



**Committee on the Peaceful Uses
of Outer Space****Report on the United Nations/Austria World Space Forum:
“Access to Space4All”****(Vienna, 18 to 22 November 2019)****I. Introduction**

1. The United Nations/Austria World Space Forum on the theme “Access to Space4All”, held in Vienna from 18 to 22 November 2019, was jointly organized by the Office for Outer Space Affairs of the Secretariat and the Government of Austria, through the Federal Ministry for Transport, Innovation and Technology and the Federal Ministry for Europe, Integration and Foreign Affairs of Austria. The Forum was co-sponsored by the European Space Agency and the International Committee on Global Navigation Satellite Systems.
2. In 2018, the Office for Outer Space Affairs hosted an event to celebrate the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE+50). The event brought more than 800 participants from all over the world together in Vienna, including representatives from more than 30 space agencies.
3. A key policy outcome of UNISPACE+50 was the international community’s agreement, endorsed by the General Assembly in its resolution [73/6](#), to establish a “Space2030” agenda, envisioned as a comprehensive strategy for reaffirming and strengthening the contribution of space activities and technologies to the achievement of global agendas such as the 2030 Agenda for Sustainable Development, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction 2015–2030. Accordingly, the “Space2030” agenda and implementation plan will be submitted by the Committee to the General Assembly for its consideration in 2020.
4. The World Space Forum provided an opportunity for representatives of the space community to collectively address international cooperation in the peaceful uses of outer space activities across the four pillars of UNISPACE+50 (space economy, space society, space accessibility and space diplomacy). The Forum concluded with specific observations and recommendations (see sect. III) which, inter alia, underscored the valuable opportunity that the “Space2030” agenda represented to elevate space as an important pillar of the global agenda.
5. The present report describes the background, objectives and programme of the Forum, provides a summary of the sessions and concludes with observations and recommendations.



A. Background and objectives

6. Launched in Vienna in November 2019, the World Space Forum is a newly established event series hosted by the United Nations that is built on the recommendations generated at four high-level forums held between 2015 and 2018. That sequence of forums demonstrated the growing interest of an increasing number of actors in discussing the future of space and international cooperation across the pillars of space economy, space society, space accessibility and space diplomacy.

7. Through the World Space Forum, the United Nations aims to leverage innovative solutions and technological developments to realize common sustainable development goals. Attention has increasingly been focused on the unique potential of space technologies in this endeavour. Building on the outcomes of UNISPACE+50 and taking advantage of the momentum it generated, the Forum held in 2019 was aimed at ensuring that the current dialogue among stakeholders in the space field fully captures the political, legal and capacity-building elements of international cooperation in space exploration.

8. The Office for Outer Space Affairs is in a unique position to bring together all relevant stakeholders to ensure that the benefits of space are available to the broadest possible user base, in all countries around the world.

9. As agreed at the United Nations/United Arab Emirates High-level Forum: Space as a Driver for Socioeconomic Sustainable Development (see [A/AC.105/1165](#)), held in 2017, the High-level Forum series, renamed in 2019 as the World Space Forum, continued to serve as a driver for dialogue between Governments, international organizations, industry, the private sector, academia and civil society, to connect the four pillars of UNISPACE+50 and the “Space2030” agenda.

10. The United Nations/Austria World Space Forum was focused on the theme “Access to Space4All”, with a view to leveraging space technologies to their full potential in order to achieve sustainable economic and social development globally.

B. Attendance

11. The Forum 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 bodies, experts from the space community, industry, business and academic communities and international centres of excellence, policymakers, researchers involved in the use of space technologies, representatives of the private sector in the space and non-space fields, and civil society leaders.

12. Funds provided by the United Nations, the Government of Austria and the co-sponsors were used to defray the costs of air travel and accommodation for 26 participants (11 female and 15 male). A total of 299 participants (104 female and 195 male) from the broader space community attended the Forum.

