



# General Assembly

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## Committee on the Peaceful Uses of Outer Space

### **Report on the United Nations/Austria Symposium on the theme “Access to space: holistic capacity-building for the twenty-first century”**

**(Graz, Austria, 3 to 7 September 2017)**

#### **I. Introduction**

1. The year 2018 will mark the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50), a milestone that will present a unique opportunity to highlight the key societal benefits of space and consequently define a stronger future international collaboration in the peaceful uses of outer space for the benefit of all of humankind.
2. At its fifty-ninth session, in June 2016, the Committee on the Peaceful Uses of Outer Space endorsed seven thematic priorities for the implementation of UNISPACE+50, including one on capacity-building for the twenty-first century (thematic priority 7), which represents the most cross-cutting aspect of the initiative. In that connection, the Committee and the Office for Outer Space Affairs of the Secretariat are seeking to define new, innovative and effective approaches to overall capacity-building and development needs as a fundamental pillar of global governance of outer space activities.
3. The United Nations Programme on Space Applications, implemented by the Office for Outer Space Affairs, was established in 1971 to assist Member States in building capacity in the use of space science, space technology and space applications in support of sustainable development and to promote international space cooperation. Since its inception, the Programme has organized several hundred training courses, conferences, seminars and meetings for the benefit of Member States, promoting collaborative participation by Member States at the regional and international levels in a variety of space science and technology activities. The Programme's emphasis has been on the development and transfer of knowledge and skills to developing countries and countries with economies in transition.
4. The Office has been carrying out an increasing number of capacity-building activities within the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), as well as in the areas of space law and policy, in particular for the purpose of developing national regulatory frameworks.
5. In that general context, the United Nations/Austria Symposium on the theme “Access to space: holistic capacity-building for the twenty-first century” was



organized jointly by the Office for Outer Space Affairs and the Government of Austria, with the support of the European Space Agency (ESA), Deutsches Zentrum für Luft- und Raumfahrt (DLR), Austrospace, Joanneum Research Forschungsgesellschaft mbH, National Point of Contact for Space Law Austria (NPOC Space Law Austria), Graz University of Technology, the city of Graz, the State of Styria and the Ministry for Transport, Innovation and Technology of Austria.

6. The outcomes and recommendations emanating from the Symposium are being compiled to provide input to a dedicated report currently in preparation that will address thematic priority 7.

7. The present report describes the background, objectives and programme of the Symposium, and provides a summary of the observations and recommendations made by the participants.

## **A. Background and objectives**

8. Following on the 2016 United Nations/International Astronautical Federation Workshop on the theme “Space Technology for Socioeconomic Benefits: Integrated Space Technologies and Applications for a Better Society”, held in Guadalajara, Mexico, which recommended that the Office for Outer Space Affairs develop a space capacity index and a space solutions compendium, the Symposium provided a unique opportunity to discuss the contributions of space technology and its applications to sustainable development in the light of technical, legal, regulatory and policy developments. To highlight its ties with the Sustainable Development Goals, the space capacity index has evolved to become the Space for Development Profile.

9. The Office for Outer Space Affairs has undertaken a pilot project to demonstrate the Space for Development Profile and the Space Solutions Compendium. The purpose of the Space for Development Profile is to create profiles of countries’ activities in the space domain, while the purpose of the Space Solutions Compendium is to provide solutions for improving the indicators defined in the Space for Development Profile. Organized as a flagship event dedicated to thematic priority 7 of UNISPACE+50, the Symposium provided the opportunity to make further progress on these pilot projects.

10. The Symposium was built around innovative approaches to capacity-building in the space sector, including the need to measure progress and development. The determination of the long-term impact of an activity can be a challenging task, but in the context of space-related capacity-building the task can be facilitated by creating a set of standardized space capability indicators covering all space-related domains and applications, which in turn can provide orientation to countries in evaluating their capabilities and priorities. Therefore, the set of indicators constituting the Space for Development Profile could serve as a key support tool for countries in making decisions on space-related matters. It could also be used by the Office for Outer Space Affairs to measure the impact of its activities and could help to identify the need for targeted initiatives by identifying gaps or areas in need of improvement.

