Go for Orion taking us 240,000 miles into the future.

Lockheed Martin. Your Mission is Ours.™
CONTENTS

1 Welcome Messages ................................................................. 4
  1.1 Message from International Astronautical Federation (IAF) ........................................ 4
  1.2 Message from State Space Corporation ROSCOSMOS ............................................ 5
  1.3 Message from the IPC Co-Chairs .................................................................................. 6

2 Organizers Information ............................................................ 7
  2.1 International Astronautical Federation (IAF) ................................................................. 7
  2.2 State Space Corporation ROSCOSMOS ........................................................................ 7
  2.3 Local Organizing Committee ......................................................................................... 8
  2.4 International Programme Committee Members .......................................................... 9

3 Practical Information .................................................................... 10
  3.1 Conference Venue and Transportation ..................................................................... 10
  3.2 Floor Plans .................................................................................................................. 12
  3.3 Opening Hours ........................................................................................................... 13
  3.4 PCR Testings ............................................................................................................... 13
  3.5 Live Streaming ............................................................................................................ 13
  3.6 Useful Information ...................................................................................................... 14
  3.7 Proceedings ................................................................................................................ 17
  3.8 Virtual Conference Bag .............................................................................................. 17

4 Conference Programme ............................................................ 18
  4.1 GLEX 2021 at a Glance .............................................................................................. 18
  4.2 Technical Programme at a Glance ............................................................................. 20
  4.3 Day-by-day ................................................................................................................. 21
      - Monday, 14 June ..................................................................................................... 21
      - Tuesday, 15 June ................................................................................................. 25
      - Wednesday, 16 June .......................................................................................... 33
      - Thursday, 17 June ............................................................................................. 42

5 Social and Cultural Programme .................................................. 50
  5.1 Welcome Reception ........................................................................................................ 50
  5.2 Gala Dinner .................................................................................................................. 50
  5.3 Excursions .................................................................................................................... 51

6 Exhibition ..................................................................................... 54

7 Technical Programme ..................................................................... 59
  7.1 Overview ..................................................................................................................... 59
  7.2 Information for Authors ............................................................................................. 60
  7.3 Best Technical Presentations Award ............................................................................ 60
  7.4 Virtual Technical Gallery ........................................................................................... 61
  7.5 Certificates of Attendance .......................................................................................... 61
  7.6 Proceedings ................................................................................................................ 61
  7.7 Technical Keynotes ..................................................................................................... 62
  7.8 Technical Papers .......................................................................................................... 63
  7.9 Authors Index .............................................................................................................. 80
1 WELCOME MESSAGES

1.1 Welcome Message from International Astronautical Federation (IAF)

Dear Colleagues,

Greetings!

As President of the International Astronautical Federation (IAF), I take great pride in welcoming all the attendees of the Global Space Exploration Conference – GLEX 2021.

Space Exploration is one of the most important aspects of the universe. Humanity's interest in the cosmos has been universal and enduring. Humans are driven to explore the unknown and as a species, we have made great strides in spaceflight and space exploration in the relatively short amount of time since such feats were first accomplished. As the 21st century gets further underway, the impact of space exploration upon the welfare of humanity will only increase.

This first in-person conference, since the beginning of the global pandemic, shows is the evidence of the great interest in there is for space exploration. After the United States in 2012, and China in 2017, the IAF is proud to offer the space community and the greater public, the unique opportunity to gather again in Russia, another leading nation in space exploration, for the third edition of the Global Space Exploration Conference.

This is also the occasion to celebrate the 60th anniversary of Yuri Gagarin’s spaceflight. The first man to reach space and circle our beautiful Earth aboard the Vostok 1 spacecraft. His mission was one of the defining moments of the 20th century and changed space history and the perception of all humankind forever. GLEX 2021 could not come at a more opportune time.

With respect to the programme of the Conference, it contains: plenary sessions, one of them is devoted to 60th anniversary of Yuri Gagarin’s spaceflight, an IAF Global Networking Forum, technical sessions, a specialized exhibition, a Welcome Reception on behalf of State Space Corporation ROSCOSMOS and a Gala Dinner on behalf of Saint Petersburg.

In this regard, during our Conference we plan to discuss the full range of issues related to space exploration: crewed spaceflights, research of objects of the Solar system and the Universe, astronomical and astrophysical research and so on.

That's why the main goal of GLEX 2021 is to bring together scientists, engineers, lawyers and students from different countries who want to study and explore space, want to share their thoughts and plans, and are ready to discuss them with colleagues. Only in such close cooperation and mutual understanding, we will be able to implement ambitious projects on the Moon, Mars and beyond the Solar system.

In this regard, during our Conference we plan to discuss the full range of issues related to space exploration: crewed spaceflights, research of objects of the Solar system and the Universe, astronomical and astrophysical research and so on.

With respect to the programme of the Conference, it contains: plenary sessions, one of them is devoted to 60th anniversary of Yuri Gagarin’s spaceflight, an IAF Global Networking Forum, technical sessions, a specialized exhibition, a Welcome Reception on behalf of State Space Corporation ROSCOSMOS and a Gala Dinner on behalf of Saint Petersburg.

A separate day, 14 June 2021, is devoted to young professionals and students who will define the future of space exploration. In addition, a rich cultural and excursion programme awaits GLEX 2021 participants. Saint Petersburg is the historical and cultural capital of the Russian Federation, so magnificent architecture will take you back in time to 18th and 19th century of Imperial Russia with its beautifully built palaces, mansions and bridges.

Taking into account the abovementioned, we are confident that GLEX 2021 will be an outstanding scientific event that will contribute to strengthen the links between the Russian Federation and the rest of the world, among present and future generations of specialists in the field of space exploration activities.

We are glad to welcome you all in Saint Petersburg at a memorable conference GLEX 2021!
1.3 Welcome Message from the IPC Co-Chairs

Dear fellow members of the global space exploration community,

We look forward to welcoming you to the Global Space Exploration Conference 2021 in St. Petersburg! GLEX 2021 is jointly organized by the International Astronautical Federation and ROSCOSMOS and follows the successful GLEX 2012 in Washington, D.C. and GLEX 2017 in Beijing.

Space Exploration has been a dream of many for a long time. Beginning in the middle of the last century humanity has started to turn this dream into reality. We remember with pride the first artificial satellite, Gagarin’s spaceflight, the first woman in space, the first spacewalk, and the first steps by man on the Moon. International partnerships have become ever more important, and today the International Space Station, the biggest and largest human-made space object, serves as a unique science laboratory in Earth orbit.

We stand today at a truly transformational time in space exploration. Humanity’s gaze is now often focused ever further out – to the Moon, and Mars, and beyond. Robotic and human lunar missions are being planned and implemented by both governments and private industry around the world. Others are planning lunar bases and villages. Others are developing missions to explore Mars, or to mine asteroids. One of the remarkable aspects of the global space world today is how commercially funded space exploration activities are becoming an ever more common compliment to government-led space programmes.

Against this exciting backdrop, GLEX 2021 will bring together all the key space exploration players for a week in wonderful St. Petersburg this coming summer. Space agency leaders, captains of industry, academic researchers, policy experts, entrepreneurs, and other enthusiasts are invited to exchange ideas, report on results, share visions, and together make space exploration plans. Delegates will be able to inform themselves about programmes around the world and establish and advance international partnerships to turn exploration dreams into reality.

We encourage all who are active and interested in moving humanity beyond the boundaries of the known world to join us for GLEX 2021 on 14-18 June 2021 in St. Petersburg!

Christian Sallaberger
Chair, IAF Space Exploration Committee,
International Astronautical Federation (IAF),
President, Canadensys,
Canada

Sergey Krikalev
Past VP for International Relations and Outreach,
International Astronautical Federation (IAF),
Executive Director for Piloted Spaceflights,
State Space Corporation ROSCOSMOS,
Russian Federation

2 ORGANIZERS INFORMATION

2.1 International Astronautical Federation (IAF)

Founded in 1951, the International Astronautical Federation is the world’s leading space advocacy body with more than 407 members, 71 countries on six continents, including all leading 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 and fosters the development and application of space assets by advancing global cooperation.

As the organizer of the annual International Astronautical Congress (IAC), and other meetings on specific space-related topics, 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 (IAF)
100 Avenue de Suffren
75615 Paris
France
Phone: +33 1 45 67 42 60
Email: info@iafastro.org
Website: www.iafastro.org

Connecting @ll Space People
Be part of the conversation @iafastro

2.2 State Space Corporation ROSCOSMOS

ROSCOSMOS is a State Corporation that was established in August 2015 to oversee and implement a comprehensive reform of the Russian space industry.

State Space Corporation ROSCOSMOS ensures the implementation of the Russian government’s space program and its legal regulation. ROSCOSMOS is also placing orders for the development, manufacture and supply of space equipment and space infrastructure objects.

The state corporation is also responsible for international space cooperation and tasked with setting the stage for the future use of results of space activities in the social and economic development of the Russian Federation.

State Space Corporation ROSCOSMOS
42, Schepkina st.,
Moscow, 107996
Russian Federation
Phone: +7 (495) 631-9-888, 7 (495) 631-90-00
Fax: +7 (495) 631-9900
Email: info@rscosmos.ru
Website: www.rscosmos.ru
2.3 Local Organizing Committee

Chair

Sergey Saveliev  
Deputy Director General, International Cooperation, State Space Corporation ROSCOSMOS

Co-Chair

Maksim Sokolov  
Vice-Governor, Saint Petersburg

Vice Chair

Sergey Kriakalev  
Executive Director, Piloted Spaceflights, State Space Corporation ROSCOSMOS

Members

Tatiana Tishchenko  
Director, International Cooperation Department, State Space Corporation ROSCOSMOS

Sergey Korneev  
Chairman, Committee for Tourism Development, Saint Petersburg

Dmitry Shishkin  
Director, Administration Department, State Space Corporation ROSCOSMOS

Ekaterina Volkhonskaya  
Director General, Convention Bureau, Saint Petersburg

Vladimir Ustimenko  
Head of Press Service, State Space Corporation ROSCOSMOS

Dmitry Lookatov  
Director General, JSC Glavkosmos

Kirill Parovtov  
Director General, AO Corporate Academy of ROSCOSMOS

2.4 International Programme Committee Co-Chairs

Christian Sallberger  
Chair, IAF Space Exploration Committee, International Astronautical Federation (IAF), President, Canadiana, Canada

Sergey Kriakalev  
Past VP for International Relations and Outreach, International Astronautical Federation (IAF), Executive Director for Piloted Spaceflights, State Space Corporation ROSCOSMOS, Russian Federation

2.5 International Programme Committee Members

Khaled Al Hasmi  
UAE Space Agency, UAE

Salem Humaid Al Marri  
Mohammed Bin Rashid Space Centre, UAE

Oleg Alifanov  
Moscow Aviation Institute, Russian Academy of Sciences, Russian Federation

Alain Borius  
OHB System SE, Germany

Pierre W. Bossuget  
Centre National d’Études Spatiales (CNES), France

Kemmy Bran  
China Head Aerospace Technology Group, China

Bruce Checkley  
The Boeing Company, USA

J.R. Edwards  
Lockheed Martin Corporation, USA

Matteo Emanuelli  
Space Generation Advisory Council (DGAC), Austria

Christian Feichtinger  
International Astronautical Federation (IAF), France

Bernard Foing  
European Space Agency (ESA), The Netherlands

Kevin Foley  
The Boeing Company, USA

Elana Fomina  
Institute of Biomedical Problems, Russian Academy of Sciences, Russian Federation

Nadeem Ghfoor  
Canadiana, Canada

Peter Graef  
German Aerospace Centre (DLR), Germany

Marielle Grassano  
GMV Aerospace & Defence SAU, Spain

Bernhard Hufenbach  
European Space Agency (ESA) and ISDEF, The Netherlands

Candace Johnson  
European Business Angels Network (EBAN), Belgium

George Karabashko  
Human Space Flight Program Center, The Central Research Institute of Machine Building (TsNII Promet), Russian Federation

Kharun Karchava  
Launch Association, Russian Federation

David Kendall  
United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS), Canada

Masaru Koga  
Japan Aerospace Exploration Agency (JAXA), Japan

Kathy Lawrini  
Draper Space, USA

Gilles Leduc  
Canadian Space Agency (CSA), Canada

Sandy Magnus  
AstroFlux, Inc., USA

Viktoriya Mayrprzinskiy  
Bauman Moscow State Technical University, Russian Federation

Fritz Merkle  
OHB System AG-Bremen, Germany

Carlo Mere  
Airbus Defence and Space, Germany

Clay Mowry  
Blue Origin, USA

Chakib Mouden  
Japan Space Exploration Agency (JAXA), Japan

Valanathan Murumani  
South African National Space Agency (SANSA), South Africa

Oleg Iosevich Orlov  
Institute of Biomedical Problems of the Russian Academy of Sciences, Russian Federation

David Parker  
European Space Agency (ESA), France

Maria Antonietta Perino  
Thea Alenia Space Italia, Italy

Nicolas Peter  
European Space Agency (ESA), France

Antoni A. Aleskendowicz  
Space Research Institute of Russian Academy of Science corresponding member of Russian Academy of Sciences, Russian Federation

Cheryl Reed  
Northrup Grumman Innovation Systems, USA

Giuseppe Reibaldi  
Mira International Institute of Sciences, Russian Federation

Oleg Barchuk  
International Astronautical Federation (IAF), Past VP for International Relations and Outreach, International Astronautical Federation (IAF), Executive Director for Piloted Spaceflights, State Space Corporation ROSCOSMOS, Russian Federation

Stephan Ueblner  
German Aerospace Center (DLR), Germany

David Voigt  
German Aerospace Centre (DLR), Germany

Chris Welsh  
International Space University (ISU), France

Dengyun Yu  
China Aerospace Science and Technology Corporation (CASC), China

Lee Matyuszew Zemest  
Space Research Institute of Russian Academy of Sciences, Russian Federation

Hans Zeller  
Arianespace, France

Maria Antonietta Perino  
Thea Alenia Space Italia, Italy

Nicolas Peter  
European Space Agency (ESA), France

Antoni A. Aleskendowicz  
Space Research Institute of Russian Academy of Science corresponding member of Russian Academy of Sciences, Russian Federation

Cheryl Reed  
Northrup Grumman Innovation Systems, USA

Giuseppe Reibaldi  
Mira International Institute of Sciences, Russian Federation

Oleg Barchuk  
International Astronautical Federation (IAF), Past VP for International Relations and Outreach, International Astronautical Federation (IAF), Executive Director for Piloted Spaceflights, State Space Corporation ROSCOSMOS, Russian Federation

Stephan Ueblner  
German Aerospace Center (DLR), Germany

David Voigt  
German Aerospace Centre (DLR), Germany

Chris Welsh  
International Space University (ISU), France

Dengyun Yu  
China Aerospace Science and Technology Corporation (CASC), China

Lee Matyuszew Zemest  
Space Research Institute of Russian Academy of Sciences, Russian Federation

Hans Zeller  
Arianespace, France
3 PRACTICAL INFORMATION

3.1 Conference Venue and Transportation

Tavrichesky Palace (St. Petersburg, Shpalernaya st., 47)

Tavrichesky or “Tauride” Palace is one of the largest and most historic palaces in Saint Petersburg.

Prince Grigory Potemkin of Tauride commissioned his favourite architect, Ivan Starov, to design his city residence in a rigorous Palladian style. Starov’s design called for an extensive park and harbour in front of the palace, which would be linked with the Neva River by a canal. Building work began in 1783 and lasted for six years. Several months after Grigory Potemkin’s death, Catherine II purchased his palace and ordered architect Fyodor Volkov to transform it into her summer townhouse.

In the 19th century, the palace was refurbished by Carlo Rossi and Vasily Stasov as a residence for minor royalty. It was then used to host balls and exhibitions until 1906, when it was transformed into the seat of the first Russian parliament, the Imperial State Duma.

Immediately after the February Revolution of 1917, Tauride Palace housed the Russian Provisional Government and the Petrograd Soviet, in opposite wings of the palace (in early March the Provisional Government moved to the Marinsky Palace). The abortive Russian Constituent Assembly held its meetings there in 1918. In May 1918 Bolsheviks used the building to hold their 7th Congress, where they first named themselves the Russian Communist Party (Bolsheviks).

From 1920 to 1991, the Tauride Palace was used for the High Party School. Since the 1990s, Tauride Palace has been home to the Interparliamentary Assembly of Member Nations of the Commonwealth of Independent States (IPA CIS).

How to get to the TAVRICHESKY PALACE:

Tavrichesky Palace is located in the north-east of the historic centre, next to the Tavrichesky Garden (formerly the grounds of the palace).

1. By feet from the closest metro station “Chernyshevskaya”

2. By buses No. 74 and No. 54 from the Moscow railway station (metro station “Ploschad Vosstaniya”)
3.2 Floor Plans

1 Floor

2 Floor

3.3 Opening Hours

Monday: 08:30 – 17:00
Tuesday: 07:30 – 20:30
Wednesday: 08:00 – 18:30
Thursday: 08:00 – 18:00

3.4 PCR Tests

PCR testing will be foreseen at the GLEX 2021 on June 14-17. A nurse will provide the collection of biomaterial for the SARS-CoV-2 (COVID-19) for PCR testing at the medical office at the venue.

<table>
<thead>
<tr>
<th>Test</th>
<th>Total price (in rubles)</th>
<th>Working hours</th>
<th>Test readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARS-CoV-2 (COVID-19) EXTRA URGENT CITOT</td>
<td>4170,00</td>
<td>09:00 - 12:00</td>
<td>until 18 o’clock of the same day</td>
</tr>
<tr>
<td>coronavirus RNA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARS-CoV-2 (COVID-19) EXTRA CITOT</td>
<td>2920,00</td>
<td>09:00 - 12:00</td>
<td>until 10 o’clock the next day</td>
</tr>
<tr>
<td>coronavirus RNA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RNA coronavirus a SARS-CoV-2 (COVID-19) CITO</td>
<td>2020,00</td>
<td>09:00 - 12:00</td>
<td>until 13 o’clock the next day</td>
</tr>
</tbody>
</table>

Payment is possible in cash and by card. The test results will be sent to the indicated email address. The translation of the test result into English is performed automatically and will be also sent to the indicated email address.

3.5 Live Streaming

The GLEX Opening and Closing Ceremonies, the Plenary Events, all IAF Global Networking Forum (GNF) Sessions and Press Conferences will be live-streamed on the IAF website: [GLEX Live-Streaming](https://glex-2021-online.iaf-registration.org/)

In order to follow the stream, everyone is kindly invited to register here: https://glex-2021-online.iaf-registration.org/

In addition, do not forget to check-out the GLEX Virtual Technical Gallery and the online Proceedings of the GLEX 2021 here: [https://dl.iafastro.directory/gallery/GLEX-2021/](https://dl.iafastro.directory/gallery/GLEX-2021/)
3.6 Useful information

Climate
The city’s northern location, its proximity to the sea and its large water area do much to determine the specific climate of Saint Petersburg, with its short winter days, white nights in summer (from late May till mid-July), and frequent and dramatic weather changes. The climate is humid, almost maritime, with moderately warm summers and quite long winters. The average temperature in June is +17°C (+62.6°F).

Given the probable rapid weather changes in Saint Petersburg, it is advisable to prepare in advance for sudden changes in the temperature and the weather in general.

Official language:
The official language of the Russian Federation is Russian. English is widely spoken among young people.

Local time in Saint Petersburg: GMT+3 time zone.

Electricity:
The power supply voltage in Russia is 220V (50–60Hz). Type C and F sockets are common.

Telephones:
Saint Petersburg operators offer a variety of mobile telecommunications services in the GSM, UMTS and LTE standards. Guests to the city may acquire SIM cards of local mobile operators. All mobile operators provide mobile Internet services.

In accordance with the laws of the Russian Federation, a participant must be physically present and show a passport (passport of a citizen of the Russian Federation or a passport of a foreign citizen) in order to purchase a SIM card and sign a contract for the provision of mobile communication services.

Please note: before using the services of a foreign operator on the territory of Russia, it is advisable to find out more about the tariffs for roaming services.

Telephone code of Russia: +7 (or 8 for long-distance calls within Russia).

