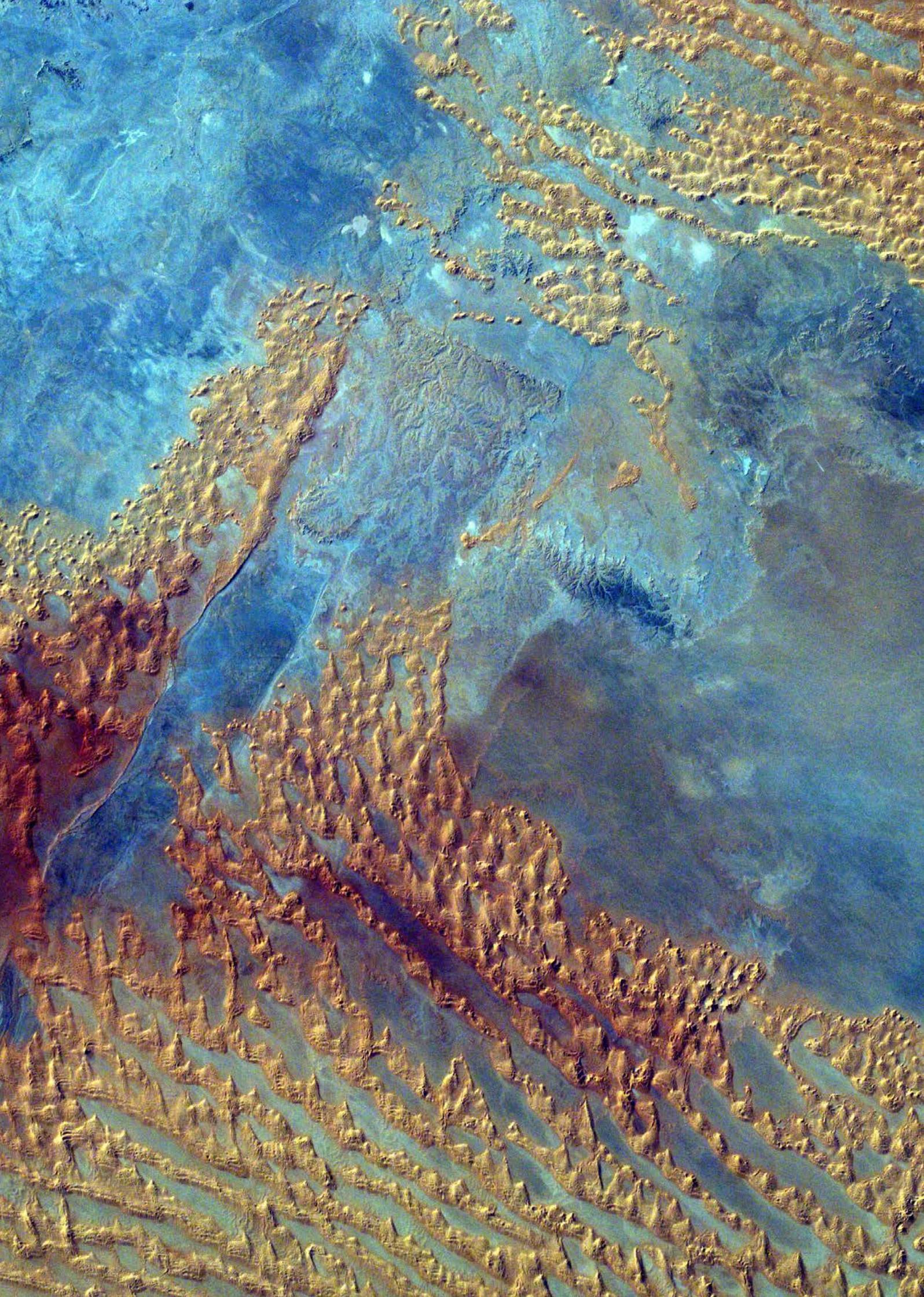


2016
Annual Report



UNITED NATIONS





UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS

Annual Report 2016

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Cover photo taken by former astronaut and now United Nations Champion for Space Scott Kelly from the International Space Station.

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Foreword



The year 2016 marked an important stepping stone towards the future of international cooperation in space activities and the work of the Office for Outer Space Affairs (UNOOSA).

Much of the Office's work in 2016 was to lay the foundations for the celebration of UNISPACE+50 in June 2018. UNISPACE+50 will be a unique opportunity for the international community to set ambitious goals for the future of global space cooperation. At its annual session in June 2016, the Committee on the Peaceful Uses of Outer Space (COPUOS) agreed on seven thematic priorities to guide preparations for UNISPACE+50, and the Office began work on these priorities.

As part of the preparations for UNISPACE+50, UNOOSA also organized the first substantive forum in the High Level Forum (HLF) series on "Space as a Driver for Socio-economic Sustainable Development", which addressed how space science and technology can support global sustainable development.

The wide-ranging stakeholder involvement in HLF reflects the increasing number of space actors and the growing complexity of the space arena. More Member States are joining COPUOS, and the Office is beginning to engage with the private sector, as appropriate. The number of topics requiring attention is also rising, including the

protection of critical infrastructures, transparency and confidence-building, space traffic management, and the long-term sustainability of outer space activities. These developments highlight the important role of UNOOSA's activities and mandates, such as the transparency facilitated by the United Nations Register of Objects Launched into Outer Space. But this new reality also calls for a shift in our collective mindset concerning space activities in order to achieve an ever more cooperative, inclusive environment.

At the same time, there is a renewed focus on the role of space in solving the greatest challenges faced by humanity. 2016 was the first year of implementation of the 2030 Agenda for Sustainable Development. Space data and technologies can—and must—be used as tools for achieving sustainable development on a global scale. The Office is striving to show the international community the crucial role played by space in this regard, as well as facilitating access to relevant tools, applications and opportunities for all Member States.

All of these developments have required UNOOSA to take a new approach to capacity-building, including a renewed focus on institutional capacity-building, on the empowerment of women and girls, on gender mainstreaming in the space sector, and on our network of regional centres.