11. In addition, the Symposium served as an opportunity to open a dialogue on thematic priority 7, including innovative approaches to capacity-building in the space domain, in particular in the areas of policy, applications and technology, as well as the need to measure progress and development, the identification of partners, capacity-building tools and funding opportunities. The Symposium was also aimed at providing recommendations on thematic priority 7 to the Committee on the Peaceful Uses of Outer Space in preparation for UNISPACE+50.

12. Participants in the Symposium proposed plans and identified partnerships for the Committee to consider as part of its strategy for implementing the “Space2030” agenda. The objectives of the Symposium were as follows:

- Identify innovative and effective approaches to overall capacity-building

- Discuss infrastructure for cross-sectoral and integrated applications
  - Enhance existing partnerships and forge new ones to strengthen capacity-building and institutional support
  - Promote the participation of women and youth in space science
  - Provide recommendations on the Space for Development Profile and Space Solutions Compendium
  - Discuss the role of the Regional Centres for Space Science and Technology Education, affiliated to the United Nations, in the area of capacity-building
  - Discuss the role of the Office for Outer Space Affairs in conducting capacity-building activities
13. The particular objectives of the Space for Development Profile and Space Solutions Compendium were defined as follows:
- Provide measurable indicators of space capabilities and space applications currently in use at the country level
  - Enable the formulation at the country level of long-term plans for developing space capabilities, on the basis of the indicators and targeting the needs of individual countries
  - Support results-based management
  - Offer a catalogue of solutions that can be used to enhance particular indicators

## **B. Attendance**

14. The Symposium brought together participants from national, regional and international public and private organizations and institutions, including decision makers from government agencies; high-ranking officials from regional and international agencies; representatives and experts from United Nations entities; experts from the broader space community, including academia and civil society, and policymakers; experts from international centres of excellence; researchers involved in the use of space technologies; representatives of the private sector in the space and non-space fields; and civil society leaders.

15. Participants were selected on the basis of their scientific and educational background and their experience in implementing programmes and projects related to the topics addressed. The selections and preparations for the Symposium were carried out by the organizers in cooperation with a programme committee of international experts.

16. Funds were provided by the United Nations, the Government of Austria, ESA, DLR, Austrospace, Joanneum Research Forschungsgesellschaft mbH, NPOC Space Law, Graz University of Technology, the city of Graz, the State of Styria and the Ministry for Transport, Innovation and Technology of Austria and were used to cover the travel, accommodation and other costs of 28 participants from 20 countries.

17. The Conference was attended by 117 registered participants. The following 34 Member States were represented: Argentina, Austria, Bahrain, Belgium, Bhutan, Brazil, Canada, China, Costa Rica, Czechia, Ecuador, Ethiopia, France, Germany, Iran (Islamic Republic of), Italy, Japan, Kenya, Mexico, Morocco, Nepal, Netherlands, Nicaragua, Nigeria, Philippines, Poland, Romania, Russian Federation, South Africa, Sudan, Switzerland, Turkey, United States of America and Zimbabwe.

18. Also in attendance at the Symposium were representatives of the Asia-Pacific Space Cooperation Organization, the European External Action Service, ESA, the United Nations Economic Commission for Africa, the African Union Commission and the Office for Outer Space Affairs.

## C. Programme

19. The Symposium's programme was developed by the Office for Outer Space Affairs in cooperation with the Symposium's programme committee, which included representatives of ESA; the Ministry for Europe, Integration and Foreign Affairs of Austria; DLR; Joanneum Research Forschungsgesellschaft mbH; Graz University of Technology; the University of Vienna; and Eurisy.

20. The programme was aligned with the objective of UNISPACE+50 to strengthen international coordination and cooperation in the use and application of space science and technology, with a particular focus on thematic priority 7 of UNISPACE+50.