Telephone code of Saint Petersburg: 812

How to call to Saint Petersburg:
1. In Russia from a landline:
   • enter the code (8 812)
   • dial the 7-digit phone number

2. In Russia from a mobile phone:
   • enter the code (+7 812)
   • dial the 7-digit phone number

3. In other countries from a landline:
   • enter the code (00 (country code) 7 812)
   • dial the 7-digit phone number

4. In other countries from a mobile phone:
   • enter the code (+7 812)
   • dial the 7-digit phone number

How to call from Saint Petersburg:
1. To another country from a mobile phone:
   • dial the code for an international line: (8 10), “+” or other
   • dial the code of the country and city you are calling
   • dial the subscriber’s number

2. To another country from a landline:
   • dial the code for an international line: (8 10)
   • dial the code of the country and city (operator) you are calling
   • dial the subscriber’s number

Local currency and exchange rate:
The rouble is the official currency of the Russian Federation. For the latest exchange rates, please see the Central Bank of Russia website: www.cbr.ru.

All the main types of payment cards are accepted in Russia, including Visa, MasterCard, Mir, UnionPay, American Express, Diners Club, and Discover. Although payment cards are accepted in most restaurants and many stores in Saint Petersburg, participants are advised to have some cash at hand.

Exchanging currency:
Dollars and euros can be exchanged at almost any bank office or special exchange office (some open 24h) upon presentation of passport. Other currencies are normally only changeable at larger banks or central exchange offices. Commission is normally negligible.

Business hours:
Government offices and banks are open from 9 a.m. or 10 a.m. to 5 p.m. or 6 p.m. (with a one-hour lunch break at noon or at 1 p.m.) on weekdays, and are closed on weekends. Some banks are also open on Saturday. Different banks may have different office hours. Post offices are open from 8 a.m. to 8 p.m. from Monday to Saturday (with a one-hour lunch break at 1 p.m.) and closed on Sunday. Hospitals provide 24-hour emergency services. Most pharmacies open from 9 a.m. to 7 p.m. Some are open 24 hours a day. Most department stores are open from 9 a.m. to 10 p.m. Monday to Sunday.
Access & Safety

The IAF together with its partner the Russian State Space Corporation ROSCOSMOS have designed and announced GLEX 2021 as the first IAF in-person conference since the beginning of the COVID-19 pandemic. While we are planning to provide some limited hybrid elements at GLEX 2021 our main focus is to bring together in person space leaders, engineers and scientists from the worldwide space community. In order to allow for easy and unimpeded entry to Russia and access to the conference and to assure the safety of all our distinguished delegates we have agreed the following measures with the Russian authorities:

Entry into Russia: Entry into Russia is granted with a registered GLEX 2021 delegates Visa and a negative COVID-19 PCR test not older than 72 hours. No quarantine is required.

Access to the GLEX 2021 venue (Tavrichesky Palace): Access to the conference venue is granted only upon producing a negative PCR test not older than 72 hours when collecting the conference badge.

Health requirements and precautions: Foreign citizens travelling to the Russian Federation must submit a medical document (certificate) in Russian or in English showing a negative Covid-19 PCR test result obtained no earlier than three calendar days before arrival in the Russian Federation. The validity of the PCR test certificate is calculated starting from the date the biological material was collected. Passengers who cannot present a certificate will be not allowed to enter the Russian Federation. If it is not possible to submit the medical certificate in Russian or in English, it may be submitted in the official language of the country where the issuing organization is registered, accompanied by a Russian translation certified by a consular official of the Russian Federation.

Foreign citizens travelling by plane must also fill in the form provided by the flight attendants.

No vaccinations are required and no quarantine is foreseen to enter the Russian Federation.

Health safety measures at the venue: Continuous temperature screening at the entry to the venue, wearing masks at all time, hydroalcoholic sanitizers placed in all areas of the venue.

Support for returning home after GLEX 2021: PCR testing at the GLEX 2021 venue will be foreseen. For more info please see 3.4

Automated Teller Machines (ATMs):

Travellers who carry internationally recognized credit cards can get cash in the local currency at ATMs. The commission depends both on the ATM and the bank that issued the credit card.

Insurance:

Participants are advised to buy a voluntary medical insurance policy for foreigners, available by pre-order or for purchase upon arrival. Insurance of foreign citizens visiting Russia is a popular service offered by many insurance companies throughout the country.

Policies for foreign citizens may cover the following risks:

- medical expenses;
- luggage;
- accidents; and
- other risks upon request.

Tips and taxes:

In Russia, tipping is voluntary. In hotels, tips are appreciated for bellhops and cleaning services. Around $1-$3 USD per bag and $2-$4 USD per day for cleaning. At restaurants, tip between 10-15% depending on service.

Emergency phone numbers:

- Rescue service (for mobile network subscribers): 112

City emergency services:

- Rescue service: 101 (from a mobile phone), 01
- Police: 102 (from a mobile phone), 02
- Emergency medical service: 103 (from a mobile phone), 03
- Free enquiry service (around the clock): 064

3.7 Proceedings

The GLEX 2021 proceedings are available on a password protected site. All registered participants will be provided after the conference with a link and online password to login and access the online proceedings which contain the full manuscript, video lectures and lightning talks from the conference Technical Programme.

If you do not receive the password, please contact: support@iafastro.org.

Papers will be indexed in the world’s leading citation databases: Elsevier’s SCOPUS and Compendex.

3.7 Virtual Conference Bag

Please view the Virtual Conference Bag at: http://goveb.co/pm/2d551d
# 4 Conference Programme

## 4.1 GLEX 2021 at a Glance

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday 14 June</td>
<td>07:00 - 12.00</td>
<td>NG Seminar Registration, NG Seminar Welcome Tea, Next Generation Seminar (NG) Opening Ceremony</td>
</tr>
<tr>
<td></td>
<td>12.00 - 13.00</td>
<td>Parallel Technical Sessions, Lunch Break, NG Seminar Parallel Working Groups, Tea Break</td>
</tr>
<tr>
<td></td>
<td>13.00 - 14.00</td>
<td>Parallel Technical Sessions, Lunch Break, NG Seminar Closing Session</td>
</tr>
<tr>
<td>Tuesday 15 June</td>
<td>08:00 - 12.00</td>
<td>Registration, Welcome Tea, Next Generation Reception at the Saint Petersburg Planetarium, Plenary 1: 60th Anniversary of Gagarin's Flight (Astronauts' Tribute)</td>
</tr>
<tr>
<td></td>
<td>12.00 - 13.00</td>
<td>Press Briefing, Plenary 2A: High-level Space Leaders, Networking Tea Break, Press Briefing</td>
</tr>
<tr>
<td></td>
<td>13.00 - 14.00</td>
<td>Plenary 3: Going Forward to the Moon, Parallel Technical Sessions, Lunch Break</td>
</tr>
<tr>
<td>Wednesday 16 June</td>
<td>08:00 - 12.00</td>
<td>Registration, Parallel Technical Sessions, Plenary 4: Human Roads to Outer Space - Real and Imaginary Dangers, Networking Tea Break</td>
</tr>
<tr>
<td></td>
<td>12.00 - 13.00</td>
<td>Parallel Technical Sessions, Lunch Break, Plenary 5: ISECG: Exploring Together - Opportunities, Challenges, Networking Tea Break</td>
</tr>
<tr>
<td></td>
<td>13.00 - 14.00</td>
<td>Parallel Technical Sessions, Networking Tea Break, Next Stop: IAC 2021 in Dubai, Closing Ceremony</td>
</tr>
<tr>
<td>Thursday 17 June</td>
<td>08:00 - 12.00</td>
<td>Registration, Parallel Technical Sessions, Plenary 6: ISECG: Exploring Together - Opportunities, Challenges, Networking Tea Break</td>
</tr>
<tr>
<td></td>
<td>12.00 - 13.00</td>
<td>Networking Tea Break, Plenary 7: Human Roads to Outer Space - Real and Imaginary Dangers, Networking Tea Break</td>
</tr>
<tr>
<td>Friday 18 June</td>
<td>08:00 - 12.00</td>
<td>Cultural Visits, Parallel Technical Sessions, Networking Tea Break</td>
</tr>
<tr>
<td></td>
<td>12.00 - 13.00</td>
<td>Networking Tea Break, Plenary 8: ISECG: Exploring Together - Opportunities, Challenges, Networking Tea Break</td>
</tr>
<tr>
<td></td>
<td>13.00 - 14.00</td>
<td>Networking Tea Break, Cultural Visits, Parallel Technical Sessions, Networking Tea Break</td>
</tr>
</tbody>
</table>

**GALA DINNER**
4.2 Technical Programme at a Glance

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Hall #</th>
<th>Location</th>
<th>Theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.06.2021</td>
<td>15:30 - 18:30</td>
<td>Hall #3</td>
<td>Hall #1</td>
<td>Exploration of Other Destinations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hall #3</td>
<td>Hall #14</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hall #3</td>
<td>Hall #16</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hall #3</td>
<td>Hall #20</td>
<td>Ground-Based Preparatory Activities</td>
</tr>
<tr>
<td>16.06.2021</td>
<td>10:00 - 13:00</td>
<td>Hall #2</td>
<td>Hall #14</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td>14:00 - 16:00</td>
<td>Hall #2</td>
<td>Hall #16</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td>16:30 - 18:30</td>
<td>Hall #2</td>
<td>Hall #20</td>
<td>Ground-Based Preparatory Activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hall #3</td>
<td>Hall #1</td>
<td>Exploration of Other Destinations</td>
</tr>
<tr>
<td>17.06.2021</td>
<td>10:00 - 13:00</td>
<td>Hall #2</td>
<td>Hall #14</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td>14:00 - 16:00</td>
<td>Hall #2</td>
<td>Hall #16</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td>16:30 - 18:30</td>
<td>Hall #2</td>
<td>Hall #20</td>
<td>Ground-Based Preparatory Activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hall #3</td>
<td>Hall #1</td>
<td>Exploration of Other Destinations</td>
</tr>
<tr>
<td>18.06.2021</td>
<td>10:00 - 13:00</td>
<td>Hall #2</td>
<td>Hall #14</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td>14:00 - 16:00</td>
<td>Hall #2</td>
<td>Hall #16</td>
<td>Key Technologies</td>
</tr>
<tr>
<td></td>
<td>16:30 - 18:30</td>
<td>Hall #2</td>
<td>Hall #20</td>
<td>Ground-Based Preparatory Activities</td>
</tr>
</tbody>
</table>

4.3 Day-by-day

All timings are in GMT+3 Moscow time (MSK). For the latest up to date programme please consult the IAF website: https://www.iafastro.org/events/global-series-conferences/glex-2021/plenary-programme/

Monday 14 June

Next Generation Day

10:00 - 11:00 Opening Ceremony

Location: Duma Hall

Speakers:
- **Pascale EHRENFREUND**
  President, International Astronautical Federation (IAF), France
- **Sergey KRIKALEV**
  Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Andrey MAKSIMOV**
  Chairman, St. Petersburg Committee for Science and Higher Education, Russian Federation
- **Sergey SAVELEV**
  Deputy Director General for International Cooperation, ROSCOSMOS, VP for Relations with International Organizations, International Astronautics Federation (IAF), Russian Federation
- **MODERATOR**
  Christian FEICHTINGER
  Executive Director, International Astronautical Federation (IAF), France

11:30 - 13:00 Plenary Session - International Collaboration for Sustainable Space Exploration

Location: Duma Hall

The activities of the GLEX2021 Next Generation Day will begin with a high-level panel discussion on the role of the young generations and international cooperation for sustainable space exploration. Questions from the audience are welcomed and will be discussed during the panel through the use of interactive tool Slido.

Speakers:
- **Hazzaa ALMANSOORI**
  Astronaut, United Arab Emirates
- **Simonetta DI PIPPO**
  Director, United Nations Office for Outer Space Affairs (UNOOSA), Austria
- **Sergey KRIKALEV**
  Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

Mercury Working Group
- Vladislav Zubko, Senior Laboratory Assistant, Space Research Institute (IKI), Russian Academy of Sciences (RAS)
- Priyanka Das, PhD Student, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE)
- Reinhold Evwald, Astronaut, Association of Space Explorers
- Sergei Krikalev, Astronaut, Association of Space Explorers

Neptune Working Group
- Sara Toffoletti, Student, Paris-Saclay University
- Andrey Belyaev, Senior Assistant, Space Research Institute of the Russian Academy of Sciences (IKI)
- Pavel Vinogradov, Astronaut, Association of Space Explorers
- Ulf Merbold, Astronaut, Association of Space Explorers

Venus Working Group
- Jan Van Baelen, YGT for Research, Technology and Innovation Management, European Space Agency (ESA)
- Miraslava Kazlouskaya, LL.M. in Air and Space Law Candidate, Leiden University, International Institute of Air and Space Law
- Jean-Pierre Haigneré, Astronaut, Association of Space Explorers
- Dorin Prunaru, Astronaut, Association of Space Explorers

14:00 - 15:30 Working Groups

Following the inputs provided during the plenary session, participants of the Next Generation Day will divide in 6 working groups to further explore and reflect on the challenges and opportunities related to the role of the young generations for sustainable space exploration. Each working group will feature 4 or 5 co-chairs equally representing established as well as young space professionals, and will present its conclusions at the closing ceremony.

Mars Working Group
- Ghanim Alotaibi, Senior Mechanical Engineer, Moon Village Association (MVA)
- Alice Barthe, Crew Data scientist, Womars
- Aleksandra Miroslavova Marinova, Director, First Steps Legal
- Mike Baker, Astronaut, Association of Space Explorers
- Alexander Alexandrow, Astronaut, Association of Space Explorers

Saturn Working Group
- Irina Chernykh, Senior Lecturer, RUDN University
- Camilo Reyes, Student, University of Wuerzburg
- Hazzaa Almansoori, Astronaut, Association of Space Explorers
- Claudie Haigneré, Astronaut, Association of Space Explorers

Jupiter Working Group
- Hamza Abdul Hameed, Legal Consultant, UNIDROIT
- Ignaty Romanov-Chernigovsky, Software Engineer, Space Products and Innovation
- Julie Patarin-Jossec, Lecturer/Associate Fellow, Saint Petersburg State University; Associate Fellow at the Centre Emile Durkheim for Comparative Sociology and Political Science, France
- Franz Viehböck, Astronaut, Association of Space Explorers
- Jean-Loup Chretien, Astronaut, Association of Space Explorers

16:00 - 17:00 Closing Session

Location: Duma Hall

The activities of the GLEX2021 Next Generation Day will be concluded by a high-level panel discussion wrapping up the main outcomes from the plenary and working group sessions. This panel will feature one co-chair per working group presenting the conclusions of its group and a final round of comments under the moderation of Antonino Salmeri from the Space Generation Advisory Council.

Speakers:
Co-Chair of each Working Group

Closing Remarks:
- Pascale Ehrenfreund, President, International Astronautical Federation (IAF), France
- Antonino Salmeri, Lead of the E.A.G.L.E. Team on Lunar Governance, Space Generation Advisory Council (SGAC), Austria
Tuesday 15 June

09:00-09:45 Opening Ceremony

Location: Duma Hall

The GLEX 2021 Opening Ceremony will feature several welcome messages from Russian Federation’s officials, as well as IAF and ROSCOSMOS leadership. The ceremony will also include several videos and a musical act.

Speakers:

- Valentina MATVIYENKO (invited)
  Chairwoman, Federation Council of the Federal Assembly, Russian Federation
- Mikhail MISHUSTIN (invited)
  Prime Minister, Russian Federation
- Ivan ABRAMOV
  Deputy Chairman, Federation Council of the Federal Assembly, Russian Federation
- Denis KRAVCHENKO
  Deputy of the State Duma of the Federal Assembly, Russian Federation
- Alexander BEGLOV
  Governor of Saint Petersburg, Russian Federation
- Pascale EHRENFREUND
  President, International Astronautical Federation (IAF), France
- Dmitry ROGOZIN
  Director General, State Space Corporation ROSCOSMOS, Russian Federation
- Christian FEICHTINGER
  Executive Director, International Astronautical Federation (IAF), France
- Christian FEICHTINGER
  MODERATOR

09:45-10:00 Ministers’ Welcome

Location: Duma Hall

Following the official Opening Ceremony, GLEX delegates will have the pleasure to hear brief welcome messages from several international Ministers present at the Conference.

Speakers:

- Rashad NABIYEV
  Minister of Transport, Communications and High Technology, Republic of Azerbaijan, Azerbaijan
- Nenad POPOVIĆ
  Minister for Innovation and Technological Development, Republic of Serbia, Serbia
- Hayk CHOBANYAN
  Minister of High Tech Industry, Republic of Armenia, Armenia
11:00-11:55  Plenary 1 – 60th Anniversary Yuri Gagarin’s Spaceflight

Location: Duma Hall

In 2021 the entire global community will celebrate the 60th anniversary of Yuri Gagarin’s first spaceflight, a truly significant event with which the era of practical space exploration began and forever changed the world. GLEX 2021 will feature a special Plenary dedicated to the 60th anniversary of Yuri Gagarin’s spaceflight. More than 15 international astronauts and cosmonauts are invited to this highlight event and will give their tribute to the first man in space and the beginning of humankind’s spaceflight era.

Speakers:

- **Alexander ALEXANDROV**
  Cosmonaut and General Director's Council, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Hazzaa ALMANSOORI**
  Astronaut, United Arab Emirates
- **Mike BAKER**
  Astronaut and Advisor, Rhodium Scientific, United States
- **Jean-Loup CHRETIEN**
  Astronaut and CEO, Tiwatron Europe, France
- **Jean-François CLERVY**
  Astronaut and Founder, Ariane, France
- **Reinhold EWALD**
  Astronaut and Professor of Astronautics, University of Stuttgart, Germany
- **Claudie HAIGNERÉ**
  Astronaut and Director General, IFPCH Espace, France
- **Oleg KOTOV**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Hazzaa ALMANSOORI**
  Astronaut, United Arab Emirates
- **Jean-François CLERVY**
  Astronaut and Founder, Ariane, France
- **Sergey KRIKALEV**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg KOTOV**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf MERBOLD**
  Astronaut, Germany
- **Pavel VINogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikalev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Kotov**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Jean-Loup Chretien**
  Astronaut and CEO, Tiwatron Europe, France
- **Jean-Francois Clervoy**
  Astronaut and Founder, Ariane, France
- **Claudie Haignere**
  Astronaut and Director General, IFPCH Espace, France
- **Hazzaa Almansoori**
  Astronaut, United Arab Emirates
- **Oleg Kotov**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation

12:00-13:00  Plenary 2A – High-Level Space Leaders

Location: Duma Hall

The IAF is organizing, also at GLEX, its flagship plenary session with the leaders of worldwide space agencies and major institutions. Participating space leaders will present and discuss their respective agencies space programmes, with a focus on current and future space explorations plans. The event will be divided into 2 main sections. In the first part, the space leaders will give a short introduction and the moderator will follow-up with a series of questions; the audience will also have the opportunity to ask questions through the IAF app.

Speakers:

- **Simonetta Di Pippo**
  Director, United Nations Office for Outer Space Affairs (UNOOSA), Austria
- **Driss El Hadani**
  Director General, Royal Centre for Remote Sensing (CRS), Morocco
- **Salvador Landeros**
  Director General, Mexican Space Agency (AEM), Mexico
- **Jean-Loup Chretien**
  Astronaut and CEO, Tiwatron Europe, France
- **Jean-Francois Clervoy**
  Astronaut and Founder, Ariane, France
- **Claudie Haignere**
  Astronaut and Director General, IFPCH Espace, France
- **Hazzaa Almansoori**
  Astronaut, United Arab Emirates
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
- **Oleg Koto**
  Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation
- **Ulf Merbold**
  Astronaut, Germany
- **Pavel Vinogradov**
  Cosmonaut and Deputy Head of Aircraft and Space Flight Center, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation
- **Dumitru-Dorin Prunariu**
  Astronaut and Expert, Romanian Association for Space Technology and Industry, ROMSPACE, Member, Board of the Romanian Space Agency, Romania
- **Sergey Krikaliev**
  Cosmonaut and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation
13:00-14:00  Press Briefing

Location: Duma Hall

The Russian Federation’s representatives, as well as IAF and ROSCOSMOS leadership will attend the press conference to give the audience the opportunity to hear firsthand all the most important and timely questions asked by journalists.

Speakers:
- Ivan ABRAMOV, Deputy Chairman, Federation Council of the Federal Assembly, Russian Federation
- Alexander BEGLOV, Governor of Saint Petersburg, Russian Federation
- Dmitry ROGOZIN, Director General, ROSCOSMOS, Russian Federation
- K. SIVAN (remotely), Chairman, Indian Space Research Organisation (ISRO), India
- Dmitry ROGOZIN, Director General, ROSCOSMOS, Russian Federation
- Grzegorz WROCHNA, President, Polish Space Agency (POLSA), Poland
- YANHUA WU (remotely), Vice Administrator, China National Space Administration (CNSA), China
- Pascale EHRENFREUND, President, International Astronautical Federation (IAF), France

14:00-15:00  Plenary 2B – High-Level Space Leaders

Location: Duma Hall

The IAF is organizing, also at GLEX, its flagship plenary session with the leaders of worldwide space agencies and major institutions. Participating space leaders will present and discuss their respective agencies space programmes, with a focus on current and future space explorations plans. The event will be divided into 2 main sections. In the first part, the space leaders will give a short introduction and the moderator will follow-up with a series of questions; the audience will also have the opportunity to ask questions through the IAF app.