In the past year the Office has continued to demonstrate its capabilities as a facilitator of both international cooperation in the peaceful uses of outer space and in the use of space for sustainable development. While the combination of increasing roles and mandates alongside insufficient resources remains a significant challenge, the UNOOSA team is honoured to uphold the vision of a more equitable future for all humankind through shared achievements in space.

Ms. Simonetta Di Pippo
Director, Office for Outer Space Affairs

Introduction





The United Nations Office for Outer Space Affairs (UNOOSA) promotes international cooperation in the peaceful use and exploration of space, and in the utilization of space science and technology for sustainable economic and social development. The Office supports all United Nations Member States in establishing legal and regulatory frameworks to govern space activities. By helping to integrate space capabilities into national development programmes, the Office also assists in strengthening the capacity of developing countries to use space science, technology and applications for development.



Roles and responsibilities

UNOOSA is the sole United Nations office responsible for promoting international cooperation in the peaceful uses of outer space. The Office serves as the secretariat for the General Assembly's only committee dealing exclusively with international cooperation in the peaceful uses of outer space: the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). The Committee has two subsidiary bodies: the Scientific and Technical Subcommittee, and the Legal Subcommittee, both established in 1961.

The Committee reports to the Fourth Committee of the General Assembly, which adopts an annual resolution on international cooperation in the peaceful uses of outer space. UNOOSA also discharges the Secretary-General's responsibilities under international space law and maintains the United Nations Register of Objects Launched into Outer Space.

The Programme on Space Applications is mandated to promote greater cooperation and build capacity in space science and technology. The priorities of the Programme include building indigenous capability in the areas of basic space sciences, basic space technology and human space technology. It also promotes the Global Navigation Satellite System and integrated space technology applications in the areas of global health, disaster management, climate change, humanitarian assistance, environmental monitoring and natural resource management.

The Office works closely with United Nations Member States to support their capacity-building efforts in space activities and their

development of national space infrastructure. The Office does this by organizing workshops on space-based technology subjects, space law and policy, as well as on questions relating to international cooperation in space activities and on United Nations space-related activities.

Furthermore, UNOOSA is the executive secretariat of the International Committee on Global Navigation Satellite Systems (ICG), which promotes voluntary cooperation on matters such as civil satellite-based positioning, navigation, timing and value-added services.

UNOOSA prepares and distributes reports, studies and publications on various fields of space science, technology applications and international space law. These documents and reports are available through the UNOOSA website.

UNOOSA is located at the United Nations Office at Vienna, and has satellite offices in Beijing and Bonn, Germany.



Number of satellites and other functional space objects registered in 2016

| STATE OF REGISTRY | SATELLITES | ROCKET STAGES |
|---|---------------------|---------------|
| Belgium | 1 | – |
| Brazil | 1 | – |
| Dem. People's Republic of Korea | 1 | – |
| Germany | 1 | – |
| India | 9 | 9 |
| Italy | 2 | – |
| Japan | 4 | – |
| Mexico | 1 | – |
| Poland | 1 | – |
| Russian Federation | 29 | – |
| Turkey | 3 | – |
| United States | 28 | 7 |
| SUBTOTAL | 81 | 16 |
| TOTAL SPACE OBJECTS | 97 | |

UNOOSA and the Sustainable Development Goals

On 25 September 2015, United Nations Member States agreed on a set of goals to end poverty, protect the planet and ensure prosperity for all as part of the 2030 Agenda for Sustainable Development. On 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the Agenda officially entered into force.

Space is an invaluable tool that can help Member States achieve the SDGs. Space science, technology and applications can help us monitor climate change, survey crops, respond to disasters, track diseases, learn remotely, achieve gender equality, and more. The SDGs therefore provide an additional framework for UNOOSA's work, and UNOOSA strives throughout its activities to promote and facilitate the use of space for the fulfillment of the SDGs.



Organizational structure

UNOOSA Director

The Office is headed by Director Ms. Simonetta Di Pippo (Italy), who leads the Office's strategies, policies and activities, ensuring that they are implemented in accordance with the mandates of the General Assembly, of COPUOS and the established policies of the United Nations. The Director advises the Secretary-General of the United Nations and the Director-General of the United Nations Office at Vienna, provides expertise on matters relating to the peaceful uses of outer space, and discharges the Secretary-General's obligations under international space law.

Office of the Director

The Office of the Director holds responsibility for administrative as well as budgetary oversight of the Office, and maintains the United Nations Register of Objects Launched into Outer Space. The Office of the Director also handles UNOOSA's public relations, including awareness-raising and outreach activities.



Committee, Policy and Legal Affairs Section

The Committee, Policy and Legal Affairs Section (CPLA) of UNOOSA provides substantive secretariat services to COPUOS, its Scientific and Technical Subcommittee and Legal Subcommittee, and related working groups. CPLA convenes and services the sessions of the United Nations Inter-Agency Meeting on Outer Space Activities (UN-Space) and provides advice on international space law.

Mr. Niklas Hedman (Sweden) has served as Chief of the Committee, Policy and Legal Affairs Section since January 2006.

