science Education Centre, Australia); Marilyn Steinberg (Canadian Space Agency, Canada);*

Rapporteur: *Anne Elisabeth Brumfitt (Space Qualified Ltd, Australia);*

IAC-11.E1.2.1

MAPPING GLOBAL SCIENCE AND ENGINEERING EDUCATION

David Vaccaro, Futron Corporation, United States

IAC-11.E1.2.2

PRACTICAL TRAINING ON SPACECRAFT OPERATIONS FOR UNIVERSITY STUDENTS

Markus Pietras, Technische Universität München, Germany

IAC-11.E1.2.3

CANOROCK AND SPACE PHYSICS EDUCATION IN CANADIAN UNIVERSITIES

Steven Bachiu, University of Saskatchewan, Canada

IAC-11.E1.2.4

SCENARIO BASED TRAINING FOR NATURAL DISASTERS

Christian D. Bodemann, VEGA Deutschland GmbH & Co, KG, Germany

IAC-11.E1.2.5

SMALL SATELLITE SYSTEMS FOR UNIVERSITY CURRICULUM

Pavel Paces, Czech Technical University In Prague, Czech Republic

IAC-11.E1.2.6

TEACHING PRACTICAL LEADERSHIP IN MIT SATELLITE DEVELOPMENT CLASS: CASTOR AND EXOPLANET PROJECTS

Alessandra Babuscia, Massachusetts Institute of Technology (MIT), United States

IAC-11.E1.2.7

FORMATION OF CANSAT COMMUNITY IN IRAN

Sajjad Ghazanfarinia, Student, Iran

IAC-11.E1.2.8

EDUCATIONAL ASSESSMENT OF FOUR YEARS OF CUBESAT ACTIVITIES AT THE UNIVERSITY OF LIÈGE, BELGIUM

Amandine Denis, University of Liege, Belgium

IAC-11.E1.2.9

INTERNATIONAL SOUNDING BALLOON PROJECT

Daniel Sors Raurell, LEEM, Spain

IAC-11.E1.2.10

SPACE-RELATED HANDS-ON EDUCATION IN NORWAY

Arne Hjalmar Hansen, NAROM - Norwegian Centre for Space-Related Education, Norway

IAC-11.E1.2.11

INTEGRATED, ONLINE SPACE STUDIES GRADUATE PROGRAM AT UNIVERSITY OF NORTH DAKOTA

Santhosh K. Seelan, Department of Space Studies, University of North Dakota, United States

IAC-11.E1.2.12

THE SOUTHERN HEMISPHERE SUMMER SPACE PROGRAM- A NEW SPACE EDUCATION PROGRAM BY THE INTERNATIONAL SPACE UNIVERSITY AND THE UNIVERSITY OF SOUTH AUSTRALIA BRINGING INNOVATIVE SPACE EDUCATION TO THE SOUTHERN HEMISPHERE

Scott Madry, United States

IAC-11.E1.2.13

A DISCUSSION OF SPACEFLIGHT-ASSOCIATED GRADUATE EDUCATION IN THE UNITED STATES (poster)

Sathya Silva, MIT, United States

IAC-11.E1.2.14

SPACE EDUCATION EXPERIENCE THROUGH STUDENT SATELLITE DEVELOPMENT (poster)

Jared Bottoms, University of Alberta, Canada

E1.3. Enabling The Future – Developing the Project Management and the Technical Space Workforce

October 5 2011, 15:00 — TS-13

Chair: *Edward J. Hoffman (National Aeronautics and Space Administration (NASA), United States); Maria Antonietta Perino (Thales Alenia Space Italia, Italy);*

Rapporteur: *Amalio Monzon (LEEM, Germany); Lewis L. Peach, Jr. (National Aeronautics and Space Administration (NASA), United States);*

IAC-11.E1.3.1

PROMOTING WORKFORCE EXCELLENCE THROUGH KNOWLEDGE SHARING AT NASA

Edward J. Hoffman, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.3.2

CAN WE FIND THE NEXT EINSTEIN IN AFRICA?

Carolina Ödman-Govender, AIMS - Next Einstein Initiative, South Africa

IAC-11.E1.3.3

DEVELOPING THE ESA WORKFORCE

Bettina Boehm, European Space Agency (ESA), France

IAC-11.E1.3.4

JAXA PROJECT MANAGEMENT TRAINING ACTIVITY

Toshihiko OIDA, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E1.3.5

UNDERSTANDING THE AEROSPACE WORKFORCE OF TOMORROW: DATA-DRIVEN INSIGHTS

Annalisa Weigel, Massachusetts Institute of Technology (MIT), United States

IAC-11.E1.3.6

YOUNG PROFESSIONALS NEEDS AND EXPECTATIONS FOR EDUCATION AND TECHNICAL WORKFORCE DEVELOPMENT

Amalio Monzon, LEEM, Germany

IAC-11.E1.3.7

"A PROCESS-ORIENTED APPROACH FOR GLOBAL KNOWLEDGE SHARING" A CASE STUDY FROM DLR - GERMAN AEROSPACE CENTER

Ruediger Süß, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.E1.3.8

ANALYSIS OF GLOBAL SPACE WORKFORCE AND EDUCATION

Mariel John, Space Foundation, United States

IAC-11.E1.3.9

DEVELOPING THE NEXT GENERATION OF SPACE TECHNICAL LEADERS

Debra Facktor Lepore, Stevens Institute of Technology, United States

IAC-11.E1.3.10

SEEDS – THE INTERNATIONAL MASTER PROGRAMME FOR PREPARING THE YOUNG SYSTEM ENGINEERS FOR EXPLORATION

Nicole Viola, Politecnico di Torino, Italy

IAC-11.E1.3.11

EXPERIENCE AND FUTURE PROSPECTS FOR INTERNATIONAL COOPERATION OF UNIVERSITIES WITH INDUSTRIAL ORGANIZATIONS AIMED TO AEROSPACE EDUCATION DEVELOPMENT UNDER TEMPUS EUROPEAN PROGRAM

A.V. Novikov, Yuzhnoye State Design Office, Ukraine

IAC-11.E1.3.12

INTEGRATION OF A NASA ESMD FACULTY FELLOWSHIP PROJECT WITHIN AN UNDERGRADUATE ENGINEERING CAPSTONE DESIGN CLASS

Christina Carmen, University of Alabama in Huntsville, United States

E1.4. Calling Planet Earth - Space Outreach To The General Public

October 4 2011, 15:00 — TS-13

Chair: *Olga Zhdanovich (, The Netherlands); Gulnara T. Omarova (Ministry of Transport and Communications, Kazakhstan);*

Rapporteur: *Carol Christian (STScI, United States);*

IAC-11.E1.4.1

KEYNOTE

Bill Nye, The Planetary Society, United States

IAC-11.E1.4.2

FIRST ORBIT: A GLOBAL VIDEO CELEBRATION OF YURI GAGARIN'S FLIGHT USING THE ISS

Chris Welch, International Space University (ISU), France

IAC-11.E1.4.3

USING SPACE SCIENCE AS THE DRIVER FOR SCIENCE ADVANCEMENT

Lee-Anne McKinnell, South African National Space Agency (SANSA), South Africa

IAC-11.E1.4.4

SPACE ECO-LITERACY FOR SSA - A CASE OF PEOPLE SCIENCE MOVEMENT IN INDIA

Jagannatha Venkataramaiah, Indian Space Research Organization (ISRO), India

IAC-11.E1.4.5

INTERNATIONAL LUNAR OBSERVATORY ASSOCIATION (ILOA), HAWAI`I, UPDATE OCTOBER 2011: ILO-X PRECURSOR, ILO-1 POLAR, AND ILO HUMAN SERVICE MISSIONS. STEVE DURST, JOSEPH SULLA, ET AL, ILOA / SPACE AGE PUBLISHING COMPANY, 65-1230 MAMALAHOA HIGHWAY

Steve Durst, International Lunar Observatory Association, United States

IAC-11.E1.4.6

OVERCOMING THE INTEGRATION OF BASIC NEEDS ISSUES IN SOUTHERN AFRICA AND DEVELOPING AWARENESS AND EDUCATION INITIATIVES TO EXCITE AND ENTHUSE THE PUBLIC, IN PARTICULAR THE YOUTH, TO EXPERIENCE AND UNDERSTAND SPACE IN A MEANINGFUL WAY.

Carla Sharpe, Foundation for Space Development South Africa, South Africa

IAC-11.E1.4.7

SOCIETAL EXPECTATIONS OF SPACE AND PUBLIC OPINION POLLING

G. Ryan Faith, Space Foundation, United States

IAC-11.E1.4.8

MYTHS AND LEGENDS OF SPACE OBJECTS AND EVENTS IN SOME NIGERIAN CULTURAL GROUPS

Lami Ali-Fadiora, African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria

IAC-11.E1.4.9

UNFORGETTABLE MEMORIES IN THE HUNGARIAN SPACE CAMP – LESSONS FROM 18 YEARS OF ORGANIZATION

Laszlo Bacsardi, Budapest University of Technology and Economics, Hungary

IAC-11.E1.4.10

YGNSS PROJECT: GNSS EDUCATION BY YOUTHS, FOR YOUTHS

Stephanie Wan, Space Generation Advisory Council (SGAC), United States

IAC-11.E1.4.11

EFFECTIVE SPACE OUTREACH CONTRIBUTES TO SUSTAINABLE SPACE DEVELOPMENT

Ayami Kojima, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E1.4.12

YURIGAGARIN50: A UK INITIATIVE TO CELEBRATE THE 50TH ANNIVERSARY OF THE FIRST HUMAN SPACE FLIGHT

Chris Welch, International Space University (ISU), France

IAC-11.E1.4.13

CONDENSING THE COSMOS FOR PUBLIC EDUCATION: SPACE IN 140 CHARACTERS OR LESS (poster)

Hannah Johnson, United States

IAC-11.E1.4.14

AGMUS CONTRIBUTIONS TO THE AEROSPACE INDUSTRY IN PUERTO RICO. (poster)

Hilda M. ColonPlumey, Ana G. Méndez University System, Puerto Rico

IAC-11.E1.4.15

OPPORTUNITIES AND THE PERCEPTION OF SPACE SCIENCES IN AFRICA. (poster)

ABUBAKAR BABAGANA, KANURI DEVELOPMENT ASSOCIATION, Nigeria

E1.5. New Worlds - Innovative Space Education and Outreach

October 6 2011, 15:00 — TS-13

Chair: *Jean-Daniel Dessimoz (Western Switzerland University of Applied Sciences (HESSO.HEIG-VD) and Swiss Association for Astronautics, Switzerland); Vera Mayorova (Bauman Moscow State Technical University, Russia);*

Rapporteur: *Mabel J. Matthews (National Aeronautics and Space Administration (NASA), United States);*

IAC-11.E1.5.1

KEYNOTE: CLOSE ENCOUNTERS WITH THE HUBBLE SPACE TELESCOPE

Claude Nicollier, EPFL, Switzerland

IAC-11.E1.5.2

ISSLIVE! - BRINGING THE INTERNATIONAL SPACE STATION TO EVERY GENERATION

Philip Harris, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States

IAC-11.E1.5.3

KIBO HI-VISION EARTHVIEW EDUCATIONAL SYSTEM DEVELOPMENT

Susumu Yoshitomi, Japan Space Forum, Japan

**IAC-11.E1.5.4**

THE ZERO ROBOTICS SPHERES CHALLENGE 2011

Sreeja Nag, Massachussetts Institute of Technology (MIT), United States

IAC-11.E1.5.5

LIVING ON MARS: EDUCATIONAL ACTIVITIES FOR AN INTERACTIVE MARTIAN SETTLEMENT ON EARTH

Melissa M. Battler, University of Western Ontario, Canada

IAC-11.E1.5.6

HUNTING FOR HABITABLE WORLDS: ENGAGING STUDENTS IN AN ADAPTIVE ONLINE SETTING

Lev Horodyskyj, Arizona State University, United States

IAC-11.E1.5.7

THE SIMONAUTS – A MARS BASE SIMULATION GAME FOR EDUCATION, OUTREACH AND ENTERTAINMENT

Katarina Eriksson, International Space University (ISU), France

IAC-11.E1.5.8

PLASTIC CUBESATS : AN INNOVATIVE AND LOW COST WAY TO PERFORM APPLIED SPACE RESEARCH AND HANDS-ON EDUCATION

Jacopo Piattoni, University of Bologna, Italy

IAC-11.E1.5.9

A NATIONAL PARTNERSHIP-BASED SUMMER LEARNING INITIATIVE TO ENGAGE UNDERREPRESENTED STUDENTS WITH SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Leland Melvin, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.5.10

NASA CASE STUDIES: REACHING OUT TO THE BROADER ACADEMIC COMMUNITY

Shanessa Jackson, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.5.11

DEVELOPMENT OF SPACE SCIENCE AND TECHNOLOGY - EDUCATION AND CAREERS FOR THE NEXT GENERATION.

Christine Hill, University of Stuttgart, Germany

IAC-11.E1.5.12

SUCCESSFULLY TARGETING A VARIETY OF POPULATIONS AND CULTURES IN MONTANA WITH SPACE EDUCATION AND OUTREACH

Kathryn Williamson, Montana Space Grant Consortium, United States

IAC-11.E1.5.13

PATHWAYS TO SPACE: A MISSION TO FOSTER THE NEXT GENERATION OF SCIENTISTS AND ENGINEERS

Kerrie Dougherty, Powerhouse Museum, Australia

IAC-11.E1.5.14

SCIFEST AFRICA AND THE FRENCH SPACE LABORATORY: 10 YEARS OF SPACE-RELATED OUTREACH IN SOUTH AFRICA

Christophe Scicluna, Planete Sciences, France

IAC-11.E1.5.15

THE WE WANT OUR FUTURE INITIATIVE, PROVIDING AN EDUCATIONAL ACTIVITY WHICH MERGES ARTWORK, CREATIVITY AND SPACE EXPLORATION (poster)

Matthew Cannella, University of Colorado, United States

IAC-11.E1.5.16

MAKING OUTREACH AND EDUCATION A MAJOR COMPONENT OF RESEARCH INSTITUTIONS: A CANADIAN UNIVERSITY PERSPECTIVE (poster)

Heather Henry, University of Western Ontario, Canada

IAC-11.E1.5.17

‘A JOURNEY THROUGH SPACE’ - TEACHING SPACE SCIENCE USING SPEECH AND DRAMA TECHNIQUES (poster)

Yohan Ferreira, Sri Lanka

IAC-11.E1.5.18

ASTRONOMY IMMERSION AND K-12 EDUCATION: A CRUCIAL LINK IN INSPIRING UNDERREPRESENTED STUDENTS TO EXCEL IN STEM EDUCATION THROUGH INNOVATIVE INSTRUCTION, STAKEHOLDER PARTNERSHIPS AND IMMERSIVE ASTRONOMY RESEARCH (poster)

Kareen Borders, University of Washington, United States

E1.6. Water From Space: Societal, Educational and Cultural Aspects

October 7 2011, 09:00 – TS-13

Chair: *Annick Bureau (Leonardo/Olats, France); Adrian Meyer (Space School Africa, South Africa); Chris Welch (International Space University (ISU), France);*

Rapporteur: *Bee Thakore (Space Generation Advisory Council (SGAC), United Kingdom);*

IAC-11.E1.6.1

ART EXPERIMENT BY THE WATER AND LIGHT ON THE ISS-JEM“KIBO”

Takuro Osaka, University of Tsukuba, Japan

IAC-11.E1.6.2

09: 21: 25 THE MAKING OF AN INSTALLATION ON SPACE TRAVEL

Jyoti Mistry, University of the Witwatersrand, South Africa

IAC-11.E1.6.3

ARTISTS AND SCIENTISTS: EXPERIMENTING TOGETHER - INSPIRING PRIMARY SCHOOL CHILDREN ABOUT SPACE AND SCIENCE USING ART AND PLAY

Jon Spooner, United Kingdom

IAC-11.E1.6.4

IMAGINARY FUTURES

Elinor Nina Czegledy, University of Toronto, Canada

IAC-11.E1.6.5

WATER MUSIC, FROM MARS

Samuel Pellman, United States

IAC-11.E1.6.6

THE INTERACTION BETWEEN (CHINESE) SPACE ACTIVITIES AND SOCIAL CULTURE

Qiang Feng, China Aerospace Science and Technology Corporation (CASC), China

IAC-11.E1.6.7

TEAM PROJECT FRESH WATER: AN INTERDISCIPLINARY ATTACK ON A GLOBAL PROBLEM

James Burke, The Planetary Society, United States

IAC-11.E1.6.8

LAUNCH: WATER. TREES IN THE DESERT... AND SPACE?

Beth Beck, National Aeronautics and Space Administration (NASA), United States

E1.7.-A1.8. Living In Space - Education and Outreach in Space Life Sciences and Infrastructure Development for Capacity Building

October 7 2011, 14:00 – TS-09

Chair: *Andrea Boese (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Marilyn Steinberg (Canadian Space Agency, Canada); Lyn Wigbels (American Astronautical Society (AAS), United States);*

Rapporteur: *Rachid Amekrane (Astrium GmbH, Germany);*

Marlene MacLeish (, United States);

IAC-11.E1.7.-A1.8.1

THE FRENCH SOUTH AFRICAN INSTITUTE OF TECHNOLOGY POSTGRADUATE PROGRAMME IN SATELLITE SYSTEMS ENGINEERING – SKILLS DEVELOPMENT FOR THE SOUTH AFRICAN SPACE INDUSTRY

Robert Van Zyl, Cape Peninsula University of Technology, South Africa

IAC-11.E1.7.-A1.8.2

THE COSPAR CAPACITY BUILDING INITIATIVE

Carlos Gabriel, European Space Agency (ESA), Spain

IAC-11.E1.7.-A1.8.3

THE UNITED NATION’S POSTGRADUATE DIPLOMA PROGRAMME IN SPACE SCIENCE AND TECHNOLOGY APPLICATIONS: THE NIGERIAN EXPERIENCE

Oladosu Olakunle, Obafemi Awolowo University, Nigeria

IAC-11.E1.7.-A1.8.4

SPACE: EDUCATION FOR EVERYBODY: EVERYWHERE

Antonio Eduardo Gutierrez Nava, Centre National d’Etudes Spatiales (CNES), France

IAC-11.E1.7.-A1.8.5

MISSION X: TRAIN LIKE AN ASTRONAUT PILOT STUDY

Charles Lloyd, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.7.-A1.8.6

THE EUROPEAN ALTERED GRAVITY STUDENT NETWORK

Tariq Al-Marahleh Montes, LEEM, Spain

IAC-11.E1.7.-A1.8.7

GLOBAL PARTNERSHIPS: EXPANDING THE FRONTIERS OF SPACE EXPLORATION EDUCATION

Marlene MacLeish, United States

IAC-11.E1.7.-A1.8.8

ISS EDUCATION PROGRAM “JAXA SEEDS IN SPACE I”

Tamotsu Nakano, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E1.7.-A1.8.9

COMMUNICATING SPACE LIFE SCIENCES - SOME GENERIC REFLECTIONS ABOUT PUBLIC RELATIONS AND MEDIA ACTIVITIES

Mathias Spude, Astrium GmbH, Germany

IAC-11.E1.7.-A1.8.9

FRAGILE OASIS: CONNECTING SPACE AND EARTH. LEARN. ACT. MAKE A DIFFERENCE.

Beth Beck, National Aeronautics and Space Administration (NASA), United States

IAC-11.E1.7.-A1.8.10

THE IMPORTANCE OF REACHING OUT TO SOCIETY: EDUCATION ENABLES US TO ENVISION AND PURSUE OUR DREAMS

Chiaki Mukai, Japan Aerospace Exploration Agency (JAXA), Japan

E1.8. Space Education and Outreach

October 6 2011, 10:00 – TS-01

Chair: *Shamim Hartevelt-Velani (European Space Agency (ESA), The Netherlands); Chris Welch (International Space University (ISU), France);*

IAC-11.E1.8.1

SP.ACE 2004-2011: CASE STUDY OF AN INCREMENTAL PROGRAMME OF CHALLENGING HANDS-ON SPACE EDUCATION AND OUTREACH OPPORTUNITIES IN HIGH-SCHOOL, STARTING FROM SCRATCH

Erik de Schrijver, Sint-Pieterscollege Jette (Brussels/Belgium), Belgium

IAC-11.E1.8.2

COLLABORATION BETWEEN ACADEMIA AND INDUSTRY TO PROMOTE STEM EDUCATION VIA THE DESIGN AND DEVELOPMENT OF LEARNING TOOLS

Brandon Setayesh, University of Alabama in Huntsville, United States

IAC-11.E1.8.3

KUSPACE: EMBEDDING SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS (STEM) AMBASSADOR ACTIVITIES IN THE UNDERGRADUATE ENGINEERING CURRICULUM

Chris Welch, International Space University (ISU), France

IAC-11.E1.8.4

SUPPORTING GERMAN REXUS STUDENT EXPERIMENTS TO NEW HEIGHTS ONBOARD SOUNDING ROCKETS

Mark Fittock, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.E1.8.5

INVESTIGATION AND MODELLING OF LARGE SCALE CRATERING EVENTS - LESSONS LEARNT FROM EXPERIMENTAL ANALYSIS

Alison Gibbings, University of Strathclyde, United Kingdom

IAC-11.E1.8.6

COMPASS, BUGS AND REDEMPTION: EDUCATIONAL EXPERIMENTS OF THE UNIVERSITY OF BOLOGNA ON SOUNDING ROCKETS AND STRATOSPHERIC BALLOONS

Stefania Toschi, University of Bologna, Italy

IAC-11.E1.8.7

SPACE AND SOCIETY IN AFRICA

Lumka Msibi, South Africa

IAC-11.E1.8.8

THE INNOVATION OF SPACE EDUCATION IN SHANGHAI EXPO

Wei Long, CASC, China

IAC-11.E1.8.10

UNIVERSE AWARENESS:AN EDUCATIONAL ASTRONOMY AND SPACE SCIENCES GLOBAL PROJECT

Pedro Russo, Universe Awareness, The Netherlands

IAC-11.E1.8.11

SPACE SCIENCE EDUCATION AND OUTREACH IN NEPAL

Sudeep Neupane, 1). Cosmology and astrophysics research Group 2). Nepal Astronomical Society (NASO), Nepal

E2. 41st STUDENT CONFERENCE

Coordinator: Marco Schmidt (University of Wuerzburg, Germany); Stephen Brock (American Institute of Aeronautics and Astronautics (AIAA), United States);

E2.1. Student Conference – Part 1

October 3 2011, 15:00 – TS-16

Chair: *Rachid Amekrane (Astrium GmbH, Germany); Benedicte Escudier (SUPAERO- Ecole Nationale Supérieure de l’Aéronautique et de l’Espace, France);*

Rapporteur: *Carsten Holze (machtwissen.de AG, Germany);*

IAC-11.E2.1.1

A HYBRID APPROACH TO RADIATION FAULT TOLERANCE IN SMALL SATELLITE APPLICATIONS

Nishchay Mhatre, University of Pune, India

IAC-11.E2.1.2

CONSTRUCTION OF A KNOWLEDGE WEB TO IMPROVE EXPERIMENTAL SOUNDING ROCKET DESIGN.

Roel Vandeberg, Delft University of Technology (TU Delft), The Netherlands

**IAC-11.E2.1.3**

NUMERICAL INVESTIGATION OF THE SHOCK-GENERATED RADIATIVE HEAT LOADS ON RE-ENTRY VEHICLES

Tim Horchler, Germany

IAC-11.E2.1.4

DEVELOPING THE CONTROL SYSTEM FOR A MULTI-PURPOSE, ROBOTIC, ASTRONOMICAL TELESCOPE

Pierre van Heerden, National Research Foundation (NRF), South Africa

IAC-11.E2.1.5

PATHS FOR PROGRESS: SPACE AND THE SOUTHERN HEMISPHERE

Crystal Forrester, International Space University (ISU), Australia

IAC-11.E2.1.6

PERTURBATION ANALYSIS AND DESIGN OF LONG-LIFETIME LOW LUNAR SATELLITE MISSION ORBITS

Feng Jinglang, China

IAC-11.E2.1.7

A SOLID STATE THRUSTER FOR ATTITUDE CONTROL OF PICOSATELLITES

Kyle Godin, University of Arkansas, United States

IAC-11.E2.1.8

THE ARCHITECT DEVELOPMENT OF THE FIRST STAGE'S LIGHT LAUNCH VEHICLE

Mykola Gryshyn, Dnipropetrovsk National University, Ukraine

IAC-11.E2.1.9

COMPARATIVE STUDY OF RIOMETER ABSORPTION AND GPS TEC DURING ADSORPTION EVENTS IN THE POLAR IONOSPHERE

Chris Watson, Canada

IAC-11.E2.1.10

THE IMPROVEMENT IN DOWNRANGE OF THE FLY-BACK BOOSTER BY RE-INGITION AFTER SEPARATION

Takaaki Isono, University of Tokyo, Japan

E2.2. Student Conference – Part 2

October 4 2011, 10:00 – TS-16

Chair: *Marco Schmidt (University of Wuerzburg, Germany); Thomas Snitch (Little Falls Associates, Inc., United States);*

Rapporteur: *Benedicte Escudier (SUPAERO- Ecole Nationale Supérieure de l'Aéronautique et de l'Espace, France);*

IAC-11.E2.2.1

PREDICTING THE SOLAR FLARE CHARACTERISTICS AND ITS IMPACT ON THE NEAR EARTH PHENOMENA USING RADIO OCCULTATION TECHNIQUE.

