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## Committee on the Peaceful Uses of Outer Space

### **Report on the United Nations/Austria symposium on the theme “Space: a tool for accessibility, diplomacy and cooperation”**

**(Graz, Austria, 2–4 September 2019)**

#### **I. Introduction**

1. The Office for Outer Space Affairs of the Secretariat and the Government of Austria jointly organized the United Nations/Austria symposium on the theme “Space: a tool for accessibility, diplomacy and cooperation”, with the aim of fostering a dialogue between the diplomatic community and civil society, taking stock of the ongoing development of the “Space2030” agenda and the implementation plan by the Committee on the Peaceful Uses of Outer Space.
2. The United Nations/Austria symposium is one of the long-standing activities of the Office for Outer Space Affairs that are performed under the United Nations Programme on Space Applications. The year 2019 marked the twenty-fifth anniversary of the first symposium, on the theme “Enhancing social, economic and environmental security through space technology”. The theme of the symposium in 2019 built upon previous United Nations/Austria symposiums.
3. The symposium was held in Graz, Austria, from 2 to 4 September 2019, co-organized by the Government of Austria and supported by Joanneum Research Forschungsgesellschaft, Graz University of Technology, Austrospace, the City of Graz, the State of Styria, the Federal Ministry for Transport, Innovation and Technology and the Federal Ministry for Europe, Integration and Foreign Affairs of Austria, National Point of Contact Space Law Austria, the European Space Agency (ESA) and the German Aerospace Center (DLR).
4. The present report contains a description of the background, objectives and programme of activities of the symposium, including of its various segments covering the cross-sectoral dimension of space science, technology, law and policy.

#### **II. Background and objectives**

5. The Office for Outer Space Affairs, through the Programme on Space Applications, addresses space technology applications in various workshops and conferences held at the request of Member States, thereby providing a platform for



exchanging knowledge. These events also help developing countries to keep pace with the rapidly developing space technology and build capacity for its effective use.

6. In its 25 years of existence, the United Nations/Austria symposium has focused on innovative themes to respond to societal needs and showcased the socioeconomic benefits of space in a wide range of topics, enabling more than 2,000 participants from various backgrounds to cooperate and interact and bringing Austria to the centre of international space discussions.

7. These past three years, the United Nations/Austria symposium has become a cross-cutting forum combining space policy and legal aspects with space technology, services and applications, allowing the yearly themes of the symposium to be tackled in a holistic manner.

8. The goal of the symposium held in 2019 was to connect the broader multinational community that uses space with the Vienna-based diplomatic community in a format that fostered dialogue and promoted and advanced knowledge on space-related activities and services as a tool for diplomacy and cooperation, by giving an overview of user needs and solutions, stimulating access to space-related services and providing an opportunity for discussion on how space functioned as a tool for cooperation and diplomacy. The programme of work was developed to prioritize knowledge exchange and interactivity, with specific sessions to stimulate the exchange of views among participants.

9. The theme of the symposium was purposely devised with a large scope, showcasing examples ranging from precision agriculture and inclusiveness to space law and policy. Attention was given to the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015–2030 and the Paris Agreement.

10. The symposium had the following main objectives:

(a) To discuss the role of the Office for Outer Space Affairs in implementing capacity-building activities, in particular in developing countries;

(b) To raise awareness in the diplomatic community of available space-related activities, services and cooperation programmes;

(c) To enable discussion on the use of space-related technologies for development and cooperation;

(d) To explore available services, demonstrating how they can be given access to and used to support development responding to national priorities while working towards the achievement of the Sustainable Development Goals;

(e) To showcase space-related services, applications, facilities and policies and how they are used in various countries.

### **III. Attendance**

11. The symposium was attended by 83 participants, 38.5 per cent of whom were women.

12. Of those participants, 15 were members of the diplomatic community, including the representatives of 14 permanent missions to the United Nations at Vienna. Representatives from space agencies at various levels were also present, including the Austrian Research Promotion Agency, the Brazilian Space Agency, the European Global Navigation Satellite Systems Agency, ESA, the Geo-Informatics and Space Technology Development Agency, DLR, the Iranian Space Research Centre, the National Centre for Space Studies, the Paraguay Space Agency and the Romanian Space Agency.