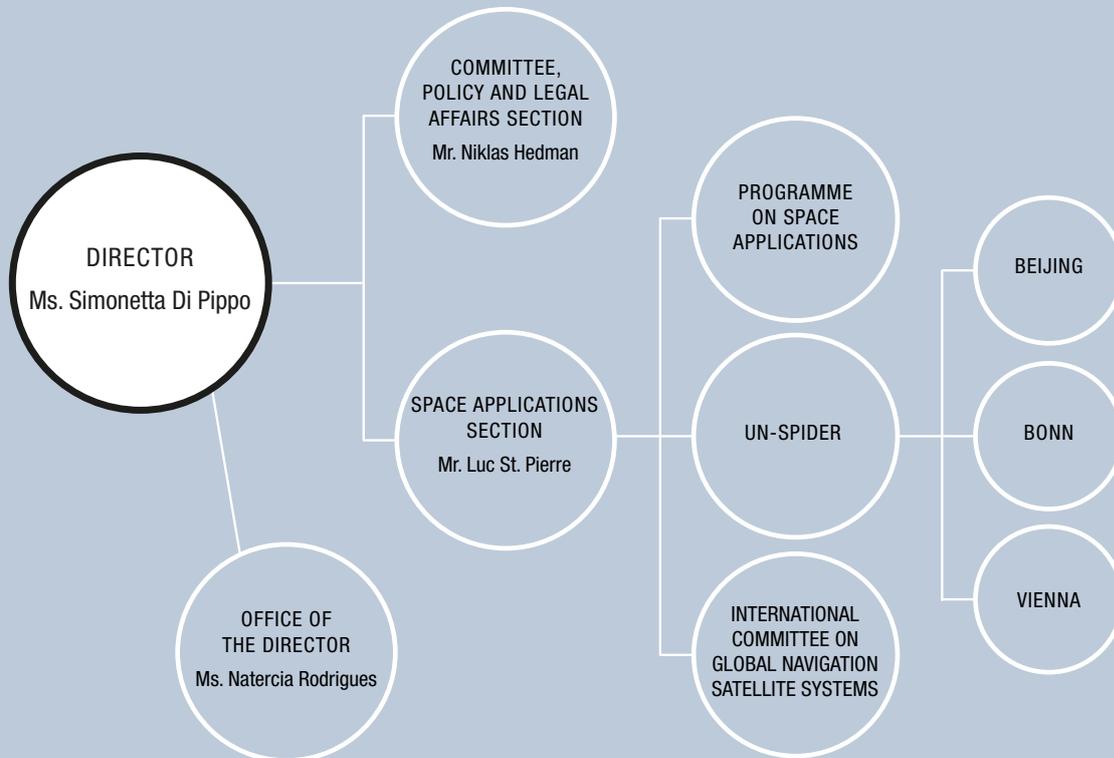
Space Applications Section

The Space Applications Section (SAS) promotes international cooperation in the uses of space research and technology for economic and social development, and implements the Programme on Space Applications by raising awareness and providing training on the practical applications of space technology, in particular for developing countries. The United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) sits within SAS, as does UNOOSA's executive secretariat support to ICG.

Mr. Luc St-Pierre (Canada) has served as Chief of the Space Applications Section since April 2016.¹

¹Mr. Takao Doi (Japan) served as Chief of the Space Applications Section until March 2016.

Organizational structure of the Office



Highlights





One of the major highlights for the Office in 2016 was the first substantive High Level Forum on “Space as a Driver for Socio-economic Sustainable Development”, held in Dubai, United Arab Emirates, from 20 to 24 November 2016 as part of preparations for UNISPACE+50. This forum was a unique opportunity for the broader space community to advance the conversation on the role of space science and technology in fostering sustainable development, based on four pillars: space accessibility, space diplomacy, space economy and space society.



Appointment of Scott Kelly as Champion for Space

At the High Level Forum in November 2016, former United States astronaut Mr. Scott Kelly was designated United Nations Champion for Space. Mr. Kelly will help the Office promote the role of space-based science and technology in sustainable development, as well as raise awareness of UNOOSA's activities and UNISPACE+50.

United Nations General Assembly proclamation of International Asteroid Day

Upon recommendation by COPUOS, the United Nations General Assembly proclaimed on 6 December 2016 that International Asteroid Day would be observed annually on 30 June to raise public awareness of the hazards of asteroid impact and the global work undertaken in this area by UNOOSA, COPUOS and Member States. The date of 30 June commemorates the anniversary of the largest asteroid impact on Earth in recorded history, the Tunguska event over Siberia, Russian Federation in 1908.



UNOOSA at the International Astronautical Congress

In September 2016, the Office significantly increased its presence at the annual International Astronautical Congress, held in Guadalajara, Mexico. In addition to another successful iteration of the annual United Nations-International Astronautical Federation Workshop on Space Technology for Socio-economic Benefits, for the first time UNOOSA had a booth at the exhibition, which received many visitors and was an invaluable outreach opportunity. UNOOSA also hosted a well-attended Global Networking Forum event on UNISPACE+50, held two press conferences with partners, and participated in other key events. In addition, UNOOSA staff presented seven technical papers on the Office's activities.

Discovery Days

Together with the Group on Earth Observations and the World Meteorological Organization, and with support from DigitalGlobe, on 11 May in Geneva the Office organized a Discovery Day on Very High Resolution (VHR) satellite imagery. In combination with United Nations Development Programme and DigitalGlobe, the Office organized a second Discovery Day at United Nations Headquarters in New York on 10 October on using space-based imagery and geospatial information for emergency response, humanitarian action, recovery and reconstruction projects, and environmental and natural resource management. These Discovery Days encouraged the use of VHR satellite imagery and analysis by various United Nations entities.



First candidate for KiboCUBE selected

UNOOSA and the Japan Aerospace Exploration Agency (JAXA) selected a team from the University of Nairobi, to be the first to benefit from the UNOOSA-JAXA KiboCUBE programme. As the successful candidate, the University of Nairobi team will build a cube satellite to be deployed from the Kibo module of the International Space Station. The team will use its KiboCUBE satellite to test technologies it has developed for the future launch of a larger earth observation satellite, and to apply data acquired to agriculture and coastal monitoring.

Tenth anniversary of UN-SPIDER

UN-SPIDER celebrated its tenth birthday in 2016. An anniversary conference in Vienna prior to the annual COPUOS session brought together experts and stakeholders to take stock of UN-SPIDER's efforts and make recommendations for its future.





Heads of Space Agencies meeting at COP22

On the occasion of the 22nd Conference of the Parties to the Climate Change Convention (COP 22) in Morocco, UNOOSA Director Simonetta Di Pippo participated in a meeting of heads of space agencies on how space technologies can contribute to efforts to curb climate change. She and the agency heads discussed how space agencies are helping implement COP agreements, and the need for enhanced cooperation and capacity-building to facilitate the use of satellite data for climate monitoring.



Dubai Declaration

The Dubai Declaration emerged as a result of the 2016 High Level Forum on “Space as a Driver for Socio-economic Sustainable Development”. The Declaration underscored the need for greater cooperation in outer space activities, outlined how to move forward in utilizing space to attain the Sustainable Development Goals, and recognized the increased role of commercial and private activities in the space sector.



Tenth United Nations Workshop on Space Law

The tenth United Nations Workshop on Space Law, held in Vienna from 5 to 8 September 2016, brought together experts in space law to address the contribution of space law and policy to space governance and space security in the twenty-first century. The workshop was a flagship activity under UNISPACE+50 thematic priority 2 “Legal regime of outer space and global space governance: current and future perspectives”. Its recommendations were provided in a final report, available on the website of the Office.