Gourav Mahapatra, Manipal Institute of Technology, India

IAC-11.E2.2.2

DESIGN OF A MARS ROVER MOBILITY SYSTEM

Jevegenjis Trunins,

IAC-11.E2.2.3

DESIGN OF AN AERODYNAMIC ATTITUDE CONTROL SYSTEM FOR A CUBESAT

Jacoba Aurret, Stellenbosch University, South Africa

IAC-11.E2.2.4

ASSESSING CROP WATER DEMANDS FROM SPACE: CLASSIFICATION OF IRRIGATION SYSTEMS IN ARID CENTRAL ASIA USING LATEST OPTICAL REMOTE SENSING SYSTEMS

Maren Rahmann, Germany

IAC-11.E2.2.5

EXAMINATION OF THE IMPORTANCE OF STUDENT SPACE PROGRAMS TO CAPACITY BUILDING IN SPACE RELATED FIELDS

Ashton Reimer, University of Saskatchewan, Canada

IAC-11.E2.2.6

FRACTAL PATTERNS IN FRACTIONATED SPACECRAFT

Giuliano Punzo, University of Strathclyde, United Kingdom

IAC-11.E2.2.7

SPACE ARCHITECTURE FOR SUSTAINABLE LIVING ON EARTH

Mahsa Taheran , Polytechnic University of Madrid, Iran

IAC-11.E2.2.8

GIMBALED PERMANENT MAGNET-BASED ATTITUDE CONTROL FOR PICO/NANO-SATELLITES

Rex A. Bair, University of Arkansas

IAC-11.E2.2.9

FLIGHT TRUST MODULATION USING HYBRID PROPULSION SYSTEM

François Laurendeau, Institut Supérieur de l'Aéronautique et de l'Espace, France

IAC-11.E2.2.10

PEEP HOLE: A CONSTELLATION OF SMALL EARTH OBSERVATION SATELLITES AIMING AT NEW APPLICATION AND CUSTOMERS

Noël Mombazet, Institut Supérieur de l'Aéronautique et de l'Espace, France

E2.3. Student Team Competition

October 4 2011, 15:00 – TS-16

Chair: *Stephen Brock (American Institute of Aeronautics and Astronautics (AIAA), United States); Naomi Mathers (Victorian Space Science Education Centre, Australia);*

Rapporteur: *Thomas Snitch (Little Falls Associates, Inc., United States);*

IAC-11.E2.3.1

MODERN SOFTWARE QUALITY CONTROL METHODS AND TOOLS APPLIED TO A UNIVERSITY SMALL SATELLITE ON-BOARD SOFTWARE PROJECT

Bastian Bätz, Institute of Space Systems, Universität Stuttgart, Germany

IAC-11.E2.3.2

EFFICIENT SPACE WEATHER PROFILING USING A MICROSATELLITE

Kanika Garg, Manipal Institute of Technology, India

IAC-11.E2.3.3

OBSERVING COLLISIONS OF SIMULATED ASTEROIDS IN MICROGRAVITY

Audrey GROCKOWIAK, Institut Néel, CNRS and Université Joseph Fourier and : CEA-Grenoble, Institut Nanosciences et Cryogénie, SPSMS-LATEQS, France

IAC-11.E2.3.4

TRANSMEMBRANE DRUG TRANSPORT IN MICROGRAVITY

Sergi Vaquer Araujo, Universitat Autònoma de Barcelona, Spain

IAC-11.E2.3.5

A MODULAR, GENERIC, LOW-COST ON-BOARD COMPUTER SYSTEM FOR NANO OR PICO SATELLITE APPLICATIONS

Nishchay Mhatre, University of Pune, India

IAC-11.E2.3.6

3STAR CUBESAT FOR THE GEOID MISSION

Federica Pellegrini, Politecnico di Torino, Italy

IAC-11.E2.3.7

EXPLORE: AN EXPERIMENT FOR ON-ORBIT REFUELING ON A SOUNDING ROCKET

Christine Hill, University of Stuttgart, Germany

IAC-11.E2.3.8

2-BLADES DEPLOYING BY CENTRIFUGAL FORCE SOLAR SAIL EXPERIMENT

Dmitry Rachkin, Bauman Moscow State Technical University, Russia

IAC-11.E2.3.9

CU3SAT: A CANADIAN STUDENT NANOSAT FOR SCIENTIFIC AND TECHNOLOGY DEMONSTRATION

Matthew Cross, Faculty of Engineering, Carleton University, Canada

E3. 24th SYMPOSIUM ON SPACE POLICY, REGULATIONS AND ECONOMICS

Coordinator: Sergio Camacho (CRECTEALC - Regional Centre for Space Science and Technology Education for Latin American and The Caribbean, Mexico); Max Grimard (EADS Astrium, France);

E3.1. National and International Space Policies and Programmes for African Development

October 3 2011, 15:00 – TS-07

Chair: *Max Grimard (EADS Astrium, France); Joseph O Akinyede (African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria);*

Rapporteur: *Christina Giannopapa (European Space Policy Institute (ESPI), Austria);*

IAC-11.E3.1.1

SPACE POLICY - WHAT IS IT AND WHY EMERGING SPACE STATES NEED IT?

Agnieszka Lukaszczyk, Secure World Foundation, Belgium

IAC-11.E3.1.2

ADVANCING KEY FOREIGN POLICY OBJECTIVES VIA SPACE: CASE STUDY FOR EUROPE

Jana Robinson, European Space Policy Institute (ESPI), Austria

IAC-11.E3.1.3

AN ASSESSMENT OF SPACE POLICIES AND PROGRAMS IN AFRICA

Olufunke Ero-Phillips, Switzerland

IAC-11.E3.1.4

HUMAN SPACEFLIGHT PROSPECTIVE IN AFRICA

Giuseppe Reibaldi, European Space Agency (ESA), The Netherlands

IAC-11.E3.1.5

FORMALISING SOUTH AFRICA'S NATIONAL SPACE PROGRAMME: THE DAWN OF A NEW SPACE ERA

Valanathan Munsami, Department of Science and Technology, South Africa

IAC-11.E3.1.6

SOUTH AFRICAN NATIONAL SPACE AGENCY (SANS) IN SUPPORT OF NATIONAL AND REGIONAL IMPERATIVES

Sandile Malinga, Republic of South Africa, South Africa

IAC-11.E3.1.7

CREATING SPACE ACTIVITIES TO ENHANCE MALI'S DEVELOPMENT

Fatoumata Kebe, Université de Paris VI, France

IAC-11.E3.1.8

POLICY RECOMMENDATIONS FOR A EUROPEAN-AFRICAN COOPERATION USING SPACE BASED APPLICATIONS

Christina Giannopapa, European Space Policy Institute (ESPI), Austria

IAC-11.E3.1.9

SPACE APPLICATIONS TO IMPROVE PUBLIC HEALTH: CANADIAN CONTRIBUTIONS TO THE UNITED NATIONS ACTION TEAM 6 ON IMPROVING PUBLIC HEALTH

Annie Martin, Ecole Polytechnique de Montreal, Canada

IAC-11.E3.1.10

TURKEY'S STRATEGIC ROLE IN SPACE: HIGHLIGHTS FROM NATIONAL SPACE RESEARCH PROGRAMME,(2005-2014, SCST11)

Tamer Özalp, Tübitak, The Scientific and Technological Research Council of Turkey, Turkey

IAC-11.E3.1.11

THE CREATION OF POLICY FOR LATIN AMERICA AREA, MYTH OR REALITY?

Camilo Guzman, UNIVERSIDAD SERGIO ARBOLEDA, Colombia

IAC-11.E3.1.12

POLISH NATIONAL ACTION PLAN FOR DEVELOPMENT OF SPACE TECHNOLOGIES & SATELLITE SYSTEMS USAGE IN THE EYES OF NON-GOVERMENTAL ORGANISATIONS

Hubert Bartkowiak, kosmonauta.net, Poland

IAC-11.E3.1.13

THE SINO-AFRICAN RELATIONSHIP: EVOLUTION AND POTENTIAL FOR AFRICAN DEVELOPMENT THROUGH SPACE ACTIVITIES (poster)

Aurélie Trur-Nicli, France

IAC-11.E3.1.14

ADVOCATING FOR A REGIONAL SPACE AGENCY AND POLICY UNDER THE AFRICAN BLUE SKIES (poster)

Angeline Asangire Oprong, University of Bremen, Germany

E3.2. International Space Exploration Policies and Programmes

October 4 2011, 15:00 – TS-07

Chair: *Nicolas Peter (European Space Agency (ESA), France); Pascale Ehrenfreund (Space Policy Institute, George Washington University, United States);*

Rapporteur: *Paul Guthrie (The Tauri Group, United States);*

IAC-11.E3.2.1

NASA'S HUMAN SPACE EXPLORATION PLANS AND ARCHITECTURE

John Olson, National Aeronautics and Space Administration (NASA), United States

IAC-11.E3.2.2

EVOLUTION OF SPACE EXPLORATION POLICY IN THE UNITED STATES

Mariel John, Space Foundation, United States

IAC-11.E3.2.3

TOWARDS THE DEVELOPMENTS ON A EUROPEAN STRATEGY ON SPACE EXPLORATION

Nicolas Peter, European Space Agency (ESA), France

IAC-11.E3.2.4

HUMAN SPACEFLIGHT AND EXPLORATION: AN EUROPEAN PROSPECTIVE AT THE TIME OF THE LISBON TREATY

Simonetta Di Pippo, European Space Agency (ESA), The Netherlands

IAC-11.E3.2.5

CHINA'S INCLUSION IN MULTINATIONAL SPACE EXPLORATION EFFORTS: HOW EVOLVING ATTITUDES TOWARD INTERNATIONAL COOPERATION IN CHINA'S SPACE POLICY COMMUNITY CHANGE THE PROSPECTS FOR CHINESE PARTICIPATION

Alanna Krolkowski, University of Toronto, United States

IAC-11.E3.2.6

GLOBAL SPACE EXPLORATION POLICIES AND PLANS: INSIGHTS FROM DEVELOPING ISECG ROADMAP

Junichiro Kawaguchi, Japan Aerospace Exploration Agency (JAXA), Japan





IAC-11.E3.2.7

WILL THE US REMAIN THE REAL LEADER OF HUMAN SPACE EXPLORATION ? A COMPARATIVE ASSESSMENT OF SPACE EXPLORATION POLICIES

Max Grimard, EADS Astrium, France

IAC-11.E3.2.8

SPACE EXPLORATION AS AN ELEMENT OF SPACE PROGRAMMES IN DEVELOPING NATIONS.

Peter Martinez, National Research Foundation (NRF), South Africa

IAC-11.E3.2.9

PLANETARY PROTECTION AND COMMERCIAL ACTIVITIES IN SPACE

Catharine Conley, National Aeronautics and Space Administration (NASA), United States

IAC-11.E3.2.10

INTERNATIONAL EARTH-BASED RESEARCH AND TECHNOLOGY PROGRAM AS STEPPING STONE FOR GLOBAL SPACE EXPLORATION

T. Smith, Space Policy Institute, George Washington University, United States

IAC-11.E3.2.11

POLICIES RELATED TO AN INTERNATIONAL LUNAR RESEARCH PARK

Gregor Hanuschak, National Aeronautics and Space Administration (NASA), United States

IAC-11.E3.2.12

THE PLANETARY SCIENCE DECADEAL SURVEY: ORIGIN, ORGANIZATION AND OUTCOME

David H. Smith, National Research Council, United States

IAC-11.E3.2.13

LEGAL ASPECTS OF SPACE TOURISM (poster)

Huang Weifen, China Astronaut Research and Training Center, China

IAC-11.E3.2.14

INNOVATIVE PROJECTS OF UKRAINE'S SPACE INDUSTRY (poster)

Yevgeniy Zakharchuk, Western Scientific Center of National Academy of Sciences of Ukraine, Ukraine

E3.3. The Space Economy in Emerging Space Countries

October 5 2011, 10:00 — TS-07

Chair: Claire Jolly (Organisation for Economic Co-operation and Development (OECD), France); Lulekwa Makapela (, South Africa);

Rapporteur: Marc Haese (European Space Agency (ESA), The Netherlands);

IAC-11.E3.3.1

NEW ACTORS IN THE SPACE ECONOMY

Claire Jolly, Organisation for Economic Co-operation and Development (OECD), France

IAC-11.E3.3.2

SOUTH AFRICA'S INITIATIVES TO ENHANCE GROWTH OF THE SPACE INDUSTRY FOR SOCIO ECONOMIC DEVELOPMENT

Lulekwa Makapela, South Africa

IAC-11.E3.3.3

THE IMPACT OF CHINESE AEROSPACE PROGRAM INVESTMENT ON CHINA NATIONAL ECONOMY AND OTHER INDUSTRIES: A CGE BASED ANALYSIS

DONG Wan-hao, Shanghai University of Finance and Economics, China

IAC-11.E3.3.4

THE NIGERIAN SPACE PROGRAMME AND ITS ECONOMIC DEVELOPMENT MODEL

Godstime James, National Space Research and Development Agency, Abuja, Nigeria, Nigeria

IAC-11.E3.3.5

SOUTH AFRICA SPACE INDUSTRY INDICATORS AND ANALYSIS

Paul Guthrie, The Tauri Group, United States

IAC-11.E3.3.6

AN ASSESSMENT OF THE POTENTIAL IMPACT OF ACTIVATING AN ENABLER INFRASTRUCTURE FOR SATELLITE BASED SERVICES IN SOUTH AFRICA.

Matthew Cruickshank, South Africa

IAC-11.E3.3.7

SURVEYING EXISTING SPACE TECHNOLOGIES AND CREATING A JOINT TECHNOLOGY PROGRAMME FOR ESTONIA, LATVIA, LITHUANIA AND POLAND IN THE FRAMEWORK OF THE EC FP7 PROJECT, NORDIC BALTSAT.

Emil Vinterhav, Swedish Space Corporation, Sweden

IAC-11.E3.3.8

THE ECONOMIC IMPORTANCE OF SPACE APPLICATIONS

Henry Hertzfeld, Space Policy Institute, George Washington University, United States

IAC-11.E3.3.9

DEVELOPING AN ECONOMIC MODEL TO ASSESS AND PROVIDE COMPARATIVE TOOLS FOR THE ECONOMIC READINESS OF A DEVELOPING NATION TO ADOPT OR EXPAND A SUSTAINABLE SPACE PROGRAM AND TO WHAT EXTENT IS VIABLE

Carla Sharpe, Foundation for Space Development South Africa, South Africa

IAC-11.E3.3.10

ENHANCING SPACE COMPETITIVENESS: MEASURING PERFORMANCE, MAPPING HUMAN CAPITAL, AND ALIGNING SPACE POLICY WITH ECONOMIC OUTCOMES

David Vaccaro, Futron Corporation, United States

IAC-11.E3.3.11

POSITIONING SMALL SATELLITE MANUFACTURERS FROM THE DEVELOPING WORLD FOR GROWTH.

Ron Olivier, Sun Space and Information Systems, South Africa

IAC-11.E3.3.12

GROWTH IN THE GLOBAL SPACE ECONOMY AND ITS IMPACT ON EMERGING SPACE COUNTRIES

Micah Walter-Range, Space Foundation, United States

E3.4. Assuring the Long-Term Sustainability of Outer Space Activities

October 5 2011, 15:00 — TS-07

Chair: Peter Martinez (National Research Foundation (NRF), South Africa); Agnieszka Lukaszczyk (Secure World Foundation, Belgium);

Rapporteur: Richard Crowther (UK Space Agency, United Kingdom);

IAC-11.E3.4.1

ASSURING THE SUSTAINABILITY OF SPACE ACTIVITIES

Ray A. Williamson, Secure World Foundation, United States

IAC-11.E3.4.2

THE COPUOS WORKING GROUP ON LONG TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES

Peter Martinez, National Research Foundation (NRF), South Africa

IAC-11.E3.4.3

DEVELOPING A POTENTIAL STRATEGY AND POLICIES FOR SPACE SUSTAINABILITY BASED ON SUSTAINABLE MANAGEMENT OF COMMON-POOL RESOURCES

Brian Weeden, Secure World Foundation, United States

IAC-11.E3.4.4

LONG TERM SUSTAINABILITY OF OUTER SPACE ACTIVITIES - LEGAL PERSPECTIVES

V. Gopala Krishnan, Indian Space Research Organization (ISRO), India

IAC-11.E3.4.5

GLOBAL SOCIO-ECONOMIC RISKS, IMPACTS, AND RECOMMENDATIONS FOR SPACE WEATHER POLICIES AND INITIATES

Emma Fry, University of Alabama in Huntsville, United States

IAC-11.E3.4.6

ENABLING COMPLEMENTARY COMMERCIAL AND GOVERNMENT ENTERPRISES IN SPACE

Michael Griffin, University of Alabama in Huntsville, United States

IAC-11.E3.4.7

ANALYSIS OF RECENT SATELLITE LAUNCH NUMBERS AND THEIR FUTURE MARKET EXTRAPOLATION

Volker Maiwald, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.E3.4.8

SPACE SAFETY AND SUSTAINABILITY – THE YOUTH DEBATE

Chijioke Cj Nwosa, National Research Foundation (NRF), South Africa

E3.5. - E7.6. 26th IAA/IISL Scientific-Legal Roundtable: Towards Space Debris Remediation (Invited Papers only)

October 6 2011, 10:00 — TS-07

Chair: Kai-Uwe Schrogl (European Space Policy Institute (ESPI), Austria); Wendell Mendell (National Aeronautics and Space Administration (NASA), United States);

Rapporteur: Nicola Rohner-Willsch (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);

IAC-11.E7.6.-E3.5.1

NOT AVAILABLE

Heiner Klinkrad, European Space Agency (ESA), Germany

IAC-11.E7.6.-E3.5.2

SPACE DEBRIS MITIGATION MEASURES AND COST ISSUES

Carsten Wiedemann, Technical University of Braunschweig, Germany

IAC-11.E7.6.-E3.5.3

NOT AVAILABLE

Joanne Wheeler, Milbank, United Kingdom

IAC-11.E7.6.-E3.5.4

NOT AVAILABLE

Catherine Doldirina, McGill University, Canada

IAC-11.E7.6.-E3.5.5

NOT AVAILABLE

Jana Robinson, European Space Policy Institute (ESPI), Austria

E3.6. IAA 2010 Space Summit Reporting and Way Forward

October 7 2011, 09:00 — TS-08

Chair: Max Grimard (EADS Astrium, France); Sergio Camacho (CRECTEALC - Regional Centre for Space Science and Technology Education for Latin American and The Caribbean, Mexico);

Rapporteur: Corinne M. Jorgenson (Advancing Space, United States);

IAC-11.E3.6.1

INTERNATIONAL COOPERATION FOR HUMAN SPACEFLIGHT

Scott Pace, Space Policy Institute, George Washington University, United States

IAC-11.E3.6.2

FUTURE PLANETARY ROBOTIC EXPLORATION AND THE NEED FOR INTERNATIONAL COOPERATION: THE IAA HEADS OF AGENCIES STUDY REPORT

Gregg Vane, United States

IAC-11.E3.6.3

CLIMATE CHANGE AND GREEN SYSTEMS: A REPORT FROM THE IAA 50TH ANNIVERSARY STUDY GROUP

John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States

IAC-11.E3.6.4

SPACE-BASED DISASTER MANAGEMENT: THE NEED FOR INTERNATIONAL COOPERATION

Ranganath Navalgund, Space Applications Centre (ISRO), India

E4. 45th IAA HISTORY OF ASTRONAUTICS SYMPOSIUM

Coordinator: Christophe Rothmund (Sneema, France); Ake Ingemar Skoog (, Germany); Philippe Jung (AAAF, France); Philippe Cosyn (, Belgium);

E4.1. 50th Anniversary of Manned Space Flight

October 4 2011, 15:00 — TS-15

Chair: Yasunori Matogawa (Japan Aerospace Exploration Agency (JAXA), Japan); Kerrie Dougherty (Powerhouse Museum, Australia);

Rapporteur: Otfrid G. Liepack (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States); Philippe Cosyn (, Belgium);

IAC-11.E4.1.1

50TH ANNIVERSARY OF THE YURI GAGARIN FLIGHT

Olga Zhdanovich, The Netherlands

IAC-11.E4.1.2

THE STRANGE CAREER OF THE SPACEPLANE: NASA AND THE QUEST FOR ROUTINE HUMAN SPACE OPERATIONS

Roger D. Launius, Smithsonian Institution, United States

IAC-11.E4.1.3

THE 'SPIRAL' PROJECT (1965-1978) – THE FIRST ATTEMPT TO REALIZE A 'REAL' MANNED SPACEPLANE

Oleg A. Sokolov, Commercial Space Technologies Ltd., Russia

IAC-11.E4.1.4

GAGARINE, A SPECIAL RELATIONSHIP WITH FRANCE

Philippe Jung, AAAF, France

**IAC-11.E4.1.5**

OPPOSING APOLLO: PUBLIC RESISTANCE TO THE MOON LANDINGS

Roger D. Launius, Smithsonian Institution, United States

E4.2. Memoirs and Organisational Histories

October 6 2011, 10:00 — TS-12

Chair: *Marsha Freeman (21st Century Science & Technology, United States); Hervé Moulin (Institut Français d'Histoire de l'Espace, France);*

Rapporteur: *Theo Pirard (Space Information Center, Belgium); Otfrid G. Liepack (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States);*

IAC-11.E4.2.1

THE ROLE OF MIKHAIL YANGEL IN SAFEGUARDING OF PEACE ON OUR PLANET STANISLAV KONYUKHOV

Stanislav Konyukhov, Yuzhnoye State Design Office, Ukraine

IAC-11.E4.2.2

THE CONTRIBUTIONS OF WALTER HÄUSSERMANN TO ROCKET DEVELOPMENT

John Alcorn, University of Alabama in Huntsville, United States

IAC-11.E4.2.3

1961, THE CNES' CREATION AND THE BIRTH OF THE FRENCH SPACE POLICY

Herve Moulin, Institut Français d'Histoire de l'Espace, France

IAC-11.E4.2.4

NAMING HISTORY OF JAPAN'S SCIENTIFIC SPACECRAFT

Yasunori Matogawa, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E4.2.5

YEARS OF TRANSITION FOR SPACE TECHNOLOGY AT NASA 1986-1993: THE END OF OART

John C. Mankins, ARTEMIS Innovation Management Solutions, LLC, United States

IAC-11.E4.2.6

NASA - W. EUROPEAN COLLABORATION IN THE POST-APOLLO PROGRAM: WHY IT CAME DOWN TO SPACELAB

John Krige, Georgia Institute of Technology, United States

IAC-11.E4.2.7

JAPANESE SPACE POLICY DURING THE 1970S: A ROAD TO AUTONOMY BY MODIFYING THE JAPAN-U.S. SPACE COOPERATION AGREEMENTS

Hirotaaka Watanabe, Osaka University, Japan

E4.3. Scientific & Technical History

October 6 2011, 15:00 — TS-12

Chair: *Philippe Jung (AAAF, France); Susan McKenna-Lawlor (Space Technology (Ireland) Ltd., Ireland);*

Rapporteur: *Christophe Rothmund (Snecma, France); William Cuthbert Jones (Executive Intelligence Review News Service, United States);*

IAC-11.E4.3.1

THE THREE HEROES OF SPACEFLIGHT: THE RISE OF THE TSIOLKOVSKY-GODDARD-OBERTH INTERPRETATION AND ITS CURRENT VALIDITY

Michael Neufeld, Smithsonian Institution, United States

IAC-11.E4.3.2

WAS THE ROCKET "INVENTED" OR "DISCOVERED"? SOME NEW OBSERVATIONS ON ITS ORIGINS

Kerrie Dougherty, Powerhouse Museum, Australia

IAC-11.E4.3.3

THE VALOIS ENGINE AND THE DIAMANT-B LAUNCH VEHICLE FIRST STAGE PROPULSION SYSTEM

Christophe Rothmund, Snecma, France

IAC-11.E4.3.4

HISTORY AND GROWTH OF AEROSPACE

Mayur Misra, SRM University Chennai, India

IAC-11.E4.3.5

REACHING FOR THE STARS? 50TH ANNIVERSARY OF ISRAEL'S SHAVIT 2 ROCKET

Tal Inbar, Fisher Institute for Air and Space Strategic Studies, Israel

IAC-11.E4.3.6

MATRA R422 & SURFACE-TO-AIR MISSILES OF THE FIFTIES

Philippe Jung, AAAF, France

IAC-11.E4.3.7

THE DEVELOPMENT OF SPACE TECHNOLOGY IN CHINA: A UNIQUE WAY

Leilei Zhang, China Aerospace Science and Technology Corporation (CASC), China

IAC-11.E4.3.8

SPACEPORT AUSTRALIA: EARLY PROPOSALS FOR EQUATORIAL LAUNCH FACILITIES IN AUSTRALIA

Kerrie Dougherty, Powerhouse Museum, Australia

IAC-11.E4.3.9

THE PHILOSOPHY, PRINCIPLES, AND PRACTICE OF KALMAN FILTER SINCE ANCIENT TIMES TO THE PRESENT IN ASTRONAUTICS

Mudambi Ananthasayanam, Indian Institute of Science, India

E4.4. History of South African Contribution to Astronautics

October 4 2011, 15:00 — TS-15

Chair: *Otfrid G. Liepack (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States); TBD (,);*

Rapporteur: *Christophe Rothmund (Snecma, France); TBD (,);*

IAC-11.E4.4.1

SOUTH AFRICA'S SPACE HERITAGE: THE HIDDEN DECADE OF THE 1980S

Keith Gottschalk, University of the Western Cape, South Africa

IAC-11.E4.4.2

SOUTH AFRICA'S SPACE JOURNEY: STORIES FROM YESTERDAY AND DECISIONS FOR TOMORROW

Danielle Wood, Massachusetts Institute of Technology (MIT), United States

IAC-11.E4.4.3

SPACE OPERATIONS IN SOUTH AFRICA THE FIRST 50 YEARS AND A VIEW TO THE FUTURE

Eugene Avenant, CSIR, South Africa

IAC-11.E4.4.4

AFRICA'S SPACE HERITAGE: INVENTORY, ANALYSIS, FUTURE POSSIBILITIES

Keith Gottschalk, University of the Western Cape, South Africa

IAC-11.E4.4.5

SA AMSAT - A 30 HISTORY OF SPACE ACTIVITY IN SOUTH AFRICA

Hans van de Groenendaal, AMSAT UK, South Africa

IAC-11.E4.4.6

SPACE APPLICATIONS IN SUB SAHARA AFRICA: AN OVERVIEW OF PROJECT SUCCESSES AND LESSONS LEARNED.

