

Viewpoint

# The need for a United Nations space policy<sup>☆</sup>

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## Abstract

The international community is entering an era of shared global utilities from space and is increasingly reliant on space systems and activities that support a myriad of applications and utilities on Earth. A growing number of states are seeking to develop or extend their space capabilities. At the same time, a variety of non-state actors are also extending their involvement in space activities. The United Nations is the principal inter-governmental forum to deal with various space issues of global importance. Moreover, the United Nations system itself has become increasingly reliant on space systems for its day-to-day operations. In order for the United Nations to play its necessary role in the space arena, it will need to be supported by a space policy. A United Nations space policy would provide over-arching guidance on space activities for UN stakeholders in the space arena; it would inform UN participation in space activities and would promote improved coordination and cooperative governance of outer space activities. A world without a common UN space policy will not be able to respond to the challenges of the rapidly evolving space arena in the 21st century.

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## 1. Introduction

Space-based systems deliver information and services that protect lives and the environment, enhance prosperity and security, and stimulate scientific, industrial and economic development. They provide improved weather forecasts, satellite broadcasting and advanced navigation services and open up new opportunities in tele-education and tele-medicine. They are therefore critical to an increasing number of key areas of the economy and to meeting development agendas worldwide. Space is thus becoming a “global commons” offering a unique vantage point from which to address many challenges of the 21st century, such as monitoring and better understanding the phenomena of climate change and global warming, as well as

supporting sustainable development. Economic globalization in a technologically advanced world has in many cases resulted in the marginalisation of countries with scarce resources. The growing reliance on space technology and the increasing pace of international space activities necessitates a more coordinated and strategic approach to space activities at a global level than is currently the case.

## 2. Space in the United Nations

Since the earliest days of the Space Age, the United Nations has been responsible for the progressive development and codification of international law governing the activities of states in outer space. The Committee on the Peaceful Uses of Outer Space (COPUOS) was established by the United Nations General Assembly in 1959 (resolution 1472 (XIV)) “to review the scope of international cooperation in peaceful uses of outer space, to devise programmes in this field to be undertaken under United Nations auspices, to encourage continued research and the dissemination of information on outer space matters, and to study legal problems arising from

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the exploration of outer space”.<sup>2</sup> At the time it was established COPUOS had 24 Member States. As of 2010, the Committee has 69 Member States and a large number of Permanent Observers comprising both intergovernmental and non-governmental organizations.

Through the efforts of COPUOS and its Legal Subcommittee, a number of significant contributions to the law of outer space have been made. A significant first step was the adoption by the General Assembly in 1963 of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space. The years that followed saw the development of five multilateral treaties that further developed concepts contained in the Declaration of Legal Principles:

- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (1967);
- Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1967);
- Convention on International Liability for Damage Caused by Space Objects (1971);
- Convention on Registration of Objects Launched into Outer Space (1974);
- Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (1979).

These instruments were later supplemented by another four sets of Principles:

- Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (1982);
- Principles Relating to Remote Sensing of the Earth from Outer Space (1986);
- Principles Relevant to the Use of Nuclear Power Sources in Outer Space (1992);
- Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (1996).

In addition to the codification of these Treaties and Principles, progress has also been made in developing a common understanding on other issues. All in all, 110 UN General Assembly resolutions or recommendations relating to outer space have been adopted from 1958 to 2009.<sup>3</sup> For instance, a set of voluntary Space Debris Mitigation Guidelines was adopted in 2007. A Safety Framework for Nuclear Power Source Applications in Outer Space is under development jointly by the

Scientific and Technical Subcommittee of COPUOS and the International Atomic Energy Agency.

However, the work of the UN and COPUOS on space issues is not limited to treaties, principles and resolutions. Several practical steps have also been taken, such as the establishment of the UN Platform for Space-based Information for Disaster management and Emergency Response (UN-SPIDER) and the establishment of the International Committee on Global Navigation Satellite Systems (ICG). The UN Programme on Space Applications provides a great number of workshops, training courses, symposia and expert meetings for the benefit of developing countries. In addition, four Regional Centres for Space Science and Technology Education, affiliated to the UN, have been established in India for the Asia–Pacific region, in Morocco for francophone African countries, in Nigeria for anglophone African countries, and jointly in Brazil and Mexico for the Latin–American and Caribbean region.