Agreement with China for increased space cooperation

In 2016, UNOOSA and the China Manned Space Agency agreed to work together to enable United Nations Member States, particularly developing countries, to conduct space experiments on board China's future space station, as well as to provide flight opportunities for astronauts and payload engineers. China expects its space station to be operational by around 2022.



Announcement of Dream Chaser® mission

In September, UNOOSA and the Sierra Nevada Corporation (SNC) announced details of their partnership for a low-Earth orbit mission using SNC's Dream Chaser® spacecraft. This dedicated mission aims to provide United Nations Member States, particularly developing countries, with the opportunity to develop and fly micro-gravity payloads for an extended duration in orbit. The experiments selected will study topics related to the Sustainable Development Goals. This mission is expected to launch in 2021.



COPUOS agrees to UNISPACE+50 thematic priorities

In order to guide preparatory work for UNISPACE+50, in June 2016 COPUOS identified and agreed seven thematic priorities, as well as their objectives and mechanisms. This was an important step towards UNISPACE+50, and has brought together the Office, Member States and other stakeholders to help the international community seize the opportunity provided by UNISPACE+50 to further develop international space cooperation for the benefit of humankind.



Focus: International cooperation in the peaceful uses of outer space

The Committee on the Peaceful Uses of Outer Space (COPUOS) is a unique United Nations platform for international cooperation in space activities with the support of UNOOSA.

As one of the oldest United Nations committees, COPUOS is uniquely positioned as a global forum for international cooperation in the peaceful uses of outer space. COPUOS and its two Subcommittees, the Scientific and Technical Subcommittee and the Legal Subcommittee, have provided critical institutional leadership for the development of the main legal and cooperation processes in space activities. These include the legal regime governing activities in outer space for peaceful purposes established through the five space law treaties and the five sets of principles and declarations on outer space.

The interaction among the Committee's broad-based membership—space powers, emerging space nations, countries that are still in the early stages of building their space infrastructures, and an impressive number of space-related intergovernmental and non-governmental organizations—continues to position the Committee at the centre of global governance of outer space activities. This has been reaffirmed by the growing membership of the Committee from an initial 24 States at its establishment to 84 member States and 35 permanent observers in 2016. This trend also reaffirms the role of COPUOS as an important platform for strengthening space capabilities in developing countries for their economic, social and scientific advancement.

COPUOS has demonstrated its ability to address the current challenges and opportunities arising

from an increasingly complex and diversified space arena as well as to further align its mandates with the goals of the global development agenda. At the core of all this stands UNISPACE+50, a dedicated segment of the sixty-first session of COPUOS to be held on 20 and 21 June 2018 to commemorate the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space. UNISPACE+50 will also aim to address overarching, long-term development concerns and to define concrete deliverables pertaining to space for development, based on the four pillars of space economy, space society, space accessibility and space diplomacy, thereby shaping a comprehensive Space2030 agenda.

The year 2016 saw significant advancements in the agendas of the Committee and its Subcommittees as they agreed on new agenda items of the Legal

What are the roles of COPUOS and UNOOSA?



COPUOS is a United Nations General Assembly committee that facilitates international cooperation in the peaceful uses of outer space. It has two Subcommittees—Scientific and Technical and Legal. It is comprised of Member States, who come to COPUOS to share information about their space activities, discuss opportunities for cooperation, consider space-related activities that could be undertaken by UNOOSA, encourage space research programmes, and study legal problems arising from the exploration of outer space. There are also international inter-governmental and non-governmental organizations who attend sessions of these bodies as permanent observers. COPUOS is a unique platform at the global level to monitor and discuss developments in the evolving space agenda.

COPUOS reports to the General Assembly, which guides the work of this Committee and its Subcommittees, including through annual resolutions on the international cooperation in the peaceful uses of outer space.

UNOOSA is an office of the United Nations Secretariat and the main United Nations entity dealing with space matters. It aims to bring the benefits of space to humankind by building the space capacity of non-space-faring countries, particularly developing countries, and acts as a global facilitator in the peaceful uses of outer space, including by serving as the secretariat to COPUOS and its subcommittees.

The Office reports to the United Nations Secretary-General and COPUOS on its work, and is comprised of professionals from around the world.



UNISPACE+50 THEMATIC PRIORITIES AND MECHANISMS

1. GLOBAL PARTNERSHIP IN SPACE EXPLORATION AND INNOVATION

A new Action Team, under the joint chairmanship of China, Jordan and the United States, was established to develop a plan of activities to be approved at UNISPACE+50 in 2018 and to identify a mechanism for coordinating global space exploration efforts.

2. LEGAL REGIME OF OUTER SPACE AND GLOBAL SPACE GOVERNANCE: CURRENT AND FUTURE PERSPECTIVES

Existing Working Group on the Status and Application of the Five United Nations Treaties on Outer Space of the Legal Subcommittee, which should coordinate its work with the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee.

3. ENHANCED INFORMATION EXCHANGE ON SPACE OBJECTS AND EVENTS

A new agenda item to be considered for establishment by the Scientific and Technical Subcommittee at its fifty-fourth session in 2017, entitled “Enhanced information exchange on space objects and events”, with a working group under a multi-year workplan covering the period 2018-2020 that will coordinate its work with the Legal Subcommittee and the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee.

4. INTERNATIONAL FRAMEWORK FOR SPACE WEATHER SERVICES

Existing Expert Group on Space Weather of the Scientific and Technical Subcommittee, to be substantively supported by UNOOSA. Space weather-related activities also to be implemented through the capacity-building activities of UNOOSA and through the role of UNOOSA as the executive secretariat of ICG, taking into account the existing workplan of the Expert Group.

5. STRENGTHENED SPACE COOPERATION FOR GLOBAL HEALTH

Existing Expert Group on Space and Global Health of the Scientific and Technical Subcommittee, to be substantively supported by UNOOSA. Space and global health-related activities also to be implemented through the capacity-building activities of UNOOSA and taking into account the existing workplan of the Expert Group.

