



# General Assembly

Distr.: Limited  
19 February 2019

Original: English

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**Committee on the Peaceful  
Uses of Outer Space  
Scientific and Technical Subcommittee  
Fifty-sixth session  
Vienna, 11–22 February 2019**

## Draft report

### V. Space debris

1. In accordance with General Assembly resolution [73/91](#), the Subcommittee considered agenda item 7, entitled “Space debris”.
2. The representatives of Brazil, Canada, China, Finland, Germany, India, Indonesia, Japan, Mexico, the Russian Federation, Thailand, the United Arab Emirates and the United States made statements under agenda item 7. A statement was made under the item by the representative of Costa Rica on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.
3. The Subcommittee heard the following scientific and technical presentations:
  - (a) “2018 space debris activities in France: highlights”, by the representative of France;
  - (b) “Orbital debris mitigation and United States Space Policy Directive-3”, by the representative of the United States;
  - (c) “United Arab Emirates Space Agency space debris management research and development activities”, by the representative of the United Arab Emirates;
  - (d) “Status update on the RemoveDEBRIS Mission”, by the representative of the United Kingdom;
  - (e) “Space debris research at JAXA”, by the representative of Japan;
  - (f) “Overview of IADC annual activities”, by the representative of Italy;
  - (g) “Observation of near-Earth space in Ukraine”, by the representative of Ukraine;
  - (h) “Space debris mitigation activities at ESA in 2018”, by the observer for ESA.
4. The Subcommittee had before it information on research on space debris, the safety of space objects with nuclear power sources on board and problems relating to the collision of such objects with space debris, in replies received from Member States and



international organizations (documents [A/AC.105/C.1/115](#) and [A/AC.105/C.1/115/Add.1](#) and conference room papers A/AC.105/C.1/2019/CRP.7 and CRP.8).

5. The Subcommittee noted with satisfaction that the endorsement by the General Assembly, in its resolution [62/217](#), of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space had proved vital in controlling the space debris problem for the safety of future space missions.
6. The Subcommittee also noted with satisfaction that many States and international intergovernmental organizations were implementing space debris mitigation measures consistent with the Space Debris Mitigation Guidelines of the Committee and/or the Space Debris Mitigation Guidelines of the Inter-Agency Space Debris Coordination Committee and that a number of States had harmonized their national space debris mitigation standards with those guidelines.
7. The Subcommittee noted that some States were using the Space Debris Mitigation Guidelines of the Committee, the European Code of Conduct for Space Debris Mitigation, International Organization for Standardization (ISO) standard ISO 24113:2011 (Space systems: space debris mitigation requirements) and ITU recommendation ITU-R S.1003 (Environmental protection of the geostationary-satellite orbit) as reference points in their regulatory frameworks for national space activities.
8. The Subcommittee also noted that, in the area of space debris, some States were cooperating under the space surveillance and tracking support framework funded by the European Union and in the ESA space situational awareness programme.
9. The Subcommittee expressed concern at the increasing amount of space debris and encouraged States, agencies, industries and academic institutions that had not yet done so to consider voluntarily implementing the Space Debris Mitigation Guidelines of the Committee.
10. The Subcommittee noted that IADC, whose initial work had served as the basis for the Space Debris Mitigation Guidelines of the Committee, continued its work to characterize the space debris environment and evaluate improvements to its own Space Debris Mitigation Guidelines.
11. The Subcommittee noted with appreciation that States had undertaken a number of actions to mitigate space debris, such as improving the design of launch vehicles and spacecraft, developing special software, reorbiting satellites, passivation, life extension, end-of-life operations and disposal. The Subcommittee noted the evolving technologies related to the in-orbit robotic servicing of satellites, the extension of satellite lifespans and active space debris removal.
12. The Subcommittee noted the development and application of new technologies and ongoing research related to space debris mitigation; collision avoidance; protecting space systems from space debris; limiting the creation of additional space debris; re-entry and collision avoidance techniques; measuring, characterizing, continuous monitoring and modelling of space debris; prediction, early warning and notification of space debris re-entry and collision; and space debris orbit evolution and fragmentation.
13. Some delegations expressed the view that the outcome of the work of the Working Group on the Long-Term Sustainability of Outer Space Activities, which included guidelines directly addressing issues of space debris, represented a significant step forward in preserving outer space for future generations.
14. Some delegations expressed the view that there was a need to evaluate the implementation of the Space Debris Mitigation Guidelines of the Committee, as well as their subsequent updating.
15. Some delegations expressed the view that the existing non-legally binding guidelines and standards represented the optimal way forward for space debris mitigation.

