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**Committee on the Peaceful  
Uses of Outer Space  
Scientific and Technical Subcommittee  
Fifty-fourth session  
Vienna, 30 January-10 February 2017****Draft report****VIII. Space weather**

1. In accordance with General Assembly resolution 71/90, the Scientific and Technical Subcommittee considered agenda item 10, "Space weather".
2. The representatives of Canada, China, Egypt, Germany, Indonesia, Italy, Japan, Mexico, Pakistan, the Russian Federation and the United States made statements under agenda item 10. During the general exchange of views, statements relating to the item were made by representatives of other member States.
3. The Subcommittee heard the following scientific and technical presentations:
  - (a) "Opportunities in science and engineering with space applications at the National Institute for Space Research", by the representative of Brazil;
  - (b) "Terrestrial gamma-ray flashes and lightning discharges", by the observer for the Scientific Committee on Solar-Terrestrial Physics;
  - (c) "Brazilian monitoring of space weather", by the representative of Brazil.
4. The Subcommittee had before it the following:
  - (a) Conference room paper entitled "Steering committee meeting of the International Space Weather Initiative, 19 February 2016: report on the adoption of an open data policy for the Initiative's instrument network", submitted by the rapporteur of the Expert Group on Space Weather ([A/AC.105/C.1/2017/CRP.8](#));
  - (b) Conference room paper entitled "Space weather: views of France", submitted by France ([A/AC.105/C.1/2017/CRP.24](#));
  - (c) Conference room paper entitled "Progress report on the work of the Expert Group on Space Weather under UNISPACE+50 thematic priority 4, 'International framework for space weather services' at the fifty-fourth session of the Subcommittee", submitted by the Rapporteur of the Expert Group on Space Weather ([A/AC.105/C.1/2017/CRP.30](#)).
5. The Subcommittee noted that space weather was an international concern because it had the potential to threaten the ground- and space-based infrastructure



upon which society increasingly relied. As such, it needed to be addressed from a global perspective through international cooperation and coordination aimed at predicting potentially severe space weather events and mitigating their impacts. In that regard, the Subcommittee noted the importance of continuous participation of countries worldwide in space-based and ground-based measurements and forecast services.

6. The Subcommittee further noted the importance of focused research that would lead to improvements in modelling and forecasting capabilities over time so as to understand both the drivers of space weather and the impact of space weather events on Earth and in space with a view to ensuring appropriate planning and coordinated responses from Member States and their national and international agencies in predicting and mitigating severe space weather events.

7. The Subcommittee welcomed with appreciation UNISPACE+50 thematic priority 4, “International framework for space weather services”, one of the seven UNISPACE+50 thematic priorities endorsed by the Committee on the Peaceful Uses of Outer Space at its fifty-ninth session in 2016 (see [A/71/20](#), para. 296).

8. The Subcommittee welcomed the fact that the Expert Group on Space Weather of the Subcommittee, as the mechanism designated to pursue the objective of UNISPACE+50 thematic priority 4 on space weather with the substantive support of the Office for Outer Space Affairs, had undertaken steps to align its workplan with the objective of the thematic priority and had started to develop a strategy, taking into account the intersessional work of the Expert Group and in coordination with the Office. The report was to be presented to the Subcommittee at its fifty-fifth session, in 2018.

9. The Subcommittee noted that a number of international and regional initiatives and programmes were aimed at addressing potentially severe effects of space weather, such as “Understanding space weather to shield society: a global road map for 2015-2025” of the Committee on Space Research; International Living with a Star; the 2016-2019 four-year plan for activities related to space weather of the World Meteorological Organization; the establishment of 18 regional warning centres linked to International Space Environment Services, the Asia-Oceania Space Weather Alliance; and the scientific studies being undertaken at the regional forum of the Asia-Pacific Space Cooperation Organization.

10. The Subcommittee noted that in order to foster international cooperation in the interests of maintaining continuous space weather monitoring in the future, including by filling gaps as appropriate, it was critical to have open access to interoperable data. In that regard the Subcommittee welcomed the progress made by the International Space Weather Initiative (ISWI) and noted with satisfaction the adoption by the ISWI steering committee of an open data policy, as presented to the Subcommittee (see [A/AC.105/C.1/2017/CRP.8](#)).