21. The programme included plenary sessions and allowed sufficient time for discussions among participants to identify the priority areas in which pilot projects should be launched, and to examine the possibility of establishing partnerships.

22. Two panel discussions were held at the Symposium, a high-level panel discussion chaired by the Director of the Office for Outer Space Affairs and a panel discussion on UNISPACE+50 and the objectives for capacity-building in the twenty-first century. The panels included senior officials of the Office for Outer Space Affairs, the Aeronautics and Space Agency of Austria, ESA, the European Space Policy Institute, Eurisy, the National Space Administration of China, DLR, the Group on Earth Observation, the Permanent Mission of Costa Rica to the international organizations in Vienna, the International Astronautical Federation and the Sierra Nevada Corporation.

23. The following 10 thematic sessions comprised the main programme of the Symposium:

- (a) Challenges for capacity-building;
- (b) Tools and technologies for capacity-building in the twenty-first century;
- (c) UNISPACE+50 panel discussion;
- (d) Infrastructure for capacity-building;
- (e) Workshop on the Office for Outer Space Affairs pilot projects Space for Development Profile (SDP) and Space Solutions Compendium (SSC);
- (f) Cross-cutting aspects of capacity-building;
- (g) Workshop on specific tools for space law capacity-building;
- (h) How to attract women and youth to space-related careers;
- (i) Workshop on education curricula for space technology and space law;
- (j) Institutional capacity-building.

24. A poster session was also scheduled for the various other presenters whose proposed contributions could not be accommodated in the above-listed thematic sessions.

25. The Symposium was advertised and promoted on various websites and on social media platforms such as Facebook and Twitter in order to highlight its importance and the interest shown in the topics to be addressed. The final programme and presentations as well as selected recordings will be made available online on a dedicated Symposium web page.

## II. Summary of the programme

26. The Symposium opened with a session on challenges for capacity-building, which provided a platform for the exchange of ideas on engaging with stakeholders in preparation for UNISPACE+50 and the sharing of different approaches to cooperation in capacity-building.

27. The opening session also provided participants with an opportunity to share their views on and experiences in capacity-building and the unique needs of individual countries, in particular with regard to thematic priority 7 and possible and recommended future collaborations between different stakeholders in the field of capacity-building.

28. At the next session, on tools and technologies for capacity-building in the twenty-first century, participants demonstrated the importance of space as an essential tool for achieving the targets enshrined in the 2030 Agenda for Sustainable Development. They also presented examples of existing and successful means for space capacity-building and identified new and innovative tools and technologies for that purpose.

29. The UNISPACE+50 panel discussion allowed participants the opportunity to discuss possible objectives for capacity-building in the twenty-first century in preparation for UNISPACE+50. Participants highlighted how the Office for Outer Space Affairs was in a unique position to encourage a broader group of stakeholders to take advantage of space technology and underlined the Office's role as a platform for connecting traditional and non-traditional actors.

30. The panel discussion also focused on the need to define and collect information on specific user needs and to provide solutions targeting them. The panel underlined the importance of the Office's work on the Space for Development Profile and the Space Solutions Compendium as tools enabling the development of long-term capacity-building plans. In addition, the panel welcomed proposals to develop a capacity-building network as a global initiative to bring together various stakeholders from the space field.

31. The session on infrastructure for capacity-building featured speakers from Governments, space agencies, universities and the private sector. They introduced their ongoing capacity-building projects, describing existing challenges and future needs, with a special focus on the contribution of the Office to overall capacity-building, in particular in the development of infrastructure for cross-sectoral applications to strengthen and deliver targeted capacity-building and technical advisory services.

32. The Office's Space for Development Profile and Space Solutions Compendium pilot projects represent a new approach to capacity-building. A workshop focusing on those projects provided an opportunity to present ideas on the new approach, as well as initial project results and lessons learned. At the workshop, speakers demonstrated the necessity and usefulness of the new approach, called for broader involvement of stakeholders and underscored the contribution of the approach to space capacity-building in developing countries.