There have been three United Nations Space Conferences, Unispace I in 1962, Unispace II in 1982 and Unispace III in 1999. The recommendations of these conferences have shaped the agendas of COPUOS and the UN Programme on Space Applications. The last of these conferences, Unispace III, adopted 33 recommendations. A review of the implementation status of the Unispace III recommendations presented by the UN Office for Outer Space Affairs during the 52nd session of COPUOS in July 2009 revealed that 30 recommendations had been implemented and three were outstanding.

Space technology and its applications are also increasingly being used within the United Nations system to support a wide range of activities. Although COPUOS focuses on space issues, at least 25 United Nations entities and the World Bank Group routinely use space systems. Space applications make important and sometimes essential contributions to the work of the United Nations (e.g. in the implementation of recommendations of major world conferences on sustainable development), but their role is not prominently recognized. Hence coordination, cooperation and synergy are essential for those activities to be effectively carried out by the United Nations system. For this reason in 1975 the UN established an annual inter-agency meeting to promote improved coordination among entities of the UN system that use space applications. The meeting serves as the focal point for inter-agency coordination and cooperation and for preventing duplication of efforts related to the uses of space applications by the UN. The inter-agency meeting held its 29th session from 4 to 6 March 2009.

While the United Nations is critically reliant on space systems for its day-to-day operations and effectiveness, its space activities are fragmented geographically and thematically among different centres. There is therefore a need to strengthen inter-disciplinary and inter-institutional cooperation and to promote and enhance space awareness at all levels in the United Nations system. This will maximise synergies and allow space to be an integral part of the main world conferences in various matters, such as development, resources and environment.

The rapid evolution of the space arena, in terms both of the growing number and the increasing diversity of users, underscores the importance of strengthening international legal and

<sup>2</sup> Website of the United Nations Committee on the Peaceful Uses of Outer Space <http://www.unoosa.org/oosa/en/COPUOS/copuos.html>.

<sup>3</sup> The full text of all these resolutions is available online in the six official languages of the UN at <http://www.oosa.unvienna.org/oosa/en/SpaceLaw/gares/index.html>.

policy frameworks for outer space. However, the changing global context for space activities is bringing into focus the need for the establishment of standards to guarantee the long-term sustainability of space activities. To adapt to emerging and future challenges, *both stability and change are needed* and there is therefore the necessity to adapt the United Nations to the needs of the 21st century. In particular, there is a need for increased coordination of United Nations activities to find holistic solutions to current and emerging global problems. The requirement to have a global United Nations approach to space affairs has never been so important.

The United Nations space organisations, and particularly the COPUOS that was created at the beginning of the Space Age, need to evolve and adapt to this new context in order to remain relevant in the future. The United Nations has up until now pursued a highly decentralised approach to space among its agencies and organisations. This should not be considered a tenable option for the future. This proposal for a UN space policy charts a course towards the United Nations regaining an important place in the global space context as the current arrangements are not fully satisfactory and a far more proactive approach is necessary to underpin and sustain the UN's capability to play its role in the rapidly evolving space arena of the 21st century. Too much is at stake for the global community for the United Nations to watch from the sidelines and to be only passive and reactive. To improve its ability to play a more strategic and purposeful role the United Nations will need to develop a balanced space policy that properly addresses the long-term requirements of the global community in its uses of outer space.

It is time to set clear directions. Space can contribute to the cohesion and identity of the United Nations and its stakeholders. A United Nations space policy is increasingly necessary to depart from the current *ad hoc modus operandi*. A sound policy that is relevant to the UN's objectives and priorities is thus essential for promoting the development and application of space activities for the benefit of humankind.

### 3. The need for a UN space policy

Given the current evolution of the space arena in the context of a diversification and multiplication of actors, threats and challenges, the United Nations needs to take action to provide an overall stewardship to space activities for the following reasons:

#### a) Stable order in orbit

The sustainability of space activities in Earth orbits over the long term is increasingly a matter of concern for spacefaring countries and regional space organisations, as well as for emerging space actors and commercial satellite operators. The Earth's orbital environment is a true common good for humankind. However, the growing population of space debris poses a major threat to the long-term sustainability of space activities. Improving the safety of space operations is thus one of the most important issues for the long-term sustainable use of orbits. Particular emphasis should be placed on the agreement

reached by COPUOS on the question of the character and utilization of the geostationary orbit and the subsequent endorsement by the UN General Assembly in resolution 55/122 of 8 December 2000 for improved management of orbital slots and electromagnetic frequencies as a measure for promoting more effective use of outer space.