13. The following countries were represented: Argentina, Armenia, Austria, Belgium, Bhutan, Brazil, Cameroon, Canada, Chile, China, Costa Rica, Czechia,

Dominican Republic, Ecuador, Fiji, France, Germany, Greece, Hungary, Iran (Islamic Republic of), Italy, Japan, Jordan, Maldives, Nigeria, Paraguay, Philippines, Poland, Romania, South Africa, Spain, Sweden, Thailand and United Kingdom of Great Britain and Northern Ireland.

## IV. Programme of activities

14. The programme was structured around panel discussions, a round table, mini-sessions, demonstration sessions, keynote speeches and regular sessions, allowing 58 speakers to make presentations. In addition, a poster session with contributions to space policy and space diplomacy and six demo sessions allowed participants to get a more practical experience of various topics and to interact with developers by informing them of their requirements. All the presentations provided by the speakers are available on the website of the Office for Outer Space Affairs.

### 1. Keynote speech

#### Setting the scene

15. In her opening keynote speech, the Director of the Office for Outer Space Affairs highlighted the importance of space technology, applications and services as frontier technologies for addressing current challenges, in particular with regard to monitoring and achieving the 17 Sustainable Development Goals of the 2030 Agenda. She drew attention to the gap in the use of those tools, with millions of people lacking access to the basic services made available by space technology. She stressed the need for collective action to meet the Sustainable Development Goals and the importance of cooperation to make the benefits of space available to everyone, everywhere. Finally, she elaborated on the objectives of the symposium and the long-standing cooperation with the Government of Austria.

### 2. Panel session

#### Twenty-five years of United Nations/Austria symposium

16. The panel stressed the added value of the United Nations/Austria symposium for the Committee on the Peaceful Uses of Outer Space stemming from the topical issues discussed at the forefront of space-related matters, and emphasized the role of Austria on space-related matters, being the host country of the Office for Outer Space Affairs and of the Committee. The panel emphasized the importance of international collaboration in space-related activities carried out through the Committee. Austria reiterated its commitment to the Office, as illustrated by its support to the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) for reducing the impact of disasters, its hosting of the World Space Forum, due to take place in Vienna in November 2019, and its interest in continuing to host future United Nations/Austria symposiums.

### 3. Round table

#### Space diplomacy: space as a tool for cooperation and development – strengthening the Committee on the Peaceful Uses of Outer Space and its subcommittees

17. The round table was held with the participation of the Chairs of the Committee on the Peaceful Uses of Outer Space for the periods 2019 and 2020–2021, the Chair of the Scientific and Technical Subcommittee for the period 2018–2019, the Chair of the Legal Subcommittee for the period 2018–2019 and the Chair and one of the Vice-Chairs of the Working Group on the “Space2030” Agenda. The round table was organized in the form of questions and answers with the audience. The panellists expressed views on several topics relevant to the Committee and its subsidiary bodies.

18. The adoption of the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space ([A/74/20](#), annex II) was recognized as a remarkable achievement by the Committee.

19. Panellists expressed the view that the Committee would be strengthened by the adoption of the “Space2030” agenda, which was expected to develop a vision and a road map prioritizing activities for the forthcoming years as a collective contribution by Member States. In addition, reaching out to the broader space community, including industry and the private sector, was deemed important.

20. Panellists noted the value of panel discussions and symposiums during the sessions of the Committee and its subcommittees, as well as side events and technical presentations, including by incorporating information from the broader space community, as they were mechanisms that could enrich the discussions of the Committee, while respecting its established rules, procedures and practices.

21. It was emphasized that space activities were increasingly becoming an international and collective endeavour. It was also noted that the time frames for space activities typically spanned a period of several years and that space systems were embedded in our society and part of critical infrastructures. These aspects were part of the challenging environment of space activities.

22. Against this growing complexity, the participation of small delegations was also discussed, as the sessions of the Committee and its subcommittees posed challenges to such delegations, given that many agenda items, working groups and expert meetings were often discussed or held in parallel. The importance of seeking inclusive and active participation of all delegations was noted. Current deliberations on the governance and method of work of the Committee provided a mechanism for addressing that issue.