33. At the session on cross-cutting aspects of capacity-building, speakers shared lessons learned and best practices in awareness-raising and public information outreach aimed at communicating the importance of space and space activities to a wider audience. Speakers emphasized the importance of having Internet access and using information technology, and in particular promoted the development of e-learning courses, the use of live broadcasts of workshops for the benefit of remote participants and the dissemination of public information through social media channels.

34. The discussion during the session on space law capacity-building served to raise awareness among the participants of the problems encountered when translating legal texts into different languages and how those problems could be overcome, using as a model a translation into Chinese and Russian of the Cologne Commentary on Space Law. The speakers highlighted the need for a holistic approach, encouraging more exchange between technical and legal experts.

35. The session on how to attract women and youth to space-related careers focused on introducing science, technology, engineering and mathematics education to women and youth. The speakers highlighted different ways and means of attracting

younger generations, with a specific focus on encouraging women to undertake programmes of study in science, technology, engineering and mathematics, and to pursue a career path in the space field.

36. The workshop on education curricula for space technology and space law was held to raise awareness of the existing United Nations curricula on space technology and space law. During the workshop, speakers presented different examples of space curricula and described their status, and highlighted the importance of reviewing the existing curricula. The workshop also identified the challenges in implementing the United Nations curricula, and gathered recommendations for future actions that could better support space law capacity-building efforts around the world.

37. During the session on institutional capacity-building, speakers presented programmes, issues and lessons learned in relation to the implementation of capacity-building activities at the local, national, regional and international levels.

38. The poster session included four presentations and one exhibit of relevance to the topics addressed in the Symposium and also contributed to the outcomes and the formulation of specific recommendations emanating from the Symposium.

### **III. Observations and recommendations**

39. The Symposium participants recognized the importance of the UNISPACE+50 process for strengthening global governance of outer space activities, acknowledging that capacity-building was a prerequisite for the economic, societal and cultural growth of all nations, and underlined that a holistic, inclusive and cross-sectoral strategy for capacity-building activities could make a significant contribution to progress towards the implementation of the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Paris Agreement on Climate Change. In that connection, the following observations, conclusions and recommendations were made.

#### **Space economy: the development of space-derived economic benefits**

(a) Given the increasing number of industry and private sector entities involved in space activities, it was regarded as important to stimulate public-private partnerships at the national, regional and international levels and involve those entities in capacity-building activities for the purpose of developing economic incentives both for the growth of the space sector and to promote the use of space applications that help create employment, economic growth and sustainable development at the national level. It was regarded as equally important to impress upon industry and private sector entities the importance of their contribution to a sustainable space economy, which in turn would make an impact on space society and space accessibility efforts;

(b) The Office for Outer Space Affairs should have a coordinating role in promoting a closer cooperation between governments, intergovernmental and non-governmental organizations, civil society, and industry and private sector entities for the purpose of facilitating developing countries' access to space, including through better access to space-based data and information, access to space exploration efforts such as space-flight research, the exchange of expertise and technology, and for capacity-building efforts aimed at strengthening the space economy and societal growth;

(c) The Regional Centres for Space Science and Technology Education, affiliated to the United Nations, should be strengthened and enhanced in their role as centres supporting local and regional economic development through space applications, and as hubs for fostering collaboration at the regional level aimed at breaking down cultural and language barriers. The Regional Centres are encouraged to establish a closer collaboration;

### **Space society: the evolution of society and societal benefits stemming from space-related activities**

(d) The Regional Centres should, in coordination with the Office for Outer Space Affairs, develop and implement new curricula and new approaches to capacity-building that are interdisciplinary, international and intercultural in nature. Noting the importance of building the capacity of young people in order to attract them to and retain them in the fields of science, technology, engineering and mathematics and inspire them, education and training opportunities for young people should be offered at an earlier age and information on career paths should be adapted and made available to them;

(e) The promotion of capacity-building for greater gender equality was recognized as a fundamental factor in further stimulating societal growth, as well as in the implementation of goal 5 of the Sustainable Development Goals and the Space for Women initiative of the Office for Outer Space Affairs. In that connection, the benefits to youth and other vulnerable groups should also be taken into account;