16. Some delegations expressed the view that the strict application of space debris mitigation measures during all missions was mandatory to safeguard the space environment.
17. The view was expressed that it was necessary to expand the scope of international agreements to include space debris to ensure security and public safety.
18. Some delegations expressed the view that space debris issues should be addressed in a manner that would neither impose an undue burden on the space programmes of developing nations nor jeopardize the development of the space capabilities of those States.
19. The view was expressed that, in addressing space debris issues, States should act in line with the principle of common but differentiated responsibilities, which was based on the recognition of historical differences in the contributions of developed and developing States to the creation of space debris and the acknowledgement of differences in States' economic and technical capacities.
20. The view was expressed that all States carrying out outer space activities should act in a responsible manner in order to prevent an increase in the amount of space debris.
21. Some delegations expressed the view that it was important for States with developed space programmes to comply with their responsibilities to provide complete and timely information and to prevent the creation of space debris, mitigate and remove space debris appropriately and provide special assistance to those countries with incipient or non-existent space programmes that could be affected by space debris.
22. Some delegations expressed the view that cooperation between spacefaring countries and countries with emerging space capabilities needed to be increased in order to strengthen national capabilities in addressing space debris and accommodate the transfer of knowledge and the sharing of data, information and analysis methods.
23. Some delegations expressed the view that it was essential for all information related to the entry of space debris into the atmosphere to be communicated with diligence and promptness to those countries that might be affected and that cooperation should be intensified to enable the measures necessary to prevent and mitigate damage to property and persons.
24. The view was expressed that it was important to strengthen the international observation network by, among others, increasing the participation of equatorial countries.
25. The view was expressed that no State alone could solve all the issues linked to the monitoring of space debris and the issuing of warnings of potentially hazardous situations, especially in higher orbits, and that there was a need for the development of an international platform for sharing information on space objects and events, which would allow for more efficient use of the technical resources of States to guarantee the monitoring of space for improving the safety of space operations.
26. The view was expressed that all participants in IADC re-entry prediction campaigns should act in a spirit of cooperation and in line with the campaigns' objectives of preparing for and responding to high-risk re-entry events through the improvement of prediction techniques.
27. Some delegations expressed the view that IADC re-entry prediction campaigns were instrumental in sharing data and improving prediction techniques for high-risk re-entry events.
28. Some delegations expressed the view that international cooperation was necessary for the exchange of situational awareness and the management of space traffic.

29. The view was expressed that the international community should identify and reduce the barriers to and risks of feasible orbital debris removal missions. The delegation expressing that view was also of the view that increased international agreement on the appropriate framework for debris removal missions would be essential to ensuring the positive and transparent contributions of such missions to the sustainability of the space environment.

30. The view was expressed that it was important to address all legal and technical issues relating to space debris, such as space traffic management, active debris removal and the servicing of space vehicles orbiting the Earth.

31. The view was expressed that there was no legal basis for active debris removal, as an internationally agreed legal definition of the term “space debris” had not yet been developed.

32. Some delegations expressed the view that a legal framework should be developed for the purposes of space debris remediation measures.

33. Some delegations expressed the view that the Safety Framework for Nuclear Power Source Applications in Outer Space and the Space Debris Mitigation Guidelines of the Committee could enrich the activities of the Legal Subcommittee and the work of the Committee in promoting the safety and sustainability of activities in outer space.

