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GLEC2022
GLOBAL CONFERENCE
ON SPACE FOR
EMERGING COUNTRIES



*Space Ecosystems that bring
Government, Industry and Society Together*

QUITO, ECUADOR, 16-20 MAY 2022



PREFACE

The Global Conference on Space for Emerging Countries – GLEC 2022, organised in Quito, Ecuador, from 16th to 20th May 2022 by the International Astronautical Federation (IAF) and the Sideralis Foundation, has been the time to bring the international community together to discuss a variety of topics related to the promotion and creation of a local space industry that is innovative, responsive, robust, commercially viable, connected and integrated to the global space industry; the benefits of space applications for the socio-economic development of emerging countries and for advancing national and regional space programmes; the essential legislative and policy elements that must be considered in establishing a firm foundation for national or regional space programmes.

Organisers felt the importance of bringing together representatives of Governments, industry and society, i.e., the three components of any space ecosystem. The Co-Chairs of the International Programme Committee (IPC), composed of seventy-four Members, Valanathan Munsami and Juan Jaramillo Rojas, considered that “a more pragmatic approach [to developing space activities] is to ensure a national or regional ecosystem approach, where indigenous capabilities are ensured to optimally meet local user requirements. This approach brings to the fore the convergence of government intentions and aspirations for a national or regional space programme, industry capabilities and resilience to ensure the long-term sustainability of the sector, and societal awareness and understanding of the benefits of space.”

The IAF General Counsel, Sergio Marchisio, was entrusted as the Master of Ceremony of the Masterclass on Space Law and Policy, along with Plenary 3: Space Law and Policy. Indeed, the Masterclass was conceived as to provide insights on the specific needs of emerging countries and the benefits that can come from applying a legal perspective in establishing a space ecosystem. The aim of the Masterclass was to assess the added value that space law and policy can provide in establishing a space ecosystem. This will vary from country to country and influence the elements considered in space legislation.

The Masterclass has been a great success, rich of worthwhile contributions and learning moments, as the attached Report highlights. In this sense, the IAF leadership, the President Pascale Ehrenfreund, the incoming President Clay Mowry, and the Executive Director Christian Feichtinger, together with the IPC Co-Chairs, deserve our gratitude for their forward-looking perspective. Special thanks also go to the IAF staff, especially Isabella Marchisio and Myriam Morabet, for their major and constant support in the organisation and management of both the Masterclass on Space Law and Policy and Plenary 3. The Sapienza Team of the Project *Outer Space Law for Sustainable Development* (OSL) extend its acknowledgements also to Juan Jaramillo Rojas, President of the Sideralis Foundation and to its Vice-President Daniela Mera and to Matias Campos, Founder of Astralintu Space Technologies.





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MASTERCLASS ON SPACE LAW AND POLICY

PLENARY 3: SPACE LAW AND POLICY

REPORT

edited by
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June 2022



THE OSL PROJECT TEAM



Project OSL Team. [From the left] Ludovica Ciarravano (Sapienza University), Pierfrancesco Breccia (Sapienza University), Mélanie Majuma (Kenya Space Agency), Sergio Marchisio, Scientific Coordinator (Sapienza University), Charles Mwangi (Kenya Space Agency), Gianfranco Nucera (Sapienza University), Anne-Sophie Martin (Sapienza University).



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EXECUTIVE SUMMARY

On 16th May 2022 the Masterclass on Space Law and Policy opened GLEC 2022 on the topic ‘Highlighting the Relevance of Space Law and Policy for Developing Space Ecosystems.’ The aim of the Masterclass was in line with the Conference objective to create awareness on the essential legislative and policy elements that must be considered in establishing a firm foundation for national or regional space programmes. Therefore, the establishment of appropriate framing of laws and policies within national and regional space ecosystems is deemed vital, as it determines the key governance constructs required for effective space programmes.

The Masterclass spurred conversation among high-level Panelists on space law, legislation and policies that emerging countries could consider to support the growth of their space industry. Several issues have been tackled during the Masterclass, especially how to better create awareness on the need for national and regional space legislation to ensure that space activities are conducted in accordance with international law; how space policy and legislation could drive space economy and foster innovation; the governance of space activities in emerging countries, notably in Latin America and Africa; as well as financing aspects and legal options for emerging space countries. The Plenary session provided an opportunity to deepen the themes examined during the Masterclass, in particular to understand the “new space”, the importance of the participation of the private sector in the space industry, the need of an appropriate policy and law to develop an adequate and enabling legal environment; the key policy drivers for the development of a space ecosystem and the development of national space programmes; the relevance of the United Nations space treaties and Conventions and States’ compliance with international obligations for establishing space ecosystems. The nature of the space industry and the rapid advancement of space activities illustrate the need for emerging space countries to consider establishing policies and pieces of legislation to support the development of their national space programmes.

FEATURES AND STRUCTURE

The Masterclass gathered 18 speakers from 10 countries and 4 continents to discuss the relevance of space law and policy for developing space ecosystems, with particular attention to the emerging countries. The event was opened by the Keynote Speech of the IAF General Counsel, Sergio Marchisio. The interventions focused on what are the benefits of space law for emerging countries in creating space ecosystems, and articulated in different sessions. The Round Table discussion, structured on the Keynote, focused on Addressing Legal and Policy Elements for Establishing Space Ecosystems in Emerging Countries and witnessed presentations by Gabriella Arrigo, Peter Martinez, Steve Mirmina, Marlène Michèle Losier and Chien Chern Loo. The Workshop on Sharing Experiences and Practices on Space Governance and Law in Emerging Countries followed, divided in two Panels. The Panels addressed the elements of space governance at the



national, regional and international levels and in its institutional and normative dimensions. The first Panel witnessed the participation of Tatiana Viana, Daniel Peñaherrera, Charles Mwangi, Hebe Romero, Ludovica Ciarravano. The Panelists sharing practises and experiences of the respective countries in the second Panel were Carolina Catani, Ian Grosner, Melanie Majuma, Gianfranco Nucera. Last session on How Better Create Awareness of the Need for Legislation and Policies to Drive Space Economy and Foster Innovation aimed at linking space economy and the fostering of innovation to the existing law. The session featured presentations by Michelle Hanlon, João Paulo Rodrigues Campos, Pierfrancesco Breccia, Anne-Sophie Martin.

KEYNOTE SPEECH: Bringing the Benefits of Space to Emerging Countries

Sergio Marchisio

Professor of Space Law, Sapienza University of Rome, IAF General Counsel

Marchisio highlighted that GLEC 2022 and the Masterclass on Space Law and Policy was the perfect moment to bring together representatives from emerging countries, space lawyers and space policy specialists in order to address the specific needs of each nation and to focus on how to bring benefits to emerging space countries. Space law is a hybrid notion, as it encompasses international space law, including the law of international organisations, and national space legislation. International space law is crucial in providing the guiding principles and overarching objectives for the legal regulation of space activities. Marchisio recalled that the UN space treaties were drafted for the benefit and in the interests of all States Parties, irrespective of the degree of their economic or scientific development and regardless whether they carry out space activities or not. As to the benefits the legal framework can provide to emerging space countries, Marchisio referred to the confidence in space activities as the treaties require States to bear international responsibility for national activities in outer space; participation in a more stable and predictable global legal regime; increase attractiveness to potential foreign partners; improve access to scientific and other space-related data. Furthermore, an overview of the increasing number of States Parties to the UN space treaties was offered. In this regard, Marchisio referred to the key principles on which international space law is founded: the benefit of all countries, the freedom of exploration and use by all States, the non-discrimination principle, the principle of equality in accordance with international law, the freedom of scientific investigation in outer space; in addition, the principle of cooperation in conducting space activities. Marchisio also detailed the concept of equality enshrined in Article X of the Outer Space Treaty (OST) referring to the duty for States Parties to consider any requests by other Parties to be afforded an opportunity to observe the flight of space objects launched by those States in order to promote international cooperation in the exploration and use of outer space. The notion is also introduced in Article 6 of the Moon Agreement referring to the freedom of scientific investigation on the Moon by all States Parties without discrimination on a basis of equality. Thus, the principle of equality is linked to the free exploration and use of outer space. Marchisio also mentioned that the implementation of the space



treaties leads to increased development of national regulatory frameworks that are a key step for space developed nations, as well as for States with emerging space capacity. States follow different approaches in setting up national space legislation as it might be a specific, sectoral legislation or a detailed one. It depends on their specific needs and some practical considerations. Indeed, national legal requirements are linked to national perspectives (space economy and society, security, space accessibility), the range of activities conducted, and the level of involvement of private entities. National legislation also ensures predictability in the conduct of space activities under the jurisdiction and control of the State, a practical regulatory system for private and NGOs involvement, and the basis for regional and international cooperation. Today, more than 40 States have drafted national space legislation. He recalled that the 2013 UNGA Resolution 68/74 related to national legislation, as well as the 2019 Guidelines for the long-term sustainability of outer space activities, especially “Section A” on “Policy and regulatory framework for space activities”, offer guidance for States in the elaboration of national space legislation. Marchisio concluded by noting that the current legal regime for space activities is facing new challenges due to a fast-paced changing space landscape with the commercialization of space activities and the NewSpace economy with the deployment of small satellites and mega-constellations. New norms are to be adopted at international level in the coming years, including in the field of space resources utilisation. Marchisio emphasised the fact that these new norms, standards and other measures should not hinder the access of nations with emerging space capabilities to space. Marchisio underlined that the principle of equality of opportunities should be the “golden rule” in that matter.