#### b) Integrated approach to the use of space

The treaties and conventions governing the exploration and uses of outer space have been in place for several decades now and have served as the legal framework for space activities. However, many states have not yet acceded to these five core instruments, including some member states of the UNCOPUOS. Nonetheless, for preserving order in outer space, it is desirable that states and international organisations should conduct their space activities under the coverage of these instruments. Moreover, many states develop, own and operate spacecraft without participating in the rule-making process of space law, or without having ratified the existing treaties and conventions, but this needs to change. There are many bodies (international, regional and national) involved in rule making on the uses of outer space. There should, however, be an integrated approach under the auspices of the United Nations. The UNCOPUOS will provide an invaluable forum for promoting inter-regional dialogue and coordination among these bodies. In particular, a greater involvement of the United Nations could help to facilitate the legal harmonisation of existing domestic and international legal frameworks for outer space activities.

#### c) Need to establish a supportive environment for new space users and spacefaring countries

In the first decades of the Space Age, space activities were the exclusive domain of the world powers. But there is now a rapidly growing number of states involved in space activities. The changing space context, and particularly its growing complexity, is raising the importance of multilateral fora to deal with the long-term sustainability of space activities. A UN space policy would therefore help to create a supportive system and valuable learning opportunities for emerging space countries.

#### d) Utilization of space for the benefit of all humankind

Space by its nature is a useful tool for the management of issues that cross national borders. UN-led activities like UN-SPIDER and ICG, among others, have to be promoted to deal with transnational issues, such as supporting disaster relief or mitigating the effects of climate change and contributing to regional development agendas. Space can also be beneficial for assisting developing countries to improve their capability for using their natural resources, optimizing their infrastructure and land use, and for implementing more effective governance. Satellite communication has become a powerful engine of growth for development. Satellite Earth observation is an increasingly important element of treaty verification for non-proliferation, test-ban and environmental treaties. The

agencies of the UN system also play a key role in this regard. A UN space policy would help to improve human lives by maximising the benefits derived from space systems and services globally.

#### 4. Guiding principles for a UN space policy

A UN space policy should be guided by the following principles.

##### *4.1. Activities in outer space should be conducted for peaceful purposes and for the benefit of all humankind*

The international space arena of the 21st century is very different from what it was in the early days of the Space Age, when a few states were the only actors. Today there is a great proliferation of governmental and non-governmental actors, operating at national and international levels. Space activities have therefore changed from being the exclusive preserve of a few technologically advanced countries to a large and growing domain providing critical services and data for all countries in the 21st century.

The beneficiaries of space activities are now much more numerous and diverse than previously. Whereas in the beginning of the Space Age, outer space was seen as a domain of scientific and technical activity, today it is a domain for the provision of information and services to people on the ground. Space systems find widespread application in modern daily life in many ways that are so ubiquitous that they are taken for granted by the many millions of people who benefit from such systems. This widespread use of space has led to a new perception of space as a valuable global commons in which a number of systems operate.

The great reliance on space systems means that security on Earth is increasingly linked to security in space. This underscores the importance of preserving the space environment for peaceful uses. Space systems should therefore not be used to undermine international peace and security.

##### *4.2. The space environment should be used in a fair and responsible manner. To this end, all space activities should be conducted in accordance with the relevant international treaties and appropriate international best practices*

Today, many states develop, own and operate spacecraft in orbit without participating in the rule-making processes or ratifying the existing Treaties and Conventions. There are a number of international bodies involved in these rule-making processes, each with their own priorities and embodying different communities of practice. There is a need for a more integrated approach under the auspices of the United Nations.

The space environment is a limited natural resource in terms of certain classes of orbits and the electromagnetic frequency spectrum available for applications. The allocation and utilization of orbital slots in the geostationary orbit

continues to be an issue of concern to many countries, especially those without the direct means to access space.

The near-Earth space environment is becoming crowded, with many operational and defunct spacecraft occupying the same orbital regions. The growing population of man-made objects in space poses a hazard to the future sustainability of space activities. Collisions of space objects often result in fragmentation, which further increases the number of man-made objects in orbit. The intentional production of space debris is of great concern to all users of space systems. For this reason, such activities should be very strongly discouraged by the international community in the interests of preserving the Earth's orbital environment as a safe area in which to operate satellites, with acceptably low risk of disruption by space debris.