11. The Subcommittee also noted a number of national activities undertaken in space weather research, training and education to improve the scientific and technical understanding of adverse space weather effects, with the aim of strengthening space weather resilience.

12. The Subcommittee noted with appreciation a number of global conferences and workshops held on space weather, including one with direct relevance for UNISPACE+50 thematic priority 4 on space weather: the United Nations/United States workshop entitled “International Space Weather Initiative: the decades after the International Heliophysical Year 2007”, to be held in Boston, United States, from 31 July to 4 August 2017.

13. The Subcommittee noted that this workshop would mark the tenth anniversary of the International Heliophysical Year 2007, which had led to the creation of ISWI. The Subcommittee noted that the workshop would focus on recent advances made in scientific research by utilizing ISWI instrument data in conjunction with space mission data to acquire significant new knowledge about space weather phenomena near Earth and in interplanetary space, and that the inputs received from the workshop would be used to further advance the work undertaken within the UNISPACE+50 thematic priority 4 on space weather.

14. The Subcommittee noted that the Expert Group on Space Weather would be invited to contribute to the United Nations/United States workshop, in particular to the high-level international forum on the economic and societal effects of extreme space weather, which will be held on the first two days of the workshop.

15. The Subcommittee further noted that the Expert Group would engage in a number of other space weather workshops around the world and that it was planning to hold a meeting and workshop dedicated to UNISPACE+50 thematic priority 4 on space weather on the margins of the congress of the European Geosciences Union to be held in Vienna from 27 to 28 April 2017, with the support of the Office for Outer Space Affairs.

16. The Subcommittee also noted that the Office for Outer Space Affairs, as the body leading the Inter-Agency Meeting on Outer Space Activities (UN-Space), was preparing a special report on space weather, to be issued for consideration by the Committee at its sixtieth session, in June 2017, in the context of the preparations for UNISPACE+50.

17. The view was expressed that space weather was an important element in the effort to ensure the long-term sustainability of outer space activities and that it was important to work collaboratively towards an international framework of space weather services as part of UNISPACE+50.

18. At the 864th meeting of the Subcommittee, the rapporteur of the Expert Group on Space Weather presented the progress the Expert Group had made on the margins of the current session of the Subcommittee, stressing the importance of working towards achieving the objectives of UNISPACE+50 thematic priority 4 on space weather.

19. At its meetings on the margins of the fifty-fourth session of the Subcommittee, which were attended by more than 27 experts from 20 countries, the Expert Group welcomed the mandate given to it by the Committee to work as the mechanism under UNISPACE+50 thematic priority 4 on space weather with the substantive support of the Office for Outer Space Affairs, and also welcomed the fact that under the mechanism, space weather-related activities were to be implemented also through the capacity-building activities of the Office and through the role of the Office as the executive secretariat of the International Committee on Global Navigation Satellite Systems (ICG). The Expert Group underlined that important synergies existed between the tasks set out in its existing workplan as endorsed by the Subcommittee in 2015 (see [A/AC.105/1088](#), para. 169) and the objectives of thematic priority 4 on space weather. In that regard, the Expert Group agreed to focus, during the coming year, on the preparation of a report for the mitigation of space weather effects to be considered by the Subcommittee and the Committee under UNISPACE+50 in 2018.

20. The Expert Group agreed to build on the successful outcomes of a space weather workshop entitled “From scientific discovery to applications, services, and infrastructure protection”, which it had hosted on the margins of the fifty-third session of the Subcommittee, in February 2016. In that regard, the Expert Group had begun to develop a road map for international coordination and information exchange regarding

space weather events and the mitigation of its adverse impacts through risk analysis and assessment of user needs, as required under the objectives of thematic priority 4 on space weather.