ROUND TABLE

Addressing Legal and Policy Elements for Establishing Space Ecosystems in Emerging Countries

Gabriella Arrigo

Director of International Affairs, Italian Space Agency

Arrigo focused her speech on “Key elements of policy for a space ecosystem”. She clarified the meaning of the terms “space policy” and “space strategy”, explaining their inherent elements. According to Arrigo, space policy means a governmental policy which defines goals and issues for a national space policy. This implies a doctrine referring to a set of principles elaborated to answer the questions “which” and “why” in order to justify the measures adopted to achieve the envisaged goals. Arrigo analysed the space policies released by the United States, Russia, China and the European Union, respectively, containing different doctrines on the point. Each policy identifies specific goals, priorities, purposes and a strategy, tailored to the country or the region. Arrigo also analysed the concept of space strategy, that is the set of means and timing necessary to achieve the goals defined by the space policy. “What” and “when” are the questions that a space



strategy should answer. Finally, a space programme implements the space strategy and should answer the question “how”. The space program is the national Plan containing proposals of projects and initiatives, map of infrastructures and resources which constitute the structure to implement the space policy and strategy. Furthermore, Arrigo addressed the concept of space governance as the interaction between governmental subjects responsible for space activities and other key subjects, including industry, academia and society. These actors collaborate and contribute to the elaboration and definition of the national space policies and strategies by creating the necessary measures to implement them. Lastly, Arrigo dealt with the concept of space ecosystem which represents the space community and its environment, where the actors define space policy goals for their needs and a better use of outer space.

Peter Martinez

Executive Director, Secure World Foundation

Martinez addressed policy considerations for establishing a space ecosystem, as well as the role of new actors in space activities, including States and private entities. While space activities were dominated by two superpowers at the beginning of the space age, there are today a large number of countries conducting space programmes, in particular in emerging regions, including Latin America and Africa. The emergence of new space actors is followed by the emergence of new space activities, namely mega-constellations, extraction and use of space resources, space debris mitigation and remediation, as well as on-orbit servicing. In this context, Martinez highlighted the importance of protecting and preserving the space environment, and the challenges connected to ensuring the sustainability of space activities. He emphasized the fact that space policy is never primary policy, in a sense that national development imperatives and priorities are the first elements to draft a space policy, taking into account historical factors (e.g., previous space activities, actors and institutions, investments, capabilities developed, international and geopolitical factors), the current landscape (e.g., institutional landscape, actors, legislative mandate, industry, human capital), desired outcomes (e.g., governance, dependence *vs* self-reliance, industrial development and international cooperation). In this sense, space policies are drafted in support of other sectoral policies. Furthermore, Martinez clarified that a policy has not to be confused with space visions. Indeed, policies and strategies turn into reality space visions. Lastly, Martinez identified the elements for a sustainable space ecosystem, including political support, enabling regulation, industrial capacity, human capital, financial capital, opportunities, educational and R&D infrastructures, as well as strategic partnerships.

Steve Mirmina

Senior Attorney, Office of the General Counsel, National Aeronautics and Space Administration



Mirmina presented some legal issues from the perspective of a national space agency. First, he underlined that international space law is only a little part of the law applicable to space activities. Then, Mirmina detailed space legislation in the United States and the existing different competent authorities for authorizing space activities, namely the Federal Aviation Administration (FAA), the Federal Communications Commission (FCC) and the National Oceanic and Atmospheric Administration (NOAA). Mirmina noted that the US has the most advanced legislation but that it is not perfect. For instance, national space legislation regulates most aspects related to the launch and re-entry of space objects from outer space, but little is said on in-orbit operations. Another point underlined is that the legal framework for space activities need to be developed with the challenges ahead. Notably, new space programmes raise legal issues, including the permanent presence of human beings in outer space, that are to be addressed by the international legal framework. Besides this, other legal instruments play a pivotal role, especially for filling the gaps of the international legal framework. These include: a) plurilateral agreements concluded among small groups of States, such as the IGA; b) bilateral agreements, such as those concluded between the US and other countries. On these latter, Mirmina mentioned the recently concluded agreements with Luxembourg, Australia and New Zealand, containing provisions on planetary protection, space sustainability, space debris mitigation. Mirmina noted that the inclusion of these non-legally binding “standards of care” in legislation make them binding, and that they are essential to prove due diligence of the operator in case of damage. According to Mirmina, these instruments should be taken into consideration in the evolution of the legal framework applicable to space activities.

Marlène Michèle Losier

Losier González, PLLC

Losier provided key considerations relating to broad and narrower multilateral and bilateral agreements for those States contemplating entering into, or expanding their, space activities in order that they can more strategically make use of these instruments. Losier emphasized the importance of monitoring the ongoing efforts to further develop the normative framework applicable to space activities by the COPUOS, as well as by States, through the use of national laws and the adoption of narrower multilateral and bilateral agreements. These efforts will inevitably impact how States can pursue their legal and practical space objectives. She also noted that broad multilateral agreements to be advantageous for any State, demands that States have the linguistic, legal, scientific, technical, economic and diplomatic capabilities to send delegates to best represent and negotiate their interests. It became evident that the normative framework needs to be revised through a broad multilateral process. In parallel, Losier noted that public and private actors have undertaken efforts outside the UN to remediate issues in the normative framework through debated interpretation and application of space rules and principles, the development of national space legislation and the creation of narrower agreements that can diversify international collaboration. Losier underscored that the practice and custom derived from narrowly created agreements could be advantageous for some States, but it competes with the efforts in the



COPUOS and could potentially lead to lessened legal and practical leverage of States to operate outside a debilitated normative framework, as well, prospects to maintain the peaceful exploration and use of outer space. She concluded that diverse agreements can assist States in making strategically advantageous decisions while maintaining legal standing and leverage to participate in international space law and policy-making mechanisms.

Chuen Chern Loo

Head of Space Publication and Registration Division, ITU Radiocommunication Bureau

Loo provided an overview of the ITU's system of registration for radio-frequency assignments and associated orbits, with a focus on emerging space countries. He presented the ITU as the United Nations specialized agency for information and communication technologies (ICTs), articulated in three sectors of competencies: Radiocommunication Sector (ITU-R), Telecommunication Standardization Sector (ITU-T) and Telecommunication Development Sector (ITU-D). Loo underscored the functions and role of the Institution and how the Radio Regulations (RR) are reviewed during the World Radiocommunication Conferences taking place every four years to consider the demands of the space industry. He recalled that frequency and orbits are limited natural resources, and thus, they must be used rationally, efficiently and economically. In addition, all stations must be established and operated in such a manner as not to cause harmful interference to the radio services or communications of other Members or of recognized operating agencies which operate in accordance with the provisions of these Regulations. Loo detailed the objectives of the RR which include facilitating the equitable access to, and rational use of, the natural resources of the radio-frequency spectrum and the geostationary-satellite orbit; ensuring the availability and protection from harmful interference of the frequencies provided for distress and safety purposes; assisting entities in the prevention and resolution of cases of harmful interference; facilitating the efficient and effective operation of all radiocommunication services; and providing for, and regulate, new applications of radiocommunications technology. Furthermore, Loo explained the new regulatory procedure adopted for non-GEO satellite networks. Lastly, he stressed the necessity to ensure equitable access to those orbits and frequencies for emerging countries, and the importance of inclusivity.

WORKSHOP - Panel 1

Sharing Experiences and Practices on Space Governance and Law in Emerging Countries

Tatiana Viana

IILA Technical-Scientific Secretary

Viana's presentation dealt with "Latin America in Space: Law, Cooperation and Future Perspectives". She shared the experience of IILA in the field of space law, regional cooperation



and recalled that space activities have to be conducted for scientific, technical and societal development. She mentioned diverse experts and professors of space law in Latin America who allowed for the development of the knowledge in the field in the region. Viana also described the so-called “Country Sheet” detailing various features for developing national space activities, such as specific motivations, space strategy, range of activities and applications, legal framework, implementation of the international obligations, membership of the COPUOS, ratification of the UN space treaties, human capital, international cooperation and capacity-building. Furthermore, Viana provided an overview of IILA Member States engagement in space activities, highlighting that 175 objects have been launched into outer space by IILA Member States, starting from 1964 with San Marco-1 launched by Italy from its facility in Malindi, Kenya and that today 17 IILA countries are members of the COPUOS, 13 have ratified the Outer Space Treaty, 12 established a space agency and most of the Member States established bilateral forms of cooperation with each other. She underscored the importance of promoting cooperation between actors of the space ecosystem, as well as high-level technical and scientific training in order to respond to the issues of digital and gender gap in the region, and to foster entrepreneurship and local industries. Lastly, Viana presented the IILA Consultancy Service in Space Law and Space Diplomacy for Member States consisting of on-line space law courses and future perspectives with the creation of study groups of space law and diplomacy taking into account the peculiarities of the Latin America region.