Speakers:
- Salem AL MARRI, Assistant Director General for Science and Technology / Astronaut Program Manager, Mohammed Bin Rashid Space Centre (MBRSC), United Arab Emirates
- Josef ASCHBACHER (remotely), Director General, European Space Agency (ESA), France
- Lisa CAMPBELL (remotely), President, Canadian Space Agency (CSA), Canada
- Christian HAUGLIE-HANSSSEN, Director General, Norwegian Space Agency, Norway
- Valanathan MUNSAMI, CEO, South African National Space Agency (SANSA), South Africa
- Bill NELSON (remotely), Administrator, National Aeronautics and Space Administration (NASA), United States
- Serdar Hüseyin YILDIRIM, President, Turkish Space Agency (TUA), Turkey
- Dmitry ROGOZIN, Director General, ROSCOSMOS, Russian Federation
- Giorgio SACCOCCIA (remotely), President, Italian Space Agency (ASI), Italy
- MODERATOR: Pascale EHRENFREUND, President, International Astronautical Federation (IAF), France
15:30-16:30  IAF GNF – Perseverance, Ingenuity, and the Future of Mars Science and Exploration

Location: Duma Hall

The panel will discuss Perseverance’s science and technology milestones to date and upcoming science plans as well as explore how this mission feeds into future Mars missions including Mars Sample Return and human exploration.

Organized by:

Speakers:

Lori GLAZE (remotely)  Director of Science Mission Directorate’s Planetary Science Division, National Aeronautics and Space Administration (NASA), United States
Sandra SÅSTÅTROM (remotely)  Research Scientist, RISE Research Institutes of Sweden, Sweden
Matt WALLACE (remotely)  Mars 2020 Perseverance Project Manager, NASA Jet Propulsion Lab, United States
Ken WILLIFORD (remotely)  Deputy Project Scientist for the NASA Mars 2020 rover mission and Director of the Astrobiology/Chemistry Laboratory (abcLAB), NASA Jet Propulsion Lab, United States
MODERATOR  Pascale EHRENFREUND  President, International Astronautical Federation (IAF), France

16:35-17:30  IAF GNF – Lunar Surface Infrastructure

Location: Duma Hall

The major spacefaring nations are embarked in a coordinated international effort to sustain space exploration beginning at the International Space Station and moving to lunar orbit and lunar surface and then Mars.

The international Lunar Gateway, a human-tended facility in orbit around the Moon, is the next step beyond LEO in the global journey to Mars.

A Moon surface infrastructure will complement the opportunities that the Lunar Gateway offers to develop a sustainable human space exploration. It will allow to validate capacities and enabling technologies for Mars (landers, rovers, protections from the cosmic radiations...) and will offer in-situ resources.

The panelists will discuss the main elements required to initiate the Moon surface infrastructure and will present the current plans at international level to contribute to its open architecture.

Organized by:

Speakers:

John CONNOLLY  (remotely)  Human Landing Systems Programme, National Aeronautics and Space Administration (NASA), United States
Matt DUGGAN  Mission Management & Operations Manager, The Boeing Company, United States
Barbara IMHOF (remotely)  Co-Founder & Co-CEO, LIQUIFER Systems Group (LSG), Austria
René PISCHEL  Head of the ESA Permanent Mission in the Russian Federation, European Space Agency (ESA), Russian Federation
Roberto PROVERA  Director New Initiatives & Customer Solutions Development, Thales Alenia Space Italia, Italy
Steve SQUYRES (remotely)  Chief Scientist, Blue Origin, United States

15:30-18:30  Technical Sessions

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>International Cooperation for Space Exploration (1)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>11.1</td>
<td>Ground-Based Preparatory Activities (1)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>12.1</td>
<td>Transcending Societal Issues for Space Exploration (1)</td>
<td>Hall #16</td>
</tr>
<tr>
<td>2.1</td>
<td>Lunar Exploration (1)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>7.1</td>
<td>Key Technologies (1)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>8.1</td>
<td>Challenges of Life Support/Medical Support for Human Missions (1)</td>
<td>Hall #9</td>
</tr>
</tbody>
</table>
17:35-18:30 IAF GNF – Enabling Science and Exploration: Extending Human Presence from Earth to The Moon and Beyond

Location: Duma Hall

Humanity’s quest to extend human space exploration beyond Earth to the Moon and on to Mars is guided by a global approach to cooperation. Humankind, including NASA and its international partners, will reach the lunar surface together through the Artemis Program. Through collaboration, we expand our understanding of the Moon and early solar system, learn to live and explore on other worlds, and observe the universe beyond from the unique vantage point of the Moon.

This discussion will provide an update from the industry perspective on Orion and the Artemis architecture, along with the lunar surface capabilities that will enable us to conduct crucial scientific investigations and extend human presence beyond our home planet.

Organized by:

Speakers:

Lisa MAY (remotely)
Chief Technologist for Commercial and Civil Space Advanced Programs, Lockheed Martin Corporation, United States

Kerry TIMMONS (remotely)
Systems Engineering Design & Integration Senior Manager for the Orion Program, Lockheed Martin Corporation, United States

MODERATOR
Pascale EHRENFREUND
President, International Astronautical Federation (IAF), France

18:30-20:30 Welcome Reception

Location: Catherine Hall

Enjoy a nice evening of networking, with a delicious cocktail and a stunning and surprising entertainment!

Wednesday 16 June

09:00-09:25 Highlight Lecture 1 – Space Transportation System of Human Mars Exploration

Location: Duma Hall

Space Transportation System of Human Mars Exploration Human Mars exploration (HME) is of great significance in exploring extraterrestrial life, interstellar migration, promoting Sci&Tech development and the progress of human society. This report first introduces the mission profile, overall scheme, relevant data and video of China’s first Mars exploration mission Tianwen-1 including the Zhurong rover, and China’s future deep space exploration plans, then briefly reviews the development of global Mars exploration, and analyses the design factors of HME mission architecture. It follows that a HME roadmap in the future is proposed with corresponding mission architectures. Also, based on the analysis of composition and characteristics, the overall scheme and design parameters of a HME space transportation system is presented, based on which the related key technologies are given as well. At last, the report draws several conclusions and suggestions, providing references for further global studies on HME and its space transportation system.

Speaker:

Xiaojun WANG (remotely)
President, China Academy of Launch Vehicle Technology (CALT), China

MODERATOR
Christian FEICHTINGER
Executive Director, International Astronautical Federation (IAF), France

09:30-10:30 Plenary 3 – Going Forward to the Moon - New Roads to Lunar Exploration

Location: Duma Hall

The 2019 marked the commitment to go back to the Moon in this decade as a major milestone in Exploration. It will not be the first time humans are on the Moon, but it will still be the decade where humanity pioneers and innovates in many exploration areas on the road to lunar Exploration. The way forward to the Moon is now at the forefront of how space exploration will be understood in the space business. New business models, new technologies, new partnerships... even though space agencies still remain the main developers of these lunar missions, they will gradually become more and more the anchor customers for commercial missions. This panel will offer an overview of different lunar exploration programmes that have appeared around the world, mostly commercial. The panel will highlight the different needs, approaches, challenges and needed solutions from the commercial providers. At the same time, it will help us understand the importance of the space agencies as main customers to them and how the customer relationships are built. It will also give a good overview of the new approaches, covering from the governmental to commercial new policies and actions, discussing over the new business models, new technologies and new partnerships.
As we conceptualize future space missions of different types, involving scientists performing their own experiments in situ, movie directors filming in space, or tourists who willing to experience life in outer space, space habitats need to be increasingly thought as a place to live – and not just as a place to work that offers the barest comforts. The type of work realised in outer space might also differ from simply operating complex machines with the support of a ground control center, which requires a rethinking of orbital workplaces for new kinds of missions.

In this GNF session, we gather a panel of experts from diverse technical, operational, and social science backgrounds in order to confront their perspectives on how the lessons learned from the ISS programme can be exploited and prioritized in the design of future orbiting (and possibly also interplanetary) habitats. We will define some questions in advance, addressing topics such as architecture, living conditions (the ability to look outside the habitat, sleeping, personal hygiene, meals, physical exercise, storage management, connectivity, cabin layout, leisure, sensory aspects, etc.), social wellbeing, work conditions, required level of training in order to use the habitat, systems compatibility, and more. The session will be structured in two parts: the first part (45 minutes) will have each expert give their own view on some of the key questions above and possibly a debate among them. The second part proposes a dialogue with the audience through a Q&A session (15 minutes).
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

11:00-13:00  Technical Sessions

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2</td>
<td>International Cooperation for Space Exploration (2)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>3.1</td>
<td>Mars Exploration (1)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>4.2</td>
<td>Exploration of Near-Earth Asteroids (2)</td>
<td>Hall #16</td>
</tr>
<tr>
<td>6.1</td>
<td>Space Transportation (1)</td>
<td>Hall #9</td>
</tr>
<tr>
<td>7.2</td>
<td>Key Technologies (2)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>9.1</td>
<td>Space Stations</td>
<td>Hall #14</td>
</tr>
</tbody>
</table>

12:00-13:00  IAF GNF – IAF-ASE Astronauts Panel

Location: Duma Hall

The IAF-ASE Astronauts GNF will feature an international panel of astronauts and cosmonauts who will share their perspectives on human space activities and space travel.

Organized by:

Speakers:

Hazzaa ALMANSOORI
Astronaut, United Arab Emirates

Mike BAKER
Astronaut and Advisor, Rhodium Scientists, United States

Jean-François CLERVOY
Astronaut and Founder, AirZeroG, France

Claudie HAIGNERÉ
Astronaut and Director General, JPCH Espaces, France

UIF MERBOLD
Astronaut, Germany

Julie PAYETTE (invited)
Astronaut and Former Governor General, Canada

Franz VIEHBOCK
Astronaut and CEO, Berndorf AG, Austria


MODERATOR
Reinhold EWALD
Astronaut and Professor of Astronautics, University of Stuttgart, Germany

MODERATOR
Oleg KOTOV
Cosmonaut and Deputy Director for Science, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation

14:00-14:55  IAF GNF – Road Map for Creation of The International Research Lunar Station

Location: Duma Hall

This GNF Sessions is a joint event of the State Space Corporation ROSCOSMOS and the National Space Administration of China (CNSA). The session is dedicated to the presentation of the Roadmap for the construction of the International Lunar Research Station, including familiarization with the preliminary aspect of the project, the main stages of its implementation, as well as the procedure of participation of international partners.

Organized by:

Speakers:

Kirill BORISOV
Director of the Department for Automated Space Systems, ROSCOSMOS, Russian Federation

Sergey SAVELEV
Deputy Director General for International Cooperation, ROSCOSMOS, Russian Federation

Yanhuaj WU (remotely)
Vice Administrator, China National Space Administration (CNSA), China

MODERATOR
Christian FEICHTINGER
Executive Director, International Astronautical Federation (IAF), France

14:00-16:00  Technical Sessions

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>International Cooperation for Space Exploration (3)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>11.2</td>
<td>Ground-Based Preparatory Activities (2)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>12.2</td>
<td>Transcending Societal Issues for Space Exploration (2)</td>
<td>Hall #16</td>
</tr>
<tr>
<td>2.2</td>
<td>Lunar Exploration (2)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>3.2</td>
<td>Mars Exploration (2)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>8.2</td>
<td>Challenges of Life Support/Medical Support for Human Missions (2)</td>
<td>Hall #9</td>
</tr>
</tbody>
</table>
15:00-16:00 IAF GNF – Towards a Sustainable Moon Economy – Vision of Agencies & Industries

Location: Duma Hall

How agencies and industries are collaborating together to build a Moon Economy. Indeed, only the development of a cis-lunar economy based on the Moon resources will achieve a sustainable human return and a successful presence on the Moon. Today, the industry is organizing itself toward this objective, involving not only space companies, but also nontraditional space actors. This panel proposes to highlight the vision of key space agencies in the Moon Exploration and the initiatives taken by industries to lead the development of a lunar ecosystem: with one common objective, the development of a Moon Economy.*

Organized by:

Speakers:

Bertrand BARATTE
Vice President New Programmes, Space Exploration
Airbus Defence and Space GmbH, Germany

Joerg KREISEL
CEO, JSIC, Germany

Sergey KRUKALEV
Commandant and Executive Director for Piloted Spaceflights, ROSCOSMOS, Russian Federation

MODERATOR
Pierre-Alexis JOUMEL
Director International & New Business, Space Systems, Airbus Defence and Space GmbH, Germany

16:30-18:30 Technical Sessions

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.1</td>
<td>Space Resources (1)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>2.3</td>
<td>Lunar Exploration (3)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>3.3</td>
<td>Mars Exploration (3)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>4.1</td>
<td>Exploration of Near-Earth Asteroids (1)</td>
<td>Hall #16</td>
</tr>
<tr>
<td>6.2</td>
<td>Space Transportation (2)</td>
<td>Hall #9</td>
</tr>
<tr>
<td>7.3</td>
<td>Key Technologies (3)</td>
<td>Hall #20</td>
</tr>
</tbody>
</table>

16:30-17:30 IAF GNF – Explore As One

Location: Duma Hall

Explore as one NASA – a dynamic dialogue with the Associate Administrators for NASA’s Science, Space Technology, and Human Exploration and Operations Mission Directorates on how NASA engages across the enterprise and with our partners around the world. Their conversation will build on our ability to work together in LEO and on the International Space Station, moving forward into future plans for Artemis and science and technology development for exploration at the Moon and Mars, demonstrating how successful exploration is a cooperative effort.

Organized by:

Speakers:

Kathryn L. LUEDERS
(remotely)
Associate Administrator of the Human Exploration and Operations (HEO) Mission Directorate, National Aeronautics and Space Administration (NASA), United States

James L. REUTER
(remotely)
Associate Administrator for the Space Technology Mission Directorate (STMD), National Aeronautics and Space Administration (NASA), United States

Thomas ZURBUCHEN
(remotely)
Associate Administrator for the Science Mission Directorate, National Aeronautics and Space Administration (NASA), United States

Pascale EHRENFREUND
President, International Astronautical Federation (IAF), France

17:35-18:30 IAF GNF – Habitats, Extreme Analogues, Research, Training, Culture and Arts for Space Exploration (Heart-Case)

Location: Duma Hall

The GLEX GNF Panel will address various aspects of habitats, exploration, astronautics, society and settlements: Science, Technology, Missions, Moon-Mars Synergy, astronauts and Moonbases, Sociocultural, Economy, MoonVillage, Young Lunar & Galilean Explorers, training and capacity building, Art Moon Mars.

The EuroMoonMars initiative with exploration partners conducted field campaigns in Moon-Mars analogue environments. The field campaigns have been organised in specific locations of technical, scientific and exploration interest, at Utah MDRS with ILEWG, ESA ESTEC, NASA Ames, VU Amsterdam. Yearly EuroMoonMars field campaigns were conducted in extreme sites and habitats. The campaigns consist of research activities for data analysis, instruments tests and development, field tests in Moon-Mars analogues, pilot projects, training and hands-on workshops and outreach activities.
The International Moonbase Alliance (IMA) and Hawaii Space Exploration Analog and Simulation (Hi-SEAS) joined on a series of EuroMoonMars, IMA and Hi-SEAS (EMMHS) campaigns, at the Hi-SEAS analogue facilities in Hawaii. As of 2018, IMA, an organization dedicated to building sustainable settlements on the Moon, has been organizing regular simulated missions to the Moon and Mars at Hi-SEAS. Some EuroMoonMars campaigns were conducted in an isolated MoonMars habitat in Poland at AATC Analog Astronaut Training Center, and in Iceland towards the deployment of a lavatube subsurface habitat. A number of extreme analogue habitats concepts have been studied, developed and tested, feeding forward the design and development of future MoonMars Habitats. We shall describe the status of projects, and of analogue astronaut simulations.

Members of IAF ITACCUS, Exploration and Space Habitats committee, have joined, enhancing technical and socio-cultural issues of MoonMars settlements. The ArtMoonMars programme of cultural and artistic activities was started by ILEWG in collaboration with ESA and partner institutions, for events, workshops and artist residencies. Artists demos with scientists and engineers, including visual, electronic, VR artifacts and art performances. One ArtMoonMars pilot project is Moongallery.eu, an international collaborative artwork toward 100 artefacts to the Moon. Moon Gallery aims to set up the first permanent museum on the Moon.

Organized by:
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

Speaker:
Jean-François CLERVOY
Astronaut and Founder,
AirZeroG,
France

Agata KOŁODZIEJCZYK
Director of Scientific Projects,
Analog Astronaut Training Center,
The Netherlands

Oleg ORLOV
Director,
Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS),
Russian Federation

Ioana Roxana PERRIER
Professor Space, Science and Physics,
IPSA (Institut polytechnique des sciences avancées)
Air and Space Engineering School,
France

Henk ROGERS
CEO,
Blue Planet Foundation,
Chair PISCES & HI-SEAS,
Founder International Moonbase Alliance,
United States

Anna SITNIKOVA
Curator, Manager and the Deputy-Chair,
Moon Gallery Foundation,
The Netherlands

MODERATOR
Bernard FOING
Executive Director,
International Lunar Exploration Working Group (ILEWG), EuroMoonMars,
Chair IAF ITACCUS Committee,
The Netherlands

19:30-00:00 Gala Dinner
Location: The “Summer Palace” Restaurant
Transfer will be provided from Conference venue to the Gala Dinner.
19:30 ~ 20:30 Welcome Cocktail
20:30 ~ 00:00 Gala Dinner offered by Saint Petersburg

Address:
Restaurant “Summer Palace”
Saint Petersburg Chaussé
140 K7
Thursday 17 June

09:00-09:25 Highlight Lecture – UAE National Space Program: Current Status and Upcoming Missions

Location: Duma Hall

The session will introduce the UAE National Space Program, highlighting the main pillars which are: 1) Satellite Development Program 2) Emirates Mars Mission (HOPE Probe) 3) UAE Astronaut Program 4) Mars 2117 strategy. The session will present the current and future missions and projects under each pillar, focusing on the new ambitious initiatives announced recently: Emirates Lunar Mission, UAE Analog Mission, and Mars Science City.

Speaker:
Adnan AL RAIS
Senior Director, Remote Sensing Department and Program Manager, Mars 2117, Mohammed Bin Rashid Space Centre (MBRSC), United Arab Emirates

Christian FEICHTINGER
Executive Director, International Astronautical Federation (IAF), France

MODERATOR
Anatoli PETRU KOVICH
Director of Space Research Institute, Russian Academy of Sciences, Russian Federation

09:30-10:30 Plenary 4 – Human Roads to Outer Space - Real and Imaginary Dangers

Location: Duma Hall

Outstanding progress of space medicine after 60 years of human flights at low Earth’s orbits allowed long term presence (~ 18 month) of astronauts/ microgravity field exposed to the space radiation enhanced due to the lack of strong protective shielding of the Earth’s atmosphere.

Outer space flights where even another shielding provided by the Earth’s magnetic field vanishes impose very different and much more challenging set of limitations for human survival in this harsh environment. The experience here is limited only by relatively short-term historical Apollo flights.

Debates are still under way—when conditions are more favorable, say for Martian expeditions-during Solar Min or Solar Max. It is well known that flux of Galactic cosmic rays (most dangerous ingredient of space radiation) anticorrelates with intensity of Solar wind.

Special gravitational conditions at the MOON (1/6 of the Earth’s gravitation) also provide many unknowns. While human adaptation to microgravity is rather well understood now— mid-term [1-2 months] presence of humans in small gravity will definitely require very different accommodation scenarios.

And last, not the least, Lunar Dust. Very aggressive toxic substance consisting of fine (starting from nanometers) charged particles with sharp edges sticking to space suits and penetrating to return vehicle according to notes of Apollo astronauts.

This is a list of main dangers for human flights to the Moon often discussed in mass media and producing serious concern not only of professionals but even usual taxpayers. Maybe some of these problems are exaggerated. This is natural and understandable, the prerequisite of any human exploration of outer space is safety of astronauts and their unique intellectual role during expedition which requires their support in excellent physical conditions.

09:00-09:25

09:30-10:30

11:00-11:30

The plenary event for GLEX 2021 will bring together specialists in different fields (gravitational medicine, space weather, dusty plasma, solar and galactic cosmic rays, space suits design, Landing vehicles protective systems, etc.) to discuss comprehensively the problems mentioned above and hopefully identify some joint international efforts which will help to solve most important among them.

