



General Assembly

Distr.: General
9 November 2022
English
Original: English/French

**Committee on the Peaceful
Uses of Outer Space
Scientific and Technical Subcommittee
Sixtieth session**
Vienna, 6–17 February 2023
Item 12 of the provisional agenda*
Long-term sustainability of outer space activities

Information and views for consideration by the Working Group on the Long-term Sustainability of Outer Space Activities

Note by the Secretariat

Addendum

Contents

	<i>Page</i>
II. Replies received from States and organizations	2
Algeria	2
Austria, Chile, Slovakia and Spain	4
France	5
Committee on Space Research	7

* A/AC.105/C.1/L.405.



II. Replies received from States and organizations

Algeria

[Original: French]
[30 October 2022]

Contribution of Algeria to the informal discussions on the long-term sustainability of outer space activities

Algeria, through the Algerian Space Agency (ASAL), firmly supports the implementation of the Guidelines for the Long-term Sustainability of Outer Space Activities of the Committee on the Peaceful Uses of Outer Space with a view to achieving the peaceful, safe and responsible use of outer space and ensuring that all nations can continue to benefit from the long-term use of outer space.

A. Policy and regulatory framework for space activities

Guideline A.1

Adopt, revise and amend, as necessary, national regulatory frameworks for outer space activities

With regard to national legislation relating to the exploration and peaceful use of outer space, Algeria enacted a law on space activities in 2019 with the aim of developing space technologies in Algeria and making the space domain an engine for other sectors.

As interest and activity in outer space continues to grow, further efforts must be made to implement a sustainable national regulatory framework for regulating and guiding space activities, and to establish a national space policy consistent with international law. Accordingly, the body of national regulations in this area is being expanded. As an initial phase, texts implementing the aforementioned law (No. 19-06 of 17 July 2019) are being drafted, namely:

- A draft decree on the procedures for registration in the national registry of objects launched into outer space, in application of the provisions of article 10 of chapter 2, entitled “Registration of space objects”, of the space law
- A draft decree on a system for space risk prevention and mechanisms for intervention in the event of a disaster, in accordance with the provisions of article 17 of chapter 3, on space risk prevention and disaster management

Chapter 3 includes a proposed amendment to Act No. 04-20 of 25 December 2004, which relates to the prevention of major risks and disaster management in the context of sustainable development, to include space risks. With respect to the adoption of non-binding United Nations instruments on outer space, Algeria adheres to the principle of precedence of international law and, in that spirit, takes into consideration the relevant resolutions of the United Nations with regard to the development of these space activities.

Guideline A.3

Supervise national space activities

Over the past 10 years, Algeria has made considerable efforts under its national space programme (2006–2020) to build up a pool of highly qualified personnel to supervise and operate its satellite systems during all phases of their life cycle in a continuous, safe and responsible manner. Those efforts have led to the launch of five satellites (Alsat-1B, Alsat-2A, Alsat-2B, Alsat-1N and Alcomsat-1), four for Earth observation and one for space communications. In order to ensure the supervision of those space

projects, Algeria has built up a pool of experts, engineers and doctors, from 100 in 2006 to more than 1,000 in 2020, in the various fields of space technologies and applications.

Guideline A.4

Ensure the equitable, rational and efficient use of the frequency spectrum and the various orbital regions used by satellites

In accordance with the objective of article 45 of the International Telecommunication Union (ITU) Constitution, Algeria takes great care to operate its satellite systems in accordance with requirements and procedures that ensure the safety of its space activities and in such a manner as not to cause harmful interference with radio signals received or transmitted from other satellite systems belonging to other States.

Guideline A.5

Enhance the practice of registering space objects

Algeria has dedicated one of the chapters of its space law to the registration of space objects and has defined the procedures for registration in the national registry on the basis of the Convention on Registration of Objects Launched into Outer Space, which was signed in New York on 14 January 1975 and ratified by Presidential Decree No. 06-468 of 11 December 2006.