Daniel Peñaherrera

Abad&Campos, Abogados

Peñaherrera’s presentation dealt with the adoption and evolution of space law and policy instruments in Ecuador. The Ecuadorian space policy was established in 1957 when NASA installed the Mini-Track Satellite Tracking Station on the Cotopaxi Volcano with the objective of tracking and monitoring the orbits of North American satellites. Due to its geographical situation, Ecuador is a strategic country for developing space programmes. Peñaherrera then referred to the legal regime of the geostationary orbit, mentioning the fact that the Constitution of Ecuador affirms rights above the geostationary orbit (Art. 4) and making reference to the 1976 Bogotá Declaration, while recognizing that such claims were finally settled in 2000 with the adoption of Resolution 55/122 (Para. 4). He recalled that the geostationary orbit must be used efficiently and economically to allow equitable access to this orbit and to its frequencies. He also mentioned the principle of non-appropriation as provided in Article II OST. Peñaherrera concluded that the efficient use of spectrum and orbital resources remains one of the most crucial challenges.

Charles Mwangi

Ag. Director, Space Sector & Technology Development, Kenya Space Agency



Mwangi presented Kenya's involvement in space activities which began in 1962. In particular, he described the establishment of the San Marco Satellite Launching and Tracking Station in Malindi in 1964 and outlined the historical bilateral cooperation with Italy, mentioning in particular the agreements concluded in 1995 and 2016, governing the San Marco Base launch facility. Then, Mwangi recalled that Kenya ratified the 1967 Outer Space Treaty and the 1972 Liability Convention and focused on the steps that led to the creation of the Kenya Space Agency. Notably, in recognition of the potential impact space activities would have on realizing a country's social-economic requirements, the government approved the creation of the National Space Secretariat (NSS) in 1993. The NSS was finally established in 2009 under the coordination of the Ministry of Defence with the mandate to coordinate all space-related activities including the San Marco Project. In 2014, the Ministry of Defence set up an Inter-Ministerial Committee coordinated by the NSS. The Committee drafted the Kenya Space Policy and recommended the need to establish the Kenya Space Agency (KSA). In 2016, the Kenya Space Policy and Strategy were adopted and in 2017 the Agency was established by the Executive Order of the President as the successor to the NSS. The KSA has the mandate to coordinate, promote and regulate space-related activities in line with the Kenya Strategic Plan (2020-2025) adopted in 2020. Mwangi also illustrated the projects Kenya took part in the sector, such as the launch in 2018 of IKUNS nano-satellite from the International Space Station in the framework of the UNOOSA/JAXA programme. He also noted the importance of capacity-building and technology transfer for the development of space activities in Kenya, and the issue of CubeSats' registration. Lastly, Mwangi underscored the challenges that the protection and the preservation of the space environment pose in the conduct of space activities.

Hebe Romero

General Director of Legal and International Affairs, Paraguayan Space Agency

Romero provided an overview of the space law and policy framework in Paraguay. She highlighted the role of the Paraguayan Space Agency, created in 2014, in promoting and developing national space activities, as well as to support innovation in the country and explained its functions and activities. The Agency's objectives are to carry out research work looking to access space technology and applications by developing highly skilled groups in this field; to propose policies and legislation on development; to use and exploit outer space in order to comply with Treaties' obligations. These objectives are in line with the Government's National Plan of Development, also known as the 2030 Paraguay Vision. She also addressed the content of the public policy and national space policy as well as the strategy's priorities of the Agency. The Paraguayan space policy identifies the country's priorities, links space technology capabilities to the 2020 national development programme, encourages and promotes the growth of scientific, technical and industrial capacities with present and future activities in the field of outer space, establishes a roadmap for developing national space programmes and gives a "global vision" for the country to



join the space community. Paraguay's Space Policy is divided in three parts including principles (capacity-building, national development, international cooperation), objectives (participation of the private sector, entrepreneurship, innovation, research) and guidelines (international cooperation, regulations, infrastructures, environmental protection, scientific divulgation, capacity and use of space technology, promotion of industry and commerce, knowledge and resources). Lastly, Romero underlined the importance of developing national space programmes and national legislation on space activities.

Ludovica Ciarravano

Research fellow in Space Law, Sapienza University of Rome

Ciarravano focused her presentation on the benefits deriving from regional governance mechanisms and their relationship with the supporting national regulatory regime for space activities in emerging countries. Ciarravano outlined that regional space governance entails a form of international cooperation at the regional level, identifying the existence of a sufficient number of States in a geographical area interested and able to enter regional mechanisms of cooperation as a prerequisite for this to be established. She provided some examples of regional forms of cooperation among emerging countries that can favour the governance of space activities at the regional level and then offered an overview of the benefits of regional space governance, with particular regard to the experiences of emerging countries. These vary depending on the institutional framework set up and the policy and legal instruments that are adopted to manage common programmes, but generally include the directing of States towards a mutual benefit, the making of full use of the geographic advantage of the locations of the countries involved, the creation of a stable environment for the implementation of space programmes, the fostering of capacity building in the space law and policy field and the avoidance of duplication of efforts. In outlining how the regulatory framework adopted at the continental level influence the national one and in assessing whether there is a one-way or two-way relation between the two, Ciarravano offered the results of a study conducted on the African continent, concluding that there cannot be a one-way relation between the regional and national levels, but it must be bi-univocal, where the regional level acts as a driving force for new countries to engage in space activities benefitting from the regional cooperation, and individual States nurture the regional framework by developing and enhancing their space programmes.

WORKSHOP – Panel 2

Sharing Experiences and Practices on Space Governance and Law in Emerging Countries

Carolina Catani

Comisión Nacional de Actividades Espaciales, Argentina



Catani introduced and detailed Argentina space activities and shared some experiences, as well as practices on space governance in the country, in connection with the pillars and objectives of the “Space 2030” Agenda. Space activities in Argentina were first developed by the national Air Force with the creation of the National commission for space research in the 1960s. In 1991, the national space agency (*Comisión Nacional de Actividades Espaciales* - CONAE) was created. Catani described the role of the CONAE, competent to understand, design, execute, control, manage and administer projects and undertakings in the space field for peaceful purposes, with competence to propose policies for the promotion and execution of activities in the space field for peaceful purposes. The Agency also maintains the national registry of objects launched into outer space (Presidential Decree No.125/1995). One of the most important roles of CONAE is to propose and execute the National Space Plan (NSP), composed of the Strategic Plan for CONAE’s priority and the State Policy of national space activities. Catani noted that the NSP is a dynamic tool for updating and strengthening practices on space governance and law, considering the technological evolution, as well as the new participants that are joining the national space programmes. The NSP makes reference to space law, and recalls the importance of international cooperation and agreements. Catani then stated that Argentina is party to four out of five UN space treaties and recalled the importance of taking into consideration the non-legally binding instruments, namely the Guidelines on the long-term sustainability of outer space activities, and the COPUOS Space debris mitigation guidelines. Catani underscored the need for cooperation between States in the field of space programmes. Notably, CONAE concluded agreements with space agencies like AEM (Mexico), CONIDA (Peru), AEP (Paraguay), CCE (Colombia), as well as with universities in the region. She underlined that bilateral cooperation has been one of the elements that have made possible to maintain harmonious and collaborative relations, strengthening confidence and mutual assistance. The Agency has a relevant position in Latin America in the global satellite industry, with five completed satellites missions, space facilities centers and ground stations, training institutes and a major national project underway with the manufacturing of the launcher Tronador. Finally, Catani stressed that the growing development of space technologies, the increase in the number of actors involved in space activities and the promotion of public-private partnerships bring to review the NSP and to consider the adoption of a national space legislation to meet this growth, to respond to new challenges dealing with launch services, space debris and to provide predictability in the performance of space activities.