#### **4. Special session**

##### **Space diplomacy – space as a tool for cooperation and development**

23. The special session was organized in an interactive manner. Participants representing the diplomatic community were provided with three questions well in advance of the symposium and asked to answer the one of their choosing. Participants were grouped alphabetically by country in groups of four or five countries. After all the countries in a group had delivered their answers, the floor was opened for discussion with the other participants. The following three questions were provided to the participants:

- (a) What does your country expect from a “Space2030” agenda?
- (b) What are your country’s needs that can be tackled through a “Space2030” agenda?
- (c) From your country’s perspective, how do you see the national implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space?

24. In their answers, participants highlighted the key role of national programmes and initiatives. The importance of the work of the Office for Outer Space Affairs and its capacity-building activities in space science, technology, law and policy was also emphasized.

25. It was stressed that the Committee on the Peaceful Uses of Outer Space was the only forum at the global level tasked with promoting international cooperation in the exploration and peaceful use of outer space, which offered an appropriate environment to discuss matters that had an impact at the national level for societal development.

26. The adoption by the Committee of the preamble and 21 guidelines for the long-term sustainability of outer space activities and the decision to continue work on that topic in a dedicated working group were highlighted. Capacity-building and awareness-raising were seen as important factors to foster responsible space activities.

27. The importance of a “Space2030” agenda was highlighted, including in relation to the 2030 Agenda. It was important to tailor the implementation plan to the actual needs of countries.

28. Several aspects of the advancement of space technology and the growing space sector were raised. The need to foster cross-cutting communication between the space community and user communities was emphasized. The need to address global challenges in a holistic manner was also raised. It was noted that space science and technology and their applications offered tools indispensable for societal development.

29. The regional cooperation and coordination of space activities were emphasized. The regional centres for space science and technology education, affiliated to the United Nations were mentioned as an important capacity-building and training tool.

## **5. Keynote speech**

### **Space climate observatory**

30. In her keynote speech, the representative of the National Centre for Space Studies focused on the use of space science and technology and their applications for addressing climate change and its impacts. She stressed that the Space Climate Observatory was being established in compliance with a commitment made at the One Planet Summit held in 2017 and responded to the need for closer international cooperation for gauging and tracking the consequences of climate change, informing the relevant actors at the regional and local levels of the consequences of climate change. More than 20 space agencies and international organizations had signed a joint declaration of interest for the creation of the Space Climate Observatory. Monitoring variables such as the concentration of carbon dioxide in the atmosphere or sea surface and air temperatures was a key objective, in order to track the impacts of climate change in different domains, such as in the environment, society, biodiversity and the economy, and to mitigate and adapt to climate change so as to protect resources, populations and socioeconomic development paths.

## **6. Mini-sessions under the topic “Space accessibility: user needs”**

31. This part of the symposium was split into five mini-sessions, each aiming at raising awareness of a particular topic. Each mini-session comprised three or four short statements related to its topic and was followed by a questions-and-answers session of equal duration.

### **(a) Space for small island developing States**

32. The mini-session consisted of interventions from the Office for Outer Space Affairs, a representative of the Pacific Community and a representative of the Ministry of Communication, Science and Technology of Maldives.

33. A project of the Office for Outer Space Affairs funded by the Government of New Zealand was presented. It supported engagement with Pacific Island States to identify priority areas for the use of space data and technology for sustainable development. Disaster risk reduction, coastal environment management and protection and the monitoring of illegal fishing activities were identified as priority areas of interest. The implementation of a second phase of the project relating to the delivery of advisory services on those priorities was being considered. Any offer of support for the project was welcome.

34. The representative of the Pacific Community illustrated the services available and the regional needs in terms of data with respect to the applications relevant to the Pacific Community. Some of the needs presented were covered using freely available imagery, such as from Landsat or the Sentinels, while other applications required very high-resolution data, both radar and optical, and in the case of disaster assessment, with a very quick delivery time. Satellite imagery was complemented by aerial photography.