21. The Expert Group highlighted two main goals through which the Committee could make significant and actionable future contributions towards the mitigation of the adverse impacts of space weather:

(a) There was a need to develop an improved basis for international monitoring, forecasting, and warning procedures, especially in the form of more coordinated international communication and coordination of warnings of extreme space weather events. The Expert Group noted that individual Member States had some existing capabilities in that regard upon which to build;

(b) There was a need to define a set of best practices, operating procedures and actions to mitigate the adverse impacts of extreme space weather, which required a prior assessment in each Member State of its exposure to risks from space weather and related socioeconomic impacts, as well as defined operating procedures, developed in partnership with administrations responsible for critical infrastructure and civil protection.

22. The Expert Group also continued to examine the potential future governance and cooperation mechanisms needed for the implementation of a comprehensive space weather mechanism. In that regard the Expert Group underlined that it was important that the Committee, through the Office for Outer Space Affairs, establish a clear relationship between its role and that of other United Nations entities and other space weather stakeholders, including the World Meteorological Organization (WMO), the International Civil Aviation Organization (ICAO), the International Space Environment Service (ISES), the Coordination Group for Meteorological Satellites (CGMS), the Committee on Space Research (COSPAR), ISWI, the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), and others.

23. The Expert Group expressed appreciation to the Office for Outer Space Affairs for its support and for its presentations on the governance structures in place in the areas of global navigation satellite systems and the associated mechanism of ICG, and on planetary defence and the associated mechanisms of the International Asteroid Warning Network (IAWN) and the Space Mission Planning Advisory Group (SMPAG).

## **XI. Long-term sustainability of outer space activities**

24. In accordance with General Assembly resolution 71/90, the Subcommittee considered agenda item 13, “Long-term sustainability of outer space activities”, under the workplan contained in the report of the Committee on the Peaceful Uses of Outer Space on its fifty-fourth session (A/66/20, annex II) and as extended by the Committee at its fifty-seventh and fifty-ninth sessions (A/69/20, para. 199 and A/71/20, para. 137).

25. The representatives of Austria, China, Germany, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Pakistan, South Africa, the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 13. A statement was made under the item by the representative of Argentina on behalf of the Group of Latin American and Caribbean States. The observer for the Secure World Foundation also made a statement. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

26. The Subcommittee had before it the following:

(a) Note by the Secretariat entitled “Guidelines for the long-term sustainability of outer space activities” ([A/AC.105/C.1/L.354/Rev.1](#));

(b) Working paper by the Chair of the Working Group on the Long-term Sustainability of Outer Space Activities entitled “Outline for the report of the Working Group on the Long-term Sustainability of Outer Space Activities” ([A/AC.105/C.1/L.357](#));

(c) Working paper by the Russian Federation entitled “Further ideas on a set of goals for achieving the Vienna Consensus on Space Security and the need for thorough reflection on the modalities of addressing the complex issues associated with space traffic management and the justifiability of the high expectations of early decisions in the area” ([A/AC.105/C.1/L.361](#));

(d) Conference room paper by the Chair of the Working Group on the Long-term Sustainability of Outer Space Activities entitled “Proposals for the guidelines for the long-term sustainability of outer space activities” ([A/AC.105/C.1/2017/CRP.13](#));

(e) Conference room paper by the United Kingdom entitled “The United Kingdom’s implementation of the first set of guidelines for the long-term sustainability of outer space activities” ([A/AC.105/C.1/2017/CRP.21](#)); and

(f) Conference room paper by France entitled “General presentation of French activities and views on the long-term sustainability of outer space activities in relation to the implementation of the first set of guidelines ([A/71/20](#), annex)” ([A/AC.105/C.1/2017/CRP.26](#)).

27. In accordance with General Assembly resolution 71/90, the Working Group on the Long-term Sustainability of Outer Space Activities was reconvened under the chairmanship of Peter Martinez (South Africa).

28. The Subcommittee welcomed the progress made by the Working Group since its most recent session, including work undertaken during the fifty-ninth session of the Committee and during the third intersessional meeting of the Working Group on the Long-term Sustainability of Outer Space Activities, held in Vienna from 19 to 23 September 2016.

29. Some delegations expressed the view that the first set of guidelines for the long-term sustainability of outer space activities ([A/71/20](#), annex), agreed to at the fifty-ninth session of the Committee, in June 2016, represented a milestone in international cooperation in the peaceful uses of outer space.