Ian Grosner

Brazilian Space Agency (AEB), Federal Attorney

Grosner described the evolution of the legal framework for space activities in Brazil. The country has a long-standing space programme which began in the early 1960s. Brazil is party to four of the five UN space treaties, namely the Outer Space Treaty, the Rescue Agreement, the Liability Convention and the Registration Convention. Grosner noted that Brazil’s national space legislation is scarce and it lacks a general set of provisions to encompass the basic guidelines for space



activities. The creation of a national agency (*Agência Espacial Brasileira* - AEB) in 1994 allowed Brazil to develop its own space programme. The Agency is responsible for preparing the National Policy for the Development of Space Activities and for formulating and implementing the National Space Activities Program. In this regard, Grosner highlighted that the main objective of AEB is to provide solutions and guidance for the development of national space programmes. Then, he focused on the recent Ordinance No. 698/2021 instituting the Brazilian Space Regulation which is divided into two different parts: Part 1 deals with the procedures and requirements for the insurance of the Operator's Licence for conducting space launch activities from Brazilian territory, while Part 2 established procedures for the granting for Launch Authorizations by the AEB. Furthermore, Grosner mentioned the *Programa Nacional de Atividades Espaciais* (PNAE) 2022-2031, a new programme representing the main instrument for planning the future activities. It contains strategic dimensions and objectives as well as defines procedures for the selection and development of space missions. Grosner illustrated the launching activities conducted in the spaceport of Alcântara which brings together two launch centres linked to the Brazilian Air Force. Lastly, Grosner noted that in 2021 Brazil became the 12th country to sign the Artemis Accords and the first in South America. This is an expression of the commitment of Brazil in the development of a practical set of principles to guide space exploration cooperation among nations participating in NASA's 21st century lunar exploration plans and beyond.

Melanie Majuma

Legal Counsel Kenya Space Agency

Majuma provided an insight of the governance of space activities in Kenya and the process underway in the country for the adoption of a national space legislation. She outlined that the adoption of the national space law is motivated by internal administrative issues and the awareness of the socio-economic benefits space activities bring to the country, as well as the expanding space industry and involvement and the growing participation of academia, start-ups and new actors in the space sector. The national space legislation would also address the operation of the Broglio Space Centre established in 1964 under the bilateral agreement between Italy and Kenya. Then, Majuma exposed the drafting steps that are being undertaken. The drafting process started with a desktop research commissioned by the Kenya Space Agency (KSA) Board of Directors and setting-up the main objectives of the law; then the drafting committee, gathering members from different areas, including legal counsels, took into consideration Kenyan international obligations, the role of space applications in achieving Sustainable Development Goals (SDGs), the African Space Policy, the Agenda 2030, the Kenya Vision 2030 and the KSA Vision. The Committee completed its work in March 2022, providing for the establishment of an institutional framework, provisions to implement Kenyan international obligations including guidelines on space debris management, and a set of general provisions. Then Majuma defined the steps ahead, namely the modalities for stakeholders participation, that in Kenya is governed by the 2010 Constitution and the Statutory Instruments Act of 2013. She underlined that in the process it is important to avoid



double regulation with instruments adopted by other authorities regulating the space sector besides the KSA. The final steps will be the approval by the Attorney General, the presentation to the Cabinet and to the Parliament, according to the common law countries procedure.

Majuma underscored the lessons learnt during the process, and in particular referred to the UNOOSA Sofia guidelines; information sharing through UNOOSA platform promoting the “Access to Space for All” initiative; virtual conferences held by UNOOSA; the goodwill by emerging space-faring countries to support each other in establishing appropriate legislation; collaboration rather than overlaps with other State corporations at the national level. Majuma concluded that space legislation should resolve a country’s indigenous challenges and support the shift from a passive use of space to an active one.

Gianfranco Nucera

Researcher in International Law, Sapienza University of Rome

Nucera focused his intervention on the role of international space law partnership for supporting space ecosystems. International partnerships, which involve entities different from States, are essential in creating a common understanding of the legal elements that are needed to regulate the growing industry. There are many examples of international partnerships, of multilateral and of bilateral nature. Among them, Nucera mentioned the Outer Space Law for International Cooperation and Sustainable Development (OSL) Project, a partnership developed between Sapienza University, Italian Space Agency and Kenya Space Agency. The OSL Project has the ambition to engage the parties in a more stable collaboration in the field of legal sciences, as it has been done in the engineering sector. Moving from this example, Nucera identified three main elements of international space law partnerships: 1) legal research, to provide legal certainty to space operators, through the definition of a clear regulatory context; 2) capacity sharing, as a kind of capacity building involving a bidirectional process and built on existing experiences; 3) educational training, to create awareness of the problems and of the available instruments and starting to find solutions. With this model in mind, it is necessary to build a joint path, considering current and future challenges, for specifically addressing the needs of emerging space countries. Concerning the quality of partnership, Nucera underlined that current international partnerships should take a step forward and move from a transactional perspective (instrumental for a specific objective) to a transformative one, aimed at creating long-term institutional platforms for collaborative work. In this kind of partnership, which pursues an authentic mutual interest, joint research is undertaken, and common understandings are reached. In the opinion of the speaker, this collaborative, shared, long-standing and multi-stakeholder approach is today the most promising to address current and future legal issues related to space activities.



SESSION

How Better Create Awareness of the Need for Legislation and Policies to Drive Space Economy and Foster Innovation

Michelle Hanlon

Co-Director of the Center for Air and Space Law, Co-Founder and the President of For All Moonkind, Inc.

Hanlon focused on international space law and the gaps that need to be filled considering the evolution of space activities and the rising of new legal issues connected to them. Hanlon recalled Article I OST which states that the exploration and use of outer space is the province of humankind, thus providing for the free exploration and use of outer space by all and that limitations need to be put in place. The same OST sets forth a number of restrictions contained in Articles II-III-IV-V-VII-VIII, but in her opinion these provisions are not enough to preserve the safe use and exploration of outer space. An important provision is contained in Article IX OST, notably the “due regard provision”. Accordingly, Hanlon focused on what due regard means: legally speaking, this means balancing different interests and she pointed out that it is challenging to implement it albeit crucial to develop the space economy. Indeed, Hanlon noted that certainty in space regulation is needed for investors to support the new space economy. Hanlon suggested harmonising national space regulation on what “due regard” means and noted that the COPUOS can play a role in doing so. Connected to this topic, Hanlon highlighted that the Artemis Accords support the OST as reflect and confirm what it sets forth and also contain guidelines that could fill the gaps and tease out a practical application of the concept of due regard.

João Paulo Rodrigues Campos

Senior Lawyer, VISIONA

As President and CEO of a company devoted to space systems integration, Campos shared some legal issues the company faced in the Brazilian space regulatory environment and the solutions they found. Campos noted that in Brazil there are too many laws that apply to space activities as these are covered also from laws not directly dealing with the space sector. Notably, Campos pointed out that in Brazil there is a lack of common understanding on how to apply the existing legislation and this is a major challenge space companies need to face. This is also more evident for those companies, as Visiona Space Technology, that are at the forefront in developing new applications. This lack of certainty hinders the exploitation by companies of the opportunities and mechanisms set up by Brazilian legislation, noting that the space sector is impacted the most. Campos followed by highlighting that for a space company to grow and gain investments it is necessary that it has success, and to achieve so it needs to carry out activities that respond to the needs of the country and that have an impact on the daily-lives of people. In this light, Brazil has



very good examples on the use of satellites for remote sensing, which properly respond to national needs. Finally, Campos outlined some throwbacks that should be taken into consideration to define a strategy: a) space sector is not a competitive market and the government can promote space industry; b) space sector is technologic intensive and needs consistent policies; c) the budget is very tight. Thus, the main objective, especially for countries with little resources, shall be to guarantee consistency and coordination. This latter, also between the public and private sector.

Pierfrancesco Breccia

Post-Doctoral Research Fellow in International and Space Law, Sapienza University of Rome

Breccia addressed the legal aspects of financing space activities, highlighting that access to outer space depends on access to capital. While technological evolution has played a key role in overcoming constraints for the development of space endeavours, public funding remains key for the space sector. It often represents the only accessible source of capital and frequently serves as a precondition for accessing other sources of financing, such as private risk capital. Moreover, a clear regulatory framework at the national level helps to stimulate and promote the development of private activities.

The development of space entrepreneurship typically relies on mechanisms, such as equity finance or project financing, for attracting investment for their operations, as an additional source to receive government funding and grants, or relying upon the financial capacity of their founders. An international initiative to boost the financing of space activities has been the adoption of the Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Space Assets, adopted in Berlin in 2012. The Protocol is part of the Cape Town Convention treaty system, whose aim is to facilitate asset-based financing and leasing for the manufacture, acquisition, and use of specific high-value equipment, however it is still not in force. Furthermore, Breccia highlighted that innovative financing methods are emerging and allow companies to diversify their source of financing such as the Fund-of-Funds model led by the InnovFin Space Equity Pilot as well as venture-debts. Other possible solutions are those offered by development banks and the Official Development Assistance.

Breccia remarked that cooperation remains one of the imperatives also in the field of financing space activities, stressing, on the one hand, the relevance of the “finance for space” forum to bridge the information gap and develop innovative financing solutions for the space sector; on the other hand, the regional initiatives of Latin America and Africa, such as the African Leadership Conference on Space Science and Technology and the Space Conference of the Americas. The two initiatives have had different impacts in terms of adoption of policies and strategies, but at the regional level, they have promoted the strengthening of cooperation. In this sense, they have played a relevant role in the establishment in both continents of their regional space agencies, namely the African Space Agency and the Latin America and Caribbean Space Agency. The Constitutive Act of the latter enshrined the promotion of actions aimed at obtaining international funding and



identifying and managing access to sources of financing and capital, for the development of space programmes and projects.