B. Safety of space operations

Guidelines B.1, B.2, B.3, B.4 and B.5

With regard to the safety of space operations, Algeria believes that guidelines B.1 and B.2 are strongly correlated with guidelines B.3, B.4 and B.5 in terms of the technological aspects of their implementation. The implementation of those guidelines must be prioritized as a matter of urgency in order to address the risks associated with the continued proliferation of low-altitude satellite constellations. In that respect, Algeria considers that the use of advanced technologies to measure, monitor and characterize the orbital properties of space objects, including such constellations and space debris, remains an activity that is costly and technologically challenging for emerging space nations.

It is therefore important to establish a plan for the safety of space operations, inter alia, by drawing on the technological facilities available to spacefaring nations. Such a plan would be supported by the development and operation of resilient and interoperable systems, the promotion of responsible behaviour in space and the sharing of information necessary to ensure the safety of space operations.

This proposal is also aimed at addressing the vital need to encourage the responsible use of space on the basis of the recognition of international law, the challenges of space sustainability and the threats posed by technological progress.

Guidelines B.6 and B.7

Share operational space weather data and forecasts; and develop space weather models and tools

Weather effects degrade the performance, reliability and service life of spacecraft. Furthermore, increased radiation caused by space weather may increase health risks for astronauts participating in crewed space missions. The aviation sector might also be adversely affected, especially with regard to the electronic components of aircraft exposed to very high radiation at high altitudes. In sum, many sectors are vulnerable to the effects of space weather, such as those relating to space telecommunications, navigation or energy distribution.

These concerns should therefore be addressed at the global level through international cooperation and coordination so that potentially hazardous space weather events can be predicted and their impact mitigated in order to ensure the long-term sustainability of outer space activities.

Algeria believes that the strengthening of coordination and collaboration among national and international space weather actors is needed as a first step towards finding solutions to the threats posed by the adverse impacts of space weather. As a second step, in order to enable member countries of the Committee on the Peaceful Uses of Outer Space to gain a deeper understanding of this field, it is suggested that international research teams specialized in meteorology be established to support relevant activities by means of operational applications.

C. International cooperation, capacity-building and awareness

Algeria is of the view that international cooperation in the peaceful uses of outer space is the most appropriate way to facilitate the sharing of knowledge and the transfer of expertise and to promote space technologies and applications in support of sustainable socioeconomic development, environmental protection and human well-being.

Accordingly, it is pursuing its international cooperation efforts by initiating bilateral governmental agreements in the space sector with spacefaring nations and by participating in events dedicated to space technologies and applications, organized by agencies or United Nations bodies active in that field.

With regard to training and capacity-building, in the field of space technologies and applications, which constitute the key element of the national space programme, ASAL has established an academy of space technology and geodesy, which is to offer specific training programmes relating to outer space. The aim of the academy is to meet the growing needs of users in various economic sectors for highly qualified personnel with expertise in space technology and applications.

In addition to these activities involving space applications for the country's development, ASAL is stepping up its activities to raise awareness among high school and university students of the uses of space (under the "Eduospace" programme).

Furthermore, education and technology centres specializing in space technologies have offered or are offering short training courses at the regional centres for space science and technology education, affiliated to the United Nations.

In conclusion, Algeria considers that the objectives of the Guidelines will be achieved through the development and operation of resilient and interoperable systems, the promotion of responsible behaviour in space and the sharing of experience and information with the aim of ensuring the peaceful use of outer space. Algeria hopes that the spacefaring nations will contribute proactively to the sharing of lessons learned in this field by organizing seminars to train and enhance the knowledge of focal points in developing countries.

Austria, Chile, Slovakia and Spain

[Original: English]
[12 October 2022]

Input to the Working Group on the Long-term Sustainability of Outer Space Activities

The use of space has become indispensable to our daily lives. Large satellite constellations are an important step in technological and economic development. They will improve global connectivity and thus enable space solutions for sustainable development all over the world.