(f) Partnerships with governmental entities at all levels and civil society would allow for more comprehensive assessments of the development needs of end-users and would provide a means for evaluating the impact of capacity-building activities in the areas of education, gender equality, health and the creation of decent jobs. The Space Development Profile and Space Solutions Compendium were welcomed as tools for assessing user needs and enabling the formulation of targeted solutions;

(g) The Office for Outer Space Affairs was encouraged to strengthen its triangular approach in order to bring together stakeholders from both developing and developed countries, in particular to promote South-South cooperation and coordination. It was noted that the proposed capacity-building network could provide research opportunities and hands-on training programmes, including student exchange programmes and programmes delivered in working environments;

(h) The Office for Outer Space Affairs should be mandated to identify, develop and offer dedicated online courses and e-learning materials as a way to increase the impact of its capacity-building activities;

(i) Considering the growing community of professional, technical and managerial personnel in the space sector, increased access to existing space law programmes was recommended;

(j) Recognizing that the United Nations curriculum on space law was an excellent initiative and an important tool for promoting space capacity-building in the implementation of the legal regime governing outer space, it was recommended that the curriculum be reviewed and updated by adding new topics and teaching materials, such as on the broader perspective of space security, in particular transparency and confidence-building measures in outer space activities;

(k) The Office for Outer Space Affairs was encouraged to continue working with the group of educators that developed the space law curriculum and the Directors of the Regional Centres for Space Science and Technology Education, affiliated to the United Nations, in order to bolster its use at the Centres and in carrying out studies at the country level in cooperation with relevant entities in support of capacity-building efforts in space law and policy;

(l) Considering the increasing number of private actors in the space sector, it was recommended that the capacity-building efforts of the Office for Outer Space Affairs in space law and policy be extended, including through partnerships with industry and the private sector. In that regard, it was also recommended that the Office seek to mobilize resources for additional fellowship programmes in order to promote space law education;

### **Space accessibility: space technology for the use and benefit of all communities**

(m) In order to reduce the space divide, which is the gap between countries that have developed space-related capabilities and technologies and those that have not, it was recommended that examples of established best practices in capacity-building be followed, including, where possible, a triangular approach, along the following lines:

- (i) Capacity-building in the development of small satellites as an efficient means for reducing gaps in infrastructure development;
- (ii) Capacity-building in the development of space-based applications as an effective approach for increasing access to the benefits of space science and technology;
- (iii) Outreach efforts focusing on the importance and benefits of open data policies and practices as a way to raise awareness of the potential of space technology, including in the South-South context;

(n) The Human Space Technology Initiative of the Office for Outer Space Affairs was commended for facilitating access to space. It was recommended that the Office seek new partnerships in order to expand the existing Initiative;

(o) It was recommended that a targeted and updated capacity-building strategy, as an outcome of thematic priority 7 of UNISPACE+50, on capacity-building for the twenty-first century, should be developed in order to deliver enhanced operational capacity-building services, establish local and bilateral collaborations on institutional development and space-related infrastructure, and promote the use of space applications in implementing the Sustainable Development Goals;

(p) A “one-stop shop” should be developed that combines the Space for Development Profile and Space Solutions Compendium tools and allows users to find space-based solutions, including on the availability of resources, in order to plan and monitor progress towards the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction 2015-2030 and the Paris Agreement on Climate Change;

(q) It was recommended that national and regional space agencies and other relevant actors in the space field contribute to the Office’s Space Solution Compendium initiative. It was further recommended that the Office be mandated, and provided with the necessary resources, to establish a global partnership to coordinate the development, operation and utilization of space-related infrastructure, data, information and services in support of the 2030 Agenda for Sustainable Development;

(r) The Office for Outer Space Affairs should further develop the Space for Development Profile, including as a tool for countries to assess their progress in the development of space capabilities and the impact of that progress on their society and economy, thus supporting their implementation of the Sustainable Development Goals;