As more states become actors in the space arena, the orbital environment will become a more crowded and complex environment in which to operate. To date, 29 states have demonstrated sub-orbital launch capability and 11 have demonstrated orbital launch capability. Security in space (just like security on Earth's roadways) will rely on the orderly, safe and predictable behaviour of all users. The international community should consequently develop a set of space traffic management rules to ensure the orderly, predictable and safe conduct of activities in outer space. The adoption of the UN Space Debris Mitigation Guidelines may provide a model for a similar approach to other issues of broad concern.

The UN Treaties and Principles on Outer Space provide the legal framework for space activities, but a significant number of countries becoming active participants in the space arena have not yet ratified these agreements. Even a number of UNCOPUOS member states have not ratified the Registration and Liability Conventions. The UN should encourage maximum accession to these international legal instruments to promote fair and responsible use of the space environment. Another area in which the UN should take a lead is in facilitating the harmonisation of domestic and international legal frameworks relating to outer space.

Although the principles upon which the United Nations Treaties and Principles on Outer Space were developed are as valid today as they were 40 years ago, the space arena is very different, with a much greater number and diversity of actors. The technological possibilities are also much greater. This may lead to situations in the future for which the present international legal instruments are not adequate. Hence there is a need to consider the development of the international legal and political framework in the context of developments likely to occur in the next 50 years of the Space Age.

##### *4.3. There should be an integrated international and inter-regional approach to space activities. The international community should support and strengthen international cooperation in the space arena to preserve the space environment and its benefits for all humankind*

By its very nature, all space activities are global in character and essence. As more users enter the space environment, it becomes more important to promote and strengthen international

cooperation in the peaceful uses of outer space. At present, there are five principal fora at which overarching space issues are discussed in the UN: the UNCOPUOS in Vienna, the Conference on Disarmament in Geneva, the UN General Assembly in New York (and several of its committees, like the Disarmament and International Security Committee and the Special Political and Decolonisation Committee), UNESCO in Paris and the ITU in Geneva. In addition to these, the World Meteorological Organisation in Geneva makes use of space systems for monitoring and predicting terrestrial weather, and also supports international coordination of space weather activities, an area of growing importance since space weather affects all space systems. One of the objectives of a UN space policy would be to improve coordination among these fora for a more effective and coordinated use of outer space by the UN system and all its stakeholders. To ensure the widest possible support and adoption by the international community, a UN space policy should focus on the peaceful uses of outer space and should not address disarmament issues.

The international community should support and strengthen international cooperation to preserve the space environment and its benefits for all humankind. In this regard, the UNCOPUOS should encourage the greatest level of accession and adherence to the international Treaties and Principles on the Peaceful Uses of Outer Space. The creation and implementation of a supportive international regulatory environment for conducting peaceful space activities should thus be encouraged.

Issues of global importance, such as space-based disaster management, space debris mitigation, space traffic management, the safety of nuclear power sources in outer space, and planetary defence from impacts of Near-Earth Objects (NEOs) all require a coordinated global response. In the area of space-based disaster management, the UN has, for many years, utilised space assets to support disaster relief operations. With the UN-SPIDER initiative, the focus is on developing capacity to ensure access to and use of space-based solutions during all phases of the disaster, including the risk reduction phase, which will contribute to a significant reduction in loss of lives and property. In the area of space debris, work in the UNCOPUOS has already led to the adoption of a set of UN Space Debris Mitigation Guidelines. Although non-binding, these guidelines are widely supported by all the leading actors in the space arena. Likewise, steady progress is being made on the other issues of broad international interest, particularly in the domain of Global Satellite Navigations Systems (GNSS). The solutions to such issues can only be found through international cooperation, and the UN is the appropriate inter-governmental forum to pursue such solutions.

*4.4. The international community at large should encourage mechanisms to improve all states' abilities to access the benefits of the exploration and peaceful uses of outer space*

The past two decades have seen the emergence of space systems that are highly capable global utilities serving millions of users around the world, every day. However, to maximise the

benefits of space technology for developing countries, it is essential to support capacity building in these countries to utilize those technologies. For many years, the United Nations has played a leading role in building capacity in developing countries to harness space applications for progress and development. Now, many of these countries are themselves beginning to enter the space arena as emerging space countries. For these countries, access to the experience and knowledge gained by more experienced countries is very important.