At the same time, this increase in space activities is becoming a challenge for the safe and sustainable conduct of space activities, and they have a serious impact on science and society.

For all of these reasons, the International Astronomical Union recommends that the Working Group on the Long-term Sustainability of Outer Space Activities consider how to ensure the sustainability of access to scientific knowledge from the night sky.

Austria, Chile, Slovakia and Spain support this proposal. Discussing the Union's proposal within the Working Group would allow for a coherent pooling of all aspects related to the sustainability of space activities by the Working Group, and thus a coherent set of recommendations to Member States.

France

[Original: French]
[8 November 2022]

Proposals of France in support of the second Working Group on the Long-term Sustainability of Outer Space Activities

Summary

The aim of the present text is to draw attention to the contributions already made by France to the implementation of the 21 Guidelines for the Long-term Sustainability of Outer Space Activities, adopted by the Committee on the Peaceful Uses of Outer Space at its sixty-second session, in 2019, and to the proposals of France for achieving the objectives of the second Working Group on the Long-term Sustainability of Outer Space Activities. The delegation of France intends to give priority to the sharing of experience with respect to the implementation of the 21 adopted guidelines and to the capacity-building measures to be undertaken to support emerging spacefaring nations that have indicated the need for such support. Owing to the rapidly changing space environment, it is necessary to review those guidelines regularly and to update them as needed.

A. Voluntary implementation of the existing guidelines

France, having been actively involved in the negotiations on the long-term sustainability of space activities since the creation – on the initiative of Gérard Brachet (France), Chair of the Committee on the Peaceful Uses of Outer Space at its forty-ninth and fiftieth sessions – of the first working group dedicated to the issue in 2008, welcomes the adoption by the Scientific and Technical Subcommittee, at its fifty-ninth session, of the terms of reference and the workplan of the second Working Group, and is grateful to the Chair of the Working Group, Umamaheswaran R., for his efficient steering of the negotiations.

The delegation of France submitted a conference room paper (A/AC.105/C.1/2022/CRP.20) to the Scientific and Technical Subcommittee at its fifty-ninth session detailing the measures taken by the National Centre for Space Studies (CNES), in collaboration with its public and private partners, to implement all 21 adopted guidelines. The paper explains the regulatory initiatives, technical and technological innovations, and cooperation and capacity-building activities carried out by France to reduce the risks of collision or interference and to preserve the sustainability of space activities.

On the basis of this experience, France wishes to emphasize the need to mobilize, in a cross-cutting and coordinated manner, all the human and technical resources of the public and private stakeholders involved in implementing the existing guidelines. Our current priority is for all established or emerging spacefaring nations to adopt and implement those guidelines. France thus wishes to give priority, within the framework

of future discussions in the Working Group, to the sharing of experience in the voluntary implementation of the 21 existing guidelines. It encourages the development of a mechanism for the periodic review of their application in order to foster continuous exchanges between Member States, in particular on how to respond to any difficulties encountered.

B. Main challenges

The delegation of France wishes to reiterate its support for the central role of the Committee in defining reference principles at the multilateral level to guide standardization work. France, in applying the guidelines adopted in 2019 (notably guideline A.2, paragraph 2 (f)), acknowledges the positive contribution of standardization institutions to the long-term sustainability of space activities. Owing to the multiplication of private initiatives in orbit, it is necessary to develop standards with a view to harmonizing good practices and reducing the risks of debris generation and of collisions. The definition and dissemination of technical standards must be in line with the reference principles defined by the States members of the Committee.

Furthermore, the long-term sustainability of space activities could take into account the challenges related to the impact of large constellations of satellites on Earth-based scientific research in the fields of astronomy and astrophysics. As a first step, the Working Group could encourage Member States to foster a constructive dialogue between the scientific and industrial communities. The aim would be to identify the issues and develop proposals for solutions to the difficulties presented by those large constellations.