### **Space diplomacy: building partnerships and strengthening international cooperation in space activities**

(s) In view of the importance of promoting the universality of the United Nations treaties on outer space and the fundamental need for capacity-building in that regard, including for policy- and decision makers, the work carried out under thematic priority 2 of UNISPACE+50, on the legal regime of outer space and global space governance: current and future perspectives, was welcomed;

(t) The guidance document envisioned under thematic priority 2 of UNISPACE+50 should be developed to serve as a tool for raising awareness among decision makers and regulators of the connections between various elements of international space law to be taken into consideration in the context of accession to



the treaties and in the implementation of the legal regime governing outer space, as well as for the purpose of establishing national space policy, as appropriate;

(u) In that context, it was considered important that the Office for Outer Space Affairs be given the necessary mandate to develop, in close cooperation with States and regional organizations and mechanisms, as appropriate, the prerequisites for targeted technical legal assistance aimed at governmental and regulatory authorities, and to take action to foster holistic cross-sectoral capacity-building efforts that address the broader space community, in order to be able to tailor such efforts in accordance with the particular needs of developing countries. In that regard, the Office for Outer Space Affairs should also be mandated to develop a model for national space legislation;

(v) The Office for Outer Space Affairs was encouraged to cooperate with other United Nations entities and programmes, including the Office for Disarmament Affairs, in capacity-building efforts aimed at ensuring the safety, security and sustainability of outer space activities;

(w) Considering that the Committee on the Peaceful Uses of Outer Space represents the fundamental platform for space diplomacy and global governance of outer space activities, the Office for Outer Space Affairs should undertake outreach efforts targeting the diplomatic community, which may also serve to encourage the involvement of developing countries in the work of the Committee;

(x) It was recommended that the next United Nations/Austria Symposium, to be held in 2018, should consider the outcomes and decisions of UNISPACE+50 related to capacity-building for the twenty-first century.

## IV. Conclusions

40. The Symposium was organized on the theme “Access to space: holistic capacity-building for the twenty-first century” in order to address the recurring requests made by the Scientific and Technical Subcommittee and the Legal Subcommittee to find ways and means of facilitating better, more collaborative efforts towards fulfilling the Committees’ mandates and objectives.

41. The exchange of views and ideas during the Symposium enabled the participants to identify and propose new and innovative capacity-building approaches to support the UNISPACE+50 process.

42. Furthermore, the integrated approach taken at the Symposium enabled the participants to propose holistic solutions for space capacity-building, ranging from space law to space applications and technologies, as well as to provide recommendations on both existing and potential capacity-building partnerships.

43. The work being carried out by the Office for Outer Space Affairs on the Space for Development Profile and the Space Solutions Compendium was well received and was regarded as a unique way forward in addressing capacity-building needs in developing countries, as well as in realizing the Office’s contribution to the implementation of the Sustainable Development Goals. The Symposium provided an opportunity to raise awareness of the Office’s work on the Profile and the Compendium, and in that regard the need for strong partnerships was underlined.

44. The Symposium served to highlight the Office’s role in capacity-building for the twenty-first century and the importance of space technology in addressing global challenges and achieving the 2030 Agenda for Sustainable Development. It was noted that access to space and holistic capacity-building efforts would be essential factors in the global implementation of all 17 Sustainable Development Goals.

45. Advancements in space capacity-building would benefit all States, and in that regard the Symposium provided a platform to consider space as a global commons that must be preserved and protected for future generations.

46. The Symposium participants noted that UNISPACE+50 would serve as an important opportunity for Member States to work jointly on a dedicated “Space2030” agenda aimed at addressing global governance in space-related cooperation and the future of space-related activities. As highlighted during the Symposium, space technology supports the common goals for addressing global challenges, and new and innovative approaches to capacity-building will be essential to facilitate the implementation of the 2030 Agenda for Sustainable Development, the Paris Agreement on Climate Change and the Sendai Framework for Disaster Risk Reduction 2015-2030.

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