In the early days of the Space Age, the Earth's orbital environment was essentially a boundless resource accessible to only a very limited number of actors. Therefore, avoiding interference or collisions with other users of the orbital environment was a relatively simple matter. Today, this is no longer the case. Emerging space countries need to take into account the many other users of the space environment and they need to take steps to avoid collisions and debris hazards in the space environment, as well as avoiding the accidental introduction of further debris. This can only happen if the necessary information is shared and the necessary capacity developed in these emerging space countries to utilize such information. Hence international cooperation between advanced and emerging space actors to build capacity is a key contributor to ensuring the long-term sustainability of space activities for all users of space.

Cooperation between established and emerging space countries in the same region is a good way to enhance and accelerate the development of space capabilities among the emerging space countries. Through its very wide reach, the United Nations is in a unique position to encourage and strengthen such regional initiatives. As one example, the five Regional Centres for Space Science and Technology Education affiliated to the United Nations provide a series of platforms for such cooperation.

## **5. The means for implementing a UN space policy**

The principles and practices of a UN space policy cannot be realized if there are no appropriate and adequate means to do so. It is therefore important to establish credible means for achieving the goals of a UN space policy. These means could be achieved if the UN were to:

- a) *Encourage member states to collaborate in the establishment of regional space cooperation fora and agencies for developing regional space programmes.* Regional space agencies and regional space programmes are of particular importance because geographically proximate states can develop and share assets to address the same concerns and issues. For instance, they can share a single satellite in geostationary orbit for satellite communications, broadcasting and meteorology. It would be highly useful to establish a common regional space policy for using the same satellites for common purposes, which would promote regional cooperation and maximise the use of limited resources such as orbital slots. Furthermore, regional space agencies can provide satellite images that

may be shared by the member states for cooperative security and confidence-building measures. The United Nations could also play a role as an inter-regional forum for the exchange of views and interests from these regional space agencies.

- b) *Strengthen the function to regulate the orbital environment for the fair and responsible use of space.* The management of the Earth's orbital environment should not be left up to individual states or agencies. It is the common interest of all humankind, and as such the UN should work towards establishing an international mechanism for monitoring debris creation and the implementation of debris mitigation measures. There should be a discussion about establishing an *ad hoc* monitoring entity within the UN Office for Outer Space Affairs that should have access to data and catalogues of debris collected by member states, and would analyze the situation of debris mitigation. This *ad hoc* entity would monitor compliance by the member states with the existing international space treaties and conventions and with relevant recommendations, particularly in regard to the UN Space Debris Mitigation Guidelines, and would report to COPUOS. Also, this entity should promote greater accession to and compliance with the Registration and Liability Conventions, not only by new actors, but also by established actors in space.
- c) *Promote dialogue between spacefaring states, space user states and other organizations.* It is the role of the United Nations to foster space activities to promote socio-economic development in developing countries. In order to do so, there should be a forum for discussing the requirements and concerns of users and of those of the spacefaring countries that build and operate space

systems. International non-governmental organisations, international agencies, such as the ITU, and private entities should support this dialogue and develop application programmes for developing countries to use space-derived data and space-based infrastructure.

- d) *Develop a forum of spacefaring states and a forum of space user states.* Although the United Nations provides a forum for all member states without any prejudice, it would be useful to establish a forum of spacefaring states which have capability for developing, launching and operating spacecraft, and a similar forum of space user states that focus on using space systems for their development. Given that the spacefaring states are also the principal space users, the space-user forum should be open to all member states. These fora would be useful platforms for facilitating communication among *and* between users and developers of space systems.

## 6. The way forward

In the unfolding new space era the United Nations cannot afford to miss the opportunity to develop its own long-overdue space policy. A world without a UN space policy would be lacking a key element to face the future with confidence, to improve current mechanisms for the exploration and uses of outer space, and to ensure the long-term sustainability of space activities. Moreover, the United Nations needs to find a new way of thinking about its role in the world, and space is a crucial element in this context. It is our sincere hope that this paper will stimulate discussion and debate on the role of the UN as both a forum for and an actor in the global space arena.