Renier Balt, South Africa

E5. 22nd SYMPOSIUM ON SPACE ACTIVITY AND SOCIETY

Coordinator: Geoffrey Langedoc (Canadian Aeronautics & Space Institute (CASI), Canada); Olga Bannova (University of Houston, United States);

E5.1. Habitation Throughout the Solar System

October 5 2011, 10:00 — TS-13

Chair: *Brent Sherwood (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States); Olga Bannova (University of Houston, United States);*

Rapporteur: *Anna Barbara Imhof (Liquifer Systems Group (LSG), Austria); A. Scott Howe (National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States);*

IAC-11.E5.1.1

EXPANDING A CONFINED SPACE: THE INTERIOR ARCHITECTURE OF THE GALACTIC SUITE FREE FLYER MODULE

Marc Zaballa Camprubi, Galactic Suite SL, Spain

IAC-11.E5.1.2

THE HUMAN SENSES IN LUNAR HABITAT ARCHITECTURE

James Burke, The Planetary Society, United States

IAC-11.E5.1.3

AN AUTOMATED FOOD SUPPLY SYSTEM WITHIN PLANETARY HABITATS FOR LONG-DURATION HUMAN MISSIONS

Daniel Schubert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.E5.1.4

COMMAND AND CONTROL CONCEPTS FOR LONG DURATION HUMAN SPACEFLIGHT

Kristine Ferrone, University of Houston, United States

IAC-11.E5.1.5

DESIGN AGAINST BOREDOM – ONBOARD COUNTERMEASURES TO MONOTONY & ISOLATION DURING TRANSFER STAGES OF EXTENDED EXPLORATION MISSIONS

Regina Peldszus, Kingston University, United Kingdom

IAC-11.E5.1.6

SOCIAL TOPOLOGIES AND THE CHALLENGE OF FLOURISHING IN SPACE

Torben Berns, McGill University, Canada

IAC-11.E5.1.7

A REALISTIC VISION OF THE MARS EXPEDITION: HOW MANY PEOPLE MUST GO?

Lynn Baroff, NASA Ames Research Center, United States

IAC-11.E5.1.8

SPACE COLONIZATION, A STUDY OF SUPPLY AND DEMAND

Dana Andrews, Andrews Space, United States

IAC-11.E5.1.9

TERRAFORMING, A REALITY OR SCIENCE FICTION ?

Remi Kahwaji, McGill University, Canada

IAC-11.E5.1.10

DECADAL OPPORTUNITIES FOR SPACE ARCHITECTS

Brent Sherwood, National Aeronautics and Space Administration (NASA)/Jet Propulsion Laboratory, United States

IAC-11.E5.1.11

A HOUSE ON THE MOON - A LUNAR LANDING PUBLIC PRIVATE PARTNERSHIP

Emil Vinterhav, Swedish Space Corporation, Sweden

E5.2. Verifying and Validating the Impact of Technology Transferred from Space

October 6 2011, 10:00 — TS-13

Chair: *Nona Minnifield Cheeks (National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States); Kevin Cook (Space Foundation, United States);*

Rapporteur: *Peter A. Swan (Teaching Science and Technology, Inc., United States);*

IAC-11.E5.2.1

IMPROVED PUBLIC AWARENESS - SCHOLARLY AND COMMERCIAL RECOGNITION OF SPACE PRODUCTS AND SERVICES

Kevin Cook, Space Foundation, United States

IAC-11.E5.2.2

A STRUCTURE FOR CAPTURING QUANTITATIVE BENEFITS FROM THE TRANSFER OF SPACE AND AERONAUTICS TECHNOLOGY

Douglas Comstock, National Aeronautics and Space Administration (NASA), United States

IAC-11.E5.2.3

THE CHALLENGES, OPPORTUNITIES AND VALUE OF COMMERCIALIZING SPACE TECHNOLOGIES

Lloyd Starks, CHEMCO Technologies, Inc.,, United States

IAC-11.E5.2.4

SPACE TECHNOLOGY COMMERCIALIZATION – BASIC CONSIDERATIONS, EXAMPLES AND INSTRUMENTS ENABLING TERRESTRIAL ECONOMIC BREAKTHROUGHS

Joerg Kreisel, JOERG KREISEL International Consultant (JKIC), Germany

IAC-11.E5.2.5

TRANSFER OF SPACE TECHNOLOGY FOR SPIN-OFF APPLICATION IN DEVELOPING COUNTRIES: PAST EXAMPLES AND FUTURE POTENTIAL

Danielle Wood, Massachusetts Institute of Technology (MIT), United States

IAC-11.E5.2.6

DEVELOPING A LAND INFORMATION SYSTEM FOR POVERTY ALLEVIATION THROUGH GEOGRAPHICAL INFORMATION SYSTEM AND COMMUNITY REMOTE SENSING

Taslim Alade, National Space Research and Development Agency, Abuja, Nigeria, Nigeria

IAC-11.E5.2.7

WHY TRACEABILITY OF SPACE TECHNOLOGY MATTERS

Nona Minnifield Cheeks, National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States

E5.3. The Effect of Space Visualization Tools in Commercial Markets

October 7 2011, 14:00 — TS-13

Chair: *Nona Minnifield Cheeks (National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States); Kevin Cook (Space Foundation, United States);*

Rapporteur: *Peter A. Swan (Teaching Science and Technology, Inc., United States);*

IAC-11.E5.3.1

IDENTIFICATION OF NASA IMAGING SOFTWARE FOR MEDICAL IMAGING APPLICATIONS

Nona Minnifield Cheeks, National Aeronautics and Space Administration (NASA)/Goddard Space Flight Center, United States

IAC-11.E5.3.2

THE MANY APPLICATIONS OF AUGMENTED REALITY IN SPACE PROGRAMS

Ana L. C. Prestes, University of Houston, United States

**IAC-11.E5.3.3**

THE EFFECT OF VISUALIZATION TOOLS IN COMMERCIAL MARKETS BY FITZ G. WALKER AND GRACE M. SCHAEFER, RN
Fitz Walker, United States Space Foundation, United States

IAC-11.E5.3.4

THE EFFECT OF SPACE VISUALIZATION TOOLS IN EMERGING MARKETS

Byron A. Okubasu Anangwe,

IAC-11.E5.3.5

THE GEOGRAPHIC INFORMATION SYSTEM AS A DECISION MAKING TOOL IN ORDER TO SUPPORT THE PLANNING AND DEVELOPMENT FOR LOCAL DISASTER PREVENTION
Javier Alfredo Valdiviezo Ortiz, Universidad del Pacifico, Ecuador

IAC-11.E5.3.6

FIREWATCH - SPACE VISUALIZATION TOOL FOR EARLY SMOKE DETECTION
Friederike Kuerzel, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), United States

IAC-11.E5.3.7

SPACE TOURISM AS A CATALYST TO BENEFIT MANKIND IN THE SPACE DEVELOPMENT PHASE
Declan O'Donnell, United Societies in Space, Inc., United States

E6. BUSINESS INNOVATION SYMPOSIUM

Coordinator: Ken Davidian (Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States);

E6.1. The General Role of Government in Encouraging Space Industry Applications October 4 2011, 10:00 — TS-09

Chair: Douglas Comstock (National Aeronautics and Space Administration (NASA), United States); Aude de Clercq (European Space Agency (ESA), The Netherlands);

Rapporteur: Ken Davidian (Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States);

IAC-11.E6.1.1

NEREUS: THE NETWORK OF EUROPEAN REGIONS USING SPACE TECHNOLOGIES
Franck Durand-Carrier, Centre National d'Etudes Spatiales (CNES), France

IAC-11.E6.1.2

ADVANCING INNOVATION THROUGH COLLABORATION: IMPLEMENTATION OF THE NASA SPACE LIFE SCIENCES STRATEGY
Jeffrey R. Davis, National Aeronautics and Space Administration (NASA)/Johnson Space Center, United States

IAC-11.E6.1.3

SPACE POLICIES TOWARDS SMES IMPLEMENTED BY THE ITALIAN SPACE AGENCY (ASI)-INDUSTRIAL ASSOCIATIONS COOPERATION INITIATIVE TO ENCOURAGE INNOVATIVE SPACE APPLICATIONS AND SERVICES IN ITALY
Osvaldo Piperno, Italian Space Agency (ASI), Italy

IAC-11.E6.1.4

INTRODUCTION TO THE FEDERAL AVIATION ADMINISTRATION CENTER OF EXCELLENCE FOR COMMERCIAL SPACE TRANSPORTATION
Ken Davidian, Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States

IAC-11.E6.1.5

DEVELOPMENT OF COMMERCIAL SPACE IN CHINA: FROM AN INDUSTRY PERSPECTIVE
Dong Zeng, China Academy of Launch Vehicle Technology, China

IAC-11.E6.1.6

NON-TRADITIONAL SPACE DEVELOPMENT: THE ISLE OF MAN AS A LEADING NON-TRADITIONAL SPACE COMPETITOR
Ian Christensen, Futron Corporation, United States

IAC-11.E6.1.7

CHALLENGES OF REMOTE-SENSING POLICIES AND CODIFICATION IN IRAN
Hadi Mahmoudi, Iran

IAC-11.E6.1.8

PROUDLY FOUND ELSEWHERE: NEW METHODS OF INNOVATION AND RESULTS AT NASA
Douglas Comstock, National Aeronautics and Space Administration (NASA), United States

IAC-11.E6.1.9

STIMULATING INTEGRATION OF EMERGING SPACE COUNTRIES - BALTIC STATES AND POLAND INTO EUROPEAN SPACE COMMUNITY
Madis Võõras, Enterprise Estonia, Estonia

IAC-11.E6.1.10

BENCHMARKING AUSTRALIA AS A USER OF SPACE PRODUCTS AND SERVICES
David Vaccaro, Futron Corporation, United States

E6.2. New Business Models in Traditional Space Industry Applications October 4 2011, 15:00 — TS-09

Chair: Max Grimard (EADS Astrium, France); Richard Brook (Surrey Satellite Technology Ltd, United Kingdom);

Rapporteur: Aude de Clercq (European Space Agency (ESA), The Netherlands);

IAC-11.E6.2.1

COMMERCIALISATION OF SPACE TRANSPORTATION AND ITS CONSEQUENCES
Emmanuelle DAVID, European Space Agency (ESA), United States

IAC-11.E6.2.2

CHINA-OECD INDUSTRY INTEGRATION IN CIVIL-COMMERCIAL AIR AND SPACE
Alanna Krolkowski, University of Toronto, United States

IAC-11.E6.2.3

THE INTERNATIONAL SPACE INNOVATION CENTRE: A NEW MODEL FOR INNOVATION
Peter M. Allan, Rutherford Appleton Laboratory, United Kingdom

IAC-11.E6.2.4

DAVID AND GOLIATH: THE RISE OF SMALL COMPANIES IN THE SPACE INDUSTRY
Devin Boyer, University of Alabama in Huntsville, United States

IAC-11.E6.2.5

ANALYZING THE PAST, PRESENT & FUTURE DEVELOPMENT OF THE MODERN SPACE AGE THROUGH THE DIFFUSION OF INNOVATIONS MODEL
Ariane Cornell, Space Generation Advisory Council (SGAC), Austria

IAC-11.E6.2.6

SPACE PROCUREMENT: IS THE COTS PROGRAM MODEL FAVOURABLE FOR EMERGING SPACE-FARING COUNTRIES?
Edwin Tachlian, UNIVERSIDAD SERGIO ARBOLEDA, Colombia

IAC-11.E6.2.7

ARE COMMERCIAL CARGO AND CREW SPACE TRANSPORTATION MARKETS EMERGING?
Ken Davidian, Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States

IAC-11.E6.2.8

ORBITAL SYNERGIES - MULTI PARTNER PROJECTS FOR INDUSTRIAL UTILISATION OF THE INTERNATIONAL SPACE STATION
Peter Bütfering, European Space Innovation AG, Germany

IAC-11.E6.2.9

OPEN COLLABORATION: A PROBLEM SOLVING STRATEGY THAT IS REDEFINING NASA'S INNOVATIVE SPIRIT
Cynthia Rando, Wyle Integrated Science and Engineering, United States

IAC-11.E6.2.10

PARADIGM SHIFT IN SPACE: FROM STRATEGIC SPACE TO ESSENTIAL SPACE
Meidad Pariente, SPACECIALIST, Israel

E6.3. New Space Industry Applications October 7 2011, 09:00 — TS-05

Chair: Ken Davidian (Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States); Kevin Stube (The Planetary Society, United States);

IAC-11.E6.3.1

NEEDS OF THE PRIVATE INDUSTRY TO PURSUE MINING OF THE MOON
Christopher Pelz, Canada

IAC-11.E6.3.2

COLLABORATIVE INTERNATIONAL SPACEPORT DEVELOPMENTS
Charles Lauer, Rocketplane Global, Inc., United States

IAC-11.E6.3.3

THE BUSINESS CASE FOR DELIVERING BROADBAND TO ANTARCTICA USING MICRO-SATELLITES
Daniel Faber, Heliocentric, Australia

IAC-11.E6.3.4

DISRUPTION THEORY APPLICATION TO COMMERCIAL CARGO AND CREW SPACE TRANSPORTATION MARKETS
Ken Davidian, Federal Aviation Administration Office of Commercial Space Transportation (FAA/AST), United States

IAC-11.E6.3.5

NEXT GENERATION CONSIDERATIONS FOR THE COMMERCIAL SPACE MARKET
Farnaz Ghadaki, Canadian Space Commerce Association, Canada

IAC-11.E6.3.6

BENEFITS BROUGHT BY ESA SPACE SPIN-OFFS
Bianca Szalai, International Space University (ISU), France

IAC-11.E6.3.7

SUBORBITAL SPACEFLIGHT MARKET IDENTIFICATION AND CLASSIFICATION
Paul Guthrie, The Tauri Group, United States

IAC-11.E6.3.8

THE SPACE E-COMMERCE REVOLUTION
Craig Clark, Clyde Space Ltd., United Kingdom

IAC-11.E6.3.9

THE SEED FUND INCUBATOR AND THE ANGEL, A NEW DISRUPTIVE MODEL FOR FOSTERING INNOVATION IN THE COMMERCIAL SPACE SECTOR
Marc Boucher, SpaceRef, Canada

IAC-11.E6.3.10

INSIGHT INTO SPACE COMMERCIALISATION
Pallav Kumar Singh, SRM University, India

E7. 54TH IISL COLLOQUIUM ON THE LAW OF OUTER SPACE

Coordinator: Corinne M. Jorgenson (Advancing Space, United States); Mark Sundahl (Cleveland State University, United States);

E7.1. Nandasiri Jasentuliyana Keynote Lecture on Space Law & 3rd Young Scholars Session October 4 2011, 10:00 — TS-12

Chair: Maurice N. Andem (, Finland); Tanja Masson-Zwaan (International Institute of Air and Space Law, Leiden University, The Netherlands);
Rapporteur: Diane Howard (McGill University, United States);

IAC-11.E7.1.1

THIRD NANDASIRI JASENTULIYANA LECTURE ON SPACE LAW
Abdul Koroma, International Court of Justice, The Netherlands

IAC-11.E7.1.2

THE PROTECTION OF THE EARTH NATURAL ENVIRONMENT THROUGH SPACE ACTIVITIES: A GENERAL OVERVIEW OVER SOME LEGAL ISSUES
Elena Carpanelli, International Institute of Air and Space Law, Leiden University, The Netherlands

IAC-11.E7.1.3

LEGAL ASPECTS OF SPACE ENVIRONMENT SUSTAINABILITY
Joyeeta Chatterjee, Institute of Air and Space Law, McGill University, India

IAC-11.E7.1.4

YOUTH INVOLVEMENT OF NEO WORKING PROJECT (SPACE GENERATION ADVISORY COUNCIL) IN DISASTER RESPONSE FOCUSING ON HUMAN AND ENVIRONMENTAL SECURITY.
TEJAL THAKORE, Kingston University, United Kingdom

IAC-11.E7.1.5

THE ENVIRONMENTAL DIMENSION OF SPACE ARMS CONTROL
Jinyuan SU, Xi'an Jiaotong University, China

IAC-11.E7.1.6

THE LEGALITY OF SPACE WEAPONS IN INTERNATIONAL LAW.
Guillermo Duberti, LL.M, Universidad de Belgrano, Argentina

IAC-11.E7.1.7

LEGAL ACCEPTABILITY OF ANTI-SATELLITE WEAPONS: A CHANGING CONCEPT
Upasana Dasgupta, India

IAC-11.E7.1.8

THE IMPACT OF LIABILITY RULES ON THE DEVELOPMENT OF PRIVATE COMMERCIAL HUMAN SPACEFLIGHT
Michael Chatzipanagiotis, Greece

IAC-11.E7.1.9

SUB-ORBITAL SPACE FLIGHT IN EUROPE - FROM THE FAA TO EASA
Kristina Reinhardt, Germany

IAC-11.E7.1.10

THE CONNECTIONS BETWEEN THE TREATY OF LISBON AND SPACE LAW.
Diego Zannoni, Italy



**IAC-11.E7.1.11**

SUPRANATIONAL SPACE: WHY THE POWERS OF THE EU ARE NOT QUITE PARALLEL

Irina Kerner, Germany

IAC-11.E7.1.12

SHAPING LEGAL FRAMEWORK FOR COMPASS—REGULATING GNSS IN CHINESE CONTEXT

Rong Du, The University of Hong Kong, Hong Kong

IAC-11.E7.1.13

SPACE COOPERATION AND COMPETITION IN THE ASIA-PACIFIC: A TWICE TOLD TALE – OR THRICE?

Jason R. Bonin, Rep. Of Singapore

IAC-11.E7.1.14

CROSS-REGIME COMMERCIAL SPACE ACTIVITY – LIABILITY REGIME FOR AEROSPACE FLIGHTS (poster)

Sethu Nandakumar Menon, University of Paris XI, France

IAC-11.E7.1.15

SETTING THE STAGE FOR A POLLUTION FREE OUTER-SPACE: WHERE ARE WE AND WHERE DO WE GO? (poster)

Ashutosh Gupta, National University of Juridical Sciences, India

IAC-11.E7.1.16

SPACE BASED SOLAR POWER- NEGOTIATING THE LEGAL POTHOLE (poster)

Nidhi Barad, National Law University, India

IAC-11.E7.1.17

PROTECTION OF THE OUTER SPACE ENVIRONMENT: NEED TO REVISIT THE LAW (poster)

Aditya Sharma, National Law University, India

IAC-11.E7.1.18

LEGAL ASPECTS OF CHINA'S LUNAR EXPLORATION AND UTILIZATION (poster)

Xiaodan Wu, University of Milan, Italy

IAC-11.E7.1.19

THE VALIDATION OF COMMERCIAL CONTRACTS DRAFTED IN OUTER SPACE; TOWARDS A LEX MERCATORIA SPATIALIS? (poster)

Eduard van Asten, The Netherlands

IAC-11.E7.1.20

SPACE DEBRIS AND LEGAL ASPECTS (poster)

ANTONIA NEDELKOPOULOU, Netherlands Antilles

IAC-11.E7.1.21

HIERARCHICAL TAXONOMY OF STATE RESPONSIBILITY FOR FORWARD CONTAMINATION BY NON-GOVERNMENTAL SPACE ACTIVITIES UNDER CORPUS JURIS SPATIALIS (poster)

Prateek Bagaria, India

E7.2. Legal Issues of Commercial Human Spaceflight

October 4 2011, 15:00 — TS-12

Chair: *Steven Freeland (University of Western Sydney, Australia); Frans G. Von der Dunk (University of Nebraska, College of Law, The Netherlands);*

Rapporteur: *Michael Dodge (Institute of Air and Space Law, McGill University, Canada);*

IAC-11.E7.2.1

NATIONAL SPACE LEGISLATION - THE WORK OF THE LEGAL SUBCOMMITTEE OF UNCOPUOS 2008-2011

Irmgard Marboe, University of Vienna, Austria

IAC-11.E7.2.2

LIABILITY RISK SHARING REGIME OF THE BILL OF JAPANS LEGISLATION ON SPACE ACTIVITIES AND ITS COMPARISON WITH THE US AND FRENCH LAW

Daisuke Saisho, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E7.2.3

SPACE PROCUREMENT REGULATION: THE COLOMBIAN PROCUREMENT ACT OF 2010

Camilo Guzman, UNIVERSIDAD SERGIO ARBOLEDA, Colombia

IAC-11.E7.2.4

JAPANESE PERSPECTIVE ON LEGAL ISSUES OF COMMERCIAL HUMAN SPACEFLIGHT -REGULATORY THRESHOLDS AND POTENTIALS-

Yu Takeuchi, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E7.2.5

ANALYSIS OF THE APPLICABLE LAW TO A PRIVATE SPACEFLIGHT CONTRACT UNDER THE LATEST CHINESE CONFLICT RULES LEGISLATION

GUOYU WANG, China

IAC-11.E7.2.6

LEGAL ISSUES IN COMMERCIALSPACEFLIGHT PROJECTS IN SPAIN

RAFAEL HARILLO, Spain

IAC-11.E7.2.7

NASA'S COMMERCIAL CREW TRANSPORTATION SYSTEM REQUIREMENTS AND THE FAA HUMAN SPACEFLIGHT REGULATIONS: A STUDY IN CONTRASTS

Mark Sundahl, Cleveland State University, United States

IAC-11.E7.2.8

PRIVATE IN HUMAN ACCESS TO SPACE AND INCENTIVE BASED REGULATION IN THE UNITED STATES

PJ Blount, National Center for Remote Sensing, Air, and Space Law, United States

IAC-11.E7.2.9

LIABILITY, INSURANCE & INDEMNIFICATION IN NATIONAL SPACE LAW

Paul Dempsey, McGill University, Canada

IAC-11.E7.2.10

REGULATING SUB-ORBITAL FLIGHTS TRAFFIC: USING AIR TRAFFIC CONTROL AS A MODEL?

Fabio Tronchetti, Harbin Institute of Technology, China

IAC-11.E7.2.11

INTERNATIONAL REGULARITY BODY, A KEY TO SPACE TOURISM SUCCESS

Ali Akbar Golroo, Aerospace Research Institute, Iran

IAC-11.E7.2.12

DOES THE RESCUE AGREEMENT APPLY TO SPACE TOURISTS?

Yan Ling, China

IAC-11.E7.2.13

PIE IN THE SKY: THRILLED OR CALAMITOUS? – A SPACEFLIGHT PARTICIPANT-FRIENDLY PERSPECTIVE

Zhuoyan Lu, University of Lapland, Finland

IAC-11.E7.2.14

A NEW INTERNATIONAL CONVENTION TO GOVERN LIABILITY IN RELATION TO COMMERCIAL SPACE TOURISM - IS IT REALLY NECESSARY?

Carol Ronan-Heath, International Institute of Air and Space Law, Leiden University, United Arab Emirates

IAC-11.E7.2.15

THE SUB-ORBITAL PRIVATE SPACE FLIGHTS MAY REQUIRE A LAW SUIT TO ESCAPE BENEFIT SHARING

Declan O'Donnell, United Societies in Space, Inc., United States

E7.3. Africa: Space Law and Applications - Past, Present, and Future

October 5 2011, 10:00 — TS-12

Chair: *Tare Brisibe (OnAir, Switzerland); Joanne Irene Gabrynowicz (University of Mississippi, United States);*

Rapporteur: *Lulekwa Makapela (, South Africa);*

IAC-11.E7.3.1

SPACE RELATED DATA: FROM JUSTICE TO DEVELOPMENT

Annette Froehlich, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

IAC-11.E7.3.2

THE RIGHT TO SATELLITE REMOTE SENSE DATA: IMPACT OF MULTILATERAL COOPERATION ON INTERNATIONAL SPACE LAW

Phetole Sekhula, South Africa

IAC-11.E7.3.3

A GLANCE AT THE EARTH OBSERVATION POLICIES AND REGULATIONS AND IMPACT ON DEVELOPING COUNTRIES: FOCUSING ON THE AFRICAN CONTINENT

Angeline Asangire Oprong, University of Bremen, Germany

IAC-11.E7.3.4

THE DIRECT RECEPTION AND DISTRIBUTION OF CBERS-3 SATELLITE DATA TO SOUTH AFRICA

Alvaro Fabricio Dos Santos, Núcleo de Assessoramento Jurídico - NAJ/SJC, Brazil

IAC-11.E7.3.5

LEGAL REGIME OF REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEM IN NIGERIA

OLUSOJI NESTER JOHN, National Space Research and Development Agency, Nigeria, Nigeria

IAC-11.E7.3.6

THE DIGITAL DIVIDE AND SPACE ACTIVITIES IN THE SOUTHERN HEMISPHERE(S): A GENERAL OVERVIEW OF AFRICA AND SOUTH AMERICA

Sylvia Ospina, S. Ospina & Associates - Consultants, United States

IAC-11.E7.3.7

SATELLITE NAVIGATION AND LOCATION BASED SERVICES TRAINING COURSE OF AFRICAN REGIONAL CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION IN ENGLISH (ARCSSTE-E) ILE-IFE, NIGERIA

Oladosu Olakunle, Obafemi Awolowo University, Nigeria

IAC-11.E7.3.8

LEGAL FRAMEWORK FOR SOUTH AFRICAN SPACE ACTIVITIES: AN ANALYSIS OF THE LEGAL RULES GOVERNING LAUNCHING, OPERATION OF A SATELLITE AND APPLICATIONS BY PRIVATE ACTORS.