6. INTERNATIONAL COOPERATION TOWARDS LOW-EMISSION AND RESILIENT SOCIETIES

UNOOSA to undertake the work under this thematic priority and report regularly to the Committee and its Subcommittees.

7. CAPACITY-BUILDING FOR THE TWENTY-FIRST CENTURY

UNOOSA to undertake the work under this thematic priority and report regularly to the Committee and its Subcommittees.

Subcommittee as well as seven thematic priorities and their mechanisms to guide UNISPACE+50 preparations by the Office and COPUOS. Significant progress was achieved in 2016 by the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee, when the Committee agreed, at its fifty-ninth session, on the first set of guidelines for the long-term sustainability of outer space activities. These guidelines address the areas of policy and regulatory framework for space activities; safety of space operations; international cooperation, capacity-building and awareness; and scientific and technical research and development. The Committee also extended the mandate of the Working Group for two years, so it may continue its work on a second set of guidelines.

COPUOS also mandated UNOOSA as the permanent Secretariat to the Space Mission Planning Advisory Group (SMPAG). SMPAG was established in 2013, along with the International Asteroid Warning Network, in response to recommendations for an international response to a near-Earth object (NEO) impact threat. The responsibilities of SMPAG include laying out the framework, timeline and options for initiating and executing space mission response activities as well as promoting opportunities for international collaboration on research and techniques for NEO deflection. This new UNOOSA mandate is aimed at ensuring the continuity of the work of SMPAG, independent of its rotating chairmanship, and will provide institutional memory in terms of record keeping and ensuring consistent annual reporting to the Committee.

Lastly, with the recent international adoption of three mutually interdependent and strategic agendas—the 2030 Agenda for Sustainable Development, the Sendai Framework for Disaster Risk



UNISPACE+50

From 20 to 21 June 2018, the international community will gather in Vienna for UNISPACE+50, a special segment of the sixty-first session of COPUOS.

UNISPACE+50 will mark the fiftieth anniversary of the first United Nations Conference on the Exploration and Peaceful Uses of Outer Space. It will also be an opportunity for the international community to consider the future course of global space cooperation for the benefit of humankind.

Reduction 2015-2030 and the Paris Agreement on climate change—COPUOS continues to align its agenda to address and strengthen the use of space for global development. This requires that space-related activities, as well as the outer space environment itself, continue to be sustainable in the long term, free from conflict, and for the common benefit of all humanity.

Scientific and Technical Subcommittee

The fifty-third session of the Scientific and Technical Subcommittee in 2016 brought a record number of technical presentations delivered over a fortnight by States and permanent observers on the latest technical and scientific developments and initiatives in space activities and exploration.

The agenda was busy with a number of items that focused on research and development in space science and technology for the benefit of human development on Earth, for protecting and preserving the Earth and the space environment, and in any exploration efforts in the universe. In 2016, the

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

In 2010, the Scientific and Technical Subcommittee established the Working Group on the Long-term Sustainability of Outer Space Activities in order to:

- Identify areas of concern for the long-term sustainability of outer space activities
- Propose measures that could enhance sustainability
- Produce voluntary guidelines to reduce risks to long-term sustainability.

This work is of critical importance in addressing sustainable space utilization, sustainable development on Earth, space debris, space operations, tools to support collaborative space situational awareness, space weather, and regulatory regimes, including guidance for actors in the space arena.

Subcommittee also considered six of the seven proposed UNISPACE+50 thematic priorities and recommended them to COPUOS for endorsement.

The session also benefited from a symposium organized by UNOOSA on “The role of industry in space exploration”, which addressed the importance of space exploration and innovation for the work of the Subcommittee, the benefits stemming from enhanced coordination among space actors, and opportunities for developed and emerging space nations to contribute.

The Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee agreed on a first set of guidelines, which was submitted to COPUOS for approval, and continued its work on

a preamble and a second set of guidelines. These will be brought together with the first set to form a full compendium of guidelines, and referred to the General Assembly in 2018.