Speakers:

Ioannis DAGLIS (remotely)
Associate Professor, National Space Science Center, Chinese Academy of Sciences, China

Hanns-Christian GUNGA
Deputy Director, Institute of Physiology, Center for Space Medicine and Extreme Environments Berlin, Germany

Anatoli PETRU KOVICH
Director of Space Research Institute, Russian Academy of Sciences, Russian Federation

Vladimir KALEGAEV
Head of the Laboratory of Space Research, Moscow State University (MSU), Russian Federation

Speakers:

Oleg ORLOV
Director, Institute for Biomedical Problems of the Russian Academy of Sciences (IBMP RAS), Russian Federation

MODERATOR

Bingxian LUO (remotely)
Associate Professor, National Space Science Center, Chinese Academy of Sciences, China

Lev ZELENYI (remotely)
President Space Research Institute, Russian Academy of Sciences, Russian Federation

MODERATOR

Sample Return Mission on Lunar Surface

Location: Duma Hall

The Chang’E-5 mission of 3rd phase of China’s Lunar Exploration Program is the first sample return mission from other celestial body in China. The objective of Chang’E-5 probe is to implement lunar transfer and circumlunar orbit flight, land on the predefined site on lunar surface, collect lunar samples, lift-off on lunar surface, transfer lunar samples after rendezvous on lunar orbit, Earth transfer flight and re-enter Earth atmosphere, and bring lunar samples back to Earth safely at last. The technical features, brief introduction and development process of Chang’E-5 probe are described in the paper. At the same time, the breakthrough and innovation of key technologies are summarized. The flight results are given as well. The implementation results on orbit shows that the function and specifications of Chang’E-5 satisfied the requirements, and the design was validated.

Organized by:
11:00-13:00 Technical Sessions

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.2</td>
<td>Space Resources (2)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>12.3</td>
<td>Transcending Societal Issues for Space Exploration (3)</td>
<td>Hall #16</td>
</tr>
<tr>
<td>2.4</td>
<td>Lunar Exploration (4)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>5.1</td>
<td>Exploration of Other Destinations (1)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>7.4</td>
<td>Key Technologies (4)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>8.3</td>
<td>Challenges of Life Support/Medical Support for Human Missions (3)</td>
<td>Hall #9</td>
</tr>
</tbody>
</table>

11:40-12:10 IAF GNF – Global Exploration at A Cross Road: The Role of Europe

Location: Duma Hall

As history has shown, exploration transforms and adds value to society by providing:
- New knowledge acquired in new locales (science, technological progress);
- A different perspective on our origins as a species ("pale blue dot" effect);
- Fresh context for our societal value.

All this allows us to imagine the next reality, our next paradigm – something previously thought impossible.

Revamped political ambitions, the availability of more modern technologies, the access to more capital – both private and public – all contribute to setting humanity’s sails on the most ambitious and global exploration initiative ever undertaken. Here, Europe and Europeans, a population of explorers, claim their role as a key international partner for the progress of humankind.

Airbus is pleased to organise a fireside chat with distinguished European guests to elaborate on European ambitions and capabilities in a global context.

Organized by:

12:20-12:50 IAF GNF – National Space Program of Turkish Space Agency (TUA)

Location: Duma Hall

The President of Turkish Space Agency (TUA), Mr. Serdar HÜSEYIN YILDIRIM is going to present National Space Program (NSP) of Turkey. NSP was declared on the 9th of February by the President of the Republic of Turkey, H. E. Mr. Recep Tayyip Erdogan. It is a comprehensive document which considers the latest developments in the world and reflects Turkey’s main objectives, which the country has set for itself in the space field, as well as the steps which are being taken to achieve them. NSP ensures that the vision, strategies, objectives and projects on space policies are carried out in a coordinated and integrated manner. NSP determines 10 Main Strategic Goals along with many sub-goals. These strategic goals planned over the 10-year period contain great opportunities for all stakeholders related to space. This session is important in order to take advantage of today’s opportunities and to realize these opportunities together with Turkey’s capabilities in the field of space.

Organized by:

Speaker:

11:00-13:00 Technical Sessions

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4</td>
<td>Lunar Exploration (4)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>10.2</td>
<td>Space Resources (2)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>12.3</td>
<td>Transcending Societal Issues for Space Exploration (3)</td>
<td>Hall #16</td>
</tr>
<tr>
<td>5.1</td>
<td>Exploration of Other Destinations (1)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>7.4</td>
<td>Key Technologies (4)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>8.3</td>
<td>Challenges of Life Support/Medical Support for Human Missions (3)</td>
<td>Hall #9</td>
</tr>
</tbody>
</table>

11:40-12:10 IAF GNF – Global Exploration at A Cross Road: The Role of Europe

Location: Duma Hall

As history has shown, exploration transforms and adds value to society by providing:
- New knowledge acquired in new locales (science, technological progress);
- A different perspective on our origins as a species ("pale blue dot" effect);
- Fresh context for our societal value.

All this allows us to imagine the next reality, our next paradigm – something previously thought impossible.

Revamped political ambitions, the availability of more modern technologies, the access to more capital – both private and public – all contribute to setting humanity’s sails on the most ambitious and global exploration initiative ever undertaken. Here, Europe and Europeans, a population of explorers, claim their role as a key international partner for the progress of humankind.

Airbus is pleased to organise a fireside chat with distinguished European guests to elaborate on European ambitions and capabilities in a global context.

Organized by:

12:20-12:50 IAF GNF – National Space Program of Turkish Space Agency (TUA)

Location: Duma Hall

The President of Turkish Space Agency (TUA), Mr. Serdar HÜSEYIN YILDIRIM is going to present National Space Program (NSP) of Turkey. NSP was declared on the 9th of February by the President of the Republic of Turkey, H. E. Mr. Recep Tayyip Erdogan. It is a comprehensive document which considers the latest developments in the world and reflects Turkey’s main objectives, which the country has set for itself in the space field, as well as the steps which are being taken to achieve them. NSP ensures that the vision, strategies, objectives and projects on space policies are carried out in a coordinated and integrated manner. NSP determines 10 Main Strategic Goals along with many sub-goals. These strategic goals planned over the 10-year period contain great opportunities for all stakeholders related to space. This session is important in order to take advantage of today’s opportunities and to realize these opportunities together with Turkey’s capabilities in the field of space.

Organized by:

Speaker:
As the new era of space exploration unfolds, an increasing number of space agencies worldwide are becoming engaged in space exploration. This is evidenced by the dramatic expansion in the membership of the International Space Exploration Coordination Group (ISECG), an inter-agency coordination forum created in 2007 to advance individual and collective efforts in space exploration. In January 2018, ISECG produced the third edition of the Global Exploration Roadmap (GER), which captured a shared vision for human and robotic space exploration of 15 members agencies. Since then, ISECG membership has steadily increased, and many space agencies have renewed their focus on the Moon. These circumstances created an opportunity for ISECG to release, in August 2020, the Lunar Surface Exploration Scenario Update as a supplement to GER. This document, produced by 24 member agencies, laid out the latest mission scenario and architecture for human and robotic lunar surface missions, integrating renewed and emerging national plans and commercial capabilities among ISECG participating countries. As of today, ISECG has 26 member agencies.

The growing endeavors and participation by emerging agencies in space exploration mean that more countries, including their industry and citizens, would contribute to and benefit from space exploration. The increased opportunities arising from the enlarged programs of established agencies, availability of commercial transportation services and other capabilities, sharing of scientific data, and lower entry-to-barrier technologies such as cubist are opening new possibilities for the emerging agencies. On the other hand, these agencies’ added missions and investments could complement those of established agencies and create business opportunities for industries, contributing to the creation of sustainable global space exploration. However, it is also true that the emerging agencies are faced with technological, budgetary, and institutional challenges. Given the limited resources and expertise, it is not easy for the emerging agencies to carry out programs or missions of their own or to determine how best they could contribute to the global exploration effort in a coordinated manner.

This plenary session will bring together both established and emerging space agencies of ISECG to discuss these topics. The first part of the session will introduce the GER Supplement to highlights the growing global momentum in lunar exploration and present ISECG’s shared vision and objectives and its approach towards the sustainable exploration of the Moon and preparation for human missions to Mars. Agencies will discuss the values of having a common scenario and architecture and explain how they aim to achieve their goals within the coordinated framework. The second part of the session will address challenges and opportunities for the emerging space agencies and the role of ISECG in fostering their participation in the global exploration. The discussion will focus on how synergies could be created between and among emerging and established space agencies and how the private sector capabilities could be leveraged in order to advance the global exploration community’s common goals and objectives.

Speakers:

**Salem AL MARRI**
Assistant Director General for Science and Technology/Astronaut Program Manager, Mohammed Bin Rashid Space Centre (MBRSC), United Arab Emirates

**Gwanghyeok JI** (remotely)
ISECG Emerging Space Agencies Working Group Co-Chair, Principal Researcher, Space Exploration Research Division, Korea Aerospace Research Institute (KARI), Republic of Korea

**Salvador LANDEROS**
Director General, Mexican Space Agency (AEM), Mexico

**Christian LANGE** (remotely)
ISECG Chair, A/Director, Space Exploration Planning, Coordination and Advanced Concepts, Canadian Space Agency (CSA), Canada

**Anthony MURFETT** (remotely)
Deputy Head, Australian Space Agency, Australia

**Marius-Ion POPO** (remotely)
President & CEO, Romanian Space Agency (ROSA), Romania

---

**Location:** Duma Hall

**15:30-16:30 IAF GNF MEDIA PANEL – A Roundtable on the Role of Media in Promoting Space Exploration**

**Speaker:**

**Stephen COLE**
Journalist, CGTN Europe

**Rachel CRANE** (invited)
Innovation and space correspondent, CNN

**Maxim PIADUSHKIN**
Journalist, Aviation Week

**Anastasia MEDVEDEVA**
Journalist, Russia Today

**Georgy PODGORNY**
Journalist, Russia 24

**Jackie WATTLES** (invited)
Journalist, CNN

Space exploration is a topic of public interest and broad public support to space exploration is the foundation for creating political commitment. However, in the past, space institutions and advocacy bodies have not always been able to effectively convey the benefits that space exploration would bring to society. Media plays a key role in communicating highly complex and technical subjects to a broad public in an understandable way and – as such – is the link between the scientific community and society.

In this original and cutting-edge session, international journalists and media representatives will discuss some of the following topics:

- How has the way space exploration activities have been communicated and promoted to the non-space community and general public changed and evolved over the past 60+ years of the space era?
- How can space organizations (government, industry, academia) better communicate and promote space exploration plans and activities?
- What is the role of media in promoting space exploration?
- How have the communication strategies evolved with the advent of new platforms and channels, including social media?

Organized by:
**15:30-17:00  Technical Sessions**

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td>International Cooperation for Space Exploration (4)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>11.3</td>
<td>Ground-Based Preparatory Activities (3)</td>
<td>Hall #9</td>
</tr>
<tr>
<td>2.5</td>
<td>Lunar Exploration (5)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>3.4</td>
<td>Mars Exploration (4)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>5.2</td>
<td>Exploration of Other Destinations (2)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>7.5</td>
<td>Key Technologies (5)</td>
<td>Hall #16</td>
</tr>
</tbody>
</table>

**16:30-17:00  IAF GNF – Next Stop - IAC 2021 In Dubai**

**Location:** Duma Hall

In this session, the IAF and MBROC will present their plans and the preliminary programme for the upcoming IAC 2021, taking place in Dubai from 25 to 29 October 2021. Make sure to attend the session to have all the latest insights on this exciting event!

**Organized by:**

- [IAF](https://www.iaf.org)
- [MBROC](https://www.mbrsc.ae)

---

**17:00-17:45  Closing Ceremony**

**Location:** Duma Hall

The Closing Ceremony provides a formal end to the activities of the GLEX 2021. It will feature some remarks from IAF and ROSCOSMOS leadership, as well as from the GLEX IPC Co-Chairs. It will also include a highlight video of the entire Conference and the announcement of the Best Technical Presentations Award. Don’t miss it!

**Speakers:**

- Pascale EHRENFREUND
  - President, International Astronautical Federation (IAF), France
- Sergey KRIKALEV
  - Executive Director for Piloted SpaceFlights, ROSCOSMOS, Russian Federation
- Christian SALLABERGER (remotely)
  - GLEX 2021 IPC Co-Chair, President and CEO, Canadensys Aerospace Corporation, Canada

---

**15:30-17:00  Technical Sessions**

<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td>International Cooperation for Space Exploration (4)</td>
<td>Hall #14</td>
</tr>
<tr>
<td>11.3</td>
<td>Ground-Based Preparatory Activities (3)</td>
<td>Hall #9</td>
</tr>
<tr>
<td>2.5</td>
<td>Lunar Exploration (5)</td>
<td>Hall #1</td>
</tr>
<tr>
<td>3.4</td>
<td>Mars Exploration (4)</td>
<td>Hall of Library</td>
</tr>
<tr>
<td>5.2</td>
<td>Exploration of Other Destinations (2)</td>
<td>Hall #20</td>
</tr>
<tr>
<td>7.5</td>
<td>Key Technologies (5)</td>
<td>Hall #16</td>
</tr>
</tbody>
</table>
5 SOCIAL AND CULTURAL PROGRAMME

5.1 Welcome Reception

Tuesday 15 June 2021 18:30-20:30
Location: Tavrichesky Palace - Catherine Hall

5.2 Gala Dinner

Wednesday 16 June 2021 19:30-00:00
19:30 – 20:30 Welcome Cocktail
20:30 – 00:00 Gala Dinner offered by Saint Petersburg
Location: The “Summer Palace” Restaurant, Saint Petersburg Chaussé, 140 K7

The “Summer Palace” restaurant is located on the Saint-Petersburg highway, a stone’s throw from the famous fountains of Peterhof, next to the Sergeiya and Alexandria parks.

During the evening guests will have a memorable dinner with different exquisite dishes. They will also become spectators of a fantastic cultural programme, which includes ballet of the Mikhailovsky theater, performance of gymnastics and singers and even popular fragments from the most famous musicals.

5.3 Excursions

<table>
<thead>
<tr>
<th>Date</th>
<th>Morning excursion program</th>
<th>Evening excursion program</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.06.2021</td>
<td>City bus excursion (for 50 pax.)</td>
<td>Excursion to the Peter and Paul Fortress with a visit to the Cathedrals of Peter and Paul (for 50 pax.)</td>
</tr>
<tr>
<td></td>
<td>Groups: 50 pax.</td>
<td>15 pax.</td>
</tr>
<tr>
<td>Time</td>
<td>08:00 – 11:00</td>
<td>11:30 – 14:00</td>
</tr>
<tr>
<td>15.06.2021</td>
<td>City bus excursion (for 50 pax.)</td>
<td>Excursion to the Peter and Paul Fortress with a visit to the Cathedrals of Peter and Paul (for 50 pax.)</td>
</tr>
<tr>
<td></td>
<td>Groups: 50 pax.</td>
<td>15 pax.</td>
</tr>
<tr>
<td>Time</td>
<td>08:00 – 11:00</td>
<td>11:30 – 14:00</td>
</tr>
<tr>
<td>16.06.2021</td>
<td>City bus excursion (for 50 pax.)</td>
<td>Excursion to the Peter and Paul Fortress with a visit to the Cathedrals of Peter and Paul (for 50 pax.)</td>
</tr>
<tr>
<td></td>
<td>Groups: 50 pax.</td>
<td>15 pax.</td>
</tr>
<tr>
<td>Time</td>
<td>08:00 – 11:00</td>
<td>11:30 – 14:00</td>
</tr>
<tr>
<td>17.06.2021</td>
<td>City bus excursion (for 50 pax.)</td>
<td>Excursion to the Peter and Paul Fortress with a visit to the Cathedrals of Peter and Paul (for 50 pax.)</td>
</tr>
<tr>
<td></td>
<td>Groups: 50 pax.</td>
<td>15 pax.</td>
</tr>
<tr>
<td>Time</td>
<td>08:00 – 11:00</td>
<td>11:30 – 14:00</td>
</tr>
</tbody>
</table>

For late bookings please contact the IAF Secretariat at on site or at glex2021@iafastro.org

5.3.1 City bus excursion

Monday 14 June - Thursday 17 June 2021 10:00-11:00

Departure to Peterhof by a coach and excursion to the Peterhof State Museum-Restoration (33 pax.)
Departure to Pushkin by a coach and excursion to the Peterhof State Museum-Reserve (134 pax.)
Departure to Pushkin by a coach and excursion to the Peterhof State Museum-Reserve (13 pax.)

Groups: 6 groups of up to 20 pax. (max. 120 pax.)
Time: 10:30 - 11:30
5.3.2 Excursion to the Peter and Paul Fortress
Monday 14 June - Thursday 17 June 2021 11:30-14:00

5.3.3 Excursion to the Faberge Museum
Monday 14 June - Thursday 17 June 2021 16:30-17:00

5.3.4 Boat sightseeing tour
Monday 14 June - Thursday 17 June 2021 17:40-19:00

5.3.5 Visit to Peterhof Park and Palace
Friday 18 June 2021 09:50-12:00 | 11:50-14:00 | 14:50-17:00

Discover all the other attractions St. Petersburg has to offer such as the Hermitage, the Russian Museum, the Elagin Island, or the Mosaic Courtyard!
6 EXHIBITION

6.1 Exhibition Area Floorplan

8.2 List of Exhibitors

<table>
<thead>
<tr>
<th>Company</th>
<th>Contact</th>
<th>Tel:</th>
<th>Mail:</th>
<th>Web:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azercosmos</td>
<td>Rena Jafarova</td>
<td>+994 12 310 0055</td>
<td><a href="mailto:info@azercosmos.az">info@azercosmos.az</a></td>
<td><a href="http://www.azercosmos.com">www.azercosmos.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>+994 12 565 0055</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Address:</td>
<td>Uzeyir Hajibayli str. 72,</td>
<td>Baku, AZ1000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central Post building, 5th floor,</td>
<td>Azerbaijan</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azercosmos</td>
<td>Social Media:</td>
<td>LinkedIn: <a href="https://bit.ly/2SLmTfy">https://bit.ly/2SLmTfy</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facebook: <a href="https://www.facebook.com/Azercosmosofficial/">https://www.facebook.com/Azercosmosofficial/</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Twitter: <a href="https://twitter.com/Azercosmos1">https://twitter.com/Azercosmos1</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Established in 2010, Azercosmos is the first and only satellite operator in the South Caucasus region, providing satellite-delivered telecommunication and Earth observation services to enterprises and governmental institutions across Europe, Africa, Middle East, Central and South Asia and the CIS region. Apart from satellite operations, Azercosmos seeks to drive technological advancement, contributes to the welfare of the Azerbaijani community through CSR initiatives and strengthens its position as a reliable partner in the international space arena. Azercosmos will welcome the global space community to the 74th International Astronautical Congress (IAC) in Baku in 2023, and will offer an exceptional congress experience, immersing participants into the elegant fusion of the past and the future.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Company</th>
<th>Contact</th>
<th>Tel:</th>
<th>Mail:</th>
<th>Web:</th>
</tr>
</thead>
<tbody>
<tr>
<td>GK Launch Services</td>
<td>Mila Savelyeva</td>
<td>+7 495 150-44-72 ext. 122</td>
<td><a href="mailto:info@gklaunch.ru">info@gklaunch.ru</a></td>
<td><a href="http://gklaunch.ru">http://gklaunch.ru</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Address:</td>
<td>26/1 Prospekt Mira Ave., Moscow,</td>
<td>129090 Russian Federation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social Media:</td>
<td>Twitter: <a href="https://twitter.com/gk_launch">https://twitter.com/gk_launch</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Facebook: <a href="https://www.facebook.com/gklaunch/">https://www.facebook.com/gklaunch/</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LinkedIn: <a href="https://www.linkedin.com/company/gk-launch-services">https://www.linkedin.com/company/gk-launch-services</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Instagram: <a href="https://www.instagram.com/gklaunch/">https://www.instagram.com/gklaunch/</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GK Launch Services</td>
<td>established in 2010, is a commercial operator of spacecraft launches. The core business of GK Launch Services is to set up and perform commercial launches using Soyuz-2 LV. The company’s prime mission is to develop the commercial launch sector and promote Russian launch vehicles on the global market.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Founded in 1951, the International Astronautical Federation is the world’s leading space advocacy body with more than 407 members, 71 countries on six continents, including all leading 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 and fosters the development and application of space assets by advancing global cooperation.