Lulekwa Makapela, South Africa

IAC-11.E7.3.9

REVIEW OF THE SOUTH AFRICAN REGULATORY FRAMEWORK IN THE CONTEXT OF UN SPACE LEGAL NORMS

Luthando S. Mkumetela, South Africa

IAC-11.E7.3.10

SPACE-FARING STATES' OBLIGATIONS TOWARD THE INTERNATIONAL COMMUNITY AS GUARDIAN OF "MANKIND" IN TERMS OF THE COMMON HERITAGE OF MANKIND PRINCIPLE

Nicolaas Marais, South Africa

IAC-11.E7.3.11

AFRICA AND THE PROGRESSIVE DEVELOPMENT OF INTERNATIONAL SPACE LAW

Tare Brisibe, OnAir, Switzerland

IAC-11.E7.3.12

NIGERIAN LAWYERS PERSPECTIVE ON SPACE LAW AND AFRICA

Timiebi Aganaba, Canada

IAC-11.E7.3.13

ROLE OF SPACE LAW IN THE DEVELOPING NATIONS WITH SPECIAL REFERENCE TO INDIA

Malay Adhikari, University, India

IAC-11.E7.3.14

THE LEGAL ISSUES OF PLANETARY PROTECTION- A PATH LESS TRAVELLED BY (poster)

Utsav Mukherjee, Clifford Chance LLP, United Kingdom

E7.4. Environmental Aspects of Space Law and of Space Activities

October 5 2011, 15:00 — TS-12

Chair: *Bernhard Schmidt-Tedd (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany); Martha Mejia-Kaiser (Independent Researcher, Germany);*

Rapporteur: *Upasana Dasgupta (, India);*

IAC-11.E7.4.1

APPLICABILITY OF SPACE TECHNICAL & LEGAL SYSTEMS FOR INTERNATIONAL/REGIONAL ENVIRONMENT PRESERVATION

Yasuaki Hashimoto, The National Institute for Defense Studies, Japan

IAC-11.E7.4.2

CONNECTING THE PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW TO SPACE ACTIVITIES

Ulrike M. Bohlmann, ESA, France

IAC-11.E7.4.3

THE ROLE OF COSPAR GUIDELINES IN INTERPRETING ARTICLE IX OST

Mahulena Hofmann, University of Luxembourg, Luxembourg

IAC-11.E7.4.4

STUDIES ON LEGAL REGIME ON INTERNATIONAL RESPONSIBILITY FOR OUTER SPACE ENVIRONMENTAL DAMAGE

Li Shouping, Beijing Institute of technology, China

IAC-11.E7.4.5

WHOSE MESS IS IT ANYWAY? REGULATING THE ENVIRONMENTAL CONSEQUENCES OF COMMERCIAL LAUNCH ACTIVITIES

Steven Freeland, University of Western Sydney, Australia

IAC-11.E7.4.6

DOES OUTER SPACE HAVE A RIGHT TO BE PROTECTED?

Timiebi Aganaba, Canada

IAC-11.E7.4.7

SPACE DEBRIS AS A 'SINGLE ITEM FOR DISCUSSION'

Maureen Williams, Chair ILA Space Law Committee & UBA/CONICET, Argentina

IAC-11.E7.4.8

CHINA AND SPACE ENVIRONMENT PROTECTION: AN EVALUATION FROM AN INTERNATIONAL LEGAL PERSPECTIVE

Xiaodan Wu, University of Milan, Italy

IAC-11.E7.4.9

INTERNATIONAL ENVIRONMENTAL LAW IMPLICATIONS FOR SPACE OPERATIONS

James Rendleman, United States

IAC-11.E7.4.10

SOME ISSUES ON INTERNATIONAL DISPUTE SETTLEMENT OF SPACE DEBRIS

Haifeng Zhao, Harbin Institute of Technology, China

**IAC-11.E7.4.11**

IS THERE SPACE FOR THE UN? PERSPECTIVES OF THE UN ROLE IN THE OUTER SPACE AND CYBERSPACE REGIMES WITH REGARD TO SUSTAINABILITY

Larry Martinez, International Institute of Space Law (IISL), United States

E7.5. Recent Developments in Space Law

October 7 2011, 09:00 — TS-12

Chair: *Lesley Jane Smith (Leuphana University of Lüneburg/ Weber-Steinhaus & Smith , Germany); Sang-Myon Rhee (Seoul National University, Korea, Republic of);*

Rapporteur: *Angeline Asangire Oprong (University of Bremen, Germany);*

IAC-11.E7.5.1

THE FUTURE OF UNIFORM INTERNATIONAL RULES ON GNSS LIABILITY

Jingjing Nie, China

IAC-11.E7.5.2

LEGAL REGIME FOR GNSS FOR ATM/CNS FOR INDIA: IMPLEMENTATION OF ARTICLES VI & VII OUTER SPACE TREATY

Ranjana Kaul, Dua Associates, India

IAC-11.E7.5.3

GLOBAL NAVIGATION SATELLITE SYSTMES AND LEGAL ISSUES FOR FUTURE INTERNATIONAL COOPERATION AND COLLABORATION, IN RELATION WITH JAPANESE GNS “MICHIBIKI” TOSHIO KOSUGE (PROFESSOR EMERITUS, UNIVERSITY OF ELECTRO-COMMUNICATION

Toshio Kosuge, University of Electro-Communications, Japan

IAC-11.E7.5.4

RECENT LEGAL DEVELOPMENTS OF GNSS IN EUROPE

Marco Ferrazzani, European Space Agency (ESA), France

IAC-11.E7.5.5

THE GALILEO PROJECT PROCUREMENT FRAMEWORK OR HOW TO ENSURE AN UNDISTORTED COMPETITION

Lydia Boureghda, France

IAC-11.E7.5.6

MIND THE GAP: LEGISLATING FOR COMMERCIAL SPACE ACTIVITIES

Lesley Jane Smith, Leuphana University of Lüneburg/ Weber-Steinhaus & Smith , Germany

IAC-11.E7.5.7

A NEW CHALLENGE FOR SPACE LAW & BUSINESS - COMMERCIAL SPACE INFRASTRUCTURE SERVICES

Indra Heed Hornsby, MDA Corporation, Canada

IAC-11.E7.5.8

WHO IS THE LAUNCHING STATE? LOOKING FOR THE LAUNCHING STATE IN CURRENT BUSINESS MODELS.

Matxalen Sanchez Aranzamendi, European Space Policy Institute (ESPI), Austria

IAC-11.E7.5.9

THE CURRENT SPACE SAFETY REGULATION, POLICY, LEGAL AND PROCEDURES FOR THE COMMERCIAL SPACE LAUNCHING IN BRAZIL

Ana Cristina Galhego Rosa, The Netherlands

IAC-11.E7.5.10

LEGAL STUDIES OF AIR LAUNCHING FOR COMMERCIAL SPACE TRANSPORTATION

Yuri Takaya-Umehara, Kwansei Gakuin University, Japan

IAC-11.E7.5.11

APPLYING FAA GUIDELINES TO SHAPE REGULATIONS FOR SPACEPORT DEVELOPMENT IN EUROPE

Taras Ploshchansky, The Netherlands

IAC-11.E7.5.12

THE EU SPACE COMPETENCE AS PER THE TREATY OF LISBON: SEA CHANGE OR EMPTY SHELL?

Frans von der Dunk, University of Nebraska-Lincoln, The Netherlands

IAC-11.E7.5.13

THE NEW START TREATY AS A CONFIDENCE BUILDING MEASURE FOR THE PEACEFUL USES OF OUTER SPACE

Stefan A. Kaiser, Germany

IAC-11.E7.5.14

NEW LEGAL DIMENSIONS OF THE ORBITAL-FREQUENCY MANAGEMENT: CONFLICT OF INTEREST BETWEEN A GROUP OF ADMINISTRATIONS AND ITS NOTIFYING ADMINISTRATION

Elina Zaytseva, INTERSPUTNIK International Organization of Space Communications, Russia

IAC-11.E7.5.15

THE ECONOMIC ASSESSMENT OF THE SPACE ASSETS PROTOCOL TO THE CAPE TOWN CONVENTION

SOUICHIROU KOZUKA, Gakushuin University, Japan

IAC-11.E7.5.16

CURRENT AMERICAN FOCUS ON SPACE LAW AND ACTIVITIES

Carl Christol, University of Southern California, United States

E7.6.-E3.5. 26th IAA/IISL Scientific-Legal Roundtable: Towards Space Debris Remediation (Invited Papers only)

October 6 2011, 10:00 — TS-07

Chair: *Kai-Uwe Schrogl (European Space Policy Institute (ESPI), Austria); Wendell Mendell (National Aeronautics and Space Administration (NASA), United States);*

Rapporteur: *Nicola Rohner-Willsch (Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany);*

IAC-11.E7.6.-E3.5.1

NOT AVAILABLE

Heiner Klinkrad, European Space Agency (ESA), Germany

IAC-11.E7.6.-E3.5.2

SPACE DEBRIS MITIGATION MEASURES AND COST ISSUES

Carsten Wiedemann, Technical University of Braunschweig, Germany

IAC-11.E7.6.-E3.5.3

NOT AVAILABLE

Joanne Wheeler, Milbank, United Kingdom

IAC-11.E7.6.-E3.5.4

NOT AVAILABLE

Catherine Doldirina, McGill University, Canada

IAC-11.E7.6.-E3.5.5

NOT AVAILABLE

Jana Robinson, European Space Policy Institute (ESPI), Austria

E7.7.-B3.8. Joint IAF/IISL Session on Policy and Law of Human Space Missions

October 7 2011, 14:00 — TS-03

Chair: *Cristian Bank (EADS Astrium Space Transportation GmbH, Germany); Lesley Jane Smith (Leuphana University of Lüneburg/ Weber-Steinhaus & Smith , Germany);*

Rapporteur: *Luise Weber-Steinhaus (, Germany);*

IAC-11.E7.7.-B3.8.1

LEGAL ISSUES IN CHINA’S POSSIBLE PARTICIPATION IN THE INTERNATIONAL SPACE STATION (ISS)

Yun Zhao, The University of Hong Kong, Hong Kong

IAC-11.E7.7.-B3.8.2

POLICY AND LAW ASPECTS OF INTERNATIONAL COOPERATION IN SPACE EXPLORATION

Christopher Johnson, International Institute of Space Law (IISL), United States

IAC-11.E7.7.-B3.8.3

NEW PARTNERSHIPS IN SPACE PROJECTS: THE LEGAL AND POLICY IMPLICATIONS OF PUBLIC AND PRIVATE PARTNERS REGARDING THE ISS

Lesley Jane Smith, Leuphana University of Lüneburg/ Weber-Steinhaus & Smith , Germany

IAC-11.E7.7.-B3.8.4

MCTR AND THE NORMS OF INTERNATIONAL COOPERATION

Sang-Myon Rhee, Seoul National University, Korea, Republic of

IAC-11.E7.7.-B3.8.5

THE RIGHT OF SELF-DEFENCE IN OUTER SPACE

José Monserrat-Filho, Brazilian Space Agency (AEB), Brazil

IAC-11.E7.7.-B3.8.6

SOME LEGAL ISSUES ON MANNED SPACE FLIGHT

Haifeng Zhao, Harbin Institute of Technology, China

IAC-11.E7.7.-B3.8.7

STATE JURISDICTION AND CONTROL OVER SPACE OBJECTS UNDER INTERNATIONAL SPACE LAW

Paul Larsen, Georgetown University Law Center, United States

IAC-11.E7.7.-B3.8.8

NATIONALITY AND LONG-ARM JURISDICTION IN COMMERCIAL SPACE TRANSPORTATION: IMPLICATIONS FOR FUTURE GLOBAL COOPERATION

Sara Langston, University of Mississippi, United States

IAC-11.E7.7.-B3.8.9

“THE LEGAL PROBLEMS OF PROVIDING THE SPACE ACTIVITY OF SPACE OBJECTS LAUNCHING BY AEROSPACE LAUNCH SYSTEMS WITH THE PARTICIPATION OF SEVERAL STATES (AIR LAUNCH PROJECT AS EXAMPLE)”

Gulnaz Khalimova, Air Launch Aerospace Corporation, Russia

IAC-11.E7.7.-B3.8.10

THE RELATIONSHIP BETWEEN RULES OF SPACE LAW AND HUMAN RIGHTS LAW: THE CASE OF THE RIGHT TO WATER

Cynthia Jimenez Monroy, Finland

IAC-11.E7.7.-B3.8.12

EXTENDING THE OUTER SPACE TREATY TO PROTECT PLANETARY ENVIRONMENTS

John D. Rummel, East Carolina University, United States

E8. MULTILINGUAL ASTRONAUTICAL TERMINOLOGY SYMPOSIUM

Coordinator: Yasunori Matogawa (Japan Aerospace Exploration Agency (JAXA), Japan); Danielle Candel (Université Paris Diderot (Paris 7), France);

Rapporteur: Tetsuo Yoshimitsu (ISAS/JAXA, Japan); Fabrice Dennemont (International Academy of Astronautics (IAA), France);

E8.1. Multilingual Astronautical Terminology

October 6 2011, 15:00 — TS-08

Chair: *Yasunori Matogawa (Japan Aerospace Exploration Agency (JAXA), Japan); Danielle Candel (Université Paris Diderot (Paris 7), France);*

Rapporteur: *Tetsuo Yoshimitsu (ISAS/JAXA, Japan); Fabrice Dennemont (International Academy of Astronautics (IAA), France);*

IAC-11.E8.1.1

IAA’S MULTILINGUAL ASTRONAUTICAL TERMINOLOGY DATABASE DEVELOPMENT; STATUS AND SOME THOUGHTS

Keiken Ninomiya, Japan Aerospace Exploration Agency (JAXA), Japan

IAC-11.E8.1.2

BRIEF INTRODUCTION FOR STUDIES OF SPACE TERMINOLOGY IN CHINA

Fengyuan Zhuang, Beihang University, China

IAC-11.E8.1.3

MANAGEMENT PROCESS OF SPACE TERMINOLOGY APPLICATION

Iurii Stryzhak, Ukraine

IAC-11.E8.1.4

COMPUTER-BASED BOOKBINDING OF MULTILINGUAL SPACE DICTIONARY

Tetsuo Yoshimitsu, ISAS/JAXA, Japan

IAC-11.E8.1.5

OFFICIALLY DEVELOPPING FRENCH TERMINOLOGY (NEOLOGISMS, DEFINITIONS): THE TERMINOLOGY COMMITTEE FOR SPACE SCIENCES AND TECHNIQUES, 1997-2011.

Danielle Candel, Université Paris Diderot (Paris 7), France

IAC-11.E8.1.6

MULTI LANGUAGE EMPOWERMENT

Jan du Plessis, SunSpace, South Africa

IAC-11.E8.1.7

SPACE TERMINOLOGY, TECHNOLOGY DEVELOPMENT AND INTERNATIONAL COOPERATION: INDONESIAN PERSPECTIVE

Harijono Djojodihardjo, Universitas Al Azhar Indonesia, Indonesia





4.12 Meeting Schedule

Time	Event	Room
Saturday, 1 October, 2011		
10:00 - 13:00	IAA Space Debris Study Group	Bartholomew Diaz (Westin Hotel)
14:00 - 15:30	IAC Steering Group	Edwards & Shappen (Westin Hotel)
15:00 - 17:00	IAF Space Exploration Committee	Marco Polo (Westin Hotel)
15:00 - 18:00	IAF Finance Committee	Sir Francis Drake (Westin Hotel)
15:30 - 16:30	IAF Technical Activities Committee (TAC)	Edwards & Shappen (Westin Hotel)
17:30 - 19:00	IPC General Meeting	Auditorium 2 (CTICC)
Sunday, 2 October, 2011		
08:00 - 13:00	Cross-Cultural Presentation Workshop	Vasco de Gama (Westin Hotel)
09:00 - 11:00	IAF Commercial Spaceflight Committee	Seal & Robben (Westin Hotel)
09:00 - 11:00	IAF Space Education & Outreach Committee	Room 1.51 (CTICC, 1st Floor)
09:00 - 14:00	UN/IAF Workshop	Roof Terrace (CTICC, 2nd Floor)
11:00 - 14:00	IAF Bureau	Sir Francis Drake (Westin Hotel)
13:30 - 16:00	IAA Academy Day	Auditorium 2 (CTICC)
14:00 - 17:00	IAF WD-YPP Committee	Board Room (CTICC 1st Floor)
14:00 - 17:00	IAF Materials and Structure Committee	Seal & Robben (Westin Hotel)
14:00 - 17:00	IAF Space Transportation Committee	Edwards & Shappen (Westin Hotel)
15:00 - 16:00	IAF Earth Observation Committee	Sir Francis Drake (Westin Hotel)
15:00 - 17:00	IAF Microgravity Science and Processes Committee	Marco Polo (Westin Hotel)
15:00 - 18:00	IAF Astrodynamics Committee	Bartholomew Diaz (Westin Hotel)
15:00 - 18:00	IAF Space Propulsion Committee	Vasco de Gama (Westin Hotel)
16:00 - 17:30	IAF Subcommittee on GEOSS	Sir Francis Drake (Westin Hotel)
16:30 - 18:00	UN/ IAF Workshop Round Table	Auditorium 2 (CTICC)
18:00 - 20:00	Young Professionals Cocktail	Roof Terrace (CTICC, 2nd Floor)
Monday, 3 October, 2011		
12:00 - 13:30	ILOA Board	Edwards & Shappen (Westin Hotel)
13:00 - 15:00	IAF Space Systems Committee	Seal & Robben (Westin Hotel)
13:00 - 18:00	IISL Board Meeting	Sir Francis Drake (Westin Hotel)
15:30 - 16:30	IAF APRG	Edwards & Shappen (Westin Hotel)
15:00 - 17:00	IAA Scientific Activities Committee (SAC)	Bartholomew Diaz (Westin Hotel)
15:00 - 18:00	IAA Steering Group 6.3	Seal & Robben (Westin Hotel)
15:30 - 18:00	IAF General Assembly	Roof Terrace (CTICC, 2nd Floor)
Tuesday, 4 October 2011		
09:00 - 10:00	IAA Board of Trustees Sec 1	Seal & Robben (Westin Hotel)
09:00 - 10:00	IAA Board of Trustees Sec 2	Edwards & Shappen (Westin Hotel)
09:00 - 10:00	IAA Board of Trustees Sec 3	Room 1.51 (CTICC, 1st Floor)
09:00 - 10:00	IAA Board of Trustees Sec 4	Room 1.55 (CTICC, 1st Floor)
09:00 - 12:00	IAF/IAA/IISL Advisory Committee on History (ACHA)	Marco Polo (Westin Hotel)
09:00 - 18:00	IADC	Bartholomew Diaz (Westin Hotel)
09:30 - 12:00	Congress and Symposia Advisory Committee (CSAC)	Sir Francis Drake (Westin Hotel)
10:00 - 12:30	IAA Board of Trustees Plenary	Vasco de Gama (Westin Hotel)
10:00 - 12:00	Committee on Integrated Applications	Edwards & Shappen (Westin Hotel)
10:00 - 12:00	IAF Human Space Endeavours Committee	Seal & Robben (Westin Hotel)
10:30 - 12:00	IAF Industry Committee	Room 1.51 (CTICC, 1st Floor)
12:00 - 14:00	IAF Policy Advisory Committee (PAC)	Sir Francis Drake (Westin Hotel)
12:00 - 14:00	ITACUS	Marco Polo (Westin Hotel)
13:00 - 14:00	Small Satellite Committee	Seal & Robben (Westin Hotel)
13:00 - 15:00	Space Power Committee	Edwards & Shappen (Westin Hotel)
13:00 - 15:00	SGAC Board Meeting	Room 1.51 (CTICC, 1st Floor)
14:00 - 17:00	IAA Commission 2	Marco Polo (Westin Hotel)
15:00 - 18:00	IAFRG Latin America and the Carribean	Sir Francis Drake (Westin Hotel)
15:00 - 18:00	IAF Space Operations Committee	Vasco de Gama (Westin Hotel)
15:00 - 18:00	Steering Group Inter Stellar Message (SETI)	Seal & Robben (Westin Hotel)

Time	Event	Room
15:00 - 17:00	IAA/IGMASS	Edwards & Shappen (Westin Hotel)
18:00 - 20:00	Young Professionals Cocktail	Roof Terrace (CTICC, 2nd Floor)
Wednesday, 5 October, 2011		
08:00 - 11:00	WSWA Board	Bartholomew Diaz (Westin Hotel)
09:00 - 11:00	IAF/SUAG	Vasco de Gamma (Westin Hotel)
09:00 - 11:00	Space Astronomy Technical Committee (SATC)	Edwards & Shappen (Westin Hotel)
09:00 - 12:00	Entrepreneurship and Investment Committee (EIC)	Board Room (CTICC 1st Floor)
09:00 - 12:00	SETI Committee	Seal & Robben (Westin Hotel)
09:30 - 12:00	Congress and Symposia Advisory Committee (CSAC)	Sir Francis Drake (Westin Hotel)
10:00 - 12:00	AIAA	Marco Polo (Westin Hotel)
11:00 - 13:00	SETI Committee	Vasco de Gamma (Westin Hotel)
12:00 - 14:30	IAF Honors and Awards Committee	Edwards & Shappen (Westin Hotel)
12:30 - 14:30	IAF Subcommittee on Dual-Use	Seal & Robben (Westin Hotel)
14:00 - 15:30	Space Policy	Marco Polo (Westin Hotel)
14:00 - 17:00	IAF Space Society Committee	Board Room (CTICC, 1st Floor)
14:00 - 18:00	Student Competition Jury	Bartholomew Diaz (Westin Hotel)
15:00 - 18:00	Space Communications and Navigation Committee	Seal & Robben (Westin Hotel)
18:00 - 19:30	SSA	Board Room (Westin Hotel)
18:00 - 20:00	Young Professionals Cocktail	Roof Terrace (CTICC, 2nd Floor)
Thursday, 6 October, 2011		
09:00 - 12:30	AIAA	Edwards & Shappen (Westin Hotel)
10:00 - 12:00	Space Security	Marco Polo (Westin Hotel)
10:30 - 13:00	IAF Bureau	Sir Francis Drake (Westin Hotel)
13:00 - 15:00	SSA	Edwards & Shappen (Westin Hotel)
15:00 - 18:00	Visions and Strategies for Far Future Committee	Seal & Robben (Westin Hotel)
15:00 - 18:00	Committee for Liaison with International Organisations and Developing Nations (CLIODN)	Marco Polo (Westin Hotel)
15:00 - 18:00	IISL Moot Court Finals	High Court of Cape Town
16:00 - 18:00	Space Education and Outreach Committee	Room 1.51 (CTICC, 1st Floor)
17:00 - 19:00	Astrodynamics Committee	Bartholomew Diaz (Westin Hotel)
Friday, 7 October, 2011		
09:00 - 13:00	IAF General Assembly	Roof Terrace (CTICC, 2nd Floor)
10:00 - 12:00	IAF Space Astronomy Committee	Sir Francis Drake (Westin Hotel)



5 Associated Events

5.1 UN/IAF Workshop

The UN/IAF International Workshop on "Space for Human and Environmental Security"

30 September – 2 October 2011, Cape Town, South Africa

The 21st meeting in the series of workshops jointly organised by the United Nations Office for Outer Space Affairs (UN-OOSA) and the International Astronautical Federation (IAF) will be held in conjunction with and an associated event of the 62nd International Astronautical Congress (IAC). It will discuss how space technologies, applications, information and services can contribute to sustainable economic and social development programmes supporting human and environmental security, primarily in developing countries.

Primary objectives of this event include the following:

- To increase awareness among decision makers and representatives of research and academic communities of space technology applications for addressing human and environmental security issues, primarily in developing countries;
- To examine low-cost space-related technologies and information resources available for addressing human and environmental security needs in developing countries;
- To promote educational and public awareness initiatives in the area of natural resources management, as well as to contribute to capacity building processes in this area; and
- To strengthen international and regional cooperation in the subjects.

The current workshop is being organised with participation of ESA, International Academy of Astronautics (IAA) and Committee on Space Research (COSPAR). Its programme will address, through plenary sessions, working groups meetings and discussions, a range of space technologies that can provide cost-effective solutions and essential information for planning and implementation of programmes or projects addressing human and environmental security. It will also discuss international and regional initiatives and capacity building activities in this area.