35. The representative of the Ministry of Communication, Science and Technology of Maldives stressed the diversity of small island developing States, as well as their commonalities, such as their vulnerability to climate change and extreme weather events. Coastal management was a key issue for those States, as a substantial portion of their territories was coastal. Communications and connectivity between the various islands were particularly difficult, and Maldives wished to create a national satellite programme for that purpose, which could serve other islands.

**(b) Space for agriculture**

36. The mini-session was focussed on the use of space technology for agriculture monitoring and management.

37. The representative of the Division of Telecom and Space of the Ministry of Information and Communications of Bhutan highlighted the importance of measuring the production of crops, in particular corn and rice, as part of the Government's five-year plan. The key space applications relevant to the country in that area were precision agriculture, yield estimation, disaster impact assessment, fallow land measurement and monitoring, weather forecasting, crop feasibility mapping in adaptation to climate change and the identification of sites for agricultural expansion.

38. The representative of the European Global Navigation Satellite Systems Agency presented how the European Geostationary Navigation Overlay Service and Galileo could be used to help farmers across the globe and were key components of the digital agriculture ecosystem.

39. The last intervention was made by a representative of the Romanian Space Agency, who described the highlights and achievements of the United Nations/Romania International Conference on Space Solutions for Sustainable Agriculture and Precision Farming (see document [A/AC.105/1214](#)).

**(c) Space for inclusiveness**

40. The mini-session was focused on three aspects of social inclusion and its links to space.

41. The first intervention focused on astronomy for inclusiveness, in particular for visually impaired individuals. "Sonification", a method for translating data into sounds, was presented as a method for exploring astronomical data. That method was available not only to visually impaired individuals but also to the wider research community.

42. The representative of "die Astronautin" initiative, an initiative to send more women into space, mentioned that, of the 38 countries that had sent astronauts into space, only 10 have sent women, and that while there had been all-male astronaut crews, a full female-crew had never been put together. She laid out the advantages for society and the economy of having more female astronauts. Even if a country did not have the means to carry out a human space flight, launching an astronaut selection campaign could stimulate and inspire new generations of women to follow scientific careers.

43. The representative of the Space Generation Advisory Council presented the Space for Youth Competition organized by the Office for Outer Space Affairs in collaboration with the Council in furtherance of the United Nations Youth Strategy launched by the Secretary-General. The competition had been aimed at gathering space-related solutions to real world problems from future space leaders.

**(d) National space law**

44. The objective of the mini-session was to provide examples of national space laws at different stages of development and the ways in which the Office for Outer Space Affairs could provide assistance to countries to support the implementation of international space law and the development of national space law and policy.

45. The representative of Armenia informed participants that the bill on space-related activities of Armenia was in its final stage of development. The law was based on three core ideas: reducing taxes for private companies; facilitating the licensing procedures for space-related companies; and recognizing the space industry as one of the main actors of economic development. Armenia was also working on a national space strategy, which would incorporate objectives and principles, as well as strategic guidelines for their implementation.

46. The representative of the Geo-Informatics and Space Technology Development Agency presented the national space master plan and space law of Thailand. The space master plan for 2017–2036 was aimed at developing and using space affairs for ensuring security, prosperity and sustainable development and consisted of seven strategies, which tackled international cooperation and the use of space technology for sustainable development, among other topics. The representative of Thailand also referred to the national space affairs bill, which was based on three principles, namely, establishing an organization as the centre of the national space affairs administration, meeting international space commitments and preparing for future commitments, and promoting and supporting the space industry, research and development in space technology and space affairs regulations.

47. The representative of the Office for Outer Space Affairs presented the capacity-building activities carried out with respect to space law and policy and highlighted the increasing number of requests received by the Office for targeted technical legal assistance to support the development of national space policy and legislation. The representative presented a project on the establishment of dedicated advisory services to assist emerging space nations with developing national space legislation and a national space policy.

**(e) Disaster management and emergency response**

48. The goal of the mini-session was to provide information on the use of space for disaster management and emergency response.