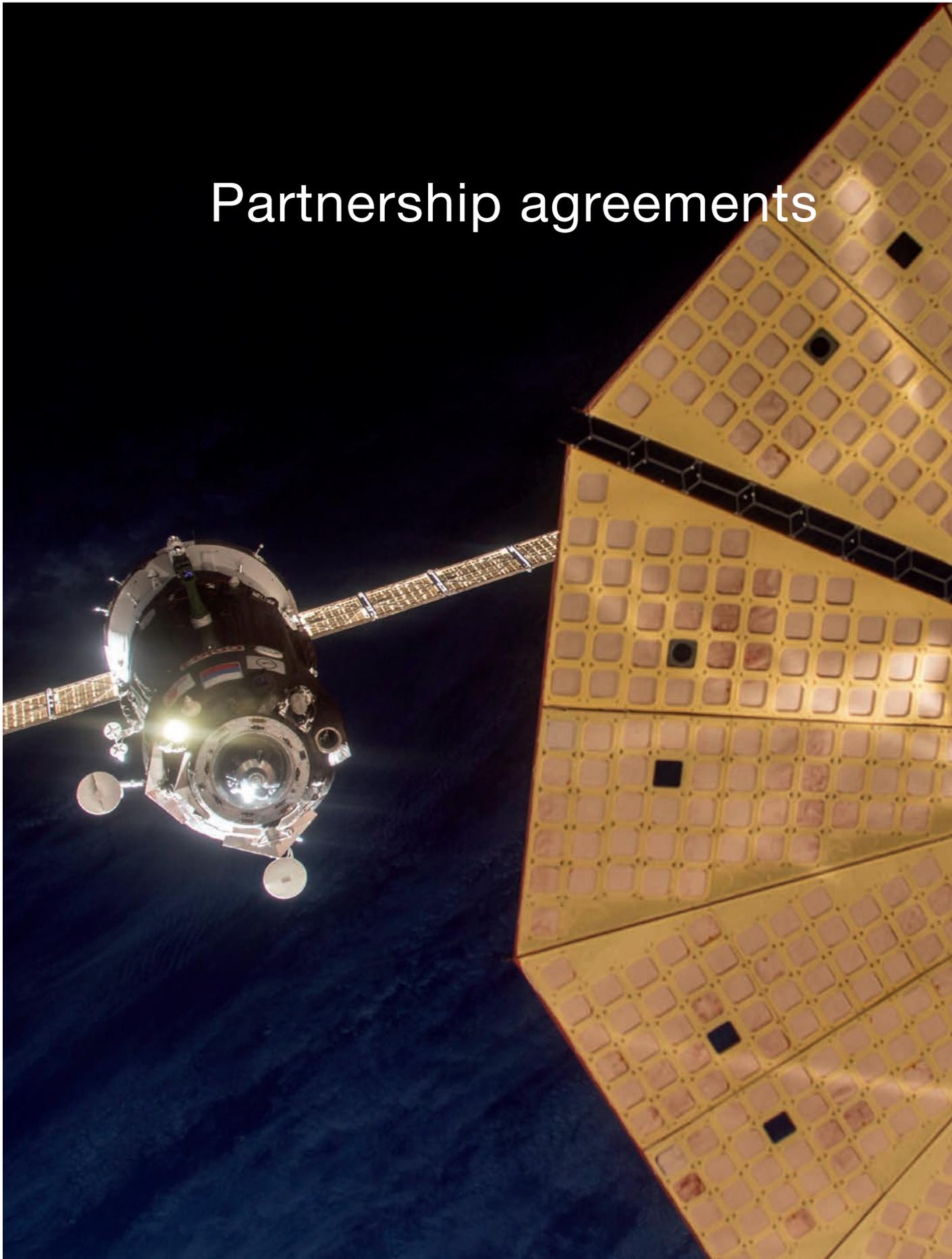
Legal Subcommittee

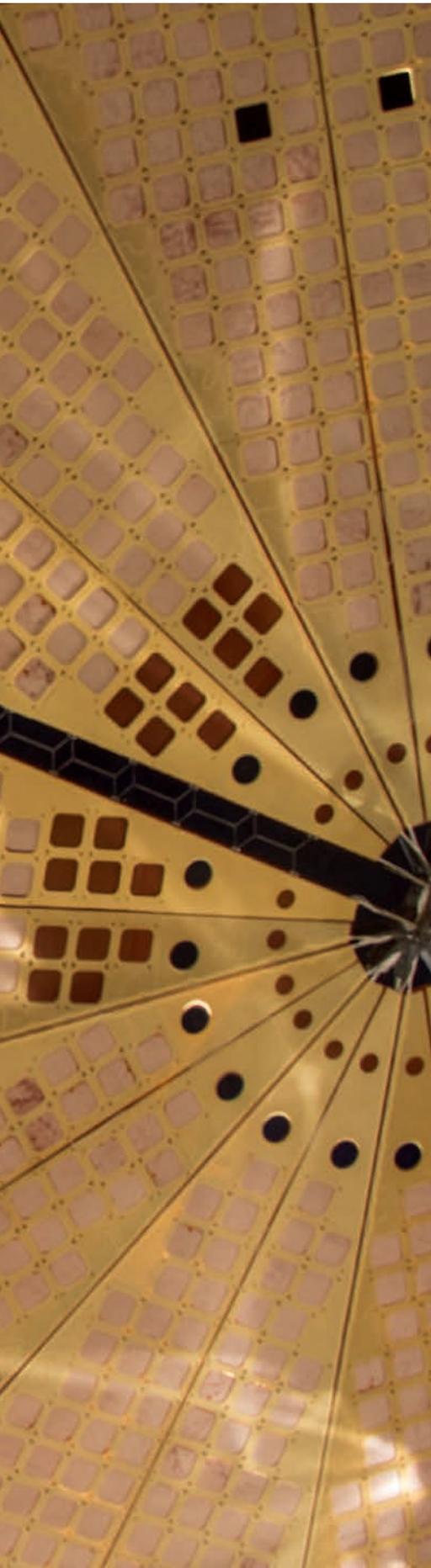
The fifty-fifth session of the Legal Subcommittee in 2016 considered several important, contemporary legal issues through the introduction of new agenda items, including legal perspectives on small and very small satellite activities and the future of space traffic management. The Subcommittee also added a new item for discussion in 2017 relating to legal models for activities in exploration, exploitation and utilization of space resources.

The Subcommittee agreed on the detailed objectives of UNISPACE+50 thematic priority 2 “Legal regime of outer space and global space governance: current and future perspectives”, which aims to promote the universality of the five United Nations treaties on outer space; assess the state of affairs of those treaties and their relationship with other relevant international instruments, such as principles, resolutions and guidelines governing space activities; and analyse the effectiveness of the legal regime governing outer space in the twenty-first century, with a view to identifying areas that may require additional regulation.

A dedicated International Institute of Space Law-European Centre for Space Law symposium was held to mark the fortieth anniversary of the Convention on the Registration of Objects Launched into Outer Space (“The Registration Convention”), which was considered and negotiated by the Legal Subcommittee from 1962 and entered into force on 15 September 1976.

Partnership agreements





UNOOSA's partnerships are integral to our ability to carry out our work. In 2016, the Office signed a range of agreements with partners around the world to support and develop our activities.

On behalf of the United Nations, the Office signed agreements with the following governments, institutions and organizations in 2016:

Memorandum of Understanding on joint collaboration with the Israel Space Agency.
(3 February 2016)

Framework Agreement for Cooperation with the China Manned Space Agency to provide opportunities for developing countries to utilize China's forthcoming manned space station.
(31 March 2016)

Framework Agreement for Cooperation with the Peace and Cooperation Foundation on the organization of a global art competition on the theme "Looking to the Stars, The Future of Our World".
(4 April 2016)

Memorandum of Agreement with the Asian Disaster Preparedness Centre, which joined the UN-SPIDER network of regional support offices.
(11 April 2016)

Memorandum of Agreement with the University of Bonn's Centre for Remote Sensing of Land Surface, which joined the UN-SPIDER network of regional support offices.
(11 April 2016)

Memorandum of Agreement with the National Observatory of Athens, which became the twentieth Member of the UN-SPIDER network of regional support offices.
(18 April 2016)

Memorandum of Understanding with the Sierra Nevada Corporation to provide a framework of cooperation and understanding, and to facilitate collaboration towards further shared goals and objectives in regard to the Dream Chaser® Global Initiative.
(21 June 2016)