The programme of the workshop will include four technical sessions addressing the following themes:

- Session 1: **Space and Climate Change**
- Session 2: **Space for Food and Water**
- Session 3: **Space for Health**
- Session 4: **Space for Environment**

Concluding round table discussion with participation of heads/top managers of space agencies and other relevant national/regional/international institutions and organisations from both space faring and non-space faring countries will be held on the last day of the meeting. Prior to the round table discussion, two Working Groups will be established in order to summarise critical issues/focal themes identified in the presentations delivered at the technical sessions of the workshop for addressing those to the panelists.

In addition to the UN and IAF, the current co-sponsorship of the meeting includes European Space Agency (ESA) and Secure World Foundation (SWF), and it is still open to interested organisations and companies. Financial

support provided by the co-sponsors will allow a number of selected participants from developing countries to attend the workshop and IAC.

Participation in the meeting is open to all registrants of the IAC, and there is no registration fee associated with the workshop.

Workshop's websites: www.unoosa.org/oosa/en/SAP/act2011/un-iaf/index.html and www.iafastro.org/index.html?title=2011_UN-IAF_Workshop

For further information, please contact:

UN-OOSA:

Sergei Chernikov,
UN Office for Outer Space Affairs
E: unpsa@unoosa.org

IAF:

Philippe Willekens,
IAF Secretariat
E: info@iafastro.org

5.2 IAF 60th Anniversary Award Ceremony

During 2011, the International Astronautical Federation is celebrating its 60th Anniversary and is honouring this occasion with a special, one-time award.

The award recognises an organisation or key individual for a singular and successful project in the field of Space Applications, Space Science and Exploration, which could demonstrate through its implementations, that measurable benefit to humanity has been achieved.

The recipient of the award was nominated through IAF member organisations and selected by the Bureau of the International Astronautical Federation on the basis of a recommendation of the IAF's Honours and Awards Committee.

The Global Positioning System (GPS), nominated by IAF member, the American Institute for Aeronautics and Astronautics (AIAA), was selected as the IAF 60th Anniversary Award for the exemplary role it has played in building international collaboration for the benefit of humanity.

General William L. Shelton (Commander, United States Air Force Space Command) will be presented with the award on **4 October at 16:00 (IAF Booth, Stand 64)** on behalf of the GPS programme. The ceremony will also include guest lecturer, Dr. Bradford Parkinson (GPS Chief Architect and First Programme Director), and guest speakers, Michael E. Shaw (Director, Navigation Systems Global Business Development, Lockheed Martin Space Systems) and Robert S. Dickman (Executive Director, American Institute of Aeronautics and Astronautics).

5.3 Third International Cluster Forum

3rd International Cluster Forum, Cape Town, South Africa, 3 – 7 October 2011

As part of its mission of Connecting Space People, the Federation developed the idea of clustering various types of organisations with the objective to foster collaboration between small enterprises, R&D institutions, universities and larger organisations.

After two very successful events organised in Daejeon in 2009 and in Prague in 2010, the 3rd International Cluster Forum will take place during the 62nd International Astronautical Congress in Cape Town, South Africa.

Hosted in the center of the main exhibition on a 150 m² area, the week-long programme includes the following topics.

Monday, 3 October 2011

- 15:00 IAF Exhibition Booth Opening Ceremony
- 16:00 IAF Network Event

Tuesday, 4 October 2011 - Collaborative Innovation

- 10:00 **Welcome**
 - Genie Bopp – *Vice President, Health and Medical Operations Division, Wyle*
 - Johann-Dietrich Wörner – *Chairman of the Executive Board, German Aerospace Center*
 - William H. Gerstenmaier – *Associate Administrator, Human Exploration and Operations Mission Directorate, NASA*
- 10:15 **Space Agency Collaboration and Innovation Initiatives**
 - NASA Innovation
 - William H. Gerstenmaier – *Associate Administrator, Human Exploration and Operations Mission Directorate, NASA*
 - SLSD Open Innovation Results and Plans
 - Jeffrey R. Davis – *Director, Space Life Sciences, NASA*
 - Collaborative Education and Outreach Initiatives
 - Andrea Boese – *German Aerospace Center, European Space Policy and Special Affairs*
 - Model for Collaboration: NASA Human Health and Performance Center
 - Elizabeth Richard – *Senior Strategist, Wyle*
 - NASA Tournament Lab
 - Jason Crusan – *Chief Technologist, Human Exploration and Operations Mission Directorate, NASA*
- 12:00 **Lunch Programme and Discussion**
Light lunch sponsored by Wyle
- 12:30 **Keynote: More innovation through Evolution or Revolution?**
 - Johann-Dietrich Wörner – *Chairman of the Executive Board, German Aerospace Center DLR*
- 12:45 **Panel 1: Innovative Problem Solving—Challenges**
 - Jeffrey R. Davis – *Director, Space Life Sciences, NASA: Portfolio Analysis*
 - Rupert Gerzer – *Director, Institute of Aerospace Medicine, German Aerospace Center DLR: Envihab Development*
 - Cynthia M. Rando – *Innovation and Strategy Coordinator, Wyle: SLSD Open Innovation Pilot Challenges*
 - MaGee Johnson – *Alliances and Strategy Coordinator, Wyle: NASA Space Act Agreement Challenges*

13:45

Panel 2: Innovative Problem Solving—Results

- Panel Members:
 - Cynthia M. Rando – *Innovation and Strategy Coordinator, Wyle: SLSD Open Innovation Outcomes*
 - Kathy Laurini – *Senior Advisor, NASA Exploration and Space Operations: International Space Exploration Coordination Group (ISECG) Global Exploration Roadmap- Enabling Human Space Exploration*
 - Rüdiger Süß – *Senior Project Manager DLR Corporate Strategy: Internal Innovative Cooperation Paves the Way for External Collaboration*
 - Jason Crusan – *Chief Technologist, Human Exploration and Operations Mission Directorate, NASA: NASA Tournament Lab Results*

14:45

Break-Out Sessions

To be determined on the basis of participant interest, and may include general collaborative innovation strategies, challenges, results, education and outreach

15:30

Conclusions

- Jeffrey R. Davis – *Director, Space Life Sciences, NASA*
- Gerd Gruppe – *DLR, Member of the Executive Board responsible for the German Space Administration*
- Elizabeth E. Richard – *Senior Strategist, Wyle*

16:00

IAF 60th Anniversary Award Ceremony

Wednesday, 5 October 2011 - Space Professional Societies Forum and 2nd IAF Nanosatellite Event

10:15

Professional Space Societies Forum

- Welcome & Objectives
 - Marc Heppener – *Chair, IAF Space and Society Committee*

10:30

Panel Discussion: The changing Role of Space Societies in the 21st Century

- Panel Members:
 - Bob Dickman – *Director, AIAA*
 - Mazlan Othman – *Director, UN-OOSA*
 - Lori Garver – *Associate Administrator, NASA*

11:30

Conclusions

12:00

Lunch

Sponsored by Canadian Space Society and Toronto Tourism

13:00

Keynote by Guest Speaker (organised SGAC)

15:00

IAF Launch Partnership Initiative

15:30

Status Updates

- Outcomes of the 1st International African CubeSat Workshop
 - Robert van Zyl – *Deputy Director, Cape Peninsula University of Technology*
- Outcomes of the ISU Space Studies Programme 2011
 - Walter Peeters – *President, International Space University*
- Outcomes of the UN/Austria/ESA Symposium on Small Satellite Programmes for Sustainable Development
 - Werner Balogh – *United Nations Basic Space Technology Initiative (invited)*
- Results and Future Perspectives of Nano-Satellite Mission Idea Contest
 - Rei Kawashima – *UNISEC, Japan*
- HumSat Status Update
 - Jordi Puig-Suari – *Cal Poly*
- QB50 Status Update
 - Jean Muylaert – *Director, von Karman Institute for Fluid Dynamics*

17:00

Happy Hour

Thursday, 6 October 2011 - Space Careers

- 10:00 – 12:00 IAF Mentoring Programme
- 13:00 – 13:30 **Keynote: Workforce Policy in the European Space Sector**
 - Walter Peeters – President, International Space University (ISU)
- 13:30 – 14:30 **Panel Discussion with Young Professionals followed by an open discussion with HR representatives and experienced professionals (moderated by HE Space)**
- 14:30 **Face-to-Face Meetings**
 - Participants: recruiters, experienced professionals, young professionals
- 17:00 **Space Astronomy Technical Committee (SATC) Event**

Friday, 7 October 2011 - IAC Students Event

- 13:00 – 15:00 **Space Ambassador Event**
 - Presentations by representatives from the aerospace industry and space agencies education offices that focuses on college and university students



5.4 IAC 2011 Professional Development Programme

In 2011, the Space Education and Outreach Committee (SEOC) of the International Astronautical Federation (IAF) will be spearheading - for the second time - a program geared towards educators at the primary and secondary levels from South Africa with representation from the US, Canadian and Australian educator communities.

In an effort to provide educators with the knowledge, tools and confidence required to bring space into their classrooms in order to inspire the next space generation, graduate students sponsored by the Canadian Space Agency and NASA, will host 2 days of interactive learning workshops Friday, 30 September and Saturday 1 October, focusing on a wide array of topics from astronomy & exploration to Earth observation and the effects of space flight on the human body. Each of these workshops were selected based specifically on their alignment to the South African science curriculum.

Interested educators are also invited to participate in the IAC and ISEB Student Programs and expand their space horizons with attendance at a variety of technical sessions during the 2011 edition of the IAF's annual International Astronautical Congress (IAC) to be held in Cape Town from 3-7 October.

5.5 2011 IAF Young Professionals Programme



ALL YOUNG PROFESSIONALS

Please join us!

We've designed events during IAC exclusively for you!

They are all included in your young professionals registration fee, so don't miss the opportunity to meet with some of the most experienced space personalities!



Sunday, October 2 – 18:00 to 20:00 Roof Terrace Room

Welcome Reception

- Jean-Yves Le Gall, Chairman and CEO of Arianespace
- Peter Martinez, Chair, Local Organising Committee IAC 2011 and Head of the Space Science and Technology Division, South African Astronomical Observatory
- Local musical entertainment

Tuesday, October 4 – 18:00 to 20:00 Roof Terrace Room

Masters with Master - Senior Agency Management Perspectives

- Charles Bolden, NASA Administrator
- Steve MacLean, President of the Canadian Space Agency (CSA)
- Moderator: Ed Hoffman, NASA Academy of Program/Project Engineering Leadership, Moderator

Wednesday, October 5 – 18:00 to 20:00 Roof Terrace Room

Perspectives on Space Exploration

- Lori Garver, NASA Deputy Administrator
- Catherine "Cady" Coleman, NASA Astronaut
- Claudia Kessler, CEO HE Space
- Simonetta DiPippo, President, Women in Aerospace-Europe and Special Advisor to the ESA Director General

Don't forget the Wednesday afternoon Plenary Session – "Next Generation Visions for Earth Observation"

You can also join in with others from around the world in our new Virtual Forums. Contact iacvirtualforum@gmail.com for information and registration instructions.

Location: The Westin Cape Town Hotel, Room Vasco de Gamma

- **Space Operations Committee** : Monday 3 October, 15:00-18:00
- **Entrepreneurship and Investment Committee**: Wednesday 5 October, 13:00-16:00
- **Human Space Endeavours Committee**: Thursday 6 October, 13:00-16:00
- **Space Communications and Navigation Committee**: Friday 7 October, 09:00-12:00

Location: CTICC, TS16 Room 1.63

- **Space Education and Outreach E2.3.**: Tuesday 4 October, 15:00-18:00



5.6 The Student Programme

Dear IAC Delegates and Students,

I would like to extend to you an invitation to attend the dedicated student programs to be held during the 62nd International Astronautical Congress (IAC). These student activities, organised by the International Space Education Board (ISEB), were carefully crafted to inspire tomorrow's engineers, scientists, and innovators from around the world.

As the Chair of the Board, I take this opportunity to highlight, as stated in the Charter, that: the purpose of the Board is to provide a mechanism for enhanced cooperation among its Members with a twofold objective of (1) increasing science, technology, engineering and mathematics literacy achievement in connection with space, and (2) supporting the future workforce needs of space programmes. To that end, the ISEB discusses global issues of importance to each Member's outreach and education programmes and implements joint education initiatives.

Engineering, technology, and space science related activities are the backbone of our Agencies' undertakings and are important elements for the creation, development, and sustainability of competitive, knowledge-based societies and economies. To ensure a long term, sustainable, and talented workforce, the ISEB Members offer unique educational activities and programmes, such as sponsoring students to attend professional conferences and congresses such as the IAC.

The quality of the student programmes designed for the 62nd IAC reflects the collaborative effort of the ISEB's Founding Members and Associate Members, respectively: the Canadian Space Agency (CSA); the European Space Agency (ESA); the Japan Aerospace Exploration Agency (JAXA); the National Aeronautics and Space Administration (NASA); the Centre National d'Etudes Spatiales (CNES); and, the Victorian Space Science Education Centre (VSSEC). The ISEB's reach and breadth of activities would not be possible without the tireless dedication and generosity of time from each of the Members. I encourage you to learn more about this group and find out how your country's space agency can join in this global effort.

This year, ISEB Member agencies will be sponsoring 60 students to attend the Congress while also providing special guest speakers, research-related activities, a dedicated International Student Zone (ISZ) and an ISEB Space Ambassadors' education outreach activity. This year's outreach activity will include an inspiration book, and discussion, where senior agency representatives from all ISEB Member agencies will share their story of what inspired them on their trajectory. Do not miss the opportunity to attend this session where you will hear first hand what catapulted the imagination of some of today's leaders. I invite you to visit the ISZ regularly throughout the week. Many interesting things are planned daily!

On behalf of the ISEB, I would like to thank the International Astronautical Federation (IAF) and the members of the Local Organising Committee for their assistance in helping us bring a quality programme to this year's participants. In particular, I wish our students a fruitful conference and a memorable experience in Cape Town.

Sincerely,

Leland D. Melvin

Associate Administrator for Education
National Aeronautics and Space Administration
Chair, International Space Education Board

IAC 2011 Student Programme

Sunday, 2 October: ISEB ORIENTATION

- 15:30 - 17:30 ISEB Space Ambassadors Meet and Greet
- 18:00 - 22:00 Gold of Africa Museum & Restaurant (ISEB members and students only)

Monday, 3 October: COMMENCEMENT DAY

- 10:00 - 12:00 Opening Ceremony
- 13:30 - 15:00 Plenary 1: Heads of Agency
- 16:00 - 17:00 Heads of Agency Q&A Session with International Space Education Board (ISEB) Students (Exhibition Hall 2 & 3) (*Questions by ISEB sponsored students but open to ALL students*)

Tuesday, 4 October: ISEB JAXA DAY

- 11:00 - 12:30 Agency Cultural Activity and Informal Presentations at *International Student Zone (ISZ)*
- 13:00 - 14:00 Lunch Presentations by Agency at ISZ (*Open to ALL students*)
- 15:00 - 18:00 *ISEB Heads of Education Annual Meeting: Part I*
- 19:00 - 23:00 ISEB Space Ambassadors Cultural Activity: The Theatre in the District Dinner Show (*Open to ALL students*)

Wednesday, 5 October: ISEB ESA DAY

- 11:00 - 12:30 Agency Cultural Activity and Informal Presentations at ISZ
- 13:00 - 14:00 Lunch Presentations by Agency at ISZ (*Open to ALL students*)
- 15:00 - 18:00 *ISEB Heads of Education Annual Meeting: Part II*

Thursday, 6 October: ISEB CSA DAY

- 11:00 - 12:30 Agency Cultural Activity and Informal Presentations at ISZ
- 13:00 - 14:00 Lunch Presentations by Agency at ISZ (*Open to ALL students*)

Friday, 7 October: NASA Sponsored ISEB Outreach Activity

- 08:00 - 12:00 Education Outreach for South African Learners (Ballroom West)
- 13:00 - 15:00 IAF Cluster Forum for ISEB Space Ambassadors: "Building the Space Workforce Pipeline" in (IAF Booth, Stand 64, Exhibition Hall) (*Open to ALL students*)

Saturday, 8 October: Optional Cultural Activity: Day Safari, Fairy Glen Private Game Reserve
(*Three hour safari*)



5.7 IAF Youth Grants Programme

The recipients of the IAC 2011 Youth Grants Programme are eleven students and young professionals who were selected from over 90 well-qualified applicants from 33 countries.

The Student recipients are:

- **Dmitry Rachkin** from Russia
- **Mykola Gryshyn** from Ukraine
- **Eloise Matheson** from Australia
- **Sudeep Neupane** from Nepal
- **Lumka Msibi** from South Africa
- **Kean How Cheah** from Malaysia

The Young Professional recipients are:

- **Olayinka Abiodun Fagbemi** from Nigeria
- **Ravit Sachasiri** from Thailand
- **Anna Solyankina** from Russia
- **Katrina Laygo** from United States
- **Nsih Mirabell Kum** from Cameroon

These grant recipients are receiving funding from the IAF to attend the IAC, and will participate in a number of events:

They will participate in the activities of the IAC Student Programme organised by the International Space Education Board and the IAF Young Professional Programme which are conducted during the Congress. They will meet with IAF-assigned mentors and student/young professional advisors and be given special recognition during the Congress.

They will also have the opportunity to participate in the Space Generation Congress and the UN/IAF Workshop held prior to the Congress. Following the Congress, the grant recipients will report on the activities they undertake upon their return home to build on the experiences they gained during the Congress and to share what they have learned.

In addition, Ms. Olayinka Abiodun Fagbemi has been chosen to participate in a special initiative jointly organised by the IAF and SGAC, to present the young generation's voice during the African Space Leaders Round Table Plenary.

5.8 Cross Cultural Presentation Workshop (for Youth Grantees and Youth Plenary Speakers)

The IAC Cross Cultural Presentation Workshop is designed for both native English speakers and non-native English speakers, and provides participants with the opportunity to speak to an audience of workshop facilitators and peers. Each presentation will include a question and answer session (Q&A) with feedback from the audience. The workshop includes guidelines for effective presentation and personal interaction in the context of the multicultural, multinational, and multilingual environment of the IAC, where English is the primary language for communication. Each participant will receive a video of his/her presentation and a written feedback document from the facilitators with recommendations/next steps. Participants will have the option to review their presentations with a Subject Matter Expert (SME).

5.9 Masters with Masters – Knowledge-Sharing Event



The 2011 International Astronautical Congress is featuring a special “Masters with Masters” knowledge-sharing session, bringing together two experienced African space leaders, Adigun Ade Abiodun, a former Nigerian space official who also served as Chairman of the United Nations Committee on the Peaceful Uses of Outer Space and Peter Martinez, Division Head, Space Science and Technology at the South African Astronomical Observatory, a facility of the National Research Foundation.

During the one-hour session, moderated by NASA Academy of Program/Project and Engineering Leadership (APPEL) Director Edward Hoffman, the African space leaders will engage in a dialogue on their personal experiences and lessons learned, their visions for the future and their thoughts on preparing the next generation of space program leaders in Africa.

This Masters with Masters knowledge-sharing session, one of a series of such events organised by NASA's APPEL program, will be video-taped and made available by the IAF, by NASA and by other organisations on the internet for later viewing by interested space program professionals, students and others.



5.10 Local Outreach Programme

Event	When	Where	Audience
Administrator of NASA talk <i>Charles Bolden Jr, the Administrator of NASA, is to give a talk at South Peninsula High School in Constantia, to learners from many diverse schools. In his powerful style he will inspire the learners to apply themselves to science, technology, engineering and maths as a living example of someone from humble beginnings who has reached the stars - literally.</i>	30 September 13:00 – 14:30	Peninsula High School, Constantia	Invited learners plus a large number brought in from disadvantaged schools by Living Maths
Space Art Competition <i>Learners are to take part in an art competition, open to the public at the Artscape Foyer. This is a short walk from the CTICC.</i>	Week of Congress	Artscape Foyer	Members of the public
Public talk at CTICC <i>Charles Bolden Jr, the Administrator of NASA, is to engage the public at an evening event, taking us with him beyond the stratosphere.</i>	4 October	Auditorium 2	Members of the public
Teacher Training Workshop Space Foundation	Before/after school holidays	SAAO Auditorium	Selected teachers from the Western Cape

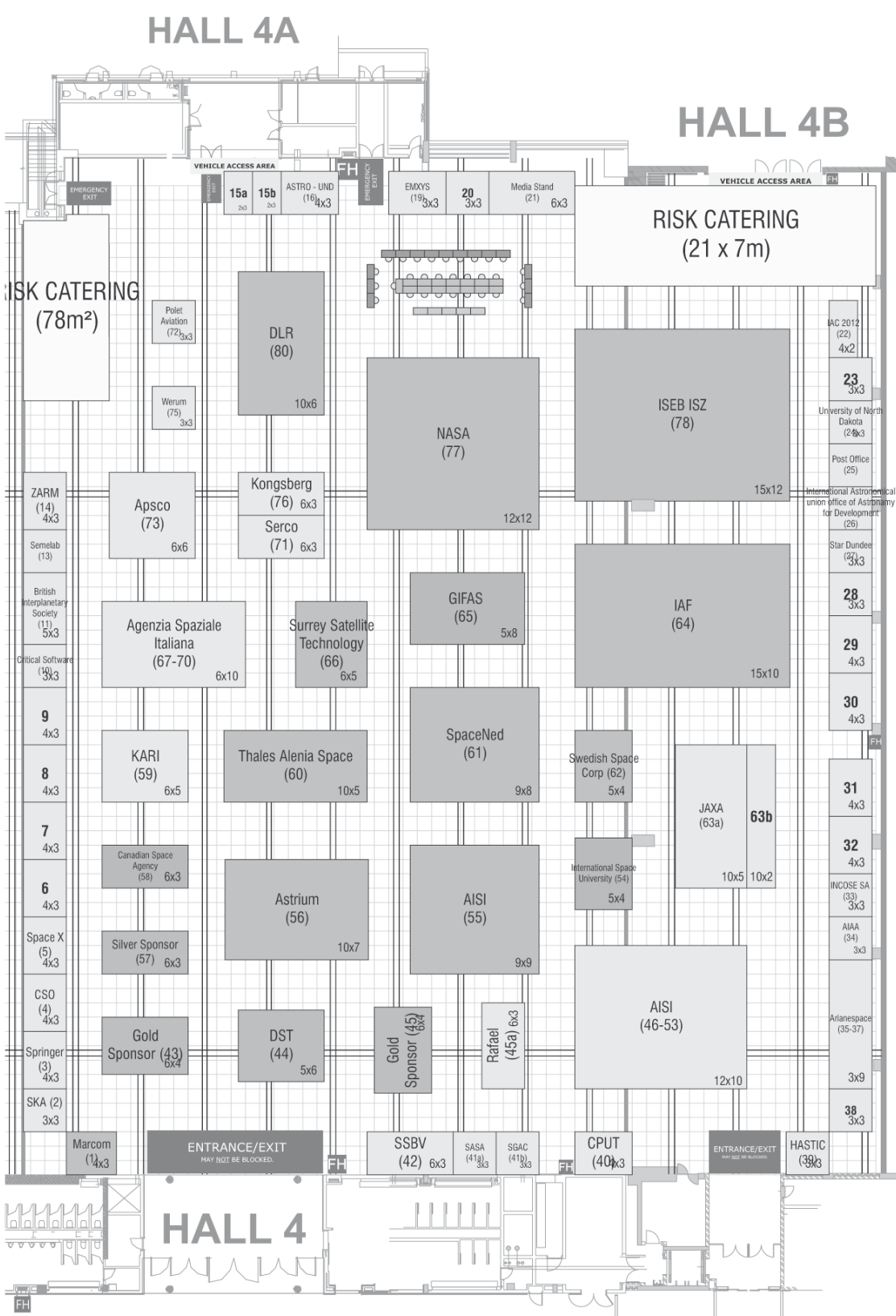
There will be several other outreach activities taking place during the Congress. Some of these are being orchestrated by the Space Generation Advisory Council. Please see www.iac2011.com for details.