Anne-Sophie Martin

Post-Doctoral Research Fellow in International and Space Law, Sapienza University of Rome

Martin addressed how space legislation can be a tool to enhance the development of space ecosystems in emerging countries by taking into account two case studies, South Africa and Nigeria. Both countries are parties to four of the five UN space treaties (except for the Moon Agreement). Martin underscored the fact that both countries started to regulate their space activities in the 90s-2000s considering their peculiarities, country's specificities and users' needs. Indeed, South Africa adopted its first national space legislation in 1993 without having really developed space programmes and then created its space agency in 2008, while Nigeria established its space agency in 1999 and adopted its national space legislation in 2010. Hence, both have proceeded in different ways but this process does not hinder the development of their respective space ecosystems. These two cases show how diversity is a value in regard to space legislation. Martin underlined the fact that South Africa has now a detailed legislation while Nigeria has adopted two legislations including a recently enacted one covering all space activities. Martin emphasized that both countries drafted a space policy and strategy dealing with innovation, economic growth, commercialisation of space activities and competitiveness of the industry. She also noted that national legal requirements depend on the range of space activities conducted, namely Earth observation, telecommunications, space science and engineering; and on the level of involvement of private entities part of the space ecosystem. While governments continue to play a primary role in the space domain, the private sector and start-ups might create a viable and innovative system which serves the needs of the user through technologies and products. Some of them are located in South Africa and Nigeria, e.g., CubeSpace, Telnet, StratoSatDataCom. Martin concluded that although States adopted different approach in the regulation of their space activities in order to respond to their respective needs, common elements can be identified, in particular in the promotion of the private sector and the creation of a domestic space industry, through appropriate regulation, with a system of authorisation and licensing of private actors, the development of indigenous technology in collaboration with universities, research centres, spacelab, and human capacity.



PLENARY 3 - SPACE LAW AND POLICY

Wednesday 18th May

Sergio Marchisio

Moderator

The Plenary, moderated by IAF General Counsel, Prof. Sergio Marchisio, was an occasion to exchange views on the fundamental issues linked to the three key concepts of GLEC 2022, namely emerging countries, space law and space policy. In particular, the discussion provided an opportunity to deepen how space law and policy can better serve the creation of space ecosystems and how governments, society and the private sector can become aware of the benefits of space legislation. Marchisio summarised the results of the Masterclass on Space Law and Policy held on Monday 16th May, which had provided insights on the governance of space activities at the international, regional and national levels and in its institutional and normative dimensions. In this light, Marchisio explained that institutional governance refers to the existing space policies, programmes, strategies and institutions devoted to apply such documents, mainly space agencies, whereas normative governance refers to the substantive norms for the regulation of space activities aimed at implementing the Treaties that States have adopted and notably the “triangle” made of Articles VI, VII and VIII of the Outer Space Treaty. These latter are the core provisions regarding the private sector as contain cross references from one to the other, namely States’ international responsibility, the consequent obligation of authorisation and supervision of space activities from the appropriate State, States’ liability for damages caused by space objects in outer space or on the surface of the Earth, and the obligation of registration of space objects that then maintains jurisdiction and control over it. Marchisio also mentioned the need to implement other principles included in the UN Space Treaties and that were objects of discussion at the Masterclass, such as the notion of due regard, and “standards of care” contained in non-legally binding instruments. Marchisio then recalled the structure and topics addressed in each of the Masterclass’ events, namely the Roundtable on “*Addressing legal and policy elements for establishing space ecosystems in emerging countries*”, the two Workshop sessions dealing with “*Sharing experiences and practices on space governance and law in emerging countries*” and the Panel on “*How better create awareness of the need for legislation and policies to drive space economy and foster innovation*”, highlighted the difficulty in linking space law and policy to the space economy and innovation.

Against this backdrop, Marchisio gave the floor to the Panelists at the Plenary to resume from what had been discussed during the Masterclass and bring new elements for debate.



Hanlon underscored some gaps in the space legal regime, in particular on the concept of due regard and the lack of a definition, highlighting that this principle can serve the new space economy at the international and national levels. She stressed that in this regard we face two competitive programmes, the Artemis Accords and the China/Russia project, and that emerging space countries might join both initiatives. **Romero** underlined the importance of the role of space agencies for developing national programmes, as well as the role of the private sector within the space ecosystem. She emphasized the need for cooperative agreements and strategic alliance between private entities and institutions taking into account capacity-building and training programmes for professionals. **Peñaherrera** mentioned the importance of the national space policy for the development of space programmes and the open issues around the legal status of the geostationary orbit. **Mirmina** stressed that space agencies need to determine and identify their capabilities, as well as their needs, to respond to country's and end users' demands. Emerging countries should start drafting a national space legislation, allowing in particular national space agencies to conclude cooperative agreements. In his opinion, the State should guide the operators and provide some indications about the applicable law. **Campos** underlined the fact that Brazil needs specific law to regulate national space activities. There is still uncertainty in the law and how to apply it, with a lack of common understanding on the meaning of provisions contained in these instruments. Campos noted that there is a necessity to support the private actors to understand norms and rules governing space activities. In this sense, States should coordinate space initiatives through an appropriate "roadmap" for actors and legislation with a common legal environment. **Loo** highlighted that the ITU is witnessing more and more requests for frequency and orbits assignments in non-geostationary orbits and mainly for small satellites. Regulation of orbits and radio-frequency allocation is changing quickly as more countries are willing to access space resources. This is mainly achieved through the revision of the Radio Regulations at the World Radiocommunication Conferences (WRC). Loo noted that a large number of representatives from industry might contribute to study groups set up within the framework of the Conference Preparatory Meeting (CPM) that aims to provide preliminary studies and "possible solutions" to the WRC agenda items. Loo concluded that enabling regulations help meet industry demand and foster the growth of the space ecosystem. **Losier** noted that the UN Space Treaties are broad multilateral agreements and that some efforts to fill gaps in legal documents by the international community, mainly within the COPUOS are underway. She underlined that it is also possible to interpret multilateral treaties through narrower agreements, but that they are to be negotiated at the international level, rather than in a unilateral way. **Viana** highlighted that not all Latin American countries are aware of the legal implications of conducting space activities. In this light, IILA supports Member States in adopting space strategies, establishing space ecosystems, engaging in space programmes, and adopting adequate space legislation. Against this background, Viana noted that regional cooperation can help to achieve common understanding on both the role of space law and policy in space ecosystems and on the benefits of creating space agencies and adopting space legislation.



ANNEX I

DETAILED PROGRAMME

MASTERCLASS ON SPACE LAW AND POLICY

h. 9.15 - Registration

h. 10.00 – Welcome by the Master of Ceremony

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

Masterclass Rapporteur

- **Anne-Sophie Martin**, *Post-Doctoral Research Fellow in International and Space Law, Sapienza University*

h. 10.05-10.20 - Keynote Speech

Bringing the Benefits of Space to Emerging Space Countries

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

h. 10.20-11.10 - Round table

Addressing Legal and Policy Elements for Establishing Space Ecosystems in Emerging Countries

Moderator

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

Panelists

- **Gabriella Arrigo**, *Director, International Affairs Directorate, Italian Space Agency*
- **Peter Martinez**, *Executive Director, Secure World Foundation*
- **Steve Mirmina**, *Senior Attorney, Office of the General Counsel, NASA*
- **Marlène Michèle Losier**, *Principal, Losier González, PLLC*
- **Chuen Chern Loo**, *Head, Space Publication and Registration Division, Radiocommunication Bureau, ITU*

h. 11.10-12.00 - Workshop

Sharing Experiences and Practices on Space Governance and Law in Emerging Countries – Panel 1

Moderator

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

Panelists

- **Tatiana Viana**, *Scientific Technical Secretary, Italo-Latin American International Organization*



- **Daniel Peñaherrera**, *Senior Lawyer, Abad&Campos Abogados*
- **Charles Mwangi**, *Director, Space Sector and Technology Development, Kenya Space Agency*
- **Hebe Romero**, *General Director, Legal and International Affairs, Paraguayan Space Agency*
- **Ludovica Ciarravano**, *Research Fellow in Space Law, Sapienza University*

Q&A

h. 12-13 - Lunch

h. 13.00-13.50 - Workshop

Sharing Experiences and Practices on Space Governance and Law in Emerging Countries Panel 2

Moderator

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

Panelists

- **Carolina Catani**, *Responsable Derecho Espacial, Comisión Nacional de Actividades Espaciales (CONAE)*
- **Ian Grosner**, *Legal Counsel and Deputy Head, Legal Services Department at the Brazilian Space Agency (AEB)*
- **Melanie Majuma**, *Legal Counsel, Kenya Space Agency*
- **Gianfranco Nucera**, *Researcher in International and Space Law, Sapienza University*

h. 13.50-15.00 - Session

How Better Create Awareness of the Need for Legislation and Policies to Drive Space Economy and Foster Innovation