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

Lavochkin Science and Production Association (Lavochkin Association)

Contact: Pavel Primakov
Tel: +7 495 575 51 56
Mail: PrimakovPV@laspace.ru
Web: www.laspace.ru
Social Media:
Facebook: NPOlavochkina
Instagram: laspace_ru

Lavochkin Association is a large design, scientific and production association, one of the leading companies of the Russian space industry. The enterprise develops and produces space systems for science purposes, unmanned spacecraft (including small spacecraft) for astrophysical and planetary research, Earth remote sensing, studies of solar-terrestrial relations as well as orbit-injection means (upper stages, fairings, transfer compartments), unified space platforms, hardware and software complexes for tests and flight control. The company performs a total cycle of spacecraft preparation for flight: ground tests, preparation at the launch pad, control from the Mission Control Center, ballistic support of interplanetary missions and near-Earth spacecraft.

Lavochkin Association cooperates with a wide range of foreign partners. The company has developed and manufactured the Spekt-r spacecraft for the RadioAstron International Project, the Spektor-RG astrophysical space observatory and is developing a descent module with a landing platform for the ExoMars-2022 mission.

Number of employees: 4,500+
Year of foundation: 1937

ROSCOSMOS is a State Corporation that was established in August 2015 to oversee and implement a comprehensive reform of the Russian space industry. The state corporation ensures the implementation of the Russian government’s space program and its legal regulation. ROSCOSMOS is also placing orders for the development, manufacture, supply of space equipment and space infrastructure objects and responsible for international space cooperation and tasked with setting the stage for the future use of results of space activities in the social and economic development of Russia.

Russian Space Systems, JSC

Contact: Denis Efimtcev
Tel: +7 495 673 9430
Mail: marketing@spacecorp.ru
Web: http://russianspacesystems.ru/

Russian Space Systems, JSC (RSS, part of ROSCOSMOS) focuses on development, manufacturing and operation of space information systems. Main capabilities: development and operation of global navigation system GLONASS, COSPAS-SARSAT system; ground-based stations for ERS information receiving and processing. RSS group of companies includes Research Institute of Precision Instruments, Scientific, Research, Production Corporation of Measuring Equipment, Research Institute for Physical Measurement, Special Research Bureau of Moscow Power Engineering Institute, Orion Scientific Production Association.
Joint stock company “Center for Operation of Space Ground Based Infrastructure” (JSC “TsENKI”) is one of the largest enterprises in the space rocket industry of Russia. The main task of JSC “TsENKI” is provision of accident-free launches as well as creation of ground based infrastructure for cosmodromes.

JSC “TsENKI” specialists are successors of launch and technical complexes designers having provided launches of first spacecrafts from Baikonur cosmodrome and blazed a trail into space for all mankind.

Due to long experience and accumulated knowledge, JSC “TsENKI” possesses great scientific and technical potential that allows to achieve high results and retain the leading position in launch service market.

Vostochny cosmodrome is a new page in the history of Russian cosmonautics. JSC “TsENKI” became a focal developer of ground launch and support equipment for the cosmodrome.

Today our company keeps up the best traditions of national space science and industry, implementing the advanced technologies and management solutions in order to provide reliable, safe and reasonable priced launches of different launch vehicles from existing and prospective launch sites in the nearest future.

7 TECHNICAL PROGRAMME

7.1 Topics Overview

1. International Cooperation for Space Exploration
   International coordination of scientific and technical objectives (ISECG, COSPAR,..), International Missions, Sharing of Scientific Mission Data, etc.

2. Lunar Exploration
   Robotic missions; Human missions; Moon Village; Outposts and Bases; Lunar orbital infrastructure

3. Mars Exploration
   Current missions; Mars sample return; Missions to Phobos/Dieoms; Human missions

4. Exploration of Near-Earth Asteroids
   Robotic missions; Human missions; Planetary Defense

5. Exploration of Other Destinations
   Mercury missions; Venus missions; Outer Planet missions; Finding planets around other stars; Astronomy;

6. Space Transportation
   New propulsion systems; Commercial lunar landers; etc

7. Key Technologies
   EDL; Robotics; GNC; Advanced Vision Systems; Radiation Robustness; Thermal technologies (RTG’s, Loop Heat Pipes); Dust mitigation; etc.

8. Challenges of Life Support/Medical Support for Human Missions
   Life support; Medical care; Crew Selection/Training; etc.

9. Space Stations
   Supporting exploration via the ISS; Gateway; other space stations current and planned.

10. Space Resources
    Lunar Oxygen/Water extraction; Mineral exploration; Helium-3; Fuel production on Moon/Mars/Asteroids; Other In-situ resource use;

11. Ground-Based Preparatory Activities
    Analogue missions and deployments; Technology demonstrations; Simulations; Test facilities

12. Transcending Societal Issues for Space Exploration
    Legal issues/models/regimes; public awareness and education; new commercial industrial models to enable space exploration; governance of future stations/outposts/bases; Policy issues; etc.
7.2 Information for Authors

All authors have been asked to upload their materials prior to the Conference in order to make them available to all participants on the Virtual Technical Gallery and the online Proceedings of the GLEX 2021. You can still update your manuscripts through the IAF platform: https://iafastro.directory/iac/account/login/.

All authors shall bring their final presentation on a USB memory stick and load it into the computer in the Technical Session rooms no later than one day prior to their presentation. Speakers are requested to report to their allocated Technical Session room 20 minutes prior to the start of their session to meet with their Session Chair and to check their presentation. Do not forget also to bring two printed courtesy copies of your manuscript. Some Session Chairs might also ask you for a short biography to introduce you at the session.

7.3 Best Technical Presentations Award

The GLEX 2021 Best Technical Presentations Award is a recognition which celebrates the most inspiring and effective video lecture presentations that are delivered by impactful and engaging authors of the conference Technical Programme.

This award will be given for the three most outstanding presentations in the entire conference and results will be announced at the Closing Ceremony on 17 June.

Jury:

Pascale EHRENFREUND
President, International Astronautical Federation (IAF)

S. SOMANATH
VP for Technical Activities, International Astronautical Federation (IAF)

Mary SNITCH
VP for Global Conferences, International Astronautical Federation (IAF)

Sergey KRIKALEV
GLEX 2021 IPC Co-Chair

Christian SALLABERGER
GLEX 2021 IPC Co-Chair

7.4 Virtual Technical Gallery

GLEX 2021 will be marked by the launch of the «The Virtual Technical Gallery», the most innovative IAF tool.

The Virtual Technical Gallery is a user-friendly digital platform and will host a vibrant mix of more than 250 brilliant video lectures, engaging lightning talks and full manuscripts. All registered participants will receive a custom Access Key ID and will be able to display the content of the respective Technical Sessions just after 08:00 (MSK) on each day following the onsite presentations.

Registered participants can scan the QR code or click on https://dl.iafastro.directory/gallery/GLEX-2021/ to access the VTG with their Access Key. In case you have not received your Access Key ID, please check your spam folder or contact: digital.library@iafastro.org.

7.5 Certificates of Attendance

Requests shall be addressed at support@iafastro.org.

7.6 Proceedings

The GLEX 2021 proceedings are available on a password protected site. All registered participants will be provided after the conference with a link and online password to login and access the online proceedings.

If you do not receive the password, please contact: support@iafastro.org. Papers will be indexed in the world’s leading citation databases: Elsevier’s SCOPUS and Compendex.
7.7 Technical Keynotes

Seemingly Different Impact of Spaceflight On NASA, ESA and ROSCOSMOS Space Crew Regarding the Perivascular Space

**Track 8.1 - Challenges of Life Support/Medical Support for Human Missions**

**Date:** Tuesday 15 June  
**Time:** 15:30  
**Speaker:** 
- Floris L. WUJTS  
  Head of Lab for Equilibrium Investigations and Aerospace (LEIA), University of Antwerp, Belgium

Human Spaceflight from Guiana Space Center

**Track 6.1 - Space Transportation**  
**Date:** Wednesday 16 June  
**Time:** 11:00  
**Speaker:** 
- Christophe BONNAL (prerecorded)  
  Senior Expert, Launch Systems, Centre National d’Etudes Spatiales (CNES), France

Modern Trends of Spacecraft Power-And-Propulsion Systems

**Track 6.2 - Space Transportation**  
**Date:** Wednesday 16 June  
**Time:** 16:30  
**Speaker:** 
- Alexander SEMENKIN  
  Head of Department at Keldysh Research Centre, S. P. Korolev Rocket and Space Corporation Energia, Russian Federation

Small Probes for Deep Space Exploration

**Track 7.4 - Key Technologies**  
**Date:** Thursday 17 June  
**Time:** 11:00  
**Speaker:** 
- Pierre W. BOUSQUET (prerecorded)  
  Senior Expert Planetologue, Exploration and Micronauteur, Centre National d’Etudes Spatiales (CNES), France

7.8 Technical Papers

For the latest updates, please consult: https://iafastro.directory/iac/browse/GLEX-2021/

**1. International Cooperation for Space Exploration (1)**

**GLEX-2021.1.1.1**  
A STRATEGIC OUTLOOK FOR SPACE EXPLORATION: ON THE VERGE OF A NEW ERA?  
- Natalia Larina Brito, Euroconsult, Canada

**GLEX-2021.1.1.2**  
AN UPDATED REFERENCE LUNAR SURFACE EXPLORATION SCENARIO FOR THE GLOBAL EXPLORATION ROADMAP (GER): THE GROWING GLOBAL EFFORT AND MOMENTUM GOING FORWARD TO THE MOON AND MARS  
- Stefan De Mey, European Space Agency (ESA), The Netherlands

**GLEX-2021.1.1.3**  
AN INTERNATIONAL APPROACH TO THE COORDINATION OF TECHNOLOGY DEVELOPMENT EFFORTS ENABLING THE GLOBAL EXPLORATION ROADMAP  
- Christian Lange, Canadian Space Agency, Canada

**GLEX-2021.1.1.4**  
FREQUENCY ALLOCATION AND REGISTRATION PROCESS FOR SPACE EXPLORATION MISSIONS  
- Chen Ci, International Telecommunication Union (ITU), Switzerland

**GLEX-2021.1.1.5**  
BUILDING A FOUNDATION FOR FUTURE INTERNATIONAL COOPERATION THROUGH IMPLEMENTATION OF INTERNATIONAL COMPONENT INTO TRADITIONAL AEROSPACE CURRICULUM. Olga Bannova, University of Houston, United States

**GLEX-2021.1.1.6**  
CLOSING THE GAP IN SPACE LAW: AN IMPLEMENTATION AGREEMENT FOR THE MOON TREATY THAT SUPPORTS ALL PRIVATE ACTIVITY WHILE PROTECTING ESSENTIAL PUBLIC POLICIES  
- Dennis O’Brien, Space Treaty Project, United States

**GLEX-2021.1.1.7**  
DEMOCRATIZING ACCESS TO SPACE BY APPLICATION OF UN NPS PRINCIPLES IN ROBOTIC AND CREWED MARS/EUROPE-INTERNATIONAL NUCLEAR POWER AND PROPULSION SYSTEM (NPPS)  
- Frank Jansen, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

**1.2. International Cooperation for Space Exploration (2)**

**GLEX-2021.1.2.1**  
SPACE’S INTERNATIONAL MISSION TO THE MOON  
- Kyle Acierno, ispace, Inc, Luxembourg

**GLEX-2021.1.2.2**  
INTERNATIONAL COOPERATION IN SPACE EXPLORATION: MITIGATING THE LOW EARTH ORBITAL ISSUES: ABSTRACT BY DR SANAT KAUL  
- Sanat Kaul, India

**GLEX-2021.1.2.3**  
EMERGING TECHNOLOGIES AND GROUNDBREAKING INVENTIONS OF JSC RKTS PROGRESS - TRENDS OF REPORT  
- Ravil Akhmetov, JSC RKTS Progress, Russian Federation

**GLEX-2021.1.2.4**  
INNOVATION THROUGH TECHNOLOGY TRANSFER  
- Arzu Kurgan, Skolkovo Institute of Science and Technology, Russian Federation

**GLEX-2021.1.2.5**  
CAPACITY BUILDING IN THE AFRICAN SPACE INDUSTRY: DRIVING INNOVATION THROUGH TECHNOLOGY TRANSFER  
- Ruvimbo Samanga, Space Generation Advisory Council (SGAC), South Africa

**GLEX-2021.1.2.6**  
MOON CONSORTIUM FOR CLIMATE CHANGE MITIGATION  
- Shamin Alotaibi, Kuwait

**GLEX-2021.1.2.7**  
THE AFRICAN SPACE INDUSTRY  
- Ruvimbo Samanga, Space Generation Advisory Council (SGAC), South Africa

**GLEX-2021.1.2.8**  
EMERGING TECHNOLOGIES AND GROUNDBREAKING INVENTIONS OF JSC RKTS PROGRESS - TRENDS OF REPORT  
- Ravil Akhmetov, JSC RKTS Progress, Russian Federation

**GLEX-2021.1.2.9**  
PHYSIOLOGICAL STATUS OF SEVEN-DAY SPACE FLIGHT PARTICIPANT  
- Oleg Kotov, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

GLEX-2021.1.2.6
COOPERATION AND CAPACITY-BUILDING OF ASIA-PACIFIC COUNTRIES FOR SPACE EXPLORATION
Harrie Quirinagaan, Space Generation Advisory Council (SGAC), The Philippines

GLEX-2021.1.2.7 (non-confirmed)
INTERNATIONAL PARTNERSHIPS - CONCEPSES, CONSENSUS, PARTNERSHIP PROJECTS WITH ISCG
Matthew Barney, Canadian Space Agency, Canada

GLEX-2021.1.2.8
INTERNATIONAL RESPONSIBILITY FOR WRONGFUL ACTS IN SPACE EXPLORATION – APPLICATION OF OBLIGATIONS ERGA OMNES TO THE OUTER SPACE.
Krzysztof Niewęgłowski, Space Generation Advisory Council (SGAC), Poland

GLEX-2021.1.2.9 (non-confirmed)
INTERNATIONAL COOPERATION FOR SPACE EXPLORATION VS. NATIONALISMS IN OUTER SPACE
Ifrak Tasriqawoklaw, Space Generation Advisory Council (SGAC), Indonesia

GLEX-2021.1.2.10
HARMONISED SYSTEM OF SECURED TRANSACTIONS FOR SPACE ASSETS - THE SPACE PROTOCOL OF THE CAPE TOWN CONVENTION
Hamza Hamed, Unisarlab, Italy

1.3. International Cooperation for Space Exploration (3)
June 16 2021, 14:00 — Hall of Library
Chair(s): Vincenzo Giorgio, Thales Alenia Space Italia, Italy

GLEX-2021.1.3.1
MR. DMITRY LOSKUTOV, GLAVKOSMOS DIRECTOR GENERAL
INTERNATIONAL COOPERATION FOR SPACE EXPLORATION
Dmitry Loskutov, JSC Glavkosmos, Russian Federation

GLEX-2021.1.3.2
RUSSIAN LUNAR EXPLORATION PROGRAM OPPORTUNITIES FOR INTERNATIONAL COOPERATION
Mariya Daniilova, Central Research Institute for Machine Building (JSC DMITROVSK), Russia

GLEX-2021.1.3.3 (non-confirmed)
RUSSIAN COMPLEX OF RECEIVING OF SCIENCE DATA AS PART OF INTERNATIONAL COOPERATION FOR SPACE EXPLORATION
Vladimir Nazarenko, Space Research Institute (IKI), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.1.3.4
PAKISTAN'S ROLE IN GLOBAL SPACE EXPLORATION: THE PAST, PRESENT AND FUTURE
Noman Sultani, SPACARCo, Pakistan

GLEX-2021.1.3.5
PAVING THE WAY TOWARDS UNIVERSALISATION: MULTIPLYING SUCCESS AND VALUE THROUGH GLOBAL COLLABORATION
Paul Kuei, BLC/ECLARE Aerospace, United States

GLEX-2021.1.3.6 (non-confirmed)
ON THE FEASIBILITY OF LANDING THE DREAM CHASER SPACE VEHICLE IN SOUTH AFRICA
Luke Colvin, Private, South Africa

GLEX-2021.1.3.7 (non-confirmed)
PROSPECTS AND CHALLENGES OF NIGERIA VENTURING INTO DEEP SPACE EXPLORATION
Joseph O Alimude, African Regional Center for Space Science and Technology Education in English (ARCSSTE-E), Nigeria

GLEX-2021.1.3.8 (non-confirmed)
MODERN AND CONTEMPORARY EUROPEAN PHILOSOPHY FOSTERS SPACE HUMANITIES: THE EUROPEAN SPACE AGENCY (ESA) REINFORCES THE INTERNATIONAL COOPERATION FOR SPACE EXPLORATION
ABHISHEK AKASH DIGWAD, International Space University (ISU), France

GLEX-2021.1.3.9
PROBLEMS OF ANTHROPOGENIC POLLUTION OF SPACE
Shehret Tilvaldyev, Universidad Autonoma de Ciudad Juarez, Canada

1.4. International Cooperation for Space Exploration (4)
June 17 2021, 15:30 — Hall #14
Co-Chair(s): Fritz Merkle, OHB System AG-Bremen, Germany

GLEX-2021.1.4.1
THE COSPAR PANEL ON PLANETARY PROTECTION: RECENT ACTIVITIES
Athana Coutsenis, LESIA - Observatoire de Paris, France

GLEX-2021.1.4.3
THINKING OF INTERNATIONAL COOPERATION FOR SPACE EXPLORATION
Pei-Ying Shao, China Academy of Space Technology (CAST), China

GLEX-2021.1.4.4
UNIVERSITY COLLABORATION MECHANISMS FOR COOPERATIVE INTERNATIONAL SPACE MISSIONS
Michael McGrath, University of Colorado Boulder, United States

GLEX-2021.1.4.5
THE MILD SPACE SCIENCE INSTITUTE: A NEW APPROACH TO SPACE SCIENCE
Unboly Papisidou, Lockheed Martin (Space Systems Company), United States

GLEX-2021.1.4.6
SPACE FOR AFRICA, KNOWLEDGE AND DEVELOPMENT: THE AFRICA UNION VISION 2063 IN ACTION
Tomkum Chio, GLOCEMDCAM, Cameroon

GLEX-2021.1.4.7
THE AUSTRALIAN SPACE AGENCY’S FIRST ROADMAPS AND PRIORITIES FOR EXPLORATION
Katherine Bennett, Australian Space Agency, Australia

GLEX-2021.1.4.8 (non-confirmed)
THE CASE OF INSPIRING ARAB YOUTH, HOW THE UAE IS PREPARING THE NEXT GENERATION OF ARAB SPACE PROFESSIONALS IN THE REGION
Rahana Alshamsi, UAE Space Agency, United Arab Emirates

GLEX-2021.1.4.9
"PRINCIPLES FOR COOPERATIVE ADR": A VIABLE PATH FOR REMEDIATION OF HIGH MASS DERELICT OBJECTS IN CROWDED LOW EARTH ORBITS?
Chuck Dickey, United States

2. Lunar Exploration

2.1. Lunar Exploration (1)
June 15 2021, 15:30 — Hall #1
Chair(s): Julie Patirin-Jossie, Russian Academy of Sciences, Russian Federation;
GLEX-2021.2.1.1 (non-confirmed)
FROM LUNA-25 TO LUNA-29: ROBOTIC MISSIONS AS PRECURSORS OF HUMANS AT LUNAR SOUTH POLE
Igor Mitrofanov, Institute for Space Research, Russian Federation

GLEX-2021.2.1.2
ARTEMIS ACCORDS, CONTEXT, RISKS AND THEIR RELATION TO THE MOON AGREEMENT
Sofia Stellatou, Institute of Air and Space Law, McGill University, Greece

GLEX-2021.2.1.3
GLEX 2021 REPORT FROM INTERNATIONAL LUNAR EXPLORATION WORKING GROUP: ILEWG TASK GROUPS, ROADMAP, HIGHLIGHTS AND RESULTS DURING 2020 PANDEMICS
Bernard Foing, ILEWG "EuroMoonMars", The Netherlands

GLEX-2021.2.1.4
ARCHITECTING A SUSTAINABLE LUNAR INFRASTRUCTURE
Christine Edwards, Lockheed Martin (Space Systems Company), United States

GLEX-2021.2.1.5
AFRICA'S PROGRESS TOWARDS HUMAN & ROBOTIC SPACE EXPLORATION
Rwambo Samango, Space Generation Advisory Council (SGAC), South Africa

GLEX-2021.2.1.6
ARCHITECTING A SUSTAINABLE LUNAR INFRASTRUCTURE
Christine Edwards, Lockheed Martin (Space Systems Company), United States