13. Participants from the following 66 Member States attended the Forum: Algeria, Argentina, Armenia, Australia, Austria, Bahrain, Bangladesh, Belgium, Bhutan, Bolivia (Plurinational State of), Brazil, Bulgaria, Cameroon, Canada, Chile, China, Costa Rica, Croatia, Czechia, Ecuador, Egypt, Finland, France, Germany, Greece, Hungary, India, Iran (Islamic Republic of), Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Libya, Luxembourg, Malaysia, Mexico, Mongolia, Myanmar, Nepal, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Paraguay, Philippines, Poland, Qatar, Romania, Russian Federation, Saudi Arabia, Senegal, Serbia, Slovakia, Slovenia, South Africa, Spain, Switzerland, Tajikistan, Thailand, Tunisia, Ukraine, United Kingdom of Great Britain and Northern Ireland and United States of America.

14. Representatives of the following United Nations entities were also present at the Forum: Comprehensive Nuclear-Test-Ban Treaty Organization, International Atomic Energy Agency, United Nations Conference on Trade and Development, United Nations Industrial Development Organization, United Nations Office on Drugs and Crime, World Health Organization, United Nations Office for Disarmament Affairs and Office for Outer Space Affairs.

C. Programme

15. The programme of the Forum was developed by the Office for Outer Space Affairs in cooperation with representatives from the Federal Ministry for Transport, Innovation and Technology and the Federal Ministry for Europe, Integration and Foreign Affairs of Austria.

16. The Forum was opened during a welcoming reception hosted by the Mayor of Vienna in the Vienna City Hall on 18 November 2019 and welcoming remarks were made on behalf of the Mayor and Governor of the City of Vienna, the Federal Ministry for Transport, Innovation and Technology, the Federal Ministry for Europe, Integration and Foreign Affairs of Austria and the Office for Outer Space Affairs.

17. In the first part of the Forum, on 19 and 20 November 2019, four moderated sessions gathered technical experts to present their views and work, as well as lessons learned and new ideas, on the following topics: (a) space economy for all; (b) the benefits of space for all; (c) access to space for all; and (d) secure space environment for all. A dedicated open panel discussion on the Inter-Agency Meeting on Outer Space Activities (UN-Space), a session focused on artificial intelligence for Earth observation and image interpretation, and a poster session were also integrated into the first segment.

18. On the following two days, 21 and 22 November 2019, the Forum additionally brought together decision makers from Governments, space agencies and other stakeholders to discuss and exchange views on the recommendations made in the four moderated panel discussions on various aspects of space economy, space society, space accessibility and space diplomacy.

19. The hosts of the World Space Forum also organized two field trips, to RUAG Space Austria and the Vienna Planetarium, as well as a dinner reception, which took place on 21 November 2019.

20. All of the presentations and panel discussion interventions made during the Forum can be found on the website of the Office for Outer Space Affairs (www.unoosa.org).

II. Summary of the Forum programme

21. The thematic sessions held during the first two days of the Forum enabled participants to learn about the value of space technology for a variety of applications and stimulated discussions on numerous international initiatives aimed at promoting the use of space technology. The presentations delivered during the thematic sessions are summarized below.

22. The session on space economy for all provided the opportunity to examine and present the topic from various perspectives. The presentations delivered during the session included topics related to the point of view of entrepreneurs and start-ups, a potential mechanism to improve the financing and funding landscape of the space sector, possibilities for collaborations and partnerships with existing programmes, and a system to improve compliance with sustainability standards.

23. The session also provided the opportunity to exchange views on topics ranging from the impact of tolerance for risk in the context of the sustainable use of space to

the support that could be established for space companies and start-ups, as well as the motivation for the increase in venture capital for space start-ups.

24. Furthermore, the session was an opportunity for the participants to present national and international partnership programmes and examine in depth the importance of responsible behaviour in space and what the private sector can contribute to efforts to improve international cooperation in outer space.

25. The panel discussion on space economy highlighted several issues that should be considered priorities when discussing the space economy and how global space economic activities can be supported at the United Nations level. The participants addressed the need to support efforts to lower the entry costs for start-up space activities, as well as facilitating public-private partnerships as a key way to reduce stakeholder risk. Additionally, it was emphasized that export control should be considered by the international community as an important mechanism to provide a level playing field for international trade in the space economy sector.