6 IAC 2011 Exhibition

6.1 Exhibition Schedule

Stand Set-up:		
Delivery of Exhibits and Stand Construction	Saturday 1 October	15:00 – 23:00
Exhibition Hours:		
	Monday 3 October	12:00 – 21:00
	Tuesday 4 October – Thursday 6 October	10:00 – 18:00
Public Day:	Friday 7 October	10:00 – 17:00
Stand Dismantling:	Friday 7 October	19:00 – 23:30

6.2 Exhibition Hall Layout



6.3 Exhibitor by Stand Number

1	MARCOM Aeronautics & Space (Pty) Ltd	45a	Rafael
2	Square Kilometre Array (SKA)	46-53	Aerospace Industry Support Initiative (AISI)
3	Springer		
4	Czech Space Office (CSO)	54	International Space University
5	SpaceX	54	International Institute of Space Commerce (IISC)
6	Antrix Corporation Ltd./ISRO		
10	Critical Software SA	55	AISI
11-12	UK Space Pavilion	56	Astrium
13	Semelab Limited	58	Canadian Space Agency
14	ZARM Centre for Applied Space Technology & Microgravity	59	Korea Aerospace Research Institute (KARI)
16	Astro-und Feinwerktechnik Adlershof GmbH	60	Thales Alenia Space
19	Emxys	61	SpaceNed
21	Media Stand	62	SSC
24	University of North Dakota-Department of Space Studies	63A	Japan Aerospace Exploration Agency (JAXA)
25	Post Office	64	International Astronautical Federation (IAF)
26	International Astronomical Union Office of Astronomy for Development	65	GIFAS
27	Star Dundee	65	Snecma
33	International Council on Systems Engineering South Africa (INCOSE SA)	65	Onera
34	American Institute of Aeronautics & Astronautics (AIAA)	66	Surrey Satellite Technology Ltd
35-37	Arianespace	67-70	Agenzia Spaziale Italiana (ASI)
38	Space Generation Advisory Council (SGAC)	71	Serco
39	Hokkaido Aerospace Science & Technology Incubation Centre NPO (Hastic)	72	Polet Aviation
40	F'SATI /CPUT	73	Asia Pacific Space Cooperation Organization (APSCO)
41A	South African Space Association (SASA)	75	Werum
42	SSBV	76	Kongsberg Satellite Services AS (KSAT)
44	Department of Science & Technology (DST)	77	National Aeronautics and Space Administration (NASA)
		78	ISEB International Student Zone
		80	German Aerospace Center (DLR)

6.4 Complete Exhibitor list by Company Name

Stand No: 46 - 53	Aerospace Industry Support Initiative (AISI)
<i>Contact: Marie Botha</i>	
Building 23A, Meiring Road, Brummeria Pretoria 0185 South Africa	Tel: +27 (0) 12 841 4947 Fax: +27 (0) 12 822 7 9716 Email: mbotha1@csir.co.za Web: www.aisi.co.za
The Aerospace Industry Support Initiative (AISI) is a fully government funded mechanism which exists to support the local South African aeronautics- space- and defence industries. It is an initiative of the South African Department of Trade and Industry (the dti), managed and hosted by the CSIR.	
The AISI operates with the vision to upgrade, propel and position the South African aerospace industry to be firmly integrated as part of global supply chains, through the collective leadership of Government and industry. The AISI serves to assist the industry by seeding and undertaking focussed development programmes on its behalf.	
Stand No: 67-70	Agenzia Spaziale Italiana (ASI)
<i>Contact: Fabrizio Zucchini</i>	
Viale Liegi, 26 Roma 0198 Italy	Tel: +39 068567 231 Fax: +39 068567 430 Email: fabrizio.zucchini@asi.it Web: www.asi.it
The Italian Space Agency, created in 1988, coordinates Italy's efforts in Space. ASI activities range from space science to Earth observation, telecommunications and navigation, launchers development. Italy is the third contributor to the European Space Agency, and participates in many major scientific missions as well as in the construction and activities of the International Space Station. ASI has developed COSMO-SkyMed, a space based radar system for Earth observation.	
Stand No: 34	American Institute of Aeronautics and Astronautics (AIAA)
<i>Contact: Megan Scheidt</i>	
1801 Alexander Bell Dr Reston, VA 20191-4344 USA	Tel: +1 703 264 3842 Fax: +1 703 264 7551 Email: megans@aiaa.org Web: www.aiaa.org
The American Institute of Aeronautics and Astronautics (AIAA) is the world's largest technical society dedicated to the global aerospace profession. With more than 35,000 individual members and 90 corporate members, AIAA brings together industry, academia, and government to advance engineering and science in aviation, space, and defense.	
AIAA is the principal voice, most knowledgeable information resource, and primary professional publisher for aerospace engineers, scientists, managers, policymakers, students, and educators. AIAA is the resource of choice for stimulating professional accomplishment and standards-driven excellence in all areas of aerospace technology and applications.	
Stand No: 6	Antrix Corporation Ltd./ISRO
<i>Contact: Bala Manikavelu</i>	
ISRO/Antrix Corporation ISRO Headquarters, Antariksh Bhavan, New BEL Road, Bangalore-560 231 India	Web: www.isro.gov.in www.antrix.gov.in
Indian Space Research Organisation (ISRO) has established multipurpose satellite systems, INSAT, for communication and meteorology, and Indian Remote Sensing Satellites System (IRS). It has operationalized PSLV and GSLV for launching satellites in low Earth and polar orbit as well as Geostationary Transfer Orbit (GTO). ISRO has expertise in launch-phase and on-orbit support for spacecraft, remote sensing data reception, processing & application and implementation of SatCom applications like tele-education and telemedicine. Antrix Corporation markets hardware and space services of ISRO.	



Stand No: 73	Asia-Pacific Space Cooperation Organization (APSCO) <i>Contact: Yoyo Gao</i> Building 13 & 14, Section 3 Beijing 100070 China Tel: +86 106 370 2677 ext 610 Fax: +86 106 370 2286 Email: gaoyoyo@apsco.int Web: www.apsco.int
	The Asia-Pacific Space Cooperation Organization (APSCO) is an inter-governmental space organisation with full international juridical personality. APSCO headquarters locates in Beijing, and starts its formal operation in December 2008. APSCO Council is the highest decision-making body of the organisation. Its financial arrangement is depended on the financial contributions from Member States. The main objective of APSCO is to promote the peaceful uses of outer space in Asia-Pacific Region, and to carry out the cooperation in the fields of space science, space technologies, and space application among Member States and regional countries.
Stand No: 35-37	Arianespace <i>Contact: Jacques Denavaut</i> Boulevard de l' Europe, B.P.177-91006 Cedex 91006 France Tel: +33 1 6087 6304 Fax: +33 1 6087 6000 Email: j.denavaut@arianespace.com Web: www.arianespace.com
	Arianespace is the world's leading launch service & solutions company, providing innovation to its customers since 1980. Backed by 21 shareholders and the European Space Agency, Arianespace offers an unrivalled family of launchers, comprising Ariane 5, Soyuz and Vega, and an international workforce renowned for a culture of commitment and excellence. As of 07 August 2011, Arianespace had launched with Ariane launchers a total of 296 payloads, including more than half of all the commercial satellites now in service worldwide. It has a backlog of 18 Ariane 5 and 17 Soyuz launches, equal to more than three years of business.
Stand No: 11 & 12	Ascend Worldwide <i>Contact: Phil Hylands</i> Cardinal Point, Newall Road, Heathrow Airport, London, TW6 2AS Tel: +44 (0) 208 564 6700 Fax: +44 (0) 208 897 0300 Email: space@ascendworldwide.com Web: www.ascendworldwide.com
	Ascend SpaceTrak Database and Space Review Online is used by satellite operators, manufacturers and insurers, launch providers and space agencies. This provides data on the reliability of launch vehicles and commercial satellite buses.
Stand No: 56	Astrium <i>Contact: Ella Legate</i> 6 Rue Laurent, Pichat Paris, Cedex 16 75216 France Tel: +33 1 77 75 8000 Fax: +33 1 77 75 8008 Email: ella.legate@astrium.eads.net Web: www.astrium.eads.net
	One-stop partner for observation and communications satellites and services worldwide. Europe's leading space company, Astrium is a major player in the global space industry with extensive prime contractor experience and an international reputation for excellence in all sectors – satellite systems, payloads, ground systems, terminals and equipment for a vast range of civil and military applications, a wide portfolio of innovative space-based services for Earth observation and telecommunications, a complete range of launch capabilities, orbital systems and manned space activities. With a 2010 turnover of €5 billion and over 15,000 employees, Astrium is part of the EADS aerospace and defence group.

Stand No: 16	Astro-und Feinwerktechnik Adlershof GmbH <i>Contact: Stefanie Sahrawi</i> Albert-Einstein-Str. 12 Berlin 12489 Germany Tel: +49 306 392 1000 Fax: +49 306 392 1002 Email: s.sahrawi@astrofein.com Web: www.astrofein.com
	Small satellite buses (up to 200 kg) and components for small satellites (1 to 400 kg) are the core business activities of Astro- und Feinwerktechnik Adlershof GmbH. In this area we focus on high reliable and smart systems for LEO and deep space applications. We are specialised in attitude control components and subsystems, power subsystem components structures and mechanism and scientific and optical payloads. Additional to that we offer ground support equipment (EGSE, MGSE, OGSE), like transport containers or AOCS test beds. The scope of services comprises the complete environmental qualification of space hardware, according to NASA or ESA standards.
Stand No: 61	Bradford Engineering B.V. <i>Contact: R.(Raoul) G.H.M. Voeten</i> Bradford Engineering De Wijper 26 NL-4726 TG Heerle (N.Br.) The Netherlands Tel: +31165305100 (Switchboard) Fax: +31165304422 Email: r.voeten@bradford-space.com Web: www.bradford-space.com
	Bradford Engineering B.V. (Bradford) is a prominent European developer and manufacturer of satellite attitude and orbit control subsystems (AOCS), propulsion and thermal subsystems and components. The activities are organised in product lines; each of which ranks top positions (first or second) within the European supplier field. The operational base of the company is located in the southwestern part of the Netherlands, near Roosendaal, about in the centre of the triangle Rotterdam, Breda and Antwerp. Thus, there is excellent connectivity and accessibility for customers and suppliers.
Stand No: 58	Canadian Space Agency <i>Contact: Nellie Lapointe</i> 6767 Route de l' Aéroport, Longueil Saint-Huber, Québec J3Y 8Y9 Canada Tel: +1 450 926 4452 Fax: +1 450 926 4352 Email: nellie.lapointe@asc.gc.ca Web: www.asc-csa.gc.ca
	Established in 1989, the Canadian Space Agency (CSA) conducts its activities through three key business lines: Space Utilisation: serving the needs of Government Departments; Space Exploration: positioning Canadian Science and Technology to advantage in future international space exploration missions; and, Space Science and Technology: which drives synergy and builds capacity in Academia, Industry and Government to respond to the current and future needs of Canada's Space Program. By leveraging international cooperation, the CSA generates world-class scientific research and industrial development for the benefit of humanity. Learn more about us by visiting our booth or: www.asc-csa.gc.ca





Stand No: 11 & 12 Commercial Space Technologies Ltd

Contact: **Mali Perera**

67 Shakespeare Rd. Hanwell,
London,
W7 1LU,
UK

Tel: +44 (0)20 8840 1082 (UK)
Fax: +44 (0)20 8840 7776 (UK)
Web: www.commercialspace.co.uk

Supplies services and support to the space industry in the form of launch solutions, market analysis, trading specialised components, new techniques for resource prospecting; the assessment of new technologies and the economics and strategies of their deployment.

Customers in Africa will be interested that:

- i) The new remote sensing resource prospecting techniques from satellite imaging have already shown positive results.
- ii) Uses its UK and Russian experts to supply detailed assessments of all space programmes worldwide.
- iii) In the last 2 years CST has brokered and managed the launches of Sumbandila Sat and NigeriaSat-2 and NigeriaSat-X.

Stand No: 10 Critical Software

Contact: **Bruno Carvalho**

Parque Industrial de Taveiro,
Lote 48
Coimbra
3045-504
Portugal

Tel: +351 239 989 100
Fax: +351 239 989 119
Email: bjcarvalho@criticalsoftware.com
Web: www.criticalsoftware.com

Critical Software is a recognised systems and software solutions provider for the aerospace & defense industry, building on a solid track record with its in-depth knowledge and experience in safety critical airborne embedded systems (up to DO-254/DO-178B Level A), Integrated Logistics Support systems and Independent Software Verification & Validation. Critical Software has placed enormous emphasis on quality assurance. The company recently achieved the highest certification level for the demanding Capability Maturity Model Integration (CMMI) process.

Stand No: 4 Czech Space Office

Contact: **Jiri M. Fuchs**

Prvniho pluku 17, Praha 8
Praha 8
18600
Czech Republic

Tel: +420 224 918 288
Email: jiri.m.fuchs@czechspace.cz
Web: www.czechspace.cz

The Czech Space Office (CSO) was founded in November 2003 as a private non-profit organisation, when the Czech Republic became ESA's cooperating state. The CSO provides support to Czech science, education, R&D and business sectors and serves as first contact point towards the international space community. The CSO carries out a broad range of activities at national as well as international level e.g. - consulting, networking, and planning. It also represents the Czech Republic at international events and in various European space organisations, especially at Boards of European Space Agency, ESA. The CSO hosted IAC 2010 in Prague.

Stand No: 61 Delft Institute of Microsystems and Nano Electronics - DIMES

Contact: **ir.dr. Chris Verhoeven**

Mekelweg 4
NL-2628 CD DELFT
The Netherlands

Tel: +31152786482
Mobile: +31626142098
Fax: +31152785922
Email: c.j.m.verhoeven@tudelft.nl

The DIMES mission is to be an international center of excellence, dedicated to promoting research and education in Microsystems and Nano electronics to enable extreme miniaturisation of both space-based and terrestrial systems.

Stand No: 44 Department of Science & Technology (DST)

Contact: **Itumeleng Makoloi**

CSIR Campus, Building 53
Pretoria
0184
South Africa

Tel: +27 (0) 12 843 6454
Fax: +27 (0) 86 680 6454
Email: itumeleng.makoloi@dst.gov.za
Web: www.dst.gov.za

The Department of Science and Technology (DST) strives toward leveraging space science and technology for socio-economic and sustainable development in South Africa. The strategic intent is for space science and technology to deliver on the wide spectrum of our national priorities including job creation, poverty reduction, resource management, rural development and improved service delivery. This will be ensured by meeting user requirements through a suite of space related technology platforms.

Stand No: 80 German Aerospace Center (DLR)

Contact: **Klaus Gering**

Linder Hohe
51147
Germany

Tel: +49 2203 601 2321
Fax: +49 2203 601 3249
Email: klaus.gering@dlr.de
Web: www.dlr.de

DLR is Germany's national research centre for aeronautics and space.

Stand No: 61 Dutch Space

Contact: **Hella van Leeuwen (In- & External Communications)**

Dutch Space B.V.
Mendelweg 30
NL-2333 CS Leiden
The Netherlands

Tel: +31715245126
Fax: +31715245388
Email: info@dutchspace.nl
Web: www.dutchspace.nl

Dutch Space, an Astrium subsidiary and leading space company in the Netherlands, is supplier of subsystems and products for the international space industry. Over the last thirty years the company has built up comprehensive expertise and a set of renowned services and products in segments like earth observation, telecommunication and space science. The portfolio of Dutch Space comprises Solar Arrays, Launcher Structures, Instruments, Descent & Landing and Verification & Simulation.

Stand No: 19 Emxys

Contact: **Fransico Garcia-de-Quiros**

UMH Science & Business Park, Avda.de la
Universidad S/N
Elche
3202
Spain

Tel: +34 63 963 8535
Fax: +34 96 545 4784
Email: fgarciaq@emxys.com
Web: www.emxys.com

EMXYS (Embedded Instruments and Systems S.L.) is a company focused in the design, development and manufacturing of instrumentation, data acquisition and control systems for Spaceflight applications.

EMXYS has a strong heritage in developing advanced electronic systems for Space sector, and also for demanding ground markets like scientific research, biomedical, Defence and industrial automation and control, providing high-reliability solutions and a flexible interface to customers.

Thanks to such background, EMXYS is the perfect partner to reach Space. EMXYS provides specific Orbital and Suborbital flight opportunities for Science and Technology demonstration, enabling a seamless access to Space to research centres and companies.



Stand No: 40	F¹ SATI /CPUT <i>Contact: Ian Van Zyl</i> Cape Peninsula University of Technology, Department of Electrical Engineering Bellville 7530 South Africa F ¹ SATI is a graduate school in electronic and electrical engineering, with particular focus on Satellite Systems Engineering using the CubeSat platform. The institute is a broad collaborative venture among national and international bodies, including Cape Peninsula University, Tshwane University of Technology, ESIEE Paris, the Paris Chamber of Commerce and Industry, the Department of Science and Technology and the National Research Foundation. The South African National Space Agency's Space Science Directorate is the key technology partner. F ¹ SATI develops human capacity in space sciences and also ensures science and technology advancement through an active schools and community engagement programme.
Stand No: 65	GIFAS <i>Contact: Jacqueline Bomer</i> 8, Rue Galilee 75016 PARIS France The first predecessor of GIFAS was founded in 1908. GIFAS, the French aerospace industries association, has 292 members, from major prime contractors and system suppliers to small specialist companies. They cover the full spectrum of skills from the design, development and production of aerospace systems and equipment to maintenance and operation. Activities extend from civil and military aircraft and helicopters to engines, missiles, spacecraft and launch vehicles, plus major systems, equipment, subassemblies, associated software, defense and security electronics systems. The present GIFAS chairman is Mr Jean-Paul Herteman, Chairman of the Safran group. The GIFAS managing director is Mr Guy Rupied.
Stand No: 39	Hokkaido Aerospace Science & Technology Incubation Centre NPO (Hastic) <i>Contact: Ito</i> Room 301, 1-23, Kita 10, Nishi4, Kita-ku Sapporo 100-001 Japan HASTIC strives to realise the goal of going into space from Hokkaido, by utilising locally developed ideas and technologies; the development of small hybrid rockets, short duration microgravity facilities, small-scale supersonic unmanned airplane and micro-sized satellites. As one of promotion activities HASTIC plans to set up the Hokkaido Aerospace Flight Center at Taiki in Hokkaido.
Stand No: 64	International Astronautical Federation (IAF) <i>Contact: Philippe Moreels</i> 94bis Avenue de Suffren Paris 75015 France Founded in 1951, the International Astronautical Federation is the world's leading space advocacy body with more than 200 members on six continents, associations and institutes worldwide. Following its theme "A space-faring world for the benefit of humanity", the Federation advances knowledge about space, fostering the developments and application of space assets by advancing global cooperation. As co-organiser of the annual International Astronautical Congress (IAC), and other meetings on specific subjects, the IAF actively encourages the development of astronautics for peaceful purposes and supports the dissemination of scientific and technical information related to space.

Stand No: 33	International Council on Systems Engineering South Africa (INCOSE SA) <i>Contact: Alwyn Smit</i> 11 Jan Cellars Street, Stellenbosch 7600 South Africa Tel: +27 (0) 21 888 2664 Fax: +27 (0) 21 888 2680 Email: asmit@csir.co.za Web: www.csir.co.za <i>Our systems engineers are building the future.</i> The International Council on Systems Engineering is the premier international organisation for systems engineering professionals <ul style="list-style-type: none"> • Network with over 8,000 members in 50 countries • Advance your career with professional systems engineering certification • Online access to INCOSE publications, papers and products • Collaborate internationally on best practices, technology and standards • Annual International Symposium: http://www.incose.org/symp2012 To become part of a vibrant, systems engineering community visit www.incose.org . Instantly read abstracts from the Systems Engineering Journal http://www3.interscience.wiley.com/journal/39084/home
Stand No: 26	International Astronomical Union Office of Astronomy for Development <i>Contact: Kevin Govender</i> SAAO Observatory Rd, Observatory Cape Town 7925 South Africa Tel: +27 (0) 21 460 6297 Fax: +27 (0) 21 447 3639 Email: kg@astro4dev.org Web: www.astronomyfordevelopment.org The International Astronomical Union (IAU) Office of Astronomy for Development (OAD) was opened in April 2011 and sets out to realise the IAU strategic plan entitled "Astronomy for the Developing World." It aims to use astronomy as a tool for development, with a focus on three particular areas: (i) university education and research; (ii) young children and school education; and (iii) public understanding of science and technology. In order to ensure maximum developmental impact the OAD will establish regional coordinating nodes across the world, with three global task forces for each respective area of development.
Stand No: 54	International Space University <i>Contact: Caroline Schwob</i> 1Rue Jean-Dominique Cassini Illkirch 67400 France Tel: +33 3 88 65 54 30 / 54 55 Fax: +33 3 88 65 54 47 Email: schwob@isu.isunet.edu Web: www.isunet.edu ISU offers unique, international and interdisciplinary education programs covering all aspects of space : space science, space engineering, systems engineering, space policy, law, business, management, and space and society. <ul style="list-style-type: none"> • Executive MBA • M.Sc. in Space Studies • M.Sc. in Space Management • Executive Space Course • Space Studies Program • Southern Hemisphere – Space Program in collaboration with University of South Australia • Space System Engineering courses in collaboration with Stevens University



Stand No: 54	International Institute of Space Commerce (IISC) <i>Contact: Geraldine Moser for IISC</i> International Business School The Nunnery Old Castletown Road Douglas IM2 1QB Isle of Man The International Institute of Space Commerce is a Not for Profit Foundation established on the Isle of Man through a partnership between the International Space University (ISU) and the Manx Government. The Institute acts as a resource for all, being an international and non-partisan think-tank drawing upon new ideas and solutions to existing and future problems the space industry faces by drawing together experts from academia, government, the media, business, international and non-governmental organisations.
Stand No: 78	ISEB International Student Zone <i>Contact: Leland Melvin, Associate Administrator for Education</i> <i>Mabel J. Matthews, Higher Education Manager</i> NASA Headquarters 300 E Street SW Washington, DC 20546 United States The International Space Education Board (ISEB) is a voluntary membership board with the leadership rotating to a new member each year. Its goals are to increase science, technology, engineering and mathematics literacy achievement in connection with space, and support the future workforce needs of space programmes. The board was founded in 2005 by four civil space agencies: National Aeronautics Space Administration (NASA), the Canadian Space Agency (CSA), European Space Agency (ESA), and Japan Aerospace Exploration Agency (JAXA). Membership was expanded to include the Centre National d'Etudes Spatiales (CNES) in 2006 and Australia's Victorian Space Science Education Centre (VSSEC) as an Associate Member in 2009. This year, NASA took the leadership role and is the host for ISEB activities. The International Student Zone is sponsored by the ISEB. ISEB International Student Zone The International Student Zone is the focal point of student activity, providing a venue for students to meet and interact with fellow students, young space professionals, and senior space agency representatives and to make informal presentations and display their posters. All students and young professionals are encouraged to visit the International Student Zone each day.
Stand No: 61	ISIS – Innovative Solutions In Space <i>Contact: Abe Bonnema – Marketing Director</i> ISIS – Innovative Solutions In Space Molengraaffsingel 12-14 NL-2629 JD DELFT The Netherlands Tel: +31152569018 Fax: +31152573969 Email: info@isispace.nl Web: www.isispace.nl www.isilaunch.com www.cubesatshop.com www.innovativedataservices.com ISIS is a leading provider of nanosatellite systems, ground stations, launch services and turn key solutions from the Netherlands. The company sells and markets products from numerous component suppliers through CubeSatShop.com and uses its experienced team of 30+ engineers to deliver turnkey nanosatellite missions to customers all over the world, which include launch solutions on regular intervals and to various orbits for 2012, 2013 and onwards. As of 2012, satellite-AIS data for monitoring vessel traffic on the oceans will become available through ISIS' subsidiary IDS based on the use of multiple of its nanosatellites equipped with an in-house developed advanced AIS-receiver.

Stand No: 63a	Japan Aerospace Exploration Agency (JAXA) <i>Contact: Eiichi Isayama</i> 1-5 Marunouchi, Chiyoda-ku Tokyo 100-8262 Japan With the aim of contributing to the peace and happiness of all living creatures on Earth, JAXA has been pursuing the possibilities of aerospace technologies and challenging their research and development. In current space development activities performed with the partnership of all the nations involved, Japan's role is expanding and receiving substantial expectations from those participating nations. We operate satellites that have a variety of missions, ranging from Earth observation to planetary exploration, as well as development of rockets that are at the world's topmost level. Transfer vehicles carrying the materials indispensable for manned space activities from the ground to International Space Station (ISS). JAXA astronauts engage in the long-term mission in space aboard the ISS. Aviation technology to make the skies safer and more comfortable, and maintain aerospace activities now and in the future. Research and development for the future aerospace activities. JAXA will continue to challenge to the skies and space to create prosperous opportunities for the future of the Earth.
Stand No: 76	Kongsberg Satellite Services AS (KSAT) <i>Contact: Ellen Wiggen</i> P. O. Box 6180, Tromsø 9291 Norway Tel: +47 9509 5039 Fax: +47 7760 0299 Email: ellen@ksat.no Web: www.ksat.no A commercial Norwegian company, KSAT is a world leading provider of satellite ground station services and satellite based maritime monitoring services. KSAT provides services such as: TT&C, LEOP, Data acquisition and processing, hosting and operation of CFE, Near-real time global Maritime monitoring and Multi-mission Rapid Response. KSAT owns and operates a global cost-effective multi-mission Ground Station Network of both polar and mid-latitude stations. The three polar ground stations are located in Tromsø at 69°N, Svalbard Satellite Station (SvalSat) at 78°N and the Antarctic station (TroilSat) at 72°S.
Stand No: 59	Korea Aerospace Research Institute (KARI) <i>Contact: Mr Ok-Kyu Lee</i> 115 Gwahakno, 45, Yuseong-gu Deajeon 305-333 Republic of Korea Tel: +82 42 860 2174, 2164 Fax: +82 42 860 2015 Email: oklee@kari.re.kr Web: www.kari.re.kr KARI is the leading organisation for aerospace R&D in Korea. KARI's R&D activities include the development of aircraft, satellite, launch vehicles and the quality certification of aircraft and space system. COMS was launched by the Ariane-5 in June, 2010 and its data are being successfully utilised for meteorological and ocean monitoring. KARI will respectively launch KOMPSAT-5 with a 1 meter resolution SAR in 2011 and KOMPSAT-3 with the Advance Earth Imaging System which has a resolution of 0.7 meters in 2012. The aforementioned programmes will contribute to advancing satellite earth observation technology and to the worldwide efforts in disaster monitoring.
Stand No: 1	MARCOM Aeronautics & Space (Pty) Ltd <i>Contact: Mark Comninos</i> Unit 3, Dunkeld Place, 11 Kent Road Dunkeld West 2196 South Africa Tel: +27 (0) 84 627 2661 Fax: +27 (0) 86 614 4414 Email: mark@marcom-as.com Web: www.marcom-as.com MARCOM Aeronautics & Space is a small, innovative high-technology company providing research, development and testing of cost effective and enabling aerospace technologies for the international space industry. MARCOM's current focus is the development of the CHEETAH-1 CSLV, an expendable, two-stage, liquid fueled, commercial satellite launch vehicle, capable of delivering small and medium sized payloads to low-Earth inclined, polar and sun-synchronous orbits. MARCOM's primary objective is the provision of reliable, cost-effective, local and global space transportation services to the burgeoning commercial space industry.