GLEX-2021.2.1.7
CIS-SIM FACILITY: THE GALILEO-BASED EUROPEAN NAVIGATION AND COMMUNICATION CONSTELLATION SIMULATOR FOR THE CIS-LUNAR SOCIETY
Kilian Hufnagel, Germany

GLEX-2021.2.1.8
CONCEPT ARCHITECTURE OF SATELLITE CONSTELLATION FOR ESTABLISHING UNINTERRUPTED PERENNIAL COMMUNICATION LINK BETWEEN A SINGLE GROUND TRACKING STATION AND A LUNAR POLAR OUTPOST
Nielesh Ranjan Saxena, TU Berlin, Germany

GLEX-2021.2.1.9
CALIFORNIA RESEARCH ANALOG FOR DEEPSPACE AND LUNAR EXPLORATION - VIRTUAL OPERATIONS AND TELEROBOTICS
Chetna Singh-Dhawan, United States

2.2. Lunar Exploration (2)
June 16 2021, 14:00 — Hall #20
Chair(s): Bernard Foing, ILEWG "EuroMoonMars", The Netherlands;
GLEX-2021.2.2.1
ANALOG-1: AN ANALOGUE MISSION TO GUIDE ESA'S ROBOTIC MOON EXPLORATION EFFORTS
Kjell Warring, European Space Agency (ESA), The Netherlands

GLEX-2021.2.2.2
FIRST STEPS TOWARDS A MOON VILLAGE: ASSESSING THE FEASIBILITY OF A SMALL MODULAR LUNAR HABITAT
Nick Gollins, European Space Agency (ESA), The Netherlands

GLEX-2021.2.2.3
EUROHAB: CONCEPT OF AN INFLATABLE HABITAT PAYLOAD AS SUPPORT TO CREWED MISSIONS ON THE LUNAR SURFACE
Peter Weiss, Spartan Space, France

GLEX-2021.2.2.4
COOPERATION AND CAPACITY-BUILDING OF ASIA-PACIFIC COUNTRIES FOR SPACE EXPLORATION
Harrie Quirinagaan, Space Generation Advisory Council (SGAC), The Philippines

GLEX-2021.2.2.5
LUNAR COMMUNICATION AS A COMMERCIAL SERVICE TO ALL LUNAR MISSIONS - 1ST GENERATION RELAY-SATELLITE OPERATIONAL IN 2024
Nick Gollins, European Space Agency (ESA), The Netherlands
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

2.4. Lunar Exploration (4)
June 17 2021, 11:00 — Hall #1
Chair(s): Jan Kolar, Czech Space Office, Czech Republic;

GLEX-2021.2.4.1 THE COMPARISON OF POWER SYSTEM DESIGN AND ANALYSIS FOR TASKS OF UNMANNED LUNAR EXPLORATION AND MANNED LUNAR EXPLORATION
Richard Fixler, European Space Agency (ESA), The Netherlands

GLEX-2021.2.4.2 THE ESA PROSPECT PAYLOAD FOR LUNA-27: DEVELOPMENT STATUS
Richard Fixler, European Space Agency (ESA), The Netherlands

GLEX-2021.2.4.4 RETURN OF A MANNED SPACECRAFT TO EARTH IN CASE OF A CONTINGENCY DURING A FLIGHT TO THE POLAR LUNAR ORBIT
Rafael Murta, Rocket Science Corporation, Russia

GLEX-2021.2.4.5 USING EXTENDED-REALITY AS A DESIGN AND TRAINING TOOL FOR A FUTURE LUNAR HUMAN HABITAT: THE FLEX-KR CASE STUDY
Bastian Petemerj, Netherlands Aerospace Centre (NLR), The Netherlands

GLEX-2021.2.4.6 PLANETARY LANDER FOR YIELDING EXPLORATION AND RANGING (PLAYER) – CONCEPT FOR A REUSABLE LUNAR LANDER FOR SHUTTLE PAYLOADS WITHIN CIS-LUNAR SPACE
Nele Scheune, TU Berlin, Germany

GLEX-2021.2.4.7 SPACEPORT: HYBRID MODEL FOR BUILDING A LONG-TERM MOON COLONIZATION AT 5 B USD EARNING BEFORE TAX (EBT)
Adri Ribolczyk, International Space University (ISU), United States

3. Mars Exploration (1)
June 16 2021, 11:00 — Hall #1
Chair(s): Oleg Orlov, Institute of Biomedical Problems (IIBMP), Russian Academy of Sciences (RAS), Russian Federation;

GLEX-2021.3.1.2 CAN AN AIRSHIP EXPLORE MARS?
Alice Barth, ., Switzerland

GLEX-2021.3.1.3 BENCHMARKE STUDY OF A MONTE CARLO BASED METHODOLOGY FOR THE EVALUATION OF SHIELDING EFFICIENCY AGAINST GCR AND SPE IN DEEP SPACE.
Joris Gobacwski, Ensai Berkene, Belgium

GLEX-2021.3.1.1 AURA REGIO - AN ENGINEERING AND DESIGN VISION FOR HUMAN LIFE ON MARS.
Yaya Akisheva, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE), France

GLEX-2021.3.1.7 TECHNICAL STUDY UPON THE CONCEPT OF ENERGY PRODUCTION AND POWER SYSTEM DESIGN OF THE FLEX-KR CASE STUDY
Bastian Petemerj, Netherlands Aerospace Centre (NLR), The Netherlands

GLEX-2021.3.1.8 IN THE EXOMARS ROSALIND FRANKLIN ROVER
Nelly Ofied (Philips), Surrey Satellite Technology Ltd (SSTL), United Kingdom

GLEX-2021.3.1.9 NUCLEAR REACTOR DESIGN FOR A SELF-SUSTAINING LUNAR ESTABLISHMENT OF 100 OCCUPANTS FOR 5 YEARS
Vibrant Sharma, University of Petroleum and Energy Studies, India

GLEX-2021.3.1.10 OPTIMIZATION OF TRANSFER TRAJECTORY TO LUNAR LIBRATION POINT VIA A LUNAR SWING BY
Lei Li, Beijing Aerospace Control Center (BACC), China

GLEX-2021.3.1.11 SELENOCENTRIC ORBIT STABILIZATION BY ELECTRIC PROPULSION
Olga Siniarczuk, Samara National Research University (Samara), Russian Federation

GLEX-2021.3.1.12 DESIGN AND SUPPORT OF ADVANCED LUNAR MISSIONS ON ESTIMATION OF ORBIT DETERMINATION ACCURACY DURING DESIGN AND SUPPORT OF ADVANCED LUNAR MISSIONS
Pavel Kozlov, Precision Systems and Instruments, Russian Federation

3.2. Mars Exploration (2)
June 16 2021, 14:00 — Hall #1
Chair(s): Fritz Markle, OHB System AG-Bremen, Germany;

GLEX-2021.3.2.1 (non-confirmed) FRIEND NEUTRON TELSCOPE ONBOARD EXOMARS TGO MAPPING OF SHALLOW SUBSURFACE WATER AT MARS MODERATE LATITUDES
Igor Mitrofanov, Institute for Space Research, Russian Federation

GLEX-2021.3.2.2 (non-confirmed) FLIGHT MODEL TEST RESULTS OF THE SAMPLE HANDLING SYSTEM IN THE EXOMARS ROSALIND FRANKLIN ROVER
Robert Paul, OHB System AG, Germany

GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

2.3. Lunar Exploration (3)
June 16 2021, 16:30 — Hall #1
Chair(s): Jan Kolar, Czech Space Office, Czech Republic;

GLEX-2021.2.3.2 MOONLIGHT INITIATIVE: CONNECTING EARTH WITH THE MOON
Bernhard Hufenbach, European Space Agency (ESA), The Netherlands

GLEX-2021.2.3.4 SMALL ROBOTIC SWARM TECHNOLOGIES FOR LUNAR SURFACE EXPLORATION
Rud Marcin, Spacebit Global Ltd, United Kingdom

GLEX-2021.2.3.5 MOON VILLAGE ASSOCIATION CONTRIBUTION TO GLOBAL LUNAR EXPLORATION AND UTILIZATION
Giuseppe Redolfi, Moon Village Association (MVA), Austria

GLEX-2021.2.3.7 OHB INSTRUMENTS DEVELOPMENT FOR VOLATILE SCOUTING ON THE MOON
Lud Rothier, OHB System AG - Munich, Germany

GLEX-2021.2.3.8 (non-confirmed)
Options of navigation systems for lunar exploration
Andrey Dmitrev, Lavoisier Association, Russian Federation

GLEX-2021.2.3.9 INSTRUMENTS TO STUDY ROCKET PLUME SURFACE INTERACTIONS (PSI) ON THE LUNAR SURFACE
Ariana Buono, University of Michigan, Ann-Arbor, United States

GLEX-2021.2.3.10 (non-confirmed)
PERSPECTIVES OF DUST AND DUSTY PLASMA OBSERVATIONS IN THE FUTURE LUNAR MISSIONS
Lei M. Zhang, Russian Academy of Sciences, Russian Federation

GLEX-2021.2.3.11 MOON GALLERY
Aina Smitkova, ILENG EuroLab Team, The Netherlands

GLEX-2021.2.3.12 ON ESTIMATION OF ORBIT DETERMINATION ACCURACY DURING DESIGN AND SUPPORT OF ADVANCED LUNAR MISSIONS
Pavel Kozlov, Precision Systems and Instruments, Russian Federation

GLEX-2021.2.3.13 VIRTUAL REALITY TECHNOLOGIES FOR HUMAN LUNAR MISSIONS PREPARATION
Maryan Darvishi, Central Research Institute for Machine Building (JSC TSNIIMASH), Russian Federation

GLEX-2021.2.3.14 TOWARDS THE MOON AND BEYOND: PREPARING FOR THE FUTURE OF CIS-LUNAR AND SOLAR SYSTEM EXPLORATION
Stephane Luy-Dentrez, Institut Supérieur de l'Aéronautique et de l'Espace (ISAE), France

GLEX-2021.2.3.15 PREPARATION OF RELAY SATELLITE AROUND EARTH-MOON LIBRATION POINT
Lei Li, Beijing Aerospace Control Center (BACC), China

GLEX-2021.2.3.16 OPTIMAL CONTROL OF TRAJECTORY OF A REUSABLE LAUNCHER IN OPENMHO/DYMONOS
Alberto Fossa, Institut Supérieur de l’Aéronautique et de l’Espace (ISAE), France

GLEX-2021.2.3.17 EVOLUTION OF THE EXOMARS SAMPLE CRUSHING UNIT FROM BREADBOARD TO FLIGHT MODEL
Daniel Redlick, OHB System AG, Germany

GLEX-2021.2.3.18 CHALLENGES OF THE MMX ROVER MISSION TO PHOBOS
Kying Liang, ISAS, JAXA, Japan

GLEX-2021.2.3.19 DATA-DRIVEN MODELLING OF ORBITAL ENVIRONMENT AROUND PHOBOS

GLEX-2021.2.3.20 MANAGING HIGH VARIATION OF SURFACE ENVIRONMENT USING EXTENDED REALITY
Yulia Akisheva, Institut Supérieur de l’Aéronautique et de l’Espace (ISAE), France

GLEX-2021.2.3.21 AMENDMENTS TO EXOMARS EDMP: SCIENCE EXPERIMENT SOC SUPPORT – STSUS UPDATE
Michela Munoz Fernandez, HE Space Operations, Spain

GLEX-2021.2.3.22 EVOLUTION OF THE EXOMARS SAMPLE CRUSHING UNIT FROM BREADBOARD TO FLIGHT MODEL
Daniel Redlick, OHB System AG, Germany

GLEX-2021.2.3.23 (non-confirmed)
EXOMARS TRACER GAS ORBITER MARs ATMOSPHERE AND GRAVITY SCIENCE EXPERIMENT SOC SUPPORT – STSUS UPDATE
Michela Munoz Fernandez, HE Space Operations, Spain

GLEX-2021.2.3.24 A ROBUST FILTER METHOD FOR DYNAMIC PRESSURE MEASUREMENT AIDED NAVIGATION FOR MARS ENTRY
Jinteng Deng, Shanghai Jiao Tong University, China

GLEX-2021.2.3.25 (non-confirmed)
THE FUTURE LUNAR MISSIONS PERSPECTIVES OF DUST AND DUSTY PLASMA OBSERVATIONS IN THE FUTURE LUNAR MISSIONS
Lei M. Zhang, Russian Academy of Sciences, Russian Federation

GLEX-2021.2.3.26 MOON GALLERY
Aina Smitkova, ILENG EuroLab Team, The Netherlands

GLEX-2021.2.3.27 INSTRUMENTS TO STUDY ROCKET PLUME SURFACE INTERACTIONS (PSI) ON THE LUNAR SURFACE
Ariana Buono, University of Michigan, Ann-Arbor, United States

GLEX-2021.2.3.28 (non-confirmed)
Options of navigation systems for lunar exploration
Andrey Dmitrev, Lavoisier Association, Russian Federation

GLEX-2021.2.3.29 INSTRUMENTS TO STUDY ROCKET PLUME SURFACE INTERACTIONS (PSI) ON THE LUNAR SURFACE
Ariana Buono, University of Michigan, Ann-Arbor, United States
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

GLEX-2021.3.2.3 GUIDANCE AND MISSION PROGRAMMING OF MMX-INFRARED SPECTROMETER (MIRS) FOR THE EXPLORATION OF MARS AND ITS MOONS
Eric Sawyer, Centre National d’Études Spatiales (CNES), France

GLEX-2021.3.2.5 COMPARISON OF AIR-LAUNCHED RELEASABLE SYSTEM VS GROUND-LAUNCHED SYSTEM FOR MARS SAMPLE RETURN
Chirantan K, Ramaiah Institute of Technology, India

GLEX-2021.3.2.6 HUMAN FLIGHT OF MARS IN 2033
Matthew Duggan, The Boeing Company, United States

GLEX-2021.3.3.10 MARS SCIENCE CITY – ENVISIONING A SETTLEMENT ON THE RED PLANET
Sandra Hanapal-Meusinger, Vienna University of Technology, Austria

GLEX-2021.3.3.12 HUMAN TO MARS: BY MARS-PLUS EUROPA-MIMPS FLAGSHIP MISSION
Frank Jensen, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

GLEX-2021.3.4.8 EXPLORE THE TERRITORIALITY OF THE MARS AS A PLANETARY RESOURCE
Frank Jensen, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

GLEX-2021.5.1.8 NON-CONFIRMED
Sandeepa Bhat, National University of Juridical Sciences, India

GLEX-2021.4.1.4 THE ESA HERA MISSION TO THE NEAR-EARTH ASTEROID BINARY DIDYMON: PLANETARY DEFENSE AND SCIENCE RETURN
Patrick Michel, University of Nice-Sophia Antipolis, CNRS, Observatoire de la Côte d’Azur, France

GLEX-2021.3.2.13 LAUNCH SITE MAPPING FOR CHINA’S TIANWEN-1 MISSION
Jia Wang, 1)Science and technology on aerospace flight dynamics laboratory, Beijing, China; 2) Beijing aerospace control center, Beijing, China

GLEX-2021.3.2.11 LAUNCHED SYSTEM FOR MARS SAMPLE RETURN
Frantz Hansch, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

GLEX-2021.4.1.5 HERA – EUROPE’S CONTRIBUTION TO ASTEROID DEFENCE
Andy Cheng, The Johns Hopkins University Applied Physics Laboratory, United States

GLEX-2021.4.1.6 THE MEASUREMENT GOALS AND PAYLOAD OF THE HERA MISSION TO 2019 SN 12
Hans-Holger Glaß, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR), Germany

GLEX-2021.4.1.7 THE ATMOSPHERE OF VENUS – AN APPROACH TO STUDY NEAR-EARTH ASTEROIDS BY AN OPERATING SPACECRAFT AFTER THE COMPLETION OF ITS MAIN MISSION
Maxim Pupkov, Bauman Moscow State Technical University, Russia

GLEX-2021.3.3.7 RESEARCH ON COOPERATIVE NAVIGATION FOR THE LONG-RANGE ROVER LOCALIZATION ON MARS
Jiad Li, Shenzhen Aerospace Datangfanghong Hi-Tech Co.Ltd, China

GLEX-2021.3.4.12 MARS MOON NETWORKS FOR AUTONOMOUS MARS LANDING
Matthew Duggan, The Boeing Company, United States

GLEX-2021.4.2.4 THE EXOMARS ROVER MISSION MANAGEMENT SOFTWARE FOR OPERATIONS PLANNING ON MARS
Laura Bix, Thales Alenia Space Italia, Italy

4. Exploration of Near-Earth Asteroids (1)
June 16 2021, 16:30 — Hall #16
Chair(s): Fritz Markle, OHB System AG-Bremen, Germany
GLEX-2021.4.1.1 AN APPROACH TO STUDY NEAR-EARTH ASTEROIDS BY AN OPERATING SPACECRAFT AFTER THE COMPLETION OF ITS MAIN MISSION
Maxim Pupkov, Bauman Moscow State Technical University, Russia

GLEX-2021.4.1.2 NON-CONFIRMED
APPHINS RENDEZVOUS MISSION FOR SCIENTIFIC INVESTIGATION AND PLANETARY DEFENSE
Huang-Kuo Moon, Korea Astronomy and Space Institute, Korea, Republic of

5. Exploration of Other Destinations

5.1. Exploration of Other Destinations (1)
June 17 2021, 11:00 — Hall #14
Co-Chair(s): Chris Welch, International Space University (ISU), France; Oleg Orlov, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.4.2.1 PREVENTION OF NEO HAZARD: THE RUSSIAN APPROACH
Ksenia Pavlova, Keldysh Institute of Applied Mathematics (Keldysh Institute of Applied Mathematics), Russia

GLEX-2021.4.2.2 MISSIONS TO NEAR-EARTH ASTEROIDS AND EXPLORING THEM FOR FUTURE HUMAN SPACE MISSIONS
Zephyr-Antal Rehá, India

GLEX-2021.4.2.7 NON-CONFIRMED
NEAR-EARTH ASTEROID EXPLORATION: LEGAL ISSUES AND THE WAY FORWARD
Sanaree Bhat, National University of Juridical Sciences, India

GLEX-2021.5.1.1 DESIGN FEATURES AND ADVANTAGES OF A MANEUVERABLE LANDER TO VENUS
Anastasia Kosenkova, Lavochkin Association, Russian Federation

GLEX-2021.5.1.3 GLOBAL DIMENSIONING OF A NEAR-TERM MANNED MISSION TO THE ATMOSPHERE OF VENUS
Thibault Pouget, Federation Open Space Makers, France

GLEX-2021.5.1.4 NON-CONFIRMED
EVALUATION OF ITERATIVE ANALYTICAL TECHNIQUES FOR THE TRAJECTORY DESIGN OF A DIRECT JUPITER ORBITER MISSION
Dr Parvathi S P, Indian Institute of Space Science and Technology (IIST), India

GLEX-2021.5.1.5 ACCESSIBLE LANDING AREAS ON THE SURFACE OF GANYMEDE: DEFINING AND ASSESSING THE OPPORTUNITY TO REACH THEM Andrey Belousov, Space Research Institute (IKI), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.5.1.6 AN L-CLASS MULTIROCKET OBSERVATORY AND SCIENCE PLATFORM FOR NEPTUNE
James E. McKevitt, University of Vienna, Austria

GLEX-2021.5.1.7 FLIGHT TRAJECTORIES DESIGN USING GRAVITY ASSIST MANEUVERS TO THE TRANS NEPTUNIAN OBJECT (20117) SEONA Vladislav Zubá, Space Research Institute (IKI), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.5.1.8 NON-CONFIRMED
AN ECONOMIC ANALYSIS OF NEAR-TERM SELF-REPLICATING PROBES FOR SPACE EXPLORATION
Oliva Borgue, Initiative for Interstellar Studies, United Kingdom
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

GLEX-2021.5.2.9
A MICRO BOSPHERE FOR LONG-DURATION SPACE TRAVEL
Jean-Louis Siméon, SIMEON Technologies, France

GLEX-2021.5.2.10 (non-confirmed)
CASE STUDY OF AN INTERSTELLAR MISSION: UNMANNED INTERSTELLAR PROBE USING GAS CORE NUCLEAR REACTORS WITH EARLY 21ST CENTURY TECHNOLOGY

Nikolay Ostrovskiy, Russian Federation
Matej Poliacek, Deutsch Luft und Raumfahrt Zentrum (DLR), Slovak

Dhanush Salunke, India
Asia Bulgarini, Queen Mary University of London, United Kingdom
Kirti Vishwakarma, University of Petroleum and Energy Studies, India
Ugur Guven, UN CSSTEAP , United States
Jean-Luc Siméon, SIMEON Technologies, France