26. Furthermore, participants highlighted the promotion of innovation in the space industry as a way of reducing barriers to accessing space and stressed the importance of ensuring downstream space economy activities, underlining in particular that space infrastructure was only part of the larger picture of the space economy.

27. In the session on the benefits of space for all, participants highlighted the role of space activities and how they were intertwined with all the other themes, including economy, accessibility and diplomacy. A wealth of options and arguments for why space was important for a society were presented and the need to formulate a mechanism for cooperation to ensure the benefits of space for societies was stressed.

28. The panellists also underlined the need for better awareness-raising tools to improve the understanding and promotion of the benefits of space for society, including the importance of space for sustainable development. In that regard, it was emphasized that the benefits derived from space exploration were achievements of and for humanity that could only have been accomplished through international cooperation.

29. Participants emphasized that restrictive data access policies, costs and the frequency of observations, which was insufficient to track changes and developments over time, and the lack of continuity and sustainability of observations and long-term Earth observation programmes were potential constraints in using satellite applications for the implementation of the Sustainable Development Goals.

30. The participants in the Forum stressed that the benefits that space brings to society were not obvious to the general public and that people were not able to identify services in their everyday life that were related to the space sector. It was therefore stressed that there was a need to better communicate to the public what the benefits of space were, as currently those benefits were only communicated within the existing communities of the space sector.

31. It was underlined that a more empathetic and emotional approach involving innovative, proactive and potentially radical ideas may be necessary to convince potential beneficiaries of the importance of space for achieving the Sustainable Development Goals. As an example, the meaningful ties between art, technology and society could be exploited to tell tangible and comprehensible stories aimed at raising awareness of how space technology influences our daily life.

32. Based on observations and recommendations made in previous Office for Outer Space Affairs workshops, the sessions enabled participants to draw attention to the potential of applying artificial intelligence to the interpretation of satellite data to support of the implementation of the Sustainable Development Goals.

33. The view was expressed that solutions offered by new technological developments, such as artificial intelligence, blockchain technology and cloud computing, could provide very useful tools to address a variety of issues currently on the agenda of the Committee, and it was consequently proposed that the Committee

could consider including opportunities for exchanges of views on those developments in future sessions.

34. The Office for Outer Space Affairs was commended for its outstanding efforts in facilitating the provision of space accessibility, ranging from the use of space-based data to actual in-orbit opportunities.

35. In that connection, the participants noted with appreciation the work being undertaken by Member States, including both space-faring and non-space-faring States, and highlighted the initiatives undertaken by the Office for Outer Space Affairs to support countries in their efforts to harness space for sustainable development.

36. During the technical sessions, the greater range of capabilities of CubeSats and the consequent increase in opportunities they afforded, as well as the increasing prospects afforded by the emergence of more sustainable, flexible and affordable micro-launchers for small satellites, were highlighted.

37. The discussion in the session on the secure space environment for all was focused on the need for the Committee to facilitate regulation in the area of space safety, in particular with regard to active space debris removal. That would, on the one hand, support commercial activities in the field of space safety and, on the other hand, ensure the sustainability of the space environment over the long term.

38. Furthermore, regulation in the area of safety, security and sustainability could also enhance transparency, which was particularly important in view of the dual-use nature of debris removal technologies.

39. It was stressed that a high level of space situational awareness and increased sharing of information on space activities could enhance transparency and thus the peaceful use of outer space. As the participants promoted access to such information for all, they therefore stressed that the need to develop international regulatory frameworks in the area of space situational awareness was regarded as urgent.

40. Participants noted that a centralized mechanism to track space debris could enhance transparency, and the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization was mentioned as an example that demonstrates the feasibility of such an international observation system.

41. In addition, participants emphasized the importance of having a robust space situational awareness mechanism in place and put forward the question of how the United Nations could help to advance such a mechanism by further developing a regulatory framework and discussing relevant policy dimensions. It was evident that the secure space environment was in the interest of all stakeholders and that further measures to improve space situational awareness at the international level could be a way forward, providing that the scope of the regulatory and policy dimensions was extended to include all stakeholders in the fast-growing “new space” environment.