34. The Subcommittee noted with satisfaction that the compendium of standards adopted by States and international organizations to mitigate the creation of space debris, which had been initiated by Canada, Czechia and Germany, and had contained at its inception information on the space debris mitigation standards adopted by Algeria, Argentina, Australia, Austria, Belgium, Canada, Chile, Czechia, France, Germany, Italy, Japan, Mexico, the Netherlands, Nigeria, Poland, Slovakia, Spain, Switzerland, Ukraine, the United Kingdom and the United States, as well as five international standards, was being continuously updated. The Subcommittee also noted with satisfaction that input to the compendium had been provided by Thailand in 2016, Indonesia in 2017, Denmark, Finland, Myanmar and ISO in 2018 and Azerbaijan and the Russian Federation in 2019. The Subcommittee noted that the compendium could be consulted on the website of the Office for Outer Space Affairs and encouraged Member States to continue to provide contributions and updates to it.

35. The Subcommittee took note of paragraph 12 of General Assembly resolution 73/91 and agreed that Member States and international organizations having permanent observer status with the Committee should continue to be invited to provide reports on research on space debris, the safety of space objects with nuclear power sources on board, problems relating to the collision of such space objects with space debris and the ways in which debris mitigation guidelines were being implemented.

## **IX. Near-Earth objects**

36. In accordance with General Assembly resolution 73/91, the Scientific and Technical Subcommittee considered agenda item 11, entitled “Near-Earth objects”.

37. The representatives of Canada, China, Germany, Indonesia, Italy, Japan, Mexico and the United States made statements under agenda item 11. Statements were also made by the observers for IAWN and SMPAG. During the general exchange of views, statements relating to the item were made by representatives of other member States.

38. The following presentation was made under the item: “Research into near-Earth asteroids with the participation of the Russian Federation”, by the representative of the Russian Federation.

39. The Subcommittee heard status reports by IAWN and SMPAG and noted with appreciation the efforts being made by IAWN and SMPAG to share information with regard to discovering, monitoring and physically characterizing potentially hazardous

near-Earth objects in order to ensure that all nations, in particular developing countries with limited capacity to predict and mitigate an impact of a near-Earth object, were aware of potential threats.

40. The Subcommittee noted that nearly 22.5 million observations of asteroids and comets had been collected in 2018 by the worldwide network of astronomical observatories, based in 41 countries. It also noted that the number of known near-Earth objects had exceeded 19,574 as at 1 February 2019, of which 1,837 had been discovered in 2018, with 1,963 asteroids now catalogued whose orbits took them within 8 million kilometres of Earth's orbit.

41. The Subcommittee also noted further progress and milestones in asteroid observation missions: the JAXA sample return mission Hayabusa2 had arrived at the target asteroid, Ryugu, in June 2018, and the NASA sample return mission OSIRIS-Rex, an international mission involving Canada, France and Japan, had arrived at the target asteroid, Bennu, in October 2018.

42. The Subcommittee further noted that the rover carried by Hayabusa2, "MINERVA-II", had landed on the target asteroid, Ryugu, in September 2018, becoming the world's first successful rover exploring the surface of the asteroid. The robotic lander "MASCOT", which was also carried by Hayabusa2 and developed by DLR and CNES, had landed on the surface of Ryugu in October 2018.

43. The Subcommittee noted efforts to pursue research in asteroid impact mitigation technology options, such as the NASA Double Asteroid Redirection Test (DART) mission, planned to impact the 160 metre-sized moonlet of the binary near-Earth asteroid Didymos and demonstrate that the kinetic impact orbit deflection technique could change the motion of an asteroid while still deep in space. The mission was in full development and flight operations were scheduled to start in mid-2021.

44. The Subcommittee noted a number of national policy activities and preparedness plans relating to near-Earth objects, including work by the NASA Planetary Defense Coordination Office, which led the efforts of the Government of the United States to coordinate the response to any actual near-Earth object impact threat, and the release of the National Near-Earth Object Preparedness Strategy and Action Plan in June 2018 by the Government of the United States, which was aimed at improving national preparedness to address the hazard of near-Earth object impacts. The five goals of that Strategy included: international cooperation and further efforts to build international support for acknowledging and addressing the potential of an Earth impact by a near-Earth object as a global challenge; and fostering more international consultation, coordination and cooperation in that area.