GLEX-2021.5.1.12
ANALYSIS OF KEPLER AND TESS EXOPLANET TRANSITS USING PYTHON FOR POTENTIAL FUTURE SPACE EXPLORATION
Ava Bulgarini, Queen Mary University of London, United Kingdom

5.2. Exploration of Other Destinations (2)
June 17 2021, 15:30 — Hall #20
Co-Chair(s): Oleg Orlof, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation; Bernard Foing, LERG “EuroMoonMar”, The Netherlands;

GLEX-2021.6.1.1 (non-confirmed)
DEVELOPMENT AND PROSPECTS OF THE D-START SIMPLEST THERMONUCLEAR FUSION DRIVE

Rudolf Sudzhalov, Moscow Technical University of Communications and Informatics (MSTU), Russia

GLEX-2021.6.1.15 (non-confirmed)
EXPLORATION OF THE SOLAR SYSTEM AND BEYOND USING A THERMONUCLEAR FUSION DRIVE

Ronaldo Garcia Diamante, New York City College of Technology, The City University of New York, United States

GLEX-2021.6.1.6 (non-confirmed)
DEVELOPMENT AND PROSPECTS OF THE D-START SIMPLER THERMONUCLEAR FUSION DRIVE

Nikolay Ostrovskiy, Russian Federation

GLEX-2021.7.1.1 (non-confirmed)
AN LPE RD11MV LIQUID ROCKET ENGINE - TRANSITION TO DIGITAL DESIGN

Serjio Soares, Brazil

6. Space Transportation

6.1. Space Transportation (1)
June 16 2021, 11:00 — Hall #9
Chair(s): Bernard Foing , LERG “EuroMoonMar”, The Netherlands;

GLEX-2021.6.1.1
KEYNOTE: HUMAN SPACEFLIGHT FROM GUATEMAL PARTNERSHIP
Christopher Beroire, Centre National d’Études Spatiales (CNES), France

GLEX-2021.6.1.2
ADVANCED CAPABILITIES OF A LEGENDARY ROCKET SOYUZ-2
Mike Jowett, QinetiQ Services, JSC, Russian Federation

GLEX-2021.6.1.4 (non-confirmed)
CONCEPT OF A SHORTCUT CREATION OF MULTIPURPOSE ORBITAL TRANSPORT MODULE BASED ON KM-10 HALL-EFFECT THRUSTER

Nikolay Ostrovskiy, Russian Federation

GLEX-2021.6.1.5
EXPLORATION OF THE SOLAR SYSTEM AND BEYOND USING A THERMONUCLEAR FUSION DRIVE

Ronaldo Garcia Diamante, New York City College of Technology, The City University of New York, United States

GLEX-2021.6.1.6 (non-confirmed)
DEVELOPMENT AND PROSPECTS OF THE D-START SIMPLER THERMONUCLEAR FUSION DRIVE

Nikolay Ostrovskiy, Russian Federation

GLEX-2021.7.1.1 (non-confirmed)
AN LPE RD11MV LIQUID ROCKET ENGINE - TRANSITION TO DIGITAL DESIGN

Serjio Soares, Brazil

7. Key Technologies

7.1. Key Technologies (1)
June 15 2021, 15:30 — Hall #7
Chair(s): Iain Simons, S.K. Korolev Rocket and Space Corporation Energia, Russian Federation

GLEX-2021.7.1.1
A PARTICLE FUSION APPROACH FOR FAULT DETECTION AND ISOLATION OF ROVER IMU SENSORS
Vito Antonio Nardi, University Mediterranea of Reggio Calabria, Italy

GLEX-2021.7.1.2
ANALYSIS OF DYNAMIC CHARACTERISTICS AND RESEARCH ON COPING STRATEGY IN MARTIAN PARACHUTE DESCENT PHASE
Jie Dong, China Academy of Space Technology (CAST), China

GLEX-2021.7.1.3
APPLICATION OF PARALLEL MECHANISMS FOR DIRECTING AND ORIENTING OF SPACECRAFTS ONBOARD EQUIPMENT
Aleksandr Kiselev, Baltic State Technical University VIDENRY, Russian Federation

GLEX-2021.7.1.4
ATTITUDE CONTROL OF A FAST-RECONFIGURABLE AGILE NANO-SATELLITE USING NEURAL NETWORK BASED STEERING FOR VARIABLE SPEED CONTROL MIRROR GYROSCEPES
Sidharth Ramakrishna Deen, Sapienza University of Rome, Italy

GLEX-2021.7.1.6
DEVELOPMENT AND PROSPECTS OF THE D-START SIMPLEST THERMONUCLEAR FUSION DRIVE

Nikolay Ostrovskiy, Russian Federation

GLEX-2021.7.1.8
THE RING AN OPTIMIZED SPACESHIP FOR THE 21ST CENTURY

Mahshar Naderi, K.N.Toosi university of technology, Iran

GLEX-2021.7.1.9
THERMONUCLEAR EMISION METHODS FOR COOLING THE HEAT SHIELDS OF REENTRY VEHICLES IN THE INTERESTS OF STUDYING THE PLANETS OF THE SOLAR SYSTEM WITH AN ATMOSPHERE

Aleksandr Kiselev, Baltic State Technical University VIDENRY, Russian Federation

GLEX-2021.7.1.10
SUBORBITAL SPACE FLIGHTS: SHOULD WE EXPECT A REVOLUTION IN LONG-HAUL AIRCRAFT?
Nikito Kainitsky, JSC Apat, Russian Federation
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

7.2. Key Technologies (2)
June 16 2021, 11:00 — Hall #20
Chair(s): Igor V. Sorokin, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation;
Pascal Barbier, Air Liquide, France

7.3. Key Technologies (3)
June 16 2021, 16:30 — Hall #20
Chair(s): Igor V. Sorokin, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation;

7.4. Key Technologies (4)
June 17 2021, 11:00 — Hall #20
Chair(s): Pierre-Alexis Joumel, Airbus Defence and Space, Germany;

8.1. Challenges of Life Support/Medical Support for Human Missions (1)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (2)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (3)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (4)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (5)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (6)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (7)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (8)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (9)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (10)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (11)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania

8.1. Challenges of Life Support/Medical Support for Human Missions (12)
June 15 2021, 15:30 — Hall #9
Chair(s): Elena Fominia, State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russia; Roman Fedorov, Romanian Space Agency, Romania
8.2. Challenges of Life Support/Medical Support for Human Missions (2)

GLEX-2021.8.1.6 STUDIES OF HUMAN HEMODYNAMICS IN A REDUCED MAGNETIC FIELD
Elima Luchitskaya, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.8.1.7 INTEGRAL ASSESSMENTS OF COSMONAUTS’ HEATH IN THE LONG-TERM PERIOD OF PROFESSIONAL ACTIVITY
Igor Uzhakov, Russian Federation

GLEX-2021.8.1.8 OPTIMIZATION OF VENTILATION AND CHEST COMPRESSION FOR SPACELIFT DESIGN
Peter Anto Johnson, University of Alberta, Canada

GLEX-2021.8.1.9 FMRI STUDIES FOR ASTRONAUT CO2 EXPOSURE TRAINING
John Christy Johnson, University of Alberta, Canada

GLEX-2021.8.1.10 AN EVALUATION OF DIFFERENT EXERCISE COUNTERMEASURES TO PREVENT MUSCULOSKELETAL DECONDITIONING IN ANALOGUE ASTRONAUTS DURING LONG-TERM BED REST
Carmen Traseira Pedraz, Imperial College London, United Kingdom

GLEX-2021.8.1.11 SYMBOLOGIES FOR SPACE TRAVELERS
V. Sorokin, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

GLEX-2021.8.1.12 NEUTRAL BIDAYNESS TESTS OF THE ADVANCED CREW MEDICAL RESTRAINT FOR COMMERCIAL HUMAN SPACEFLIGHT
Matti Naranurmäki, Analog astronaut Training Center, Finland

GLEX-2021.8.1.13 HYGIENE WATER PROCESSING DURING LONG-TERM MANNED SPACE MISSIONS
Nicolas Salvi, NICHIMASH, Russian Federation

GLEX-2021.8.1.16 SPACEBAKERY – A CLOSED ECOCLOGICAL PLANT CULTIVATION SYSTEM AND BAKERY FOR EXTENDED STAYS ON PLANET MARS AND THEIR APPLICATIONS FOR PLANET EARTH
Lucie Beckers, Belgium

GLEX-2021.8.1.18 ASTRONAUTS, MEAL THYSELF
Deepavali Bangaru-Raju, UK NHS Trust, United Kingdom

8.3. Challenges of Life Support/Medical Support for Human Missions (3)

GLEX-2021.8.2.3 PARACrine Activity of Mesenchymal Stem Cells Under Simulated Microgravity
Andrey Ratushnyy, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.8.2.4 EFFECTS OF SUNLIGHT SIMULATOR LIGHTING SYSTEM ON SEROTONIN, MELATONIN AND PHYSIOLOGICAL PARAMETERS RELATED WITH CIRCADIAN CLOCK OF THE ANALOG ASTRONAUT CREWS PERFORMING SIMULATION OF SPACE MISSION IN THE AATC HABITAT IN POLAND
Agata Kiudaliaziute, Analog astronaut Training Center, Poland

GLEX-2021.8.2.5 Can high energy particle detectors be used for improving risk models in space radiobiology?
Alessandro Bartrionsi, Italy

GLEX-2021.8.2.6 DESIGN AND CREATION OF A NEW MEDICAL AND PSYCHOLOGICAL CONTROL SYSTEM FOR MANNED MISSIONS TO THE MOON
Aron Gustafsson, Moscow-Airport Institute (National Research University, MAI), Russian Federation

GLEX-2021.8.2.7 MAINTAINING ALLOWABLE CONCENTRATION OF CARBON DIOXIDE IN THE ATMOSPHERE OF HABITABLE PRESSURIZED MODULES OF SPACE STATIONS.
Arakely Gussenberg, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

GLEX-2021.8.2.8 ANALYSIS OF PLANT MORPHOLOGY AND PHYLOGENETICS OF INDIGENOUS PLANTS AS A SOURCE OF FOOD, OXYGEN AND MEDICINAL PURPOSES FOR SPACE APPLICATIONS
I. Yakhovleva, V. M. Skrinsky, A. N. Zheleznyakov, Moscow, Russia

GLEX-2021.8.2.9 MINIMIZATION OF THE EQUIVALENT SYSTEM MASS OF A VITAMIN GREENHOUSE WITH A LED LAMP FOR VARIOUS SCENARIOS OF SPACE MISSIONS
Andrey Burulya, Russian Academy of Sciences / Lomonosso Moscow State University, Russian Federation

GLEX-2021.8.2.10 DEVELOPMENT OF CRYOGENIC AIR PURIFICATION FOR DEEP SPACE APPLICATIONS
Pascal Barbier, Air Liquide, France

GLEX-2021.8.3.1 TECHNICAL REQUIREMENTS FOR AUTONOMOUS AI-ENABLED HEALTHCARE DIAGNOSTICS IN SPACE
Elimi Antoniades, United States

GLEX-2021.8.3.2 KYMIRA: ASTRONAUT PHYSIOLOGICAL HEALTH MONITORING USING SMART UNDERWEAR GARMETN
Ashfaq Gokalp, United Kingdom

GLEX-2021.8.3.3 WALKING STRATEGY DURING THE REPEATED LONG-DURATION SPACE FLIGHTS
Alina Savov, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

GLEX-2021.8.3.4 THE INFLUENCE OF DIET ON BEHAVIOR IN SIMULATED SPACE MISSION CONDITIONS
Natalia Butyravaya, Jagiellonian University, Poland

GLEX-2021.8.3.5 (non-confirmed) HUMAN HEART DOES NOT YEARN TO BE FREE FROM GRAVITY: A REVIEW OF CARDIOVASCULAR HEALTH IN SPACE
Alexander Van Herwen, UK NHS Trust, United Kingdom

GLEX-2021.8.3.6 TRAINER TO PREVENT BONE RESORPTION IN SPACEFLIGHT
John Christy Johnson, University of Alberta, Canada

GLEX-2021.8.3.7 THE IMPACT OF MICROCLIMATE PARAMETERS OF LONG-TERM SPACE FLIGHTS AND CONSEQUENTLY SIMULATING CONFINEMENTS ON THE HUMAN PHYSOPHYSIOPATHOLOGICAL STATE AND BODY COMPOSITION
Igor Nichiporuk, AF SRC - Institute of Biomedical Problems of the RAS, Russian Federation

GLEX-2021.8.3.8 (non-confirmed) VARIABLE CLIMATE BIOSPHERE
Serge Ameye, Russia

GLEX-2021.8.3.9 USE OF METHANE IN CLOSED LOOP LIFE SUPPORT SYSTEMS.
Alexandr Zhiltsovsky, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation

GLEX-2021.8.3.10 TOWARDS QUANTUM ASTRONAUTICS
Michael Papad, University of Oxford, United Kingdom

GLEX-2021.8.3.11 BARTOLOGMED: EXTERNAL PAYLOAD MISSION HOSTING ON THE ISS AS A SERVICE
Tmrk JdS4, Airbus Defence & Space, Germany

GLEX-2021.8.3.12 APPLICATION OF A HEAT PIPE NETWORK IN THERMAL DESIGN OF MECHANICAL ARM JOINT OF CHINESE SPACE STATION
Li Zhang, China Academy of Space Technology (CAST), China

GLEX-2021.9.1.1 CONCEPT FOR A SATELLITE PHASE 2 ELEMENT
Timothy Cichon, Lockheed Martin Corporation, United States

GLEX-2021.9.1.5 CONCEPTS FOR JOINT INTERNATIONAL MODULES
Matthew Duggan, The Boeing Company, United States

GLEX-2021.9.1.6 MISSION ANALYSIS TO MEASURE RADIATION DOSE ABOUT THE EARTH-MOON LAGRANGIAN POINTS
Marion Bumitchian, Institut Supérieur de l’Aéronautique et de l’Espace (ISAE), France

GLEX-2021.9.1.7 CENTRIFUGAL SPACE STATION
Hart Naka, University of Mumbai, India

GLEX-2021.9.1.8 INTERNATIONAL LEGAL REGIME OF FUTURE SPACE STATIONS: PROBLEMS OF OPERATION FROM THE LEGAL POINT OF VIEW
Irina Chernykh, People’s Friendship University of Russia (RUON University), Russian Federation

GLEX-2021.9.1.10 THE INTERNATIONAL SPACE STATION AS AN EXAMPLE OF INTERNATIONAL COOPERATION
Maria del Llano Flores, , Uruguay

GLEX-2021.9.1.11 DESIGN CASE STUDY OF A NATIONAL SPACE STATION: ORBITAL, LOGISTICAL AND STRATEGIC CONSIDERATIONS
Vitaly Shemeta, , India

GLEX-2021.9.1.12 RADIATION SAFETY ISSUES FOR HIGH-LATITUDE SPACE STATIONS
Veselin Shurchalov, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

9. Space Stations

9.1. Space Stations

GLEX-2021.11.1.11 (non-confirmed) INTERNATIONAL SPACE STATION: MAKING THE MOST OF OUR FUTURE
Kevin D. Foley, The Boeing Company, United States

GLEX-2021.11.1.12 BARTOLOMEO: EXTERNAL PAYLOAD MISSION HOSTING ON THE ISS AS A SERVICE
Tmrk JdS4, Airbus Defence & Space, Germany

GLEX-2021.11.1.13 APPLICATION OF A HEAT PIPE NETWORK IN THERMAL DESIGN OF MECHANICAL ARM JOINT OF CHINESE SPACE STATION
Li Zhang, China Academy of Space Technology (CAST), China

GLEX-2021.11.1.14 CONCEPT FOR A SATELLITE PHASE 2 ELEMENT
Timothy Cichon, Lockheed Martin Corporation, United States

GLEX-2021.11.1.15 CONCEPTS FOR JOINT INTERNATIONAL MODULES
Matthew Duggan, The Boeing Company, United States

GLEX-2021.11.1.16 MISSION ANALYSIS TO MEASURE RADIATION DOSE ABOUT THE EARTH-MOON LAGRANGIAN POINTS
Marion Bumitchian, Institut Supérieur de l’Aéronautique et de l’Espace (ISAE), France

GLEX-2021.11.1.17 CENTRIFUGAL SPACE STATION
Hart Naka, University of Mumbai, India

GLEX-2021.11.1.18 INTERNATIONAL LEGAL REGIME OF FUTURE SPACE STATIONS: PROBLEMS OF OPERATION FROM THE LEGAL POINT OF VIEW
Irina Chernykh, People’s Friendship University of Russia (RUON University), Russian Federation

GLEX-2021.11.1.19 THE INTERNATIONAL SPACE STATION AS AN EXAMPLE OF INTERNATIONAL COOPERATION
Maria del Llano Flores, , Uruguay

GLEX-2021.11.1.20 DESIGN CASE STUDY OF A NATIONAL SPACE STATION: ORBITAL, LOGISTICAL AND STRATEGIC CONSIDERATIONS
Vitaly Shemeta, , India

GLEX-2021.11.1.21 RADIATION SAFETY ISSUES FOR HIGH-LATITUDE SPACE STATIONS
Veselin Shurchalov, Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

V. Sorokin, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation;
GLOBAL SPACE EXPLORATION CONFERENCE (GLEX 2021)
Tavrichesky Palace, St. Petersburg, Russian Federation
14 - 18 JUNE 2021

10. Space Resources

10.1. Space Resources (1)

June 16 2021, 16:30 — Hall of Library
Co-Chair(s): Chris Welsh, International Space University (ISU), France; Anatoli Petrovich, Institute for Space Research, Russian Federation;
GLEX-2021.10.1.1 LUNAR IRIS GROUND PROTOTYPE FOR THE DEMONSTRATION OF OXYGEN EXTRACTION FROM LUNAR REGOLITH
Iacopo Pretto, ONp Italia SpA, Italy
GLEX-2021.10.1.2 MOONLIFE: FERMENTATION AS IN-SITU RESOURCE UTILIZATION TECHNOLOGY
Álvaro Tomás Soria Salinas, HE Space Operations, Germany
GLEX-2021.10.1.3 AIRBUS - AIR LIQUIDE: COMMON VISION AND ROADMAP FOR A LUNAR INDUSTRIAL ECOSYSTEM
Pascal Barber, Air Liquide, France
GLEX-2021.10.1.4 CONCEPT FOR A LUNAR STATION MADE OF ISRU PRODUCED FIBRE MATERIALS
Stephan Kapsis, FORTH Aschen University, Germany
GLEX-2021.10.1.5 ISRAEL’S ISRU 2022 MISSION TO THE MOON
Oren Milstein, StemRad, Israel
GLEX-2021.10.1.6 AUTONOMOUS ROVER FOR LUNAR MINING AND EXPLORATION (ARMLE)
Joyeet Kumar Vermaevate, Vallés Marítim’s International Private Limited, India
GLEX-2021.10.1.7 ATMOSPHERIC RE-ENTRY ENERGY STORAGE (ARES): A NOVEL CONCEPT FOR UTILIZING ATMOSPHERIC-RE-ENTRY ENERGY
Rajo Pend Pavuluri, University of Luxembourg, Luxembourg
GLEX-2021.10.1.8 ASTEROID MINING: MULTIPLE SPACECRAFT LOGISTICS FOR MARS SUPPLY
Serena Suriano, Italy
GLEX-2021.10.1.9 LEGAL ASPECTS OF THE NOTION “SPACE RESOURCES”
Irina Chernykh, People’s Friendship University of Russia (RUDN University), Russian Federation
GLEX-2021.10.1.10 RESEARCHING THE ‘CHICKEN-OR-EGG’ PROBLEM IN SPACE RESOURCE DEVELOPMENT: AN ECOSYSTEM DESIGN APPROACH
Lucretta Zhang, National University of Singapore, Singapore, Republic of Singapore
GLEX-2021.10.1.11 IN THE SEARCH FOR IMPROVEMENTS OF SPACE MINING INTERNATIONAL REGULATION: ANALOGY WITH OTHER REGIMES
Anatoli Petrukovich, Institute for Space Research, Russian Federation;
GLEX-2021.10.1.12 IN THE SEARCH FOR IMPROVEMENTS OF SPACE MINING INTERNATIONAL REGULATION: ANALOGY WITH OTHER REGIMES
Mikhaila Razoukova, International Institute of Air and Space Law, Leiden University, The Netherlands