49. The representative of the Paraguay Space Agency presented the space-related activities carried out in Paraguay. He introduced the plan of the Agency for the following two years, which included becoming an authorized user of the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (International Charter on Space and Major Disasters). The Agency had activated that mechanism with the assistance of Argentina earlier in 2019. Thanks to international cooperation and assistance from the National Commission on Space Activities of Argentina, the National Institute for Space Research of Brazil and the United States Geological Survey, more than 30 value-added products had been generated. The activation had demonstrated the capabilities of the Agency, which later in 2019 had succeeded in generating disaster-related maps without assistance.

50. The representative of Canada made a presentation on the International Charter on Space and Major Disasters, providing an overview of its functioning. The International Charter was a cooperation of space agencies operating on a voluntary basis and without the exchange of funds, each member devoting its own resources to support it.

51. The representative of the Iranian Space Research Center provided an overview of the Center and explained its role during the floods that had struck the Islamic Republic of Iran from March to May 2019. He described in detail the process from satellite image acquisition to the issuance of warnings and alerts. He also shared the experience of the Center in using social media to circulate information. In addition to sending alerts and warnings to the population during the floods, the Center had also been able to carry out a post-flood assessment of agricultural damage, thanks to its knowledge of and experience in precision agriculture. The use of space technology for damage assessment had helped the Government to reduce the cost of financial support for compensation of damage.

52. The representative of DLR provided an overview of the activities of the Center in disaster management and emergency response. DLR had established the Center for Satellite-based Crisis Information, which was specialized in emergency response and damage assessment, crisis monitoring and early warning and risk assessment and disaster preparedness. The representative stressed the importance of research and innovation, adding in this respect that DLR could provide expert knowledge on the activities of the Center for Satellite-based Crisis Information upon request. In addition, he highlighted the importance of the different tools available for satellite-based emergency mapping, such as the International Charter on Space and Major Disasters, the European Earth Observation Programme (Copernicus) or UN-SPIDER. DLR had supported UN-SPIDER since it had been established to build capacity and strengthen the use of space technology and applications by countries.

## **7. Keynote speech**

### **Space research and technology for sustainable development**

53. In her keynote speech, the representative of DLR focused on the topic of space research and technology for sustainable development, highlighting the role of science, technology and innovation for the successful implementation of the 2030 Agenda. Space was proving to be essential for monitoring the progress of the Sustainable Development Goals indicators. DLR continued to demonstrate its engagement with international organizations, in addition to supporting UN-SPIDER, and cooperated with the World Food Programme on global humanitarian risk mapping, identifying at an early stage environmental risks recurring in certain regions and at intervals, making available a spatial risk calendar. To increase the reach of its work, DLR had also organized a matchmaking event for various companies to exchange ideas between “problem owners” and DLR staff, apply existing DLR technologies to humanitarian tasks and establish networks. In addition, DLR was conducting an internal assessment, the SDGs@DLR project, which matched research with the Sustainable Development Goals.

## **8. Space accessibility: space-derived services for development**

54. The objective of the session was to present the connection between space and development.

55. A representative of ESA presented the ESA catalogue of space-related solutions in support of the Sustainable Development Goals, which was available online. She said that ESA was mandated to take steps to contribute decisively to meet the major challenges faced by society worldwide, including challenges to the achievement of the Sustainable Development Goals.

56. A representative of the Copernicus Academy introduced the Academy as a gateway to Copernicus, linking research and academia with authorities and service providers, contributing to the development of the use of Earth observation and Copernicus data. The Copernicus Academy was an initiative open worldwide.

57. A representative of the African Regional Centre for Space Science and Technology Education in English, affiliated to the United Nations introduced the various programmes implemented by the Centre, highlighting the importance of interdisciplinary and transboundary cooperation and capacity-building. He gave an overview of space-based collaborative projects and their internal dynamics. He also highlighted the need for capacity-building and space-based technology in sub-Saharan Africa. Disparity among countries in the adoption of technologies was great, despite efforts to redress that situation.

58. During the session, the model of space teams located in universities was introduced. The model provided incentives to and encouraged students to get involved in international projects and competitions, developed the skills of the team members, connected academia and industry and laid the foundation for start-ups.