Stand No: 77	National Aeronautics and Space Administration (NASA) <i>Contact: Todd Cannon</i> <div> <div>Schofer Corp for Nasa,MSFC CS20, Bldg 4200 102-1 Huntsville AL 35812 USA</div> <div> Tel: +1 256 544 3939 Fax: +1 256 544 0001 Email: todd.cannon@nasa.gov Web: www.nasa.gov </div> </div> <p>NASA salutes the thousands who made the shuttle program successful on the ground and in space. NASA's pathway forward speeds development of technology trekking deeper into space and anticipates travel to destinations including asteroids, our Moon, moons of Mars, eventually Mars itself. NASA expects private sector resources to continue taking Americans to International Space Station. COTS, (Commercial Orbital Transportation Services) and Commercial Crew - Cargo Program provide routine United States access to low Earth orbit and ISS. ISS is to drive US human spaceflight activities.</p> <p>Research and technology breakthroughs aboard ISS will facilitate travel to destinations beyond low Earth orbit.</p>
Stand No: 61	National Aerospace Laboratory - NLR <i>Contact: Bas van der Peet, Manager Marketing</i> <div> <div>National Aerospace Laboratory - NLR Anthony Fokkerweg 2 NL-1059 CM Amsterdam The Netherlands</div> <div> Tel: +31885114746 Email: peet@nlr.nl Web: www.nlr.nl </div> </div> <p>NLR, an independent technological institute, performs research to develop new technologies for aviation and space, not only from a scientific perspective, but also for the application of this research in industrial and governmental sectors.</p>
Stand No: 61	Netherlands Space Office <i>Contact: Jasper Wamsteker</i> <div> <div>Netherlands Space Office PO box 93144 NL-2509 AC The Hague The Netherlands</div> <div> Tel: +31886024500 Mobile: +31652525914 Email: j.wamsteker@spaceoffice.nl Web: www.spaceoffice.nl </div> </div> <p>Netherlands Space Office (NSO) is the space agency of the Dutch government. The NSO develops and executes the Dutch space policy.</p>
Stand No: 65	Onera <i>Contact: Miranda Musialek</i> <div> <div>Chemin de la Hunière BP 80100 FR-91123 Palaiseau Cedex</div> <div> Tel: +33 1 80 38 60 60 Fax: +33 1 80 38 65 10 Web: www.onera.fr </div> </div> <p>Onera, First Aerospace Research Player in France</p> <p>Onera is the French national aerospace research center, with eight facilities in France and 2,000 employees, including 1,500 scientists.</p> <p>key missions:</p> <ul style="list-style-type: none"> • conduct aeronautical research • operate the experimental facilities • Supply industry with high-level technical analyses. • Perform technical analyses for the government • Perform scientific training • Support industry for business applications <p>Application-Oriented Research</p> <p>ONERA's computation codes, methods, tools, technologies, products ,services and systems studies have a large range of applications :</p> <ul style="list-style-type: none"> • Civil and military aircraft • Helicopters and tiltrotors • Propulsion systems • Space applications • Defense applications

Stand No: 72	Polet Aviation <i>Contact: Oleg Sokolov</i> <div> <div>32a Khoroshevskoye Moscow 123007 Russia</div> <div> Tel: +7 495 6453578 Fax: +7 495 6453582 Email: sokolov@airlaunch.ru Web: www.polet.ru </div> </div> <p>The Russian "Polet" Aviation Company has a fleet of heavy cargo airplanes including the Antonov An-124s with payload capability of 100 tons. The company is providing deliveries of spacecraft to various launch sites. The "Polet's" daughter company, "Air Launch" Aerospace Corporation is developing the "Air Launch" launching system in which the "Polet" launch vehicle will be launched in air from the An-124 carrier airplane. This system would launch up to 3.5 tons of payload into LEOs and up to 1.8 ton into GTOs from near-equatorial areas.</p>
Stand No: 45a	Rafael <i>Contact: Sofi Vinas</i> <div> <div>P. O. Box 2250 Haifa 31021 Israel</div> <div> Tel: +972 4 8793047 Fax: +972 4 8791216 Email: sofiv@rafael.co.il Web: www.rafael.co.il </div> </div> <p>Rafael designs, develops, manufactures and supplies a wide range of advanced systems. These leading edge products include space propulsion products, micro-satellites, naval, air and ground precision systems, electro-optic systems, exploitation systems, Command, Control, Communications and Intelligence. Rafael's space activities are focused on: Space propulsion, Composite materials and Micro-satellite technologies. The company has presently in orbit propulsion modules or components in over thirty satellites. Rafael has gained extensive experience with customers worldwide, in developing, qualifying and producing propulsion systems based on solid rocket motors, cold gas, hydrazine and electrical propulsion for space application.</p>
Stand No: 11 & 12	Reaction Engines Ltd <i>Contact: Mark Hemsell</i> <div> <div>D5, Culham Science Centre, Abingdon, Oxon, OX14 3DB, UK</div> <div> Tel: +44 (0)1865 408314 Web: www.reactionengines.co.uk </div> </div> <p>Reaction Engines Ltd (REL) is an 85% privately funded UK company which has received significant support from the UKSA and ESA towards designing and building the enabling technologies for the SKYLON spaceplane, and the SABRE (Synergetic Air-Breathing Rocket Engine) propulsion system.</p> <p>SKYLON is an unpowered spaceplane that will be capable of runway take-off and landing, with a turnaround time of 2 days in mature operation. It will reduce the cost of space access significantly, allowing SKYLON to be operated on a profitable basis. This is because of the SABRE engine technologies being developed at Reaction Engines Ltd.</p>
Stand No: 13	Semelab Limited <i>Contact: Andrew Langford</i> <div> <div>Coventry Road Lutterworth, Leicestershire LE17 4JB UK</div> <div> Tel: +44 1455 552505 Fax: +44 (0) 14555 52612 Email: andrew.langford@semelab-tt.com Web: www.semelab-tt.com </div> </div> <p>Semelab Ltd is a lead player of TT Electronics, Power and Hybrid Business unit.</p> <p>We offer high reliability solutions for demanding environmental applications. Semelab has worked in the Space arena for over 30 years' supplying small signal & power devices.</p> <p>Our unique MCA technology offers a low cost small minimum volume solution for today's Geostationary and Nano satellites. They have gain 100K's hours of flight heritage and are presently being used in many prestigious Space constellations</p> <p>Our sister companies can offer fully custom Hybrids, Opto couplers and Isolators, and Passives Semelab is rarely restricted by ITAR export restriction.</p>



Stand No: 71	Serco <i>Contact: Giuseppe Spoliti</i> C/o Serco Spa, via Sciadonna 24-26 Frascati (Rome) 00044 Italy Tel: +39 069835440 0 Fax: +39 069419 426 Email: giuseppe.spoliti@serco.com Web: www.serco.com/space Serco is a global management and service company with over 35 years experience in the Space Business. We are one of the top 50 World Space Manufacturing and Service companies, and currently employ over 1500 specialist staff in Space related business across Europe, the Middle East and North America. Serco provides operational and engineering support worldwide across: <ul style="list-style-type: none"> • International organisations • Government Agencies • Defense • Aerospace Industry • End User Support Businesses Our track record in a wide range of market sectors and geographies allows us to share best practice, expertise and innovation in the business solutions we propose today.
Stand No: 65	Snecma (Safran Group) <i>Contact: Agnès Grangeat</i> 10 Allée du Brévent CE 1420 Courcouronnes 91019 EVRY Cedex France Tel: +33 (0)1 60 59 41 31 Snecma (Safran group, France) is one of the world's leading manufacturers of aircraft and rocket engines, with a wide range of propulsion systems on offer. The company designs, develops, produces, markets and services commercial aircraft engines – the CFM56* world's leader – along with military aircraft engines that have always delivered world-class performance. Snecma also develops and produces propulsion systems and equipment for launch vehicles (particularly the cryogenic propulsion systems for Ariane 5) and satellites (plasma propulsion systems). * CFM56 engines are produced and marketed by CFM International, a 50/50 joint company between Snecma (Safran group) and GE (U.S.A.).
Stand No: 41a	South African Space Association (SASA) <i>Contact: Carla Sharpe</i> P.O Box 624 Greenpoint 8051 South Africa Tel: SA +27 731 469504 Tel: UK +44 726 42540 Email: info@spacesa.org Web: www.spacesa.org The South African Space Association provides a forum for space professionals to interact and exchange ideas, it is a membership-based professional association. It is leading platform for industry, academia and civil society to engage in the South African space arena incorporating education, research, space awareness, policy, science and technology issues.
Stand No: 38	Space Generation Advisory Council (SGAC) <i>Contact: Ariane Cornell</i> C/o ESPI Schwarzenbergplatz Vienna A-1030 Austria Tel: +43 1 718 11 18 30 Fax: +43 1 718 11 18 99 Email: ariane.cornell@spacegeneration.org Web: www.spacegeneration.org The Space Generation Advisory Council in support of the United Nations Program on Space Application (SGAC) is a non-governmental organisation and professional network that aims to represent university students and young space professionals to the United Nations, space agencies, industry, and academia. SGAC currently has 4000 members in over 100 countries. Our focus is on pragmatic space policy advice based on the interests of the next generation of global space sector leaders broadly in the age range 18-35.

Stand No: 61	SpaceNed <i>Contact: Geert Mennenga</i> P. O. Box 277 2200 AG Noordwijk The Netherlands Tel: +31 71 524 5120 Fax: +31 71 524 5388 Email: info@spacened.nl Web: www.spacened.nl SpaceNed is the Association of Space companies in The Netherlands, rebranded from NISO in 2009. The objective of SpaceNed is to strengthen the position of its members in the international space market. SpaceNed interconnects almost all Dutch companies active in space, together with research institutes and universities, active in both the downstream and upstream space markets. SpaceNed represents its members in communication with the Dutch Government, through the Netherlands Space Office, in creating a well aligned strategy for space in The Netherlands, and realisation thereof.
Stand No: 5	SpaceX <i>Contact: Jessica Taylor</i> 1 Rocket Road Hawthorne CA 90250 United States Tel: +310 363 6433 Fax: +310 363 6001 Email: essica.taylor@spacex.com Web: www.spacex.com SpaceX is a leading commercial launch services provider, delivering a family of launch vehicles and spacecraft that increase the reliability and reduce the cost of both manned and unmanned space transportation—ultimately by a factor of ten. SpaceX's Falcon 9 launch vehicle delivered back-to-back successes with its first two debut launches. In addition, SpaceX's first flight of an operational Dragon spacecraft made history, marking the first time a commercial company successfully reentered and recovered a spacecraft from Earth orbit. Founded in 2002 by Elon Musk, SpaceX is a privately owned company with over 1,500 employees. For more information, visit SpaceX.com.
Stand No: 3	Springer <i>Contact: Caroline Rudnicki</i> Tiergartenstrasse 17 Heidelberg 69121 Germany Tel: +49 6221 487 8993 Fax: +49 6221 487 68993 Email: carolin.rudnicki@springer.com Web: www.springer.com Enjoy 20% discount on Springer's world-leading books on Space Exploration & Astronautics! Our portfolio includes the new books "Russian Space Probes" and "Apollo 12 - On the Ocean of Storms" and leading journals such as <i>Space Science Reviews</i> . Come and browse our highlights and find out about our eBooks, journals, and new initiatives. Or talk to our Publishing Editor Maury Solomon about the publication of your research.
Stand No: 2	Square Kilometre Array (SKA) <i>Contact: Lynley Merrington</i> 17 Baker St, Rosebank 2196 JHB South Africa Tel: +27 (0) 11 442 2434 / +27 (0) 21 506 7300 Fax: +27 (0) 11 442 2454 Email: lynleymerrington@gmail.com Web: www.ska.ac.za The South African Square Kilometre Array Project encompasses the country's bid to host the SKA (in partnership with eight African countries); the building of a cutting-edge 64-dish SKA pathfinder telescope – MeerKAT; and developing skills in astrophysics and engineering in South Africa and across the continent to build and operate these mega telescopes. A seven-dish engineering prototype – KAT-7 – is already complete in the remote Karoo region of South Africa's Northern Cape Province. The project head office is in Johannesburg, while the MeerKAT engineering office, laboratories and telescope control room are in Cape Town. Find out more at www.ska.ac.za.



Stand No: 61 SRON Netherlands Institute for Space Research

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SRONs mission is to conceive and develop world-class innovative space instruments for astrophysical and earth-oriented research, and to analyze the data provided by these instruments for advanced research. As the national institute for space research SRON promotes, coordinates and supports Dutch activities in space research and advises the Dutch government on participation in international space research programs, in particular those of ESA.

SRONs research programme is based on the close interaction between the scientific challenges in specific areas, the technological and scientific expertise and the ability to develop, build and deliver instrumentation that meets the specifications for operations in space. It is this combination that has rendered the institute a leading position in the international space research arena.

Stand No: 42 SSBV

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SSBV Aerospace & Technology Group

SSBV, established in 1985, is a technology driven organisation, active in: (aero)Space, Remote Sensing & Monitoring, Defense & Security and the development of High-Tech Systems. Based on in-house technology, engineering skills and long-lasting partnerships, SSBV is able to provide system, subsystem and unit/product level solutions for Ground and Space based applications and services.

These range from the provision of ground based systems for simulation, test and communication to the provision of smallsat subsystems, sensors and involvement in small satellite platforms. Through internally available systems, infrastructure and experience, ground-based and airborne services are provided. Please explore www.ssbv.com for further information.

Stand No: 62 SSC

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The SSC Group – formerly the Swedish Space Corporation – comprises several specialised companies such as SSC, NanoSpace, ECAPS, LSE Space and the Universal Space Network. Our activities cover many business areas and are built on decades of experience. The SSC Group offers proven expertise in the development of satellite subsystems as well as in satellite communication and operations. We develop rocket systems, experiment payloads and airborne maritime surveillance systems. We launch sounding rockets and high-altitude balloons, and provide flight test services for air and space vehicles.

Stand No: 27 Star Dundee

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STAR-Dundee Ltd specialises in supporting users and developers of SpaceWire, a standard for data communications onboard satellites and spacecraft. SpaceWire has emerged as one of the main spacecraft data-handling networks and is used on many ESA, NASA and JAXA spacecraft and by research organisations and space industry worldwide. SpaceWire's speed, simplicity, flexibility and interoperability have contributed to its popularity.

STAR-Dundee Ltd provides the largest product line of SpaceWire test and development equipment of any manufacturer, enabling the development, simulation and testing of SpaceWire networks and devices, along with industry-leading flight IP cores, chip designs, design services, consultancy and training.

Stand No: 66 Surrey Satellite Technology Ltd

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More than 25 years of space innovation, taking a unique approach to the design, build, launch and operation of satellites, has propelled SSTL to the forefront of the small satellite industry. SSTL has delivered 36 satellites to international customers, increasing to more than 40 within the next half year. We continue to push the boundaries of space, exploiting advances in technologies and challenging conventions, to bring affordable space exploration to our customers.

SSTL delivers complete mission solutions for remote sensing, science, navigation and telecommunications as well as supplying avionics suites, subsystems and ground infrastructure. Our vertically integrated projects allow us to deliver to short schedules and within tight budgets.

Stand No: 61 SystematIC Design

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SystematIC design is a design house for analog and mixed mode ASICs and electronics since 1998. Services range from feasibility studies up to complete designs. SystematIC design has a long track record of successful projects (over 100 projects since 1998), including space projects.

SystematIC design has customers in the space segment but also in the automotive, industrial, medical and consumer industry. Key subjects are sensor readout and power conversion.

Customers of SystematIC design are located worldwide. Support in ASIC and PCB production, testing and packaging can also be offered as a service.

Stand No: 60 Thales Alenia Space

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European leader in satellite systems and a major player in orbital infrastructures, Thales Alenia Space is a joint venture between Thales (67%) and Finmeccanica (33%). Thales Alenia Space and Telespazio embody the two groups' "Space Alliance". Thales Alenia Space sets the global standard in solutions for space telecoms, radar and optical Earth observation, defense and security, navigation and science. The company, which achieved revenues of Euro 2 billion in 2010, has a total of 7,200 employees located in 10 industrial sites in France, Italy, Spain, Germany and Belgium.



Stand No: 11 & 12 The British Interplanetary Society (BIS)

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Stand No: 61 Delft University of Technology (TU Delft)

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TU Delft is the largest and most all-round university of technology in the Netherlands. Its faculty of Aerospace Engineering is the largest in Western Europe. With its fully English taught programme, it attracts many international students which contribute more than 30% to the student body. The faculty covers almost all areas of aerospace engineering both with expertise and laboratory equipment. Space Engineering is renowned among others for its achievements in orbital dynamics and the development of extremely miniaturized spacecraft and spacecraft systems.

Stand No: 61 TNO

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TNO delivers breakthrough technology for space instruments and ground-based astronomy to enhance the quality of life on Earth and to search for the origin of life. We develop instruments with unparalleled creativity that deliver world-class performance. Innovation beyond Earth.

Dozens of satellites are equipped with systems that have been designed, built and tested by TNO. Our technology ranges from spectrometers for Earth observation to opto-mechanical instruments and other high-tech space components.



Stand No: 24 University of North Dakota-Department of Space Studies

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The Department of Space Studies, John D. Odegard School of Aerospace Sciences, University of North Dakota, offers a premier online and campus based graduate programme in the field of space studies. The Space Studies Master of Science degree offered since 1987 is a leading inter-disciplinary programme in the world, combining space physical science, space life science, space engineering, space policy and law, space business and economics, and space history. The popular online program is ideally suited for early and mid-level space professionals who wish to enhance their career opportunities in the space arena. A PhD programme is under consideration.

Stand No: 75 Werum

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Werum Software & Systems develops standard software products and implements complete software systems. The Germany-based company provides amongst others DIMS-EO, the Data Information and Management System for Earth Observation, which offers comprehensive functions for long-term archiving, the generation of products based on primary data received from satellites as well as the administration, delivery and invoicing for these products including online user services. Werum's platform HyperTest manages measurement data and most diverse information about test beds, test results with test procedures and units under test. Founded in 1969, Werum currently employs 400plus people in Germany, France, Singapore, Japan and the USA.

Stand No: 14 ZARM Centre for Applied Space Technology & Microgravity

Contact: **Christine Steinseifer-Jeshe**

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Web: www.zarm.uni-bremen.de

The Center of Applied Space Technology and Microgravity (ZARM) is a research center mainly concentrated on the investigation of phenomena under conditions of weightlessness and questions related to space technology.

The main laboratory is the 146m high drop tower, which offers the opportunity for short-term experiments under high-quality microgravity conditions. The ZARM Drop Tower Operation and Service Company (ZARM FAB mbH) was established in 1990 along with the start of operation of the Drop Tower Bremen. Since 1997 the ZARM Technik AG is offers space technology products and scientific and technical services.

Stand No: 11 & 12 4Links Limited

Contact: **Paul Walker**

Suite E U 2,
Bletchley Park,
Sherwood Drive,
Milton Keynes,
MK3 6EB UK

Tel: +44 1908 642001
Fax: +44 1908 363463
Web: www.4Links.co.uk

4Links designs and manufactures test equipment for SpaceWire, with blue-chip customers including NASA, ESA, JAXA, prime contractors and many others world-wide.

4Links SpaceWire products routinely save cost and time by enabling customers to solve problems where other methods have failed. Customer comments include "Good value, very reliable, very accurate" and "The gold standard of SpaceWire test".

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Contact: *Ella Legate*

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31402,
France

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Fax: +44 2392 708280
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With a 2010 turnover of €5 billion and over 15,000 employees, Astrium is part of the EADS aerospace and defence group.

Denel Dynamics

Contact: *Shantall Tshoshane*

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Web: www.deneldynamics.co.za

Denel Dynamics is a leader in innovative aerospace systems and technology. Its core business covers tactical missiles, precision-guided weapons and unmanned aerial vehicles (UAVs).

Denel Dynamics is respected as a large, world class, vertically integrated engineering capability; employing top engineers. This advanced engineering is available to local and international partners in Space.

Department of Trade and Industry - (DST)

please see Exhibitors Listing page 155

Space Comercial Services (SCS)

Contact: *Ciska Esterhuizen*

A5 Octo place
Electron street
Techno park
7600
Stellenbosch
South Africa

Tel: +27 (0) 21 300 0061
Fax: +27 (0) 86 529 0880
Email: Ciska@scs-space.com
Web: www.scshgroup.com/

Space Commercial Services delivers services and products that add value to small and medium space programs. SCS delivers independent satellite engineering advisory services, turnkey image processing systems, geospatial observation solutions using space and airborne observation systems for government and commercial customers.

Technoloy Information Agency (TIA)

Contact: *Kgomotso Matjila*

83 Lois Avenue
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Fax: +27 (0) 86 638 4784
Email: kgomotso.matjila@tia.org.za
Web: www.tia.org.za

TIA is tasked with stimulating and intensifying technological innovation in order to improve economic growth and the quality of life of all South Africans. The Agency pursues its mandate by providing financial and non-financial support to develop and exploit technological innovations. TIA has adopted a sector driven approach focusing on Health, Mining, Energy, Information Communication Technology, Advanced Manufacturing, Industrial Biotechnology, and Agriculture.

Please refer to the adverts placed for contact details of the following Sponsors:

AISI: Outside back cover and exhibitor listing page 151
Lockheed Martin: page 188
SANSA: inside front cover
Surrey Satellite: inside back cover and exhibitor listing page 165



7 Tours and Social Events

7.1 Social Event Details

The Local Organising Committee has prepared a diverse social programme for delegates and accompanying persons for this years 62nd International Astronautical Congress in Cape Town.

Opening Ceremony

Date: Monday 3 October 2011
Where: CTICC – Exhibition Hall 2 & 3
Time: 10:00 – 12:00

Both events: Entrance are free for all registered participants and accompanying persons

Welcome Reception

Date: Monday 3 October 2011
Where: CTICC – Exhibition Hall
Time: 19:15



Accompanying Persons Tour – Cultural Shopping Experience

Date: Monday, 3 October 2011
Where: Cape Town City Centre & V & A Waterfront
Time: 10:00 for 10:30
Price: R500.00 per person

Departure from CTICC at approximately 12:00

Cape Town is blessed with grand quality shopping opportunities. Colourful African crafts are present here in almost every store. Some of the shops, such as Imagenious, offer the items entirely unique to Cape Town. On this tour we go to Greenmarket Square, a vibrant craft market where you will experience the pulse of Cape Town, Imagenious, Monkey Biz and Street Wires. For lunch, we enjoy a scrumptious meal at the Waterfront before finishing the tour with more retail therapy at the V&A Waterfront. Take this tour to explore the best shopping venues of Cape Town

Cultural Evening – moyo Stellenbosch

Date: Tuesday, 4 October 2011
Where: moyo Stellenbosch
Time: 20:00
Price: R450.00 per person

Shuttles depart from CTICC at 19h00 and 19h30

moyo is the realisation of one man's passion for all things African - from art and design to music, cuisine and crafts. In 1998, Jason Lurie started moyo as a small 120-seater restaurant in Norwood, Johannesburg, serving exceptional African cuisine amidst soulful vibes. Today, live African music and sophisticated African dining are the benchmarks of the seven evocative moyo establishments. In 2002, stylish moyo Melrose Arch rose from its granite bedrock to five enchanting levels offering diverse fine-dining experiences to privileged guests. Then the winelands of the Western Cape called our name, and magical moyo Stellenbosch emerged - surrounded by ancient oak trees. On Spier Wine Estate, moyo treats guests to a supreme African-inspired buffet, under a canopy of stars and Bedouin tents - or in an ethereal tree house - all nestled in lush gardens.

ISEB Student Cultural Activity

Date: Tuesday, 4 October 2011
Where: Theatre in the District, Chapel Street, District Six
Time: Guests to arrive at 18:15
Price: R210.00 per person (limited to 150 guests)

Please make your own way to the Theatre in the District

"WOZA CAPE TOWN" presented by Theatre in the District looks at Cape Town through the thoughts, views and experiences of three young South Africans from different cultural backgrounds. Their anxieties, pleasures, hopes and pains are conveyed through verse penned by some of this country's most respected poets. It is a musical and dance extravaganza that brings people of different pasts together and celebrates the joys and challenges of being South African! A city so diverse in all its culture that its identity is unique.

Wine & Dinner Evening

Date: Wednesday, 5 October 2011
Where: Headquarter Restaurant
Time: from 19:30
Price: R300.00 per person

Each person must find their own way there by means of hotel transfers or taxis

Enjoy an evening in one of the City of Cape Town's top steak restaurants. The restaurant is loosely based on the famous Parisian restaurant, Le Relais de L'Entrecote, in its homage to meat. Headquarters' focus on one dish aims to ensure excellence in every meal.