10.2. Space Resources (2)
June 17 2021, 11:00 — Hall of Library
Chair(s): Dmitry Grishko, Bauman Moscow State Technical University, Russia
GLEX-2021.10.2.1 THE EUROPEAN SPACE RESOURCES INNOVATION CENTRE – EURIS Bob-Lamboray, Luxembourg Space Agency, Luxembourg
GLEX-2021.10.2.2 THE CIS-LUNAR ECOSYSTEM SIMULATOR - AN INTERACTIVE SYSTEMS MODEL AND SCENARIOS OF THE RESOURCES INDUSTRY
Marc-Andre Choisy-Marchand, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland
GLEX-2021.10.2.3 WHETHER INTERNATIONAL COOPERATION OF STATES IS POSSIBLE IN THE EXPLORATION OF SPACE RESOURCES?
Vladimir Ashabalin, People’s Friendship University of Russia (RUDN University), Russian Federation
GLEX-2021.10.2.4 WHAT’S NEXT FOR THE REGULATION OF UTILISING SPACE RESOURCES? TERRESTRIAL MINING VERSUS SPACE MINING – THE PERSPECTIVE OF THE TERRESTRIAL EXTRACTIVE INDUSTRY
Katarzyna Malinowska, Kozminski University, Poland
GLEX-2021.10.2.5 NUCLEAR FUSION AND THE MOON AS A SOURCE OF POWER FOR THE WORLD—POSSIBILITY OF HELIUMS FUSION WITH HELIUMS AS A LUNAR RESOURCE
Ugo Guven, UN COSTE, United States
GLEX-2021.10.2.6 NEURAL NETWORK CONTROL OF WHEEL LOADER BUCKET FILLING FROM PILE APPROACH TO EXTRACTION
Miikka Hannela, Finland
GLEX-2021.10.2.7 THE USE OF RADIATION-RESISTANT MATERIALS IN SPACE: EXPERIENCE FROM PILE APPROACH TO EXTRACTION
Elena Karpachev, People’s Friendship University of China (RUDN University), Russian Federation
GLEX-2021.10.2.8 NEUTRAL NETWORK CONTROL OF WHEEL LOADER BUCKET FILLING FROM PILE APPROACH TO EXTRACTION
Eric Halbach, Finland
GLEX-2021.10.2.9 RECYCLING OF PLASTIC WASTE MATERIALS ON-BOARD ISS INTO RADIATION PROTECTIVE EQUIPMENT USING ADDITIVE MANUFACTURING TECHNIQUES
Oren Milstein, StemRad, Israel

11. Ground-Based Preparatory Activities

11.1. Ground-Based Preparatory Activities (1)
June 15 2021, 15:30 — Hall #14
Chair(s): Kevin D. Foley, The Boeing Company, United States;
GLEX-2021.11.1.1 TIME FOR MARS 2020: RESULTS FROM THE MISSION SIMULATION IN THE LUNARES HABITAT
Emma Forgues-Mayet, France
GLEX-2021.11.1.2 LABS: LUNAR EXPLORATION TO ASCERTAIN PHILOLAUS SKYLIGHTS
Dimitri Hollosi, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
GLEX-2021.11.1.3 MARS ANALOG MISSIONS: ARE WE GO OR NO GO?
Laurel Bire, University of Arizona, United States
GLEX-2021.11.1.4 DESIGN AND MANUFACTURING OF HARDWARE IN LOOP SIMULATION TESTBED EQUIPPED WITH VARIABLE SPEED CONTROL MOMENT GSROSCOPES
GLEX-2021.11.1.5 DESIGN AND IMPLEMENTATION OF EMBEDDED SIMULATION PLATFORM FOR IN-ORBIT LARGE-SCALE SOFTWARE DEVELOPMENT
Shihab Ahmed, China Academy of Space Technology (CAST), China
GLEX-2021.11.1.6 LEAPS: LUNAR EXPLORATION TO ASCERTAIN PHILOLAUS SKYLIGHTS
Omar Nabil, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
GLEX-2021.11.1.7 PLANETARY PROTECTION AND MARTIAN ISRU
Emma Forgues-Mayet, France
GLEX-2021.11.1.8 MINING TECHNOLOGIES FOR MOON MINING
Dimitri Hollosi, Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland
GLEX-2021.11.1.9 SIMULATION TESTBED EQUIPPED WITH VARIABLE SPEED CONTROL MOMENT GSROSCOPES
GLEX-2021.11.1.10 DESIGN AND MANUFACTURING OF HARDWARE IN LOOP SIMULATION TESTBED EQUIPPED WITH VARIABLE SPEED CONTROL MOMENT GSROSCOPES
GLEX-2021.11.1.11 DESIGN AND MANUFACTURING OF HARDWARE IN LOOP SIMULATION TESTBED EQUIPPED WITH VARIABLE SPEED CONTROL MOMENT GSROSCOPES

11.2. Ground-Based Preparatory Activities (2)
June 16 2021, 14:00 — Hall #14
Chair(s): Kevin D. Foley, The Boeing Company, United States;
GLEX-2021.11.2.1 LIFE AND RESEARCH AT MOONBASE: RESULTS FROM ILEWG EUROMOONMARS CAMPAIGNS AND SIMULATIONS
Bernard Foing, ILEWG “EuroMoonMars”, The Netherlands
GLEX-2021.11.2.2 MATERIALS AND INVENTORY OF DATA OF REGIMES OF ARE-S III AND LEARN ANALOG MISSIONS IN THE LUNARHABITAT
Matej Poliacek, Deutsch Luft und Raumfahrt Zentrum (DLR), Slovak Republic
GLEX-2021.11.2.3 LIFE AND RESEARCH AT MOONBASE: RESULTS FROM ILEWG EUROMOONMARS CAMPAIGNS AND SIMULATIONS
Bernard Foing, ILEWG “EuroMoonMars”, The Netherlands
GLEX-2021.11.2.4 MARS ANALOG MISSIONS: ARE WE GO OR NO GO?
Katarzyna Malinowska, Kozminski University, Poland
GLEX-2021.11.2.5 PLANT NEON: EXPERIMENTAL CO2 AND O2 PHOTO-RECOMBINATION REACTION IN ANHABITAT FROM 2016-2020
Elena Tomilovskaya, Institute of Biomedical Problems (IBMP), Russian Federation
GLEX-2021.11.2.6 LIFE SUPPORT SYSTEMS FOR AN EXPEDITION TO THE MOON BASE
Emma Forgues-Mayet, France
GLEX-2021.11.2.7 MATERIALS AND INVENTORY OF DATA OF REGIMES OF ARE-S III AND LEARN ANALOG MISSIONS IN THE LUNARHABITAT
Matej Poliacek, Deutsch Luft und Raumfahrt Zentrum (DLR), Slovak Republic
GLEX-2021.11.2.8 LIFE SUPPORT SYSTEMS FOR AN EXPEDITION TO THE MOON BASE
Emma Forgues-Mayet, France
GLEX-2021.11.2.9 LIFE AND RESEARCH AT MOONBASE: RESULTS FROM ILEWG EUROMOONMARS CAMPAIGNS AND SIMULATIONS
Bernard Foing, ILEWG “EuroMoonMars”, The Netherlands
GLEX-2021.11.2.10 MATERIALS AND INVENTORY OF DATA OF REGIMES OF ARE-S III AND LEARN ANALOG MISSIONS IN THE LUNARHABITAT
Matej Poliacek, Deutsch Luft und Raumfahrt Zentrum (DLR), Slovak Republic
GLEX-2021.11.2.11 LIFE AND RESEARCH AT MOONBASE: RESULTS FROM ILEWG EUROMOONMARS CAMPAIGNS AND SIMULATIONS
Bernard Foing, ILEWG “EuroMoonMars”, The Netherlands
GLEX-2021.11.2.12 LIFE AND RESEARCH AT MOONBASE: RESULTS FROM ILEWG EUROMOONMARS CAMPAIGNS AND SIMULATIONS
Bernard Foing, ILEWG “EuroMoonMars”, The Netherlands
GLEX-2021.11.2.13 LIFE SUPPORT SYSTEMS FOR AN EXPEDITION TO THE MOON BASE
Emma Forgues-Mayet, France
11.3. Ground-Based Preparatory Activities (3)

June 17 2021, 15:30 — Hall #9
Co-Chair(s): Igor V. Sorokin, S.P. Korolev Rocket and Space Corporation Energia, Russian Federation; Kevin D. Foley, The Boeing Company, United States;

GLEX-2021.11.3.1 RESEARCH ON FAST TEST METHOD OF SPACECRAFT FOR EMERGENCY LAUNCH MISSION Weihe Zhao, China Academy of Space Technology (CAST), China

GLEX-2021.11.3.2 STUDY AND DESIGN FOR DISTRIBUTED-ON-ORBIT MONITORING SYSTEM OF MANNEquin SPACECRAFT JongXu Xu, China

GLEX-2021.11.3.3 THE ESA/DLR LUNA ANALOGUE FACILITY PREPARING FOR LUNAR EXPLORATION: STATUS AND LATEST DEVELOPMENTS Jurgen Schlutz, European Space Agency (ESA), Germany

GLEX-2021.11.3.4 RESEARCH ON SPACECRAFT ASSEMBLY INTEGRATION AND TEST CENTER PROJECT MANAGEMENT Wener Li, China Academy of Space Technology (CAST), China

GLEX-2021.11.3.5 PREPARING FUTURE MOON EXPLORATION MISSIONS THROUGH ENGINEERING AND SCIENTIFIC EXPERIMENTS IDONIA-RONANA PIERRER, Institute of Polytechnic Science and Aeronautics (IPSA), France

GLEX-2021.11.3.7 (non-confirmed) SPACE TECHNOLOGY APPLICATIONS – INTEGRATION GEOTECHNICAL INVESTIGATION AND SPACE TECHNOLOGY ENVIRONMENT Rustam Rustamov, Azerbaijan

GLEX-2021.11.3.8 (non-confirmed) THE LOGISTICS REQUIREMENTS AND THE DESIGN OF A SPACEPORT Weihe Diao, China Academy of Space Technology (CAST), China

12. Transcending Societal Issues for Space Exploration

12.1. Transcending Societal Issues for Space Exploration (1)

June 15 2021, 15:30 — Hall #16
Co-Chair(s): Anatali Petrukhov, Institute for Space Research, Russian Federation; Ajati AlMaazmi, UAE Space Agency, United Arab Emirates

GLEX-2021.12.1.2 FUTURE SPACE COMMUNITIES: WHICH LAWS APPLY AND CAN AFFIRMATIVE DEFENSES TO PATENT INFRINGEMENT PREEMPT ENFORCEMENT THAT MAY PREVENT COLLABORATIVE VISITS BY ASTRONAUTS, COSMONAUTS, GAGANAUTS AND TANOEANTS TO RESPECTIVE FOREIGN FACILITIES Steven Wood, State University of New York, United States

GLEX-2021.12.1.3 A NEW STATE IN OUTER SPACE: THE LEGAL CHALLENGES AND THE NEED TO GRANT STATEHOOD TO ASSARDAJA Israt Sanchez Aguirre, United States

GLEX-2021.12.1.5 SAVING ASTRONAUTS WHO? Conghui Liu, China

GLEX-2021.12.1.6 (non-confirmed) WILL ELOX MUSK END UP LIKE GRIEPE? THE LEGAL FATE OF PRIVATE COLONIES ON EARTH: THE CASE OF GENERAL JOHN SUTTER’S NEW HELVETIA Alice Riviere, Airbus Defence & Space, Germany

GLEX-2021.12.1.7 A POLICY FRAMEWORK FOR A BETTER SPACE PROGRAM Aaron Oesterl, United States

GLEX-2021.12.1.8 DEMYSTIFYING SPACE SCIENCE TO THE SOCIETY FOR A FORTUNATE SPACE EXPLORATION Seth Nywowscha, Space Generation Advisory Council (SGAC), Kenya

GLEX-2021.12.1.9 ARTMOWBOWNS PROGRAMME OF CULTURAL AND ARTISTIC ACTIVITIES Elizaveta Glukhova, ILEWG ExoHab Team, The Netherlands

GLEX-2021.12.1.10 (non-confirmed) CREATING A SELF-SUSTAINING SPACEFLIGHT SECTOR IN THE UAE Hoos Almazoom, UAE Space Agency, United Arab Emirates

GLEX-2021.12.1.11 DREAMS OF THE ERATH AND SKY: BIRTH OF THE RUSSIAN SPACE AESTHETICS Oleg Turkina, Russian Federation

GLEX-2021.12.1.12 INTERPLANETARY HUMAN RIGHTS: REIMAGINING HUMAN RIGHTS FOR OUTER SPACE Alix Link, Jus Ad Astra, United States

GLEX-2021.12.1.13 HOW TO BE A TOURIST IN SPACE: INTERNATIONAL LEGAL ASPECTS AND PERSPECTIVES Andrey Demenkov, Peoples’ Friendship University of Russia (RUDN University), Russian Federation

GLEX-2021.12.1.14 BENEFITING MANKIND: THE ROLE OF CIVIL SOCIETY IN THE EMERGENCE OF A SPACE-ACTIVE STATE Ina Ramul Cantinovic, Slovenia

GLEX-2021.12.1.15 EARTH-MOON SOLAR SAIL CHALLENGE GLOBAL CIRCUS Guy Pigeonlot, Reunion Island Space Initiative (RIS), Reunion Island

GLEX-2021.12.1.16 (non-confirmed) GLOBAL FRAMEWORKS FOR SOCI-TECHNO ARCHITECTURES TO TRANSCEND SOCIOPOLITICAL CONSTRAINTS WITH SYSTEMATIC TRANSPARENCY, CONFIDENCE BUILDING, AND TRUST: Practical Outil Disney, The MITRE Corporation, United States

GLEX-2021.12.1.17 A SYSTEMS ENGINEERING FRAMEWORK FOR SPACE SECTOR EDUCATION Yaroslav Menchenin, Skolkovo Institute of Science and Technology, Russian Federation

GLEX-2021.12.1.18 (non-confirmed) DEVELOPING A VIEW OF SOCIO-TECHNICAL RESILIENCE FOR SPACE SECTOR Olga Sokolova, Switzerland

GLEX-2021.12.2.1 RECONVENE ASIAN MIRACLE: SPACE INDUSTRIALIZATION IN INDONESIA Yuni Permatasari, Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia

GLEX-2021.12.2.2 SPACE AND SPACE EDUCATION IN EAST AFRICA Sharon Muhirwa, Kenya

12.2. Transcending Societal Issues for Space Exploration (2)

June 16 2021, 14:00 — Hall #16
Chair(s): Anatali Petrukhov, Institute for Space Research, Russian Federation;

GLEX-2021.12.2.1 INTEGRATING SPACE SUSTAINABILITY INTO DOUBLE MATERIALITY DECISION-MAKING AND REPORTING Christopher Gojerg, Lockheed Martin Corporation, United States

GLEX-2021.12.2.2 SPACE CYBERSECURITY CONSIDERATIONS FOR INTERNATIONAL COLLABORATION Aline McNeeve, United States

GLEX-2021.12.2.4 INSURING THE UNINSURABLE: HOW SPACE LAWS SHIFT THE BOUNDARIES OF INSURANCE – THE CASE OF EMERGING NATIONAL SPACE LAWS Katerzyna Makowska, Kazimierz University, Poland

GLEX-2021.12.2.5 LONG TERM MISSION ASTRONAUTS’ PSYCHOLOGY: RETURNING TO EARTH AND INTO THE SOCIETY Natasha Hryzun, Russian Federation

GLEX-2021.12.2.7 SCIENCE OUTREACH THROUGH ART: EXPERIENCE AS A SCIENTIST-ARTIST IN PUBLIC ENGAGEMENT Prisca Jos Djalokait, Institut Supérieur de Mécatronique et de l’Espace (ISME), France

GLEX-2021.12.2.8 ROBOTIC EDUCATION FOR SPACE EXPLORATION. TRANSCENDING SOCIETAL BARRIERS BETWEEN HUMANS AND ROBOTS FOR EDUCATION AND EXPLORATION. Michal Welschmante, Ruhr-University Bochum, Germany

GLEX-2021.12.2.9 (non-confirmed) INTERNATIONAL COOPERATION IN SPACE EDUCATION Dennis Prakh, Russian Federation

GLEX-2021.12.2.10 IT TAKES A NATION TO RACE TO SPACE: THE ROLE OF THE PUBLIC IN EMERGING SOUTHEAST ASIAN SPACEFARING NATIONS Anika Ray, National University of Singapore, Singapore, Republic of Singapore
### 7.9 Authors Index

**A**

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.2.4</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.8.1.2</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.4.1.2</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.1.4.9</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Aleksandrov, Oleg</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Ahmadov, Farid</td>
<td>A</td>
<td>GLEX-2021.1.4.10</td>
</tr>
<tr>
<td>Bangaru-Raju, Deepasree</td>
<td>A</td>
<td>GLEX-2021.2.1.16</td>
</tr>
<tr>
<td>AlMaazmi, Hoor</td>
<td>A</td>
<td>GLEX-2021.11.1.3</td>
</tr>
<tr>
<td>Name</td>
<td>Role</td>
<td>Paper</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>Novikov, Valery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nizami, Mohammed Abrar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nicollier, Claude</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nazirov, Ravil</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naik, Heet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Author</td>
<td>Type</td>
<td>GLEX ID</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------</td>
<td>---------------</td>
</tr>
<tr>
<td>Zheleznyakov, Alexandr</td>
<td>A</td>
<td>GLEX-2021.8.3.10</td>
</tr>
<tr>
<td>Zheng, Wei</td>
<td>CA</td>
<td>GLEX-2021.11.3.3</td>
</tr>
<tr>
<td>Zhukov, Yu.A.</td>
<td>CA</td>
<td>GLEX-2021.8.1.4</td>
</tr>
<tr>
<td>Zhuravleva, Olga</td>
<td>CA</td>
<td>GLEX-2021.9.3.4</td>
</tr>
<tr>
<td>Zhuravleva, Tatiana</td>
<td>CA</td>
<td>GLEX-2021.9.3.7</td>
</tr>
<tr>
<td>Zu Eulenburg, Peter</td>
<td>CA</td>
<td>GLEX-2021.8.1.1</td>
</tr>
<tr>
<td>Zubko, Vladislav</td>
<td>CA</td>
<td>GLEX-2021.9.3.3</td>
</tr>
<tr>
<td>Zubko, Vladislav</td>
<td>CA</td>
<td>GLEX-2021.9.3.5</td>
</tr>
<tr>
<td>Zubko, Vladislav</td>
<td>A</td>
<td>GLEX-2021.9.3.7</td>
</tr>
<tr>
<td>Zubko, Vladislav</td>
<td>CA</td>
<td>GLEX-2021.9.2.1</td>
</tr>
<tr>
<td>Zuccotti, Chiara</td>
<td>CA</td>
<td>GLEX-2021.9.2.3</td>
</tr>
</tbody>
</table>

NOTES:
Join the IAF, the world leading space advocacy body!

Become an IAF Member

✓ Download the Application Form on www.iafastro.org
✓ Participate in the IAF Committees in charge of defining the Technical Programme
✓ Propose to host a Plenary Event during the IAC
✓ Propose a Global Networking Forum (GNF) Event to showcase your organization’s latest achievements or to discuss the most interesting topics about Space
✓ Participate and vote in the General Assembly and nominate IAF Officers
✓ Host one of our events!

Join Us

1. Download the Application Form on our website (www.iafastro.org) or request it to the Secretariat.
2. Complete the Application Form and attach the requested documents.
3. Send everything to our Secretariat. (info@iafastro.org)
4. We will review your application and ask in case of missing information.
5. Once reviewed, your application will be recommended by the IAF General Counsel.
6. Final approval by the General Assembly during the IAC.

Connecting @ll Space People
This year, the IAC will take place for the first time in an Arab country and open its doors to the global space community in the United Arab Emirates, in Dubai, the city also hosting the EXPO 2021.

Covering all space sectors and topics, the IAC offers everyone the latest space information and developments in academia and industry, networking opportunities, contacts and potential partnerships.

Inspire, Innovate & Discover for the Benefit of Humankind
Supporting Milan’s candidacy as the host city of the 75th International Astronautical Congress (IAC)

AIDAA is recognized as the second oldest scientific aerospace society in the world and since 1920 we promote and celebrate aerospace ingenuity and collaboration.

The Italian Association of Aeronautics and Astronautics (AIDAA) is founding member of the IAF.

PSB
GOLD SPONSOR
International Astronautical Federation (IAF)
100 Avenue de Suffren
75015 Paris
France
Phone: +33 1 45 67 42 60
Email: info@iafastro.org
Website: www.iafastro.org

State Space Corporation ROSCOSMOS
42, Schepkina st.,
Moscow, 107996
Russian Federation
Phone: + 7 (495) 631-9-888, 7 (495) 631-90-00
Fax: +7 (495) 631-9900
Email: info@roscosmos.ru
Website: www.roscosmos.ru