42. Participants underlined the importance of treating space as a finite resource and of finding technical solutions to prevent the overconsumption of space resources. In that regard, it was stressed that all current and future operators needed to be supported in recognizing that the long-term sustainability of the environment is a common goal.

43. It was stressed that the current level of accuracy of information about space objects was not sufficient and should be improved, and that the current situation was a threat to both the sustainability and the peaceful use of our space environment, as uncontrolled objects were not being accurately tracked.

44. Consequently, collision avoidance had already become a reality and a necessity, and also constituted a potential business opportunity. It was stressed that the future would bring an increasing number of launches and deployments of smaller satellites and constellations, which would be observable through more and improved space surveillance networks. In that regard, it was estimated that the number of objects tracked would increase from less than 30,000 to more than 500,000 in the coming

years. Precision forecasting would enable reliable collision warnings, potentially reducing the overall number of such warnings to less than 100,000 per year and improving the precision of predictions of the location of uncontrolled objects by an order of magnitude.

45. Participants noted that increased transparency, facilitated by improved information, was an important factor in maintaining peace in space and ensuring the sustainability of space operations, and also contributed to confidence-building measures.

46. During the panel discussion on UN-Space, it was stressed that the common aspiration of participating United Nations entities was to strengthen the capacities of Member States for sustainable development, which could be achieved through the increased integration of space science, technology and their applications and relevant regulatory frameworks in national development strategies.

47. Furthermore, participants recognized the need for an integrated and coordinated approach based on the principles of equality and inclusiveness in order to ensure that the benefits of outer space were accessible to all States irrespective of their level of economic, social, scientific or technical development.

III. Observations and recommendations

48. The following observations and recommendations were made during the World Space Forum under the discussions in the respective sessions on space economy, space society, space accessibility and space diplomacy.

49. With regard to fostering a stronger and more sustainable space economy, participants in the Forum underlined the importance of education, training and development, and stressed the need for strategic and increased financial, administrative and start-up support for entrepreneurs in the space sector.

50. International partnerships, as well as public-private partnerships, had been promoted because the space economy could only grow through the pursuit of strategic partnerships, cooperation and coordination between State and non-State actors.

51. It was recommended that, rather than being enforced through the use of punitive or prohibitive measures, sustainable and responsible behaviour in space activities should be incentivized and should be supported by transparency and confidence-building measures in the private sector, including measurement activities and the publication of results, as well as the consideration and recognition of data from other actors.

52. The international community had an important role to play in fostering the space economy, as the development of a sustainable, future-oriented and strong space economy depended significantly on the success of cooperation, coordination and initiatives taken in and by the international community.

53. The importance of close cooperation between States was stressed and it was highlighted that the risk of fragmentation of space law and the need for consultations between States aimed at the harmonization of national space laws were particularly relevant factors in the development of the space economy. It was noted that the same rules were not sensible for all States, but harmonization efforts would take national situations into consideration and the Committee could offer the appropriate framework to initiate discussions in that regard, as cooperation in the enactment of national legislation would enable a level playing field.

54. International symposiums, workshops and networking events are important platforms for exchanges aimed at increasing awareness of the importance of space to society as a whole. The Office for Outer Space Affairs was commended for its efforts to bring together the entire space community and, in that regard, it was stressed that, at the World Space Forum to be held in 2020, concrete project ideas, proposals and

cooperation opportunities addressing the implementation of the Sustainable Development Goals should be presented.

55. Participants in the Forum recommended that the international community should consider holding discussions on a multilateral mechanism for the effective sharing of space-derived data and digital assets, and products derived from geospatial data, as well as continue to contribute to multilateral cooperation in the scientific research and development of space technologies and collaborate on global education and capacity-building programmes.

56. Inspiring and motivating the next generation are key to the success of maintaining space as a peaceful environment for all. It was therefore recommended that awareness-raising projects should be started as early as possible in the learning process, and should involve the organization of hands-on activities, the support of role models and the provision of mentoring programmes at the primary and secondary levels, as well as practical training in space exploration and the development of technology and applications at the university level.