The cost per person includes two paired wines from a local wine farm and a 3 course menu.



Coldplay Hospitality Package Cape Town Stadium

Date: Wednesday, 5 October 2011
Where: Cape Town Stadium
Time: 19:00 (TBC)
Price: R3,561.00 per person

Please make your own way to the stadium

VIP Suite Hospitality Package

Coldplay is undoubtedly one of the world's best selling acts, with over 50 million album sales worldwide. They have won numerous awards through their career including six Brit Awards, four MTV Video Music Awards, seven Grammy Awards and they have headlined major festivals including Coachella, Glastonbury and Isle of Wight Festival.

Your Hospitality Package includes: Fully staffed VIP suite facility; Suite ticket; 3 course buffet dinner; Full premium bar; Parking tickets ratio 2:1 (if applicable)

Gala Dinner

Date: Friday, 7 October 2011
Where: Ballroom East, CTICC
Time: Starts at 19:30
Price: R550.00 per person

Delegates to arrange own transport to the CTICC if required

7.2 Tour Details

Discover why South Africa is the adventure capital of the world, why our natural beauty and wildlife will leave you awe-struck, why it's possible to afford luxury and why our friendly people, rich culture and freedom struggle will warm your heart! Follow the African drum and gumboot beat; the bright sun, stars and city streets; the bouquet of our prize-winning wines; the invigorating mountain or ocean air. And, most of all follow your desire for a personal journey, one that will change you beyond expectation, starting right here ...

The Local Organising Committee is proud to present delegates attending the 62nd International Astronautical Congress in Cape Town with an array of specially selected day tours and pre or post Safari's and/or overland tours.

CAPE TOWN DAY TOURS

Complimentary collection available from central Cape Town Hotel. Others on request. Tour duration and collection times may vary depending on hotel collection route.



Full Day Cape Peninsula Tour

Time: Departs daily at approx. 09:00 and returns at approx. 17:00
Price: R680.00 pp

Bring your camera and plenty of film; we're headed for Cape Point at the south western tip of the Cape Peninsula, and the most spectacular views in the world. The drive there is just as inspiring, passing steep mountains, secluded coves and sweeping beaches, as well as villages and fishing communities. Our tour begins with a scenic drive along the Atlantic coast, passing through the cosmopolitan suburb of Sea Point and Camps Bay with its glorious views of the Twelve Apostles, part of the Table Mountain range. We'll continue to the fishing village of Hout Bay, one of Cape Town's best-kept secrets. Here there is an option to take a short boat trip to Duiker Island (for own account & time permitting) to view the Cape Fur Seals, which inhabit the island. From here we travel to the Cape Point Nature Reserve, comprising over 17,300 acres of indigenous fauna and flora. Here we can see a variety of wildlife that includes baboons, rhebok, Cape Mountain zebra, bontebok and the elusive eland. The reserve is also one of the world's largest breeding grounds for tortoises. Bird-watchers, too, will find many fine species to observe. The majestic coastline offers drama worthy of being called "Nature's Greatest Show." We'll be able to see the union of the Atlantic and Indian Oceans (as per legend), and may even feel the brisk wind that is dubbed the "Cape Doctor" for its presumed curative powers. Following the coastline along False Bay, we'll return to Cape Town by way of Simon's Town, where we visit the Penguin colony at Boulders Beach (for own account), Fish Hoek fishing village and Muizenberg. Before our return, we'll stop at Kirstenbosch National Botanical Gardens for a short walking tour of the beautiful gardens. We return to Cape Town, passing the University of Cape Town, Rhodes Memorial and the Groote Schuur Hospital.

Full Day Cape Highlights Tour

Time: Departs daily at approx. 08:00 and returns at approx. 17:00
Price: R870.00 pp

Fantastic combination of Half Day Cape Point and Half Day Winelands Tour. Tour might include a trip back to Cape Town to collect additional passengers for 2nd half of tour. Tour may be operated in reverse direction. This combination tour offers the highlights of Cape Point and the Cape Winelands. Our tour begins with a scenic drive along the Atlantic coast, passing through the cosmopolitan suburb of Sea Point and Camps Bay with its glorious views of the Twelve Apostles, part of the Table Mountain range. From here we travel to the Cape Point Nature Reserve, comprising over 17,300 acres of indigenous fauna and flora. Here we can see a variety of wildlife that includes baboons, rhebok, Cape Mountain zebra, bontebok and the elusive eland. The reserve is also one of the world's largest breeding grounds for tortoises. Bird-watchers, too, will find many fine species to observe. The majestic coastline offers drama worthy of being called "Nature's Greatest Show." We'll be able to see the union of the Atlantic and Indian Oceans (as per legend), and may even feel the brisk wind that is dubbed the "Cape Doctor" for its presumed curative powers. Following the coastline along False Bay, we'll continue to the Stellenbosch winelands. Stellenbosch is an architectural jewel with a gracious blend of 18th century Cape Dutch, Georgian and Victorian buildings. We then head for a wine tasting session in the Stellenbosch area before returning to Cape Town.

Full Day Hermanus Tour

Time: Seasonal Departures: July – November 2011 only on Wednesdays, Fridays & Sundays at approx. 08:30 and returns at approx. 17:30
 Minimum 2 passengers required.
 (excludes lunch)
Price: R680.00 pp

This circular tour takes you over a mountain pass to the seaside town of Hermanus. This town, nestled between mountains and the sea is not only very beautiful but offers some of the best shore based whale watching opportunities in the world (August – November). Close sightings of the Southern Right whale are likely. On the return journey we follow the coastline with the possibility of further sightings of whales (and even the possibility of sighting dolphins). A stop is made at Stoney Point, near Betty's Bay to have a look at the penguins (optional, for own account & time permitting) and a wine tasting will be enjoyed before returning to Cape Town in the afternoon.



Full Day Winelands Tour

Time: Departs daily at approx. 09:00 and returns at approx. 17:00
Price: R680.00 pp (excludes lunch)

While South Africa's fertile valleys are world famous for their crisp white and classic French-style red wines, the area is also a treasury of rustic beauty and sprawling estates shaded by giant oak trees. Our drive today will include the country's principal wine routes of Paarl, Stellenbosch and Franschhoek, with a stop en route for lunch (for own account).

Our day starts with a visit to Paarl where you will be struck by the beauty of the Valley, the pristine blue sky, the rolling vineyards and the Pearl of Paarl set high above the valley. Paarl made headlines when President Mandela was released from the Groot Drakenstein prison (ex Victor Verster), on the outskirts of the town, to freedom and the start of the new South Africa. We enjoy a wine tasting and cellar tour at one of the local estates.

From Paarl, we'll continue north-west to the beautiful village of Franschhoek, near the Drakenstein Mountains founded in 1688 by French immigrants fleeing the Huguenot religious persecution in Europe. A memorial in the town commemorates the arrival of these early settlers who helped develop the wines sought after by Napoleon, Bismark and royalty such as Edward VII, the Prince of Wales. Here we will stop for lunch (for own account) and another wine tasting at a vineyard.

We'll then head to Stellenbosch, the second oldest town in South Africa and the historic heart of the country's wine region. In 1679, Dutch East India Company governor Simon van der Stel, recognized the fertility of this long valley on the banks of the Eerste River, as perfect for vineyards. The rest is history, which has been carefully cultivated in this town. A gracious blend of 18th-century Cape Dutch, Georgian and Victorian buildings is evident on Dorp Street, where massive oaks still shade original water furrows. Enjoy a final wine tasting before returning to Cape Town.



Full Day Safari

Time: Depart daily at approx. 05:30 and returns at approx. 16:30
 (lunch included)
Price: R2,100.00 pp

After an early morning departure we head up the N1 Highway, through the spectacular Hex River Valley and arrive at the Aquila Private Game Reserve. The bio-diverse habitat of the reserve ensures plenty of interest for the avid game viewer and birder. Giraffe, blesbok, black and blue wildebeest, zebra, springbok, gemsbok klipspringers, duiker, greyback, steenbok, ostriches, baboons, caracul, foxes, jackal, leopard and 172 species of birds, including the black eagle are found on the reserve. An experienced game ranger will take you on a game drive which includes San Bushmen rock art. Lunch is enjoyed at the Lodge.

Full Day Great White Shark Cage Diving

Time: Departs daily at approx. 06:00 and returns at approx. 17:00
(Includes lunch)
Minimum 2 passengers required

Price: R1,670.00 pp

Between the islands of Geyser Rock and Dyer Island is a narrow and shallow channel called Shark Alley – reputed to be the world’s best place for Great White shark diving. Due to the resident seal colonies in the area, Shark Alley has been dubbed “the supermarket for sharks”.

A short boat ride from Gansbaai, Shark Alley is ideal for those who wish to experience the thrill of getting up close and personal with these giant predators, but who do not possess a dive certification. Your cage dive takes place just meters below the surface of the water so no diving experience is necessary. (Scuba cage dive on request)

Half Day Winelands Tour

Time: Departs daily at approx. 14:00 and returns at approx. 17:00

Price: R490.00 pp

This enchanting excursion begins with a tour through historic Stellenbosch, an architectural jewel that serves as the historic heart of the country’s wine region. A gracious blend of 18-century Cape Dutch, Georgian and Victorian buildings is evident as we drive down Dorp Street, where massive Oaks still shade original water furrows, then enjoy a wine tasting in the Stellenbosch area. A second wine tasting will be included (time permitting), before returning to Cape Town.



Half Day Cape Point

Time: Departs daily at approx. 08:00 and returns at approx. 12:30

Price: R490.00 pp

Our tour begins with a scenic drive along the Atlantic coast, passing through the cosmopolitan suburb of Sea Point and Camps Bay with its glorious views of the Twelve Apostles, part of the Table Mountain range. From here we travel to the Cape Point Nature Reserve, comprising over 17,300 acres of indigenous fauna and flora. Here we can see a variety of wildlife that includes baboons, rhebok, Cape Mountain zebra, bontebok and the elusive eland. The reserve is also one of the world’s largest breeding grounds for tortoises. Bird-watchers, too, will find many fine

species to observe. The majestic coastline offers drama worthy of being called “Nature’s Greatest Show.” We’ll be able to see the union of the Atlantic and Indian Oceans (as per legend), and may even feel the brisk wind that is dubbed the “Cape Doctor” for its presumed curative powers. Following the coastline along False Bay, we’ll return to Cape Town by way of the Simon’s Town (optional, own account & time permitting visit to Penguin colony), Fish Hoek fishing village and Muizenberg. We return to Cape Town, passing the University of Cape Town, Rhodes Memorial and the Groote Schuur Hospital.

Half Day City and Table Mountain Tour

Time: Departs daily at approx. 08:00 and returns at approx. 12:30 (morning tour) or approx. 13:00 and returns at approx. 17:30 (afternoon tour) (excludes the Cable Way ticket)
Visit to the Castle of Good Hope (time permitting).

Price: R350.00 pp

Our drive to the city centre takes us past famous landmarks such as the Castle of Good Hope built in 1666 by the Dutch East India Company and City Hall, a baroque building and the Grand Parade. As we follow the city’s main thoroughfare, Adderley Street, we will see St. George’s Cathedral, the Anglican Diocese of Nobel Peace Laureate Archbishop Desmond Tutu. We will pass the Company Gardens and the Malay Quarter [also known as the Bo-Kaap] which means “Above Cape” because of its location up against the slopes of Table Mountain. In the early 18th century, thousands of slaves from Java, Ceylon and other Far Eastern regions were brought to Cape Town. After slavery was abolished, their descendants, known as the Cape Malay’s, settled here. Our route then leads us to Kloof Nek and the magnificent Table Mountain. We’ll ascend to the top [weather permitting] by the revolving cable car. Here, we’ll see wild flowers and the famous silver tree, and marvel at a birds-eye view of the city and its beaches. On a clear day it is even possible to see Robben Island where Nelson Mandela was imprisoned on one side and Cape Point on the other. Descend from the Upper Cableway station to your awaiting vehicle and then proceed around Table Bay to the Milnerton area (time permitting). From here we can see Table Mountain from the same perspective as the early settlers did when they sailed into Table Bay.

Half Day Township Cultural (Minimum 2 passengers required)

Time: Departs Mon-Fri at approx. 09:00 and returns at approx. 12:30 or
Departs Mon-Fri at approx. 13:30 and returns at approx. 17:00
Sat/Sun & Public Holidays at approx. 09:00 and returns at approx. 12:30
The Sunday morning tour includes a visit to a church service in Langa.

Price: R400.00 pp

Join us for a unique experience travelling through the three South Africa’s – The birth, where it all started, Apartheid South Africa, what happened then – the New South Africa, what is different since Nelson Mandela was released from prison. The tour affords the opportunity to interact, mingle and exchange cultural values with the local community. You will be welcomed in the traditional African manner in the townships of Langa (the oldest formal township) & Khayalitsha (the largest informal settlement). The tour includes visits to the Malay Quarter [also known as the Bo-Kaap] which means “Above Cape” because of its location up against the slopes of Table Mountain, and Gugulethu township, meaning “our pride”, which was established as a result of the migrant labour system. Experience a visit to a “shebeen”, an informal tavern and see local crafters at work.

Afternoon Tea at the Mount Nelson Hotel

Tour includes: collection from Cape Town City Centre, Green Point and Sea Point.

Time: Tour departs Monday to Friday, subject to availability, at 14:00 and ends at 17:30

Price: R675.00 pp

Experience one of the world’s most famous Afternoon Tea buffets complete with a selection of Chocolate Éclairs and Petit Fours, Mini-Cakes and Classic Carrot, Chocolate and Cheesecake, Savoury Sandwiches and Empanadas, Scones and Succulent Fresh Cape Fruit. Graceful notes from the Grand Piano add to the ambiance, and a selection of over thirty of the finest loose leaf teas, from Rooibos and Lapsang Souchong, to Earl Grey and Darjeeling, completes the indulgence.

ASTRONOMY EXCURSIONS (4 or more people required before tours run)



Astronomy Historical Tour of Cape Town

Time: Departs 3, 5, and 7 October 08:30 returns 13:00, includes refreshments at the South African Astronomical Observatory.

Price: R625.00 pp

Cape Town has a rich astronomical history. Discover more on this tour guided by the Director of the Historical section of the Astronomical Society of Southern Africa.

This tour takes us to the place where Sir John Herschel mounted his extraordinary telescope, as well as the South African Astronomical Observatory (S.A.A.O.), founded in 1820 and to this day the headquarters of astronomy for the country. We also learn about Lacaille’s Arc of the Meridian which was surveyed in order to help determine the size and shape of the earth, and the mistake he made. We also learn about how Thomas Maclear’s solved the mystery.

The history of astronomy in the southern hemisphere is linked to maritime history, and the need to set accurate timings for navigation. Cape Town owes its existence to shipping, and the Observatory played a crucial role in its history. To this end we visit the noon gun, still fired every day under instruction from the SAAO, as well as the time ball at the Waterfront, used to indicate time to ships in the harbour.

Astronomers from the northern hemisphere used the time-keeping imperative to build the first scientific establishment in the southern hemisphere, and you will take tea in the very spot where great astronomers stood, visit the astronomical museum on site, and see the places where astronomical discoveries were made, and still are to this day.

SANSA Space Science (Formerly Hermanus Magnetic Observatory)

Time: Departs 4 and 6 October 08:00 returns 18:00. Includes tour of SANSA Space Science, whale watching in Hermanus, and a visit to the Harold Porter botanical gardens in Betty's Bay.

Price: R900.00 pp

SANSA Space Science is an active participant in the worldwide network of magnetic observatories (INTERMAGNET), which monitor and model variations of the Earth's magnetic field. SANSA Space Science is also one of thirteen Regional Warning Centres globally that forms part of the ISES (International Space Environment Service) Regional Warning Centre network. Specifically, SANSA Space Science is appointed as the Regional Warning Centre for Africa.

You will visit this scientific establishment, and after tea and a tour of their facilities, there will be the opportunity to watch whales in the historical and pretty seaside town of Hermanus. After lunch (to own account) in Hermanus, we return to Cape Town via the spectacular seaside route called Clarens Drive, taking in the lovely Harold Porter botanical gardens in Betty's Bay.



Astronomy Tour of Carnarvon (SKA) and Sutherland (SALT)

Time: Departs 8 October 08:00 from Cape Town, returns 10 October 17:00.

Transport, accommodation and meals included. Please inform us if you have any special dietary requirements.

Price: R5,627.00 single
R5,375.00 per person sharing

This is the grand Astronomy Tour, taking in the site of the Square Kilometre Array, currently the MEERKAT project in Carnarvon, and the South African Astronomical Observatory site in Sutherland, including the Southern African Large Telescope (SALT). You will visit the facility where the satellite dishes are being built and erected in Carnarvon, far into the Northern Cape.

On the first night you will receive local hospitality from guest houses near to the SKA site, and after a refreshing night under the southern hemisphere Karoo stars in one of the darkest places on earth, you will take a tour of the SKA site. After lunch in Carnarvon, you will drive in one of the least populated places in South Africa to Sutherland, and it is likely no other vehicles will be seen on this stretch of road. The second night will be spent in the Karoo town of Sutherland, 18km from the SAAO site. After a night's star gazing (moon and weather permitting) there will be a tour of SALT and the telescopes at the SAAO in Sutherland. Lunch will be in the historic town of Matjiesfontein, and the tour will arrive back in Cape Town around 5pm. All meals and accommodation will be catered for.

RESEARCH FACILITY VISITS

For technical visits to research facilities in South Africa, please refer to the IAC2011 website. Details will appear under the 'Tours' section. This is distinct from the 'Astronomy Excursions'.

POST CONGRESS TOURS DEPARTING FROM CAPE TOWN

6 Day Garden Route & Winelands Tour (SMCC6) (Minimum 2 passengers)

Time: Departs weekly on Wednesdays from Cape Town and Sea Point area hotels, others on request.

Price: R11,420.00 per person sharing
R1,465.00 single supplement

Spend 6 days exploring the Garden Route and Winelands at a leisurely pace. Highlights include wine tasting in Stellenbosch, an ostrich farm tour in Oudtshoorn, a scenic journey via the Swartberg Pass and a tour of the Featherbed Nature Reserve in Knysna. This tour starts and ends in Cape Town.



6 Day Garden Route Splendour Tour (SCP6)

(Minimum 2 passengers)

Time: Departs weekly on Tuesdays from Cape Town and Sea Point area hotels, others on request.

Price: R9,730.00 per person sharing
R1,470.00 single supplement

Departing from Cape Town, spend 6 days exploring the superb coastal scenery and exciting sightseeing of the Garden Route including Oudtshoorn, Knysna and Tsitsikamma. This tour ends in Port Elizabeth.

11 Day S.A Highlights Tour (SCJ11) (Minimum 2 passengers)

Time: Departs 11 October from Cape Town and Sea Point area hotels, others on request.

Price: R21,500.00 per person sharing
R3,740.00 single supplement

This colourful 11 day tour combines the scenic diversity of Cape Town, Garden Route and the wildlife of the Kruger National Park. This tour ends in Johannesburg.

POST CONGRESS TOURS DEPARTING FROM JOHANNESBURG



3 Day Kruger Park Breakaway Tour (SMJJ3K)

Time: Departs daily, subject to availability.
From Sandton area hotels, others on request

Price: R6,420.00.00 per person sharing
R790.00.00 single supplement

Additional night
R2,845.00.00 per person sharing
R395.00.00 single supplement

Established in 1898, the Kruger National Park is one of the world's oldest and greatest wildlife preservation areas. More than twice the size of Yellowstone National Park in the USA, Kruger Park is a paradise for the wildlife enthusiast. Enjoy superb game viewing in comfortable open safari vehicles, accompanied by specialist field guides. This tour ends in Johannesburg

6 Day Buffalo Tour (SJD6) (Minimum 2 passengers)

Time: Departs weekly on Mondays from Sandton area hotels, others on request

Price: R11,270.00 per person sharing
R2,795.00 single supplement

Sabi Sabi Private Game Lodge option
R4250.00 per person sharing extra
R1,945.00 single supplement extra

Explore the dramatic scenery of the Panoramic Route, the wildlife of the Kruger Park, craft factories in Swaziland and the wildlife and culture of Zululand in this 6 day coach tour. This tour ends in Durban.



Time: Departs daily (subject to availability) from Sandton area hotels, others on request

Price: R7,855.00 per person sharing
R4,872.00 single supplement

A three night package to Sun City, with a choice of three different hotels. Included in the price are return transfers from OR Tambo International Airport, Johannesburg, 3 nights accommodation on a bed and breakfast basis and an early morning game drive into the Pilanesberg National Park.

3 Day Eastern Cape Nguni River Lodge Game Experience (SPP3)

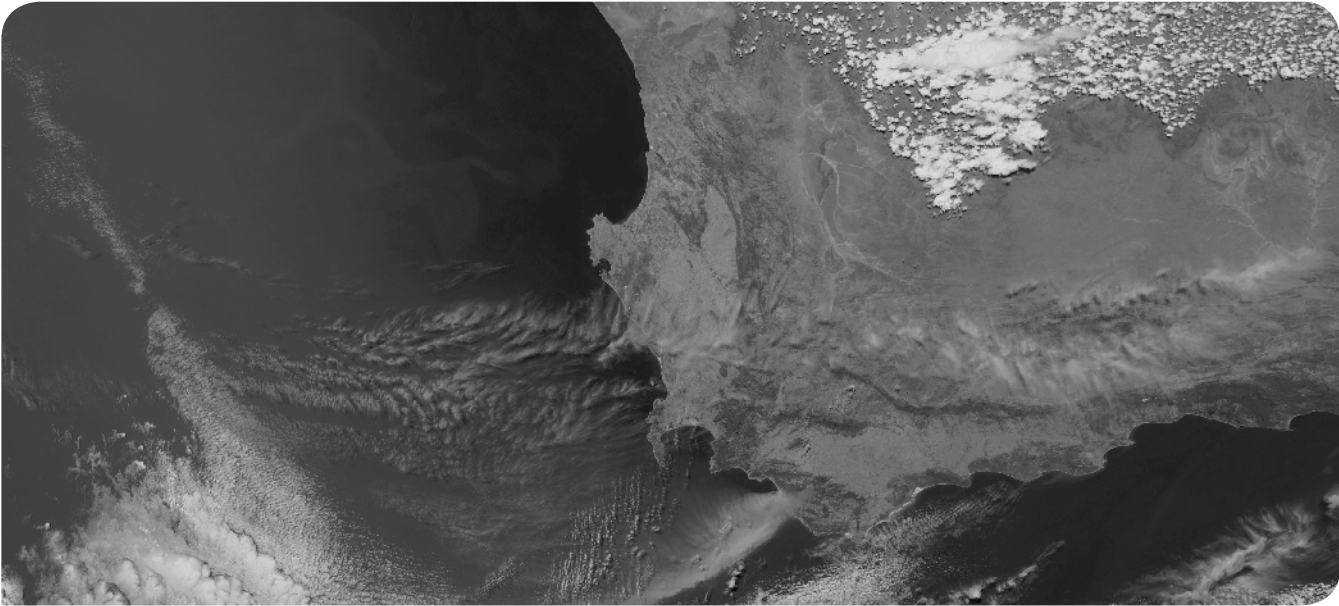
(Minimum 2 passengers)

Time: Departs daily (subject to availability) from Sandton area hotels, others on request
Price: R9,285.00 per person sharing
R3,720.00 single supplement

Enjoy a game experience in the malaria-free Addo Elephant National Park. This wildlife break includes accommodation, open vehicle safaris and return transfers from Port Elizabeth.

For further information regarding any of the tours please contact us on one of the following:

Tel: 086 104 8433
Email: enquiries@iac2011.com
Web: www.iac2011.com



Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Notes

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SWF is working globally to answer these questions. As a private operating foundation, SWF continues to build on our 5 years of dedicated efforts to ensure the secure and sustainable use of space for the benefit of Earth and all humanity. The Foundation acts as a research body, convener and facilitator, advocating for key space sustainability and other space-related topics and examining their influence on governance and international policy development.

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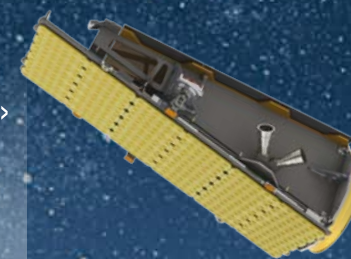
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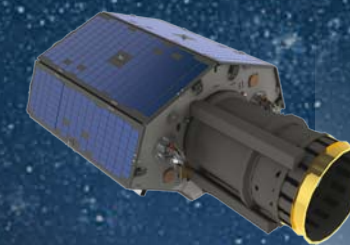
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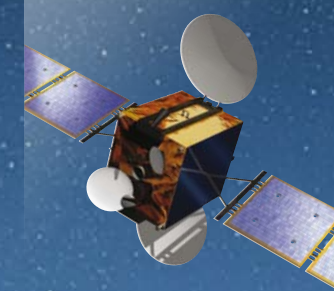
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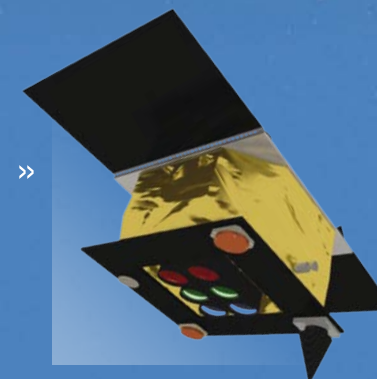


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