Moderator

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

Panelists

- **Michelle Hanlon**, *Co-Director, Center for Air and Space Law, University of Mississippi*
- **João Paulo Rodrigues Campos**, *President & CEO, Visiona Space Technology*
- **Pierfrancesco Breccia**, *Post-Doctoral Research Fellow in International and Space Law, Sapienza University*
- **Anne-Sophie Martin**, *Post-Doctoral Research Fellow in International and Space Law, Sapienza University*

Q&A

h. 15.00 - Closing Remarks by Master of Ceremony

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*



PLENARY 3: SPACE LAW AND POLICY

h.09:00 – 10:15 – Panel Discussion and Q&A

Moderator

- **Sergio Marchisio**, *Professor of Space Law, Sapienza University, IAF General Counsel*

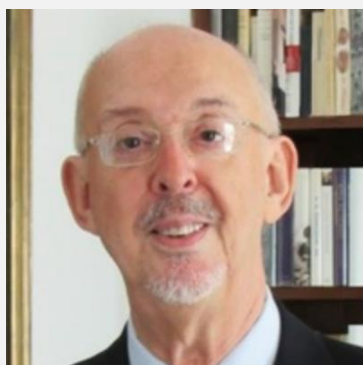
Panelists

- **Michelle Hanlon**, *Co-Director, Center for Air and Space Law, University of Mississippi*
- **Daniel Peñaherrera**, *Senior Lawyer, Abad&Campos Abogados*
- **Hebe Romero**, *General Director, Legal and International Affairs, Paraguayan Space Agency*
- **Steve Mirmina**, *Senior Attorney, Office of the General Counsel, NASA*
- **Chuen Chern Loo**, *Head, Space Publication and Registration Division, Radiocommunication Bureau, ITU*
- **Marlène Michèle Losier**, *Principal, Losier González, PLLC*
- **João Paulo Rodrigues Campos**, *President & CEO, Visiona Space Technology*
- **Tatiana Viana**, *Scientific Technical Secretary, Italo-Latin American International Organization*



ANNEX II

LIST OF SPEAKERS



MASTER OF CEREMONY, KEYNOTE SPEECH

SERGIO MARCHISIO

IAF Bureau, General Counsel

Sapienza University of Rome, Full Professor of International Law

Sergio Marchisio is Professor of Space Law at Sapienza University of Rome, Chairman of the European Centre for Space Law at the European Space Agency (ECSL/ESA), Member of the Advisory Council of the European Space Policy Institute (ESPI), General Counsel of the International Astronautical Federation (IAF), Senior Legal Advisor of the Italian Space Agency (ASI). Scientific Responsible of the following research project: OSL - *Outer Space Law for International Cooperation and Sustainable Development*, funded by the Italian Space Agency (ASI). Member of the Board of Directors of the Italian Space Agency (2014-2018). Legal Expert at Italian Ministry of Foreign Affairs and Italian Delegate to many international conferences. Chair of the Intergovernmental Committee entrusted to negotiate the Space Assets Protocol to the Cape Town Convention (2001-2012) and Chair of the Commission of the Whole of the Berlin Diplomatic Conference. Italian delegate to the UN COPUOS where he served as Chairman of the Legal Subcommittee (2004-2006), and Delegate to the Working Group on the Long-Term Sustainability of the Outer Space Activities (2010-2018). Member of the EEAS-EU Task Force for an International Code of Conduct on Outer Space Activities and Chair of the multilateral negotiations on an ICoC held at the United Nations in New York, in July 2015. Member of the UN Group of Governmental Experts on Outer Space Transparency and Confidence-Building Measures (TCBMs, UNGA Resolution 65/68) (2011-2013) and of the UN Group of Governmental Experts on Practical Measures for the Prevention of an Arms Race in Outer Space (PAROS, UNGA Resolution 72/250). Member of the Specialized Panel of Arbitrators pursuant to the Optional Rules for Arbitration of Disputes relating to Outer Space Activities of the Permanent Court of Arbitration.





PANELIST MASTERCLASS AND PLENARY 3

GABRIELLA ARRIGO

Italian Space Agency (ASI), Director, International Affairs Directorate

Director of the International Affairs at the Italian Space Agency (ASI), where she started her professional career in 1991. Graduated in Political Sciences at the University of Messina (Italy) and specialized in International and Diplomatic studies at the University of Geneva (Swiss) and the Italian Society for International Organization (SIOI) in Rome. Senior Member of the Italian delegation to the European Space Agency (ESA), in particular, in the International Relations Committee since 1992 and, today, Head (alternate) of the delegation. Senior Member of the Italian delegation to the United Nations Committee on the Peaceful Uses of Outer Space (UN-COPUOS) since 1994 and in the Space Council of the European Union. ASI delegate in the General Assembly of the European Space Policy Institute (ESPI) in Vienna (Austria) and in the Board of Trustees of the International Space University (ISU) in Strasbourg (France). Vice President of the International Astronautical Federation (IAF) in the years 2018-2020 and member of the IAF Space Diversity Award Committee. Scientific Director of the Master's course in Space Institutions and Policies at the SIOI in Rome, where she has been professor of space policy and international space relations since 2009. Member of the Academic Council of the Mario Gulich Institute of Advanced Space Studies at the University of Cordoba (Argentina) since 2007. Full Member of the International Academy of Astronautics (IAA) and President of the IAA Commission on Space Policies, Law and Economics.



PANELIST MASTERCLASS

PETER MARTINEZ

Secure World Foundation, Executive Director

Peter Martinez is the Executive Director of the Secure World Foundation. He has extensive experience in multilateral space diplomacy, space policy formulation and space regulation. He also has extensive experience in capacity building in space science and technology and in workforce development. Prior to joining SWF, from 2011 – 2018 he chaired the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) Working Group on the Long-Term Sustainability of Outer Space Activities that negotiated a set of international consensus guidelines to promote the safety and sustainability of space operations. In 2012 and 2013 he was South Africa's representative on the United Nations Group of



Government Experts on transparency and confidence-building measures for space activities. From 2010 – 2015 he was the Chairman of the South African Council for Space Affairs, the national regulatory authority for space activities in South Africa. He has presented invited guest lectures at several universities around the world. From 2014 – 2018 he was Professor of Space Studies at the University of Cape Town. He is a member of the International Academy of Astronautics, the International Institute of Space Law and a Fellow of the Royal Astronomical. He has authored or co-authored over 200 publications on topics in space policy, space sustainability, astronomy, space research, space law and space policy.



PANELIST MASTERCLASS AND PLENARY 3

STEVE MIRMINA

National Aeronautics and Space Administration (NASA), Senior Attorney, Office of the General Counsel

For more than two decades, Steve Mirmina has worked as an attorney at NASA in the International Law division of the Office of the General Counsel. He has helped negotiate and conclude more than 1,000 international agreements for missions ranging from human space flight and Mars exploration, to Earth science missions and aeronautics research. Before joining NASA, he practiced Aviation Law with the law firm of Crowell & Moring. Steve has LL.M. degrees from Leiden University (The Netherlands) and Georgetown (Washington, DC). He received his Juris Doctor from the University of Connecticut (UCONN) School of Law and his B.A. from Brandeis University (Boston). Outside of work, Steve has taught Space Law at the Law Schools of Georgetown, UCONN, and Yale. He has spoken widely and has authored numerous articles in the fields of international air and space law. He has received awards from both NASA and the White House for his exceptional and distinguished service. Steve also recently co-authored a new Space Law textbook, which should be available in late 2022. When he's not working or teaching, he is probably playing with his two sons.



PANELIST MASTERCLASS AND PLENARY 3

MARLÈNE MICHÈLE LOSIER

Losier González, PLLC, Principal



Dr. Marlène M. Losier is a legal expert in international law. She advises private and public clients on international and national laws relating to culture and space policies affected by maritime, terrestrial and beyond Earth considerations often resulting from the succession of states in the post-colonial context. She advises on the United Nations treaty system and its auspices, counsels on bilateral and multilateral agreements and assists in developing corresponding domestic rules. Dr. Losier is an expert in complex matters of sovereign immunity and jurisdiction, where they conflict, when they are evoked in areas beyond national jurisdiction and specifically in respect to issues relating to title and proprietary rights under international law. Her academic background is in government and social anthropology and her legal basis is in international litigation, alternative disputes resolution and contractual matters. She is Principal of Losier & González, PLLC based in Washington, D.C.