Framework Agreement for Cooperation with the Government of El Salvador.
(14 July 2016)



Memorandum of Understanding with the European Global Navigation Satellite Systems (GNSS) Agency for cooperation on themes related to satellite navigation.
(15 July 2016)

Funding Agreement with CANEUS International to fund a pre-feasibility study of a “UNOOSA-coordinated partnership for a constellation of EO/GNSS/telecommunication satellites”.
(27 September 2016)

Framework Agreement for Cooperation with the Mexican Space Agency of the United Mexican States, which joined the UN-SPIDER network of regional support offices.
(28 September 2016)

Memorandum of Understanding with the Mexican Space Agency of the United Mexican States to contribute to the implementation of UNISPACE+50, to the promotion of the use of space technologies and space-based information in

relevant areas of the Sustainable Development Goals, the Paris Climate Change Agreement and the Sendai Framework for Disaster Risk Reduction 2015-2030, and to collaborate in the implementation of capacity-building and institutional strengthening activities, with the possibility of encouraging the development of activities in countries of Latin America and the Caribbean.
(28 September 2016)

Memorandum of Understanding and Funding Agreement with the Prince Sultan bin Abdulaziz International Prize for Water to implement a dedicated space and water web portal to link the needs of the global water management community to the space sector.
(11 December 2016)

Framework Agreement for Cooperation with GRID-Arendal, which joined the UN-SPIDER network of regional support offices.
(19 December 2016)



Awareness-raising and capacity-building activities





In addition to the activities listed in the Highlights section, the Office also undertook the following awareness-raising and capacity-building initiatives in 2016.

Conclusion of #whyspacematters

The successful #whyspacematters campaign, launched in June 2015, drew to a close in February 2016 with over 1,000 entries received. During the campaign, the Office collaborated with the United States National Aeronautics and Space Administration (NASA) and astronaut Scott Kelly throughout his mission to the International Space Station to promote a global photography competition to highlight the importance of outer space for sustainable development. Participants submitted entries to the UNOOSA Instagram account, and every month Mr. Kelly announced the winning photo on his Instagram account.

Open Forum on Near-Earth Objects

Vienna, 18 February 2016

The Open Forum on Near-Earth Objects, held during the fifty-third session of the Scientific and Technical Subcommittee, was organized by the International Asteroid Warning Network and the Space Mission Planning Advisory Group to raise awareness of the potential near-Earth object impact hazard to our planet.

“The Force of Nature in Mexico, as seen from space” exhibition

Vienna, 22-26 February 2016

The Office hosted the second iteration of an exhibition by the Mexican Space Agency in the Rotunda of the Vienna International Centre entitled “The Force of Nature in Mexico, as seen from space”. In cooperation with governmental entities specialized in disaster management, the Mexican Space Agency developed a series of 20 panels showing how Earth observation is used in disaster management.



UN-Space 2016

New York, United States, 3 March 2016

In its capacity as the Secretariat of UN-Space, the United Nations Inter-Agency Meeting on Outer Space Activities, the Office organized the thirty-sixth session of UN-Space, in cooperation with the Office for Disarmament Affairs. It also prepared a special report on the “Role of United Nations entities in supporting Member States in the implementation of transparency and confidence-building measures in outer space activities” and the “Report of the Secretary-General on coordination of space-related activities within the United Nations system: directions and anticipated results for the period 2016-2017—meeting the 2030 Agenda for Sustainable Development”, which are both available on the website of the Office.

United Nations-Costa Rica Workshop on Human Space Technology

San José, 7-11 March 2016

With the support of the Government of Costa Rica and the International Academy of Astronautics, this UNOOSA-led workshop was part of the Human Space Technology Initiative of the Office’s Programme on Space Applications. The workshop considered achievements in human space programmes, ways to promote international cooperation by further facilitating the participation of developing countries in human space exploration-related activities, creating awareness of the benefits of human space technology and its applications, building capacity in microgravity science education and research, and exploring participation in space commercialization.



ICAO-UNOOSA Symposium 2016

Abu Dhabi, 15-17 March 2016

The second International Civil Aviation Organization (ICAO)-UNOOSA Aerospace Symposium on “Emerging Space Activities and Civil Aviation—Challenges and Opportunities” was held in Abu Dhabi. This symposium was a continuation of the first ICAO-UNOOSA Aerospace symposium held at ICAO Headquarters in Montreal, Canada in March 2015. This second symposium furthered dialogue by focusing on a number of space and civil aviation subjects, including perspectives on aerospace innovation showcases and the latest trends in commercial space transportation and suborbital operations. The symposium also looked at the regulatory and legal frameworks for aerospace operations and cooperation with aerospace stakeholders, and into concepts for the evolution of aerospace transportation.

Long Night of Research

Vienna, 22 April 2016

In April, the Office participated in Austria’s biggest research event, the Long Night of Research. Over 1,300 visitors were welcomed in the Vienna International Centre to learn about the different research projects and programmes of the Vienna-based organizations. UNOOSA promoted the benefits of space technologies and applications, especially in relation to the 17 Sustainable Development Goals and the 2030 Agenda for Sustainable Development, as well as the Office’s specific programmes and activities.

DLR Conference on Climate Change 2016: Challenges for Atmospheric Research

Cologne, Germany, 26-28 April 2016

With the support of UNOOSA, the German Aerospace Center organized the “Conference on Climate Change 2016: Challenges for Atmospheric Research”. The aim of the conference was to summarize state-of-the-art space technology concerning atmospheric

research, identify pressing open questions, point the way forward on atmospheric research related to climate change, and identify how space and atmospheric research could support the global stocktaking that has been incorporated in the Paris climate change agreement.

GNSS-GLONASS training course

Rabat, 23-27 May 2016

UNOOSA, Roscosmos and Reshetnev Information Satellite Systems organized a French language training course on GLONASS and the future perspectives of GNSS for African researchers at the African Regional Centre for Space Science and Technology Education in Rabat. The course was held simultaneously with a nine-month postgraduate course on GNSS and introduced GLONASS, navigation signals and navigation data messages, error sources, technologies for the modelling and mitigation of ionospheric scintillation effects on GNSS receivers, compatibility and interoperability of GNSS systems, and international cooperation.