45. The Subcommittee noted that the IAWN steering committee had held its seventh meeting on 14 February 2019, on the margins of the current session of the Subcommittee. There were currently 15 signatories to the IAWN Statement of Intent, representing observatories and space institutions in China, Colombia, Croatia, Mexico, the Republic of Korea, the Russian Federation and the United States, as well as countries in Europe, and even an amateur observer in the United Kingdom.

46. The Subcommittee also noted that signatories to the IAWN Statement of Intent were international experts from a variety of disciplines relevant to the detection, characterization and notification of the potential hazard to the Earth posed by asteroids and comets, and actions that could be taken to prevent or minimize the devastating effects of an asteroid impact. It was further noted that more information was available on the IAWN website, hosted by the University of Maryland (United States), at <http://iawn.net>.

47. The Subcommittee further noted that, since the previous session of the Subcommittee, SMPAG had held two meetings: the 11th meeting had been held in Knoxville, United States, on 18 October 2018 and had been hosted by NASA; and the 12th meeting had been held on 13 February 2019, on the margins of the current session of the Subcommittee. Both meetings had been supported by the Office for Outer Space Affairs, as the secretariat to SMPAG, pursuant to General Assembly resolution 71/90.

The Subcommittee was informed of the progress made in the work of SMPAG, as contained in the summary reports of the meetings, available at <http://smpag.net>.

48. The Subcommittee also noted that Czechia (in particular, the Ministry of Transport, the coordinator of the space activities in Czechia) had become the nineteenth member of SMPAG, and that COSPAR had become its sixth permanent observer.

49. The Subcommittee further noted that the SMPAG Ad Hoc Working Group on Legal Issues, established by SMPAG in 2016 and coordinated by DLR, had presented to SMPAG at its 12th meeting, held on the margins of the current session of the Subcommittee, a report containing an initial analysis and assessment of the current legal context and of relevant legal questions and issues regarding planetary defence.

50. The Subcommittee noted in that regard that issues analysed in the report included whether, under international law, States had an obligation to provide information about or to take action to mitigate a potential near-Earth object impact threat; the legality of the use of planetary defence methods; and the responsibility and liability of States in relation to planetary defence efforts. The Subcommittee also noted that the report was being reviewed by SMPAG, which had commended its Working Group on Legal Issues for its efforts in producing it.

51. The Subcommittee noted a number of events and workshops dedicated to the topic of near-Earth objects, such as the four-week workshop held by the Munich Institute for Astro- and Particle Physics in Munich, Germany, from 14 May to 8 June 2018; the Near-Earth Object and Debris Detection Conference, held at the European Space Operations Centre in Darmstadt, Germany, from 22 to 24 January 2019; and the 2018 Erice Seminar on Planetary Emergencies, held in Erice, Italy, from 18 to 26 August.

52. The Subcommittee also noted that IAWN, SMPAG and the Office for Outer Space Affairs were planning to collaborate in the organization of an international seminar on the topic of near-Earth objects, to be held in Erice, Italy, from 20 to 24 April 2020.

53. The Subcommittee further noted that the sixth IAA International Planetary Defense Conference would be held from 29 April to 3 May 2019 in the Washington, D.C., area.

54. The Subcommittee noted with appreciation that a brochure on near-Earth objects and planetary defence ([ST/SPACE/73](#)) had been made available at the UNISPACE+50 event in June 2018, as well as at the current session of the Subcommittee, to raise awareness among member States and the wider space community of all the aspects of ongoing activities in international cooperation to effectively address potential risks from hazardous near-Earth objects. The brochure had been jointly produced by IAWN, SMPAG and the Office for Outer Space Affairs, with funding from ESA in its capacity as the Chair of SMPAG.

55. The Subcommittee noted that the next meetings of the IAWN steering committee would be held on 27 April 2019, in conjunction with the sixth IAA International Planetary Defense Conference, and on 12 September 2019, to be followed by the SMPAG meeting on 13 September 2019, at ESO, in Garching, Germany.