59. Some space-based services, such as emergency responses or the detection of illegal fishing, were only possible if data were delivered fast enough. A novel satellite architecture to reduce the latency between the observation and the reception of data on the ground in order to improve existing services was presented. The architecture was based on two elements, namely, bringing more computing power to the satellite so that it could generate products, as opposed to just raw data, and a network of telecommunication satellites in low Earth orbit to reduce even further the time between acquisition and downlinking. The simulation results of that architecture indicated that it was possible to reduce by several orders of magnitude the amount of transmitted data.

## **9. Space accessibility: global solutions for local problems**

60. The session comprised six presentations primarily focused on space accessibility and the use of satellite information to address local problems, as summarized below.

61. The cooperation between Brazil and China on their Earth Resources Satellite programme was presented as an example of successful international cooperation that had been in place for more than 30 years. A new satellite providing multispectral data, CBERS 4A, was planned to join the series. The data policy of the programme allowed the free use of the data worldwide, and the data had been successfully used in Brazil to address local problems.

62. The documentation of vegetation change on low-lying islands was brought to the attention of the symposium. Participants discussed various examples of the use of satellite imagery, aerial photography and geographic information systems (GIS) in the areas of agriculture and environmental monitoring. However, there were still problems with the transfer and storage of data in some locations.

63. The concept of the smart classroom was raised by a representative of the Regional Centre for Space Science and Technology Education in Asia and the Pacific, affiliated to the United Nations. The curriculum used for the courses on space law and policy, micro-satellite technology, remote sensing, GIS, the Global Navigation Satellite System and satellite communications were also presented.

64. A presentation was made on the use of the Global Navigation Satellite System, in particular in relation to the European Geostationary Navigation Overlay Service and Galileo, and on the various applications that those technologies could have, such as search and rescue, safer aircraft landings, responses to emergency calls and road safety and security. In addition, an example of the use of uncrewed aerial vehicles coupled with positioning services and remote sensing to protect animals before crop harvest was presented in detail.

65. Participants discussed the use of Earth observation information for local humanitarian and development interventions based on the experiences of non-governmental organizations, including by presenting the Earth observation-based support for humanitarian operations (EO4Hum) services covering a wide range of applications, such as camp mapping, urban population estimation, damage assessment, flood extent mapping, land cover mapping, groundwater exploration and vulnerability and resilience analyses.

## **10. Keynote speech The Space4Water Portal**

66. The Space4Water Portal, developed by the Office for Outer Space Affairs and sponsored by the Prince Sultan Bin Abdulaziz International Prize for Water, was presented during the keynote speech. The Portal was aimed at enabling all stakeholders involved in the space and water communities to access data and knowledge, be creative and realize their full potential in contributing to a world in which the availability and sustainable management of water and sanitation for all had become a reality. The Portal was a platform for interdisciplinary knowledge exchange

on space technology and water-related topics. It allowed organizations active in the field to share information on projects, initiatives, satellite missions, software, community portals, capacity-building and training material, conferences, workshops, data, news and publications in that area. The information was categorized and shared publicly in a user-friendly format. The Portal was part of the efforts by the Office to promote space as a tool to achieve the 2030 Agenda and its 17 Sustainable Development Goals, and more specifically Goal 6 on clean water and sanitation and Goal 17 on partnership for the Goals.

## **11. Round table**

### **Accessing space in the twenty-first century**

67. The objective of the round table was to present projects and initiatives that promoted or benefited from reduced costs to gain access to space, in particular through the example of small satellite projects.

68. The Access to Space for All initiative of the Office for Outer Space Affairs was presented. The initiative was structured around opportunities at various entry levels. The opportunities were provided in partnership with research institutes, space agencies and private sector actors. In addition, educational opportunities were offered through the Office in the form of fellowships and training programmes, which were essential for the success of the initiative, as the number of applications not meeting the quality standards for qualifying for the opportunities was still high.

69. Offering opportunities and training programmes was, however, not considered enough, as such efforts should be part of a more comprehensive strategy at the country level, based on the needs of the countries in order to be sustainable, which would allow for capitalizing on the benefits derived from those opportunities, even long after participation therein had concluded.