France recognizes the growing role of the private sector in the long-term sustainability of outer space activities and intends to continue to pursue a policy of supporting innovation and the competitiveness of industry and start-ups involved in the preservation of space and the long-term sustainability of space activities (for example, the France 2030 investment plan). In this respect, it intends to involve private actors more closely in the work of the second Working Group.

The deployment of regulatory, operational, scientific and technical solutions to meet the challenges of the long-term sustainability of space activities must take into account the ongoing, profound changes in the practices and nature of the stakeholders involved in those activities. Privatization, the growing number of space actors, the rapid increase in the number of objects in orbit – to which the development of large constellations has contributed – and the miniaturization of satellites have all accelerated in recent years, posing a challenge to the implementation of the 21 adopted guidelines yet also bearing testimony to their relevance.

Accordingly, the Working Group could, following in-depth exchanges between Member States on the consequences of this evolving orbital situation, encourage avenues for further development of the guidelines. Such development could first consist in reinforcing or adapting existing guidelines concerning, for example, the place of new innovative space-sector companies in the sustainability of in-orbit activities, support for research and development and for the creation of innovative ecosystems, or awareness-raising among current and future managers of national agencies and companies with respect to the issues at stake in the Working Group through targeted basic training and continuous learning activities. Such deliberations, together with periodic review, could make it possible to identify gaps or to determine whether it would be impracticable to update existing guidelines, in which case the creation of new guidelines might be justified.

As highlighted in the conference room paper submitted by France (A/AC.105/C.1/2022/CRP.20), the dual nature – civilian and military – of technologies for monitoring debris in space or for actively removing debris is an important fact to be taken into consideration by the Working Group. On these specific issues, the competence of the Committee with respect to the peaceful uses of outer space should be acknowledged, and the Committee's work should focus on reducing

the risks posed to activities in orbit. Efforts should therefore be made to avoid raising issues in the Working Group that fall within the sphere of competence of Geneva, where work is being done to develop norms, rules and principles of responsible behaviour to reduce threats in outer space.

C. Capacity-building for emerging spacefaring nations

CNES implements a range of capacity-building measures on a bilateral basis by organizing conferences or training courses with its international partners on topics related to space traffic or the sustainable design of satellites. For example, several recent initiatives have been implemented in association with the Republic of Korea¹ and Singapore.²

France also participates in the capacity-building programme on space law set up by the Office for Outer Space Affairs of the Secretariat. In 2023, the Ministry for Europe and Foreign Affairs of France, in collaboration with CNES, will participate in the financing and facilitation of training courses organized by the Office for Outer Space Affairs at the Kenya Space Agency, as part of the programme entitled “Space law for new space actors”. The delegation of France would like to take this opportunity to stress that the implementation of the international treaties negotiated under the auspices of the Committee and of the provisions of the United Nations Charter through a national framework is a fundamental element of the long-term sustainability of outer space activities.

Committee on Space Research

[Original: English]
[7 October 2022]

Committee on Space Research contribution to the Working Group on the Long-term Sustainability of Outer Space Activities

As mentioned in the terms of reference of the Working Group on the Long-term Sustainability of Outer Space Activities, addressing this subject requires identifying the challenges and considering possible guidelines for addressing them, as well as raising awareness and building capacity. In the following discussion, the Committee on Space Research (COSPAR) addresses these two elements in turn.

Challenges and guidelines

Change of paradigm

The space landscape is rapidly changing, owing to the multiplicity of recent actors in the field. Institutions such as COSPAR must keep pace with this rapidly expanding space sector and increase its scope and must reach out to multiple stakeholders leading and influencing the global space dialogue and use their established and long-standing international networks to support and strengthen international cooperation in science.

Indeed, the emergence of a profusion of unconventional space actors on the landscape is changing the way in which space agencies manage space activities such as launches and satellite procurement, in line with the accumulated experience of industry actors in terms of the diversity of management approaches.

At the same time, the new actors in the so-called “Space 2.0” sector have revolutionized access to space and are laying out their ambitions to expand their activities on the Moon and in the solar system, sometimes even asking for an abrupt

¹ The fourth France/Republic of Korea seminar, held in September 2022.