PANELIST MASTERCLASS AND PLENARY 3

CHUEN CHERN LOO

International Telecommunication Union (ITU), Head, Space Publication and Registration Division, Radiocommunication Bureau

Chuen Chern Loo graduated from the National University of Singapore with an Honours degree in engineering, the Nanyang Technological University with a Masters of Science in Digital Communications, and the University of Bradford with a Master of Business Administration. He has worked for more than 20 years in the space industry, including working with satellite operators and manufacturers, before moving to Geneva to work in the space services department in ITU, where he is currently the Head of Space Publication and Registration Division, responsible for the registrations and publication of all satellite network filings as well as the maintenance of the Master Register.



PANELIST MASTERCLASS AND PLENARY 3

TATIANA RIBEIRO VIANA

Italo-Latin American International Organization, Scientific Technical Secretary

Scientific and Technical Secretary of the International Italian Latin-American Organization (IILA), based in Rome. Specialized in International Law and in Space Institutions and Policies. Doctor of Philosophy (PhD) in Public, Comparative and International Law (Space Law), at the Sapienza University of Rome. Dr. Tatiana is a founding member of the International Academy of Space Studies (IASS), based in



Florianópolis/Brazil, member of the Brazilian Society of Aeronautical and Space Law (SBDA), based in Rio de Janeiro, of the International Institute of Space Law (IISL), of the ESA's European Center for Space Law (ECSL) and of the Società Italiana di Diritto Internazionale e dell'Unione Europea (SIDI). She has been a legal advisor on International Space Law at IILA. She has advised international organizations and the Brazilian delegations on the UNCOPUOS-Legal Subcommittee. She is the author of several scholarly articles on international law and space law.



PANELIST MASTERCLASS AND PLENARY 3

DANIEL PEÑAHERRERA

Abad&Campos Abogados, Senior Lawyer

PhD candidate in Law, Political Science and Criminology, University of Valencia-Spain. Master in Fundamental Rights in national perspective, supranational and global, University of Granada-Spain. Master in Business Law and Justice, University of Valencia-Spain. Specialist with mention in Law Procedural, Simón Bolívar Andean University, Ecuador. Lawyer, Central University of Ecuador. Studies in Foreign Trade and International Negotiation, Polytechnic School of the Army- Ecuador.



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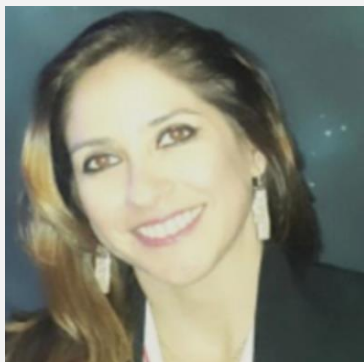
CHARLES MWANGI

Kenya Space Agency (KSA), Director Space Sector and Technology Development

Charles Mwangi is the Ag. Director, Space Sector & Technology Development who is overseeing Earth Observation (EO), Research, Education and Outreach programs at the Kenya Space Agency (KSA). He represents Kenya as an alternate member of the Programme Board of the Group on Earth Observation (GEO). Mr. Mwangi is currently leading a number of Earth Observation and Research projects at KSA and also serves in the advisory panel for EO Farm (initiative of NASA Harvest), UNEP's Global Science Diplomacy Program and Stockholm+50 scientific report (main & youth report). He previously served as Coordinating Lead Author to the Sixth Global Environmental Outlook (GEO-6) report on Data and Knowledge chapters and was the co-chair of UNEP's GEO-6 for Youth, a derivative product of UN Environment's Sixth Global Environmental Outlook (GEO-6) assessment report for the youth. I hold a Master's degree in Electrical Engineering (Control Engineering) from Jomo Kenyatta University of



Agriculture, an International Master degree on Space Mission Design and Management from University of Rome, La Sapienza. He has also undertaken a Postgraduate course in GIS and Remote Sensing from ITC, University of Twente in Netherlands amongst other diverse training on project management, satellite engineering and remote sensing.



PANELIST MASTERCLASS AND PLENARY 3

HEBE ROMERO

Paraguayan Space Agency, General Director of Legal and International Affairs

Hebe Romero graduated from Universidad Nacional de Asunción, the leading university in Paraguay, where she got her law degree in 1997 and public notary in 2000. After successful completion, she had continued her education in Didactics in Higher Education and, PhD in Legal Sciences from Universidad Católica de Asunción (Thesis in Process). She got her LLC license: Public Administration (2012). In addition, she had completed the Aerospace Strategy and Policy program (Air Force of Paraguay - 2013). From 2002, she is working as tenured assistant professor at the Universidad Nacional de Asunción, teaching Aeronautical and Space Law, and Public International Law. In 2006 and 2011, she worked as professor, lecturing on the legal of energy at the Universidad Nacional de Itapúa. Hebe Romero professional experience as an attorney and law practice started from 1997. In the public sector, from 1998, she was hired to work as an attorney of Administración Nacional de Electricidad (ANDE), the government utility company in Paraguay. From 2010, she is appointed to be the Director of Legal Affairs of ANDE. She was responsible of providing ANDE legal advice, as well as, instructing in several training courses and, on current developing legal frameworks. From 2015, she is a member of the Ibero-American Institute of Aeronautical Law and Space and Commercial Aviation. From 2016, she is a member and general secretary of Aerospace Research Center of Paraguay. Hebe Romero is an International Deputy Director and National Point Contact of ReLaCa Space (Space Latin American and Caribbean Network). She coauthored the book on space law (2017), the first of its kind in Paraguay. Currently, Hebe Romero is working as the Legal and International Affairs Director of the Paraguayan Space Agency (AEP). From 2018, she is part of the current list of Specialized Panel of Arbitrators established pursuant to the optional rules arbitration of disputes relating to outer space activities. She participated as a Faculty Advisor in the Latin American Test Round of the Manfred Lachs Space Law Moot Court Competition in Bogotá, Colombia (may, 2019) and virtually in May 2020. She participated in the 2019 Summer Course on Space Law and Policy on Natural Disasters in Messina, Italy, organized by ESCL (ESA). She participated as an Instructor in the Online Expert Course in Air Transportation, Aeronautical and Space Law, of the Ibero-American Institute of Aeronautical Law and Space and Commercial Aviation (2020-2021-2022). She participated in the course organized by the OAS: "International Law of Cyber Operations" (2020). She was the coordinator of the first regional art competition "Tu Propia Misión Espacial" with the Space4Women Latam Mentor. She holds a Diploma in International Contracts and Litigation, Universidad Austral, Buenos Aires (2020/2021). She participated in the Expert Meeting for Space4Women (UNOOSA/New York 2017, Dubai 2021). She was invited to participate in the Advisory Board of the Space Generation Advisory Council – SGAC (2022-2023). She participates in the COPUOS Legal Sessions (LSC), part of the Paraguayan delegation since 2019.





PANELIST MASTERCLASS

LUDOVICA CIARRAVANO

Sapienza University of Rome, Research Fellow in Space Law

Ludovica Ciarravano is a research fellow in space law at Sapienza University of Rome. She graduated in Political Sciences and International Relations in 2018 and obtained her master's degree in International Relations in 2020 with a final dissertation in international space law at Sapienza University of Rome. She is a member of the Italian National Point of Contact (NPOC) of the ECSL based in Rome. In 2021 she was selected to take part in the Summer Course on Space Law and Policy organised by the ESA/ECSL. She participated as Panelist in the 2021 ECSL Young Lawyers' Symposium and the 2021 International Institute of Space Law (IISL) Young Scholars Symposium. She is currently focusing her research on achieving sustainability of space activities through space law within the framework of the OSL Project – Outer Space Law for International Cooperation and Sustainable Development, realised by the Department of Political Sciences of Sapienza University in collaboration with the Italian Space Agency (ASI) and the Kenya Space Agency (KSA).



PANELIST MASTERCLASS

CAROLINA CATANI

Comisión Nacional de Actividades Espaciales (CONAE), Technical and Legal Responsible in Space Law

She is the Technical-Legal Responsible in Space Law of the NATIONAL COMMISSION FOR SPACE ACTIVITIES (CONAE) and former Director of the Board of Directors of VENG S.A., a high-tech space company controlled by CONAE. In her 30 years of professional practice, she has worked in the private, public and governmental sectors, where she has spent almost half of her working life in different positions and roles. In her career she has broad experience in the field of international space law, advising the highest authorities of the Argentine space agency and, when required, other governmental areas. She is involved in international cooperation agreements, including international space organizations, acting proficiently in matters of Space Law and Policy, Earth Remote Sensing, Data Policy, Space and Service Contracts, including ground Stations services, and many other issues that need to be locally implemented. She is a Lawyer, Researcher and Specialist in Aeronautic and Space Law, in addition to having taken several courses, careers and other postgraduate studies in the country (among them the Master in Science, Technology and Society at UNQuilmes, Communications Update Program at UBA- University of Buenos



Aires), and abroad (University of Michigan-USA; University of Hunan- CHINA). Currently, she has started her PhD in Law (JFKennedy University) with a focus on Space Law. She is a member of the Delegation of the Argentine Republic before the UN-COPUOS, including its Sub-Commissions. She is a Professor of "Jurisprudence and Space Legislation" of the Specialization in Aeronautic, Space and Airport Law of the National Institute of Aeronautic and Space Law -INDAE-, a postgraduate course at the UNDEF University, and is also a member of the Academic Council of such academic institution, representing the Space branch. She also promote the permanent generation of better legal capacities in young lawyers and the women in the field of science and technology. She is full Member of several professional legal-academic entities, including: Argentine Council for International Relations (CARI), Institute of Land, Maritime and Space Transport Law of the Argentine Bar Association of the City of Buenos Aires (CPACF); Member of the Argentine Association of Studies for Public Administration (AAEAP) and Member of the Latin American and Caribbean Space Network (ReLaCa Espacio), for Argentina; She is regularly invited to speak at specialized conferences and courses, and has published several papers throughout her career. She has participated as a member of Committees for the selection of public professional positions within the scope of the Ministry of Science, Technology and Innovation.