57. It was noted that the Committee, as the only United Nations body specifically concerned with matters relating to the peaceful uses of outer space, was instrumental not only for awareness-raising but also for bridging the gap between the user and provider communities. In that regard, the Committee should make efforts to enhance connections with other platforms, with a view to strengthening cooperation, as well as to increasing awareness of the very unique and particular nature of space-related matters, as, it was stressed, it was not the producers' beliefs about the needs of the beneficiaries that would foster innovation but rather concrete user awareness.

58. Several participants underlined the importance of the promotion of inclusiveness and equality in the space sector and, in that regard, highlighted the capacity of the Office for Outer Space Affairs to facilitate access to space for all through its various initiatives and activities. In particular, the upcoming Space for Women conference to be held in Brazil in 2020 was highlighted as an important future occasion.

59. To make maximum use of space applications for sustainable development, panellists recommended the inclusion of technology developments such as artificial intelligence, blockchain technology and cloud computing in the capacity-building activities of the Office for Outer Space Affairs aimed at supporting innovative approaches to the extraction, preparation and provision of data.

60. To overcome some of the constraints identified in the application of space technology in implementing the Sustainable Development Goals, participants recommended closer cooperation between space agencies and global, regional, national and local actors to maximize the benefits of Earth observation. Potential collaborations could be facilitated through the creation of global datasets, guidance on good practices, joint capacity-building initiatives, infrastructure, tools and platforms that enable Earth observation, and the use of sharing hubs to exchange knowledge on Earth observation.

61. Participants in the Forum recommended the inclusion of rural, remote and poor areas in plans to provide Internet access to all by means of space technology, in line with the efforts of the Secretary-General's High-level Panel on Digital Cooperation and its recommendation that every adult should have affordable access to digital networks, as well as digitally-enabled financial and health services, as a means to make a substantial contribution to achieving the Sustainable Development Goals.

62. The success of the Committee in adopting meaningful, politically binding instruments in the areas of space debris and the long-term sustainability of outer space activities was commended. Participants furthermore stressed that the issue of space debris was not solely a safety concern but also a security concern and should be pursued by the Committee, including in coordination with other concerned United Nations bodies.

63. Participants highlighted the importance of the enhanced understanding and consequent utilization of the benefits of space technology and in that regard stressed the importance of merging existing space data and making them accessible to the general public in a transparent manner, with a view to providing an affordable and sustainable entry point to space for the wider scientific community and the general public.

64. The participants in the Forum underlined that the current regulatory framework governing outer space activities did not provide for deterrence against the deterioration of the space environment, and stressed that, owing to the absence of space traffic and safety rules, there was a lack of transparency, responsibility and accountability among space actors.

65. Therefore, the need for regulation in the fields of active space debris removal and space traffic management, including the increased sharing of space situational awareness information and space safety provisions, was highlighted. Moreover, such regulation could also include rules for regulating and managing risk, as well as for regulating access to, and the availability and use of, space-based data, as risk probabilities were rising owing to the increase in space traffic and space debris, the lack of space sustainability and society's increased dependence on space-based services.

66. It was stressed that, for space to be accessible, a functioning international regime was essential, and that accessibility was defined by the level of access to technology and funding; in that connection, the importance of political will was highlighted.

67. The importance of elaborating a well-defined space traffic management mechanism was noted, as such a mechanism would play an important role in supporting space accessibility. Discussions relating to such a mechanism would need to address relevant legal, technical and policy-related topics, and it was stressed that the Committee would provide the appropriate forum for such discussions.

68. The importance of international cooperation in the development of space traffic management was stressed, as global engagement was a key aspect of that domain. It was highlighted that, to facilitate space accessibility, the involvement of the private sector, the special role of the Committee in capacity-building, and efficient communication and awareness-raising in relation to space flight safety, were needed.

69. Therefore, the capacity-building role of the Committee was regarded as key to facilitating the development of basic standards, open data repositories and the collection and analysis of data with a view to fostering international coordination in the area of space flight safety.