GNSS seminar on “capacity-building in the use of GNSS-related technologies in various fields of science and industry”

The Hague, 1 June 2016

The Global Navigation Satellite Systems (GNSS) seminar on “capacity-building in the use of GNSS-related technologies in various fields of science and industry”, held in conjunction with the fourth European Space Solutions conference, was aimed at a wide audience including scientists, developers, entrepreneurs, policymakers, end users and beneficiaries of positioning, navigation and timing technologies. The main objectives of the event were to share technical expertise and experiences in specific GNSS-related projects and initiatives through formal presentations and panel discussions. The event focused on interference detection and mitigation, and on promoting the use of GNSS technologies as tools for scientific applications, in particular the effects of space



weather on GNSS. Participants also had the chance to learn about multi-GNSS cooperation.

ICG-ICTP Workshop on Space Weather

Trieste, Italy, 20-24 June 2016

A workshop on the use of ionospheric GNSS-derived total electron content (TEC) data for navigation, ionospheric and space weather research was held in cooperation with the Abdus Salam International Centre for Theoretical Physics, Boston College, and ICG. The first part of the workshop was devoted to theoretical information about TEC calibration techniques. The second part consisted of hands-on practice in the computer laboratory to ensure the appropriate utilization of the techniques. A total of 55 experts from 21 countries participated in the workshop.

United Nations-Kenya Conference on Space Technology and Applications for Wildlife Management and Protecting Biodiversity

Nairobi, 27-30 June 2016

In cooperation with the Kenyan Ministry of Environment and Natural Resources and with support from the European Space Agency and the United Nations Environment Programme, UNOOSA organized the United Nations-Kenya Conference on Space Technology and Applications for Wildlife Management and Protecting Biodiversity. The Conference was closely linked to the 2030 Agenda for Sustainable Development, in particular to the targets set out for Sustainable Development Goal 15, and addressed topics such as wildlife management and protecting biodiversity with space technology solutions, biodiversity assessment, ecosystem and wildlife habitat management, wildlife monitoring and tracking for law enforcement, wildlife crime, legal, governance and policy challenges of information sharing, capacity-building and awareness-raising, as well as international

experiences and cooperation opportunities. The Conference was attended by stakeholders involved in biodiversity and wildlife management, the space industry, and governmental and non-governmental organizations.

United Nations-Austria Symposium on Integrated Space Technology Applications for Climate Change

Graz, Austria, 12-14 September 2016

The twenty-second United Nations-Austria Symposium was dedicated to climate change. Participants learned about satellite observation of the climate, research on greenhouse gas concentrations in the atmosphere, and upcoming missions to improve our understanding of the drivers of climate change. Experts from developing countries highlighted the applications of satellite technologies in coastal and marine ecosystems, forests, glaciers, tracking land-use changes in urban and rural areas, and the planning of irrigation and flood/drought coping measures.

United Nations-International Astronautical Federation Workshop on Space Technology for Socio-economic Benefits

Guadalajara, Mexico, 23-25 September 2016

The twenty-fifth United Nations-International Astronautical Federation Workshop on Space Technology for Socio-economic Benefits was held in conjunction with the sixty-seventh International Astronautical Congress in Guadalajara, Mexico. Titled “Integrated Space Technologies and Applications for a Better Society”, the workshop discussed the role of space technology and its applications in support of implementing the 2030 Agenda for Sustainable Development. It considered a range of topics, including space and sustainable development, space technology capacity-building, disaster management and early warning, space for global health and education, space solutions for managing growing cities and populations, environment and biodiversity, and connectivity for reducing the social divide.



Announcement of second round of KiboCUBE

Guadalajara, Mexico, 27 September 2016

At the International Astronautical Congress in September 2016, UNOOSA and the Japan Aerospace Exploration Agency (JAXA) announced the second round of applications for the KiboCUBE initiative. Educational or research institutions from developing countries that are United Nations Member States were invited to apply. KiboCUBE was launched in September 2015 as a capacity-building initiative between UNOOSA and JAXA to offer developing countries the opportunity to deploy cube satellites (CubeSats) from the Kibo module of the International Space Station.



Launch of “Looking at the Stars: The Future of the World”

Vienna, 5 October 2016

During World Space Week, UNOOSA and the Peace and Cooperation Foundation launched the 2017 Peace and

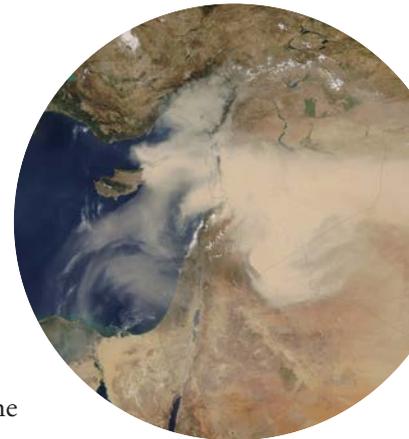
Cooperation School Award “Looking at the Stars: The Future of the World”. The launch was preceded by a question and answer session between local students and three space explorers.

The goal of the Award is to demonstrate the value of space technology in improving lives around the world and to raise awareness about global social topics, especially among the younger generation. Students from around the world are invited to submit art that reflects current social problems and how the exploration of space benefits the whole of humankind. The winners will be announced in October 2017.

United Nations-Islamic Republic of Iran Workshop on the Use of Space Technology for Dust Storm and Drought Monitoring in the Middle East Region

Tehran, 5-9 November 2016

The United Nations-Islamic Republic of Iran Workshop on the Use of Space Technology for Dust Storm and Drought Monitoring in the Middle East Region was organized in Tehran by UNOOSA in cooperation with the Government of the Islamic Republic of Iran, represented by the Ministry of Information and Communications Technology and the Iranian Space Agency. The workshop explored how space technologies help identify and monitor the effects of a changing climate on vulnerable regions, both regionally and internationally. Such space technologies offer cost-effective solutions for the monitoring of droughts and dust storms, and provide essential information for the planning and implementation of programmes or projects to mitigate the effects of events of this nature and combat desertification.



International Committee on Global Navigation Satellite Systems (ICG): Annual Meeting