PANELIST MASTERCLASS

IAN GROSNER

Brazilian Space Agency (AEB), Federal Attorney

Mr. Ian Grosner is a federal attorney in Brazil. Since 2022, he has been serving as a Legal Counsel and Deputy Head of the Legal Services department at the Brazilian Space Agency (AEB), based at its headquarters in Brasilia, Brazil. Mr. Grosner has a Law bachelor degree from the Law School of Centro Universitário de Brasília - UniCEUB (1997) and a Post-Graduate degree in Public Law at the University of Brasilia - UNB (2012-2014). He also has a master degree (LL.M.) from the University of Leiden (The Netherlands) in Air & Space Law (2017-2018). He is Vice-President of the Chair of Air & Space Law from the Bar Association of the Federal District in Brazil. He is also a member of the Space Law Group (NEDE) of the Brazilian Air and Space Law Association (SBDA) and a member of the space law and policy research group at the Catholic University of Santos (Brazil). In 2019-2020 he was a member of the Working Group 12 of the Brazilian Commission for Space Activities, which developed a draft bill of the Brazilian national space law. He has created, coordinated and mediated the first and second Space Law Seminars at the Brazilian Bar Association (OAB) in 2020 and 2021. Also, he gave the first space law course at the Superior School of Lawyers (ESA-DF) in Brasilia (Brazil). Since 2021, he has been the first correspondent of SpaceWatch.Global for Brazil, where he hosts the Space Café Brazil. He is a founding member of IASS - International Academy of Space Studies. He idealized, organized and formulated the first Brazil's Post-Graduation Course in Space Law and Policy at the Catholic University of Santos (Brazil), where he is a visiting Professor (Space Law). Since 2021, he has been a full member of the International Institute of Space Law - IISL.





PANELIST MASTERCLASS

MELANIE MAJUMA MUNYORI

Kenya Space Agency (KSA), Legal Officer

Melanie Majuma, is a qualified Advocate of the High Court of Kenya and the Legal Officer at the Kenya Space Agency. She has 6 years post qualification experience in international law, commercial law, and policy research development. At the Kenya Space Agency, she is the legal advisor to the senior management on the Agency's contractual, bilateral and international obligations. Additionally, she spearheads the teams that are drafting Kenya's first space legislation and reviewing Kenya's 2015 space policy. She is certified in Project Management and holds a Masters of Laws Degree from The University of Warwick (U.K.) in International Development Law and Human Rights.



PANELIST MASTERCLASS

GIANFRANCO GABRIELE NUCERA

Sapienza University of Rome, Researcher in International and Space Law

Gianfranco Gabriele Nucera is Researcher in International and Space Law and Aggregate Professor of "Environmental Justice and Climate Change Law" at the Department of Political Sciences of Sapienza University. PhD in International Law and Human Rights, from 2017 to 2020 he was Post-doctoral Research Fellow in Space Law. In 2017, he participated in the research program "50 Years of Space Law. Space Law in 50 Years" of the Centre for Studies and Research of The Hague Academy of International Law. He currently participates in various research projects, among which: OSL – Outer Space Law for International Cooperation and Sustainable Development, in collaboration with the Italian Space Agency and the Kenya Space Agency; HABITABLE – Linking Climate Change, Habitability and Social Tipping Points: Scenarios for Climate Migration, Horizon 2020, funded by the European Commission. Full list of publications on iris.uniroma1.it



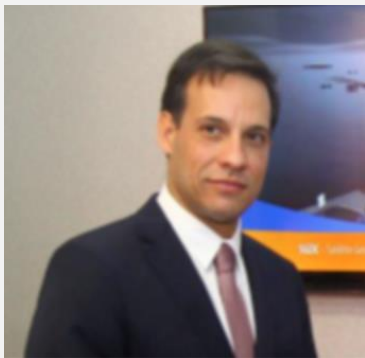


PANELIST MASTERCLASS AND PLENARY 3

MICHELLE HANLON

University of Mississippi, Co-Director, Center for Air and Space Law

Michelle is a Co-Director of the Center for Air and Space Law and an instructor of aviation and space law. Michelle received her B.A. in Political Science from Yale College and her J.D. magna cum laude from the Georgetown University Law Center. She earned her LL.M in Air and Space Law from McGill University where the focus of her research was commercial space and the intersection of commerce and public law. Prior to focusing on aviation — including uncrewed aircraft — and space law, Michelle was engaged in a private business law practice. Her legal career commenced with the restructuring of sovereign debt for a number of South and Latin American countries and evolved into the negotiation and implementation of cross-border technology mergers and acquisitions. Her subsequent solo practice advised entrepreneurs across four continents on all aspects of bringing their innovative ideas to market: from basic corporate formation to financings and buyouts. Michelle is a Co-Founder and the President of For All Moonkind, Inc., a nonprofit corporation that is the only organization in the world focused on protecting human cultural heritage in outer space. For All Moonkind has been recognized by the United Nations as a Permanent Observer to the United Nations Committee on the Peaceful Uses of Outer Space. Michelle is the President of the National Space Society and is on the Advisory Board of several start-ups involved in commercial space activities including orbital debris removal, remote sensing and the support of lunar resource extraction. Michelle is the Editor-in-Chief of the Journal of Space Law and the Faculty Advisor for the Journal of Drone Law and Policy.



PANELIST MASTERCLASS AND PLENARY 3

JOÃO PAULO RODRIGUES CAMPOS

Visiona Space Technology, President & CEO

João Paulo Campos is the President & CEO of Visiona Space Technology, an Embraer and Telebras joint-venture. Over his career, he has held various leadership positions at Embraer and TV Cabo Portugal, and also worked as a strategy consultant at McKinsey & Co. He holds a Mechanical Engineering degree from Unicamp, a Master`s degree from Ecole Centrale de Lyon/Paris and a MBA from Insead. João Paulo is also



a member of the board of directors of the São José dos Campos Technology Park, one of the largest innovation and entrepreneurial centers in Brazil.



PANELIST MASTERCLASS

PIERFRANCESCO BRECCIA

Sapienza University of Rome, Post-Doctoral Research Fellow in International and Space Law

Pierfrancesco Breccia is a post-doctoral research fellow in International Law and Space Law at Sapienza University of Rome. He currently participates in the OSL Project – Outer Space Law for International Cooperation and Sustainable Development, carried out by the Department of Political Sciences of Sapienza University in collaboration with the Italian Space Agency and the Kenya Space Agency. PhD in Public, Comparative and International Law, he is Adjunct Professor of “International Law and Cooperation” at the Università degli Studi Internazionali di Roma and of “International Organizations” at Università degli Studi Guglielmo Marconi. He is Responsible of the research project on “Jam in Orbit: Legal Features and New Challenges for Space Traffic Management”, funded by Sapienza University of Rome. In 2016, he was the recipient of the Prof. Dr. I.H.Ph. Diederiks-Verschoor Award granted by the International Institute of Space Law.



RAPPORTEUR, PANELIST MASTERCLASS

ANNE-SOPHIE MARTIN

Sapienza University of Rome, Post-Doctoral Research Fellow in International and Space Law

Anne-Sophie Martin is a postdoctoral research fellow in international law and space law at Sapienza University of Rome. She currently participates in the OSL Project – Outer Space Law for International Cooperation and Sustainable Development, realised by the Department of Political Sciences of Sapienza University in collaboration with the Italian Space Agency and the Kenya Space Agency. She received her LL.M. in Space Law and Telecommunications Law from the University of Paris-Saclay and her Ph.D. from Sapienza University. During her doctoral research, she participated in the Centre for Studies and Research of The Hague Academy of International Law. She previously worked at Thales Alenia Space, the Centre National d’Etudes Spatiales (CNES) and the European Commission. She is a member of the International



Institute of Space Law (IISL), the European Centre for Space Law (ECSL), and the Institut Droit, Espaces et Technologies (IDEST). She is also involved in the Legal Council of the organization For All Moonkind and in the Board of Advisors of The Space Court Foundation.