70. The role of the international community was mainly highlighted in connection with the adoption by the Committee of the Guidelines for the Long-term Sustainability of Outer Space Activities (A/74/20, annex II), the establishment of a new working group under the agenda item on the long-term sustainability of outer space activities of the Scientific and Technical Subcommittee, and the need for regulation in the fields of active space debris removal and space traffic management, including increased sharing of space situational awareness information and space safety provisions.

71. Participants noted that the adoption of the Guidelines for the Long-term Sustainability of Outer Space Activities was a great success of the Committee. However, the risks that private players did not consider themselves bound by the non-binding guidelines and that the guidelines were not enforced by States at the national level had also been observed. Consequently, it was stressed that enhanced consistency in monitoring and enforcement was needed at the national level, and that it was important to ensure that industry played a role in the implementation of the guidelines.

72. It was recommended that a bridge be established between the different United Nations entities based in Vienna and Geneva, as the issues of sustainability and safety

in space now intersected with traditional security concerns, in particular in relation to the substantive issues of launch, space debris mitigation, space situational awareness, and on-orbit servicing, rendezvous and active debris removal. It was noted that such an effort could also include the institutionalization of cooperation through a common road map for the international community.

73. Improved communication, including in relation to the weakness of the existing global space regulations, and more proactive promotion of responsible behaviour among and between institutional, public and private space actors, acting in common to preserve our limited space resources, was recommended.

74. Participants in the Forum underlined the need for responsible behaviour in outer space, as it was in the common interest of commercial space operators, States and the international community to preserve space. It was noted that the establishment of national standards for space situational awareness constituted the beginning of a trend similar to the trend in regulating space traffic.

75. Participants in the Forum wished to remind all space actors of the importance of taking responsibility for sustainability in outer space and commended the Committee for the adoption of the 21 Guidelines for the Long-term Sustainability of Outer Space Activities, which was seen as an important step forward towards a stable and orderly space environment. Furthermore, it was stressed that the guidelines, which had been developed by the Committee, could also be beneficial for other discussions within the United Nations, as they would, for example, support transparency and confidence-building measures benefiting the discussions in the Conference on Disarmament.

IV. Conclusions

76. The United Nations/Austria World Space Forum: “Access to Space4All” provided an opportunity to advance the debate on the future of space and of international cooperation in relation to space economy, space society, space accessibility and space diplomacy.

77. The World Space Forum demonstrated the importance of continued and proactive action to raise awareness of the existing normative structure for promoting the consistency of global space governance, because a rule-based international framework serves as an important means for influencing national space law, which in turn influences non-State actors.

78. Given the rapidly evolving nature of the space sector and the current developments in that sector, the Forum provided an important platform to contribute to ensuring that the diplomatic community has the skills, knowledge and experience needed to advance the international, interdisciplinary discussions associated with space diplomacy.

79. Furthermore, the Forum provided an additional opportunity for the diplomatic community to engage with the broader space community, to see the international space context through a different lens and to provide cross-cutting knowledge that builds bridges for international cooperation.

80. At the Forum, a common understanding of the importance of space technology for the development of both space-faring and non-space-faring nations was demonstrated. It was noted that that common understanding would provide the essential basis for future exchanges within the Committee on the Peaceful Uses of Outer Space, as well as upcoming World Space Forums.

81. The Forum demonstrated the increasing interest of the broader space community in contributing to the exchange of information and views, and in collectively addressing international cooperation in the peaceful uses of outer space and appealing for a proactive solution that preserves space. Furthermore, the Forum served as a unique platform for highlighting the importance of international cooperation, as well

as the broadest possible inclusion of the various space actors, to commonly address the potential future challenges in the outer space domain.

82. Building on the results of a series of high-level forums, the World Space Forum held in 2019 offered a unique occasion to facilitate constructive dialogue between a wide range of stakeholders and to exchange information and views on key initiatives, policies and projects.

83. At the Forum, Austria announced its continued support for the World Space Forum until 2024 and committed to hosting the Forum every other year until 2024. The Office invited all Member States and the community at large to express their interest in providing additional support for the preparation, administration and implementation of the World Space Forum. In addition, interested Member States were invited to present their proposals to host the World Space Forums to be held in 2022 and 2024.