30. The view was expressed that the successful completion of a full compendium of guidelines would strengthen the role of the Committee as the anchor institution of the United Nations for space governance.

31. The view was expressed that the Committee and its Subcommittees have a fundamental role in addressing the long-term sustainability of outer space activities, as that is a topic that demands a multilateral approach and needs to be addressed at the international level.

32. The view was expressed that it was imperative that the process to ensure the long-term sustainability of outer space activities within the Subcommittee succeed in order to underscore and strengthen the role of the Committee as the leading multilateral forum for the progressive development and codification of space law and norms guiding the actions of States in outer space.

33. Some delegations expressed the view that the completion of a final compendium of guidelines for the long-term sustainability of outer space activities would represent an important contribution to UNISPACE+50.
34. The view was expressed that those topics for which it may not be possible to complete specific guidelines by the fifty-fifth session of the Subcommittee could be considered further using the mechanisms specified under the relevant thematic priorities of UNISPACE+50. In that context, the thematic priorities on the legal regime governing outer space and on the enhanced exchange of information on space objects and events, the mechanisms for which included coordination with the Working Group, were specifically underscored.
35. The view was expressed that it should be possible for the Working Group to reach a consensus on an additional number of guidelines during the current session of the Subcommittee.
36. The view was expressed that work on the second set of guidelines should be conducted in a spirit of equality and in an open and tolerant manner, with all comments welcomed and all parties listened to.
37. The view was expressed that the work on the guidelines for the long-term sustainability of outer space activities would only be completed once a complete version of all guidelines was available that took into account the interests of all States. The delegation expressing this view also stated that it reserved the right to comment on any guideline at any time.
38. The view was expressed that all guidelines for the long-term sustainability of outer space activities must align with current international law on outer space activities.
39. Some delegations expressed the view that the legal aspects of some of the topics under consideration by the Working Group should be discussed in the Legal Subcommittee.
40. Some delegations expressed the view that outer space should be used exclusively for peaceful purposes and that all legal means should be sought to preserve outer space for such purposes. Delegations expressing this view also stated that the lack of agreed definitions for the terms “arms” or “weapons” or the lack of progress in other specialized forums on non-militarization should not prevent the Committee from taking decisions reaffirming the use of outer space for exclusively peaceful purposes.
41. The view was expressed that two new sections were needed in the guidelines document: one focusing on definitions and another focusing on principles.
42. Some delegations expressed the view that the guidelines for the long-term sustainability of outer space activities should protect the interests of developing countries and emerging space nations and not limit their access to outer space.
43. Some delegations expressed the view that the guidelines for the long-term sustainability of outer space activities should not become an instrument for countries that have traditionally managed space technology to impose restrictions on other countries. The delegations expressing this view also stated that it was the right of each State to develop and use space technology as a fundamental tool to improve the living conditions of its inhabitants.
44. The view was expressed that special importance should be given to the technical aspects of ensuring the long-term sustainability of space activities, and that emphasis should be put on international cooperation and the transfer of technology as effective means to promote research programmes and build capacity in countries with emerging space capabilities.

45. Some delegations expressed the view that States should begin to focus their attention on implementing the guidelines.

46. The view was expressed that it might be useful to agree that each member State would submit a report on its status of implementation of the guidelines, taking into consideration that the guidelines are not legally binding and their implementation is voluntary. The delegation expressing this view also stressed the importance of gathering and sharing information, insights and experiences, ensuring transparency and building mutual confidence in a constructive atmosphere.

47. The view was expressed that the guidelines should be effective, practicable, concise and based on evidence and best practices.

48. Some delegations expressed the view that issues related to the long-term sustainability of outer space activities should be considered in the light of the conclusions set out in the report of the Group of Governmental Experts on Transparency and Confidence-Building Measures in Outer Space Activities ([A/68/189](#)).

49. The view was expressed that some of the proposed guidelines could be considered as potential measures to build transparency and confidence, whereas others could provide the technical basis for the implementation of other measures to strengthen stability in outer space.

50. At its [...] meeting, on [...] February, the Subcommittee endorsed the report of the Working Group on the Long-term Sustainability of Outer Space Activities, which is contained in annex [...] to the present report.

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