² Two seminars held since 2020, including on the topics “International and regional developments in space policy and law” and “Framework for registration of space objects”.

change to the rules and legal framework according to which the traditional actors were functioning.

Planetary protection

This is, for instance, the case for planetary protection, in relation to which the COSPAR Panel on Planetary Protection has been guiding, for over six decades, compliance with the provisions of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies in terms of potential biological contamination of solar system bodies. In this regard, some of these new actors are calling for a drastic relaxation of the existing guidelines established by COSPAR and followed by space agencies worldwide to this day.

Satellite constellations

Apart from the subject of planetary protection, the evolution in the number and capabilities of space actors is also creating new challenges, or rather, adding new constraints to pre-existing challenges, such as the increase in space debris and in light pollution in the night sky.

Need for regulations

All of these new or evolving challenges are critical when considering guidelines for the future exploration of outer space, to allow for the coexistence of a much-welcomed economic development alongside the vital need for protecting the scientific exploration of space. In short, space exploration requires regulations and, even more importantly, the means to enforce these regulations, to avoid inheriting a lawless frontier.

Space weather

Improving space weather forecasting capabilities requires adequately supporting the scientific baseline in this area. The COSPAR Panel on Space Weather, as well as the international space weather action teams hosted by COSPAR, are playing a critical role in this area, with regular reports to the Committee on the Peaceful Uses of Outer Space through the COSPAR Panel on Space Weather liaison to the United Nations, Hermann Opgenoorth, and the memorandum of understanding that exists between the Office for Outer Space Affairs of the Secretariat and COSPAR.

On this topic, COSPAR, the World Meteorological Organization (WMO) and the International Space Environment Service have recently responded positively to the Committee on the Peaceful Uses of Outer Space on the proposal to lead efforts to improve the global coordination of space weather activities in consultation and collaboration with other relevant actors and international organizations, including the Committee.

A COSPAR-WMO-International Space Environment Service working group was created accordingly and met for the first time in Coimbra, Portugal, from 30 September to 1 October 2022.

Sustainable space exploration

Although COSPAR holds no specific mandate under the Outer Space Treaty of 1967 to address the topic of sustainable space exploration, we argue that the already established role of COSPAR with the Committee on the Peaceful Uses of Outer Space in establishing planetary protection guidelines and providing space weather-related input is indicative of our capacity to serve as the ideal forum to address this other matter at a scientific and societal level.

If requested to do so, COSPAR would be willing to undertake further related activities, including in full coordination with the Working Group on the Long-term

Sustainability of Outer Space Activities, and these could fall within the remit of the existing memorandum of understanding.

Raising awareness and building capacity

Apart from the challenges described above, it is crucial to raise awareness about the contribution of space to society, for instance, with regard to a matter as important as the fight against climate change. In that sense, extending this conversation to the social sciences and humanities disciplines is critical to helping the community in raising awareness of such subjects among the public and decision makers.

Beyond their related research on space topics, social sciences and humanities scholars can indeed serve as a bridge between traditionally arcane disciplines and a less informed audience and can also relay the concerns and expectations of the public with respect to space scientists.

Activities to support the increasing number of developing and emerging space nations and to foster gender equality, diversity and the attractiveness of science, technology, engineering and mathematics careers are also crucial, in particular to be able to address and support the Sustainable Development Goals and the peaceful exploration and use of outer space, or the contribution of space to climate action.

COSPAR, as well as other organizations, including the United Nations, must therefore continue to develop their decades-long effort in the organization of capacity-building events and practical implementation tools. Strengthening these events and tools is vital to conveying practical knowledge to scientists in countries with less developed space capabilities and to building lasting bridges between scientists worldwide.