70. KiboCUBE, the United Nations/Japan Cooperation Programme on CubeSat Deployment from the International Space Station Japanese Experiment Module (Kibo) implemented in partnership with the Japan Aerospace Exploration Agency (JAXA), and the United Nations/Japan post-graduate study on nano-satellite technologies conducted in cooperation with the Kyushu Institute of Technology were also presented. KiboCUBE was a model of triangular cooperation, in which the Office for Outer Space Affairs was responsible for issuing the announcement of opportunity, compiling applications, establishing a selection board with JAXA and notifying the selected entity. The selected entity was responsible for the design, construction, operations and decommissioning of the cube satellite, while JAXA followed the project from a technical point of view, provided a launch opportunity for the satellite heading for the International Space Station and deployed it using the Japanese Experiment Module Small Satellite Orbital Deployer.

71. It was stressed that cooperation with the Office for Outer Space Affairs had made it easier for Japan to reach out to potential applicants and entities in developing countries and that cooperation with Japan had enlarged the number of space actors.

72. Participants in the round table also highlighted the importance of nano-satellites, which were now used for remote sensing, telecommunications or weather forecasting and included in both governmental and private constellations. Austria had developed three satellites in that category as part of the Bright Target Explorer constellation.

73. Nano-satellites were the choice of many countries for their first asset in space. The first satellite of Kenya, 1KUNS-PF, and the first satellite of Costa Rica, Irazú, had both been deployed from the Japanese Kibo module. Project Irazú stimulated cooperation in the region, and Costa Rica, Honduras and Guatemala were now working together on a new satellite design, project Morazán, which involved universities and science and research institutes. The satellite was being developed in close cooperation with the Kyushu Institute of Technology and JAXA with the specific needs of regional users in mind and the objective of having a real and positive impact in the lives of the local populations.

74. Participants stressed the importance of incorporating the legal aspects of satellite projects right at the developing stage, especially if such projects were undertaken for the first time. The importance of adhering to existing national and international rules, standards and procedures was emphasized. Reference was made in this regard to the issues of authorization, licensing, registration, frequency coordination and compliance with space debris mitigation standards.

## **12. Demo sessions and poster session**

75. Several demo sessions were held to provide a practical view on some of the topics presented during the symposium. The demo sessions, which were independent from one another, covered the following topics: data exploration through sonification, using the SonoUno software; use of the open software gr-satellites to receive data from the Kenyan satellite 1KUNS-PF; the ESA Debris Risk Assessment and Mitigation Analysis tool; requirement gathering for solutions compendiums; and how to apply to opportunities under the Access to Space for All initiative. In addition, an online survey was conducted during the requirement gathering session allowing participants to state their requirements. The demo sessions were welcomed by the participants, who expressed appreciation for the wide range of topics covered and the quality of the presentations. It was recommended that this approach be taken further in future events organized by the Office for Outer Space Affairs. Two posters were exhibited during a dedicated session. The posters addressed space diplomacy and space policy formulation as a tool for improving transparency and confidence-building measures.

## **V. Conclusions**

76. The symposium accomplished its goals, fostering dialogue between the diplomatic community and those communities that used space science and technology and their applications, promoting and advancing knowledge on space-related activities and services as a tool for diplomacy and cooperation, stimulating access to available space-related services, providing an opportunity for discussion on how space functioned as a tool for cooperation and diplomacy and providing an overview of user needs and solutions. The participation in the symposium of representatives from the Vienna-based diplomatic community was therefore particularly welcomed.

77. The use of facilitation tools to facilitate interaction during the symposium and the inclusion of demo sessions were also welcomed, and a recommendation was made to extend that approach to other activities of the Office for Outer Space Affairs. The holistic nature of the symposium, which combined legal and technical aspects, was confirmed as the right approach, and it was recommended to continue to carry out multidisciplinary activities that tackled both technical and legal aspects of space matters.

78. The need for capacity-building was highlighted repeatedly during the symposium. The Access to Space for All initiative and the new project on legal advisory services, entitled “Space law for new space actors”, of the Office for Outer Space Affairs were welcomed.