Relevant activities of the Committee on Space Research

1. Discussion on sustainable space exploration

COSPAR has recently initiated a discussion that is relevant to the subject of sustainable space exploration among its Panel on Exploration, Panel on Planetary Protection, Panel on Potentially Environmentally Detrimental Activities in Space and newly created Panel on Social Sciences and Humanities. The pathway for this discussion is to hold a series of workshops in 2023 to gather input and thoughts from the relevant communities and draft a white paper to express what is at stake and make recommendations to the concerned stakeholders (at the industry, policy and legal levels). We would welcome the participation of the United Nations, in particular through the Working Group on the Long-term Sustainability of Outer Space Activities and the COSPAR-WMO-International Space Environment Service working group.

2. Space weather-related international coordination

Activities of the Panel on Space Weather and the international space weather action teams, and the creation and development of the COSPAR-WMO-International Space Environment Service working group.

3. Climate action

Creation of a COSPAR task group on global climate change to coordinate the capabilities and activities of COSPAR to urge action on global climate change. A first milestone in the work of this task group will be the organization of the next COSPAR symposium, to be held on the margins of the session of the Scientific and Technical Subcommittee in 2023, entitled “Space-based Earth observation supporting climate action”. This activity should be coordinated with other relevant efforts, such as the International Astronautical Federation global space conference on climate change, to be held in Oslo in May 2023.

Committee on Space Research scientific bodies involved in addressing the long-term sustainability of outer space activities

COSPAR has three types of active scientific bodies within its structure: scientific commissions, panels and task groups. In addition, the President of COSPAR receives advice on how to best integrate the capabilities of industry into COSPAR activities, through our Committee on Industry Relations, which currently comprises 18 aerospace companies.

Although the subject of the long-term sustainability of space activities is of principal interest to all domains of expertise addressed by the 23 COSPAR entities, those whose remit covers more directly matters related to the long-term sustainability of outer space activities are:

- Scientific Commission B (Space studies of the Earth-Moon system, planets, and small bodies of the solar system), within which future exploration missions are being discussed
- Scientific Commission D (Space plasmas in the solar system, including planetary magnetospheres), which addresses, among other subjects, the Sun-Earth interaction and the space weather effects of such interaction
- The Panel on Potentially Environmentally Detrimental Activities in Space, covering subjects such as space debris in Earth orbit, the release of chemicals into the atmosphere from launches, and the disturbance of the lunar or Martian environment by human activities
- The Panel on Space Weather (see above, on Scientific Commission D)
- The Panel on Planetary Protection, which establishes guidelines concerning biological interchange in the conduct of space exploration, in guiding compliance with the corresponding provisions of the Outer Space Treaty
- The Panel on Capacity-Building, which conducts the COSPAR programme of capacity-building workshops to convey practical knowledge to scientists in countries involved in capacity-building and to build lasting bridges between scientists
- The Panel on Education, which develops means and media for the encouragement and spread of space-related education
- The Panel on Exploration, which provides advice to support the development of exploration programmes, to safeguard present and potential scientific assets of solar system objects and to understand the consequences of proposed and ongoing research, exploration and utilization activities
- The Panel on Innovative Solutions, which disseminates knowledge regarding new technologies and approaches that will benefit space research and also reflects on developments in the space domain that could generate spin-offs in other domains. There is a clear connection to industry and the Committee on Industry Relations
- The Panel on Social Sciences and Humanities. Newly created, the panel ensures a strong dialogue with social sciences and humanities colleagues and corresponding international unions. This dialogue should also extend to consideration of the Sustainable Development Goals and to the critical need to build awareness in society of the relevance and importance of space research to society, for example, regarding the challenges associated with the impact of human activity on the Earth system, and the role of space observations and research

In addition, the activities of other COSPAR task groups are also relevant to the long-term sustainability of outer space activities in relation to:

- Building constellations of small satellites for research

- Inclusion and diversity and the supporting of science, technology, engineering and mathematics careers
- Earth observation in support of climate action

Delegates are encouraged to contact the COSPAR secretariat (cospar@cosparhq.cnes.fr), or the Chairs of the commissions, panels and task groups, for further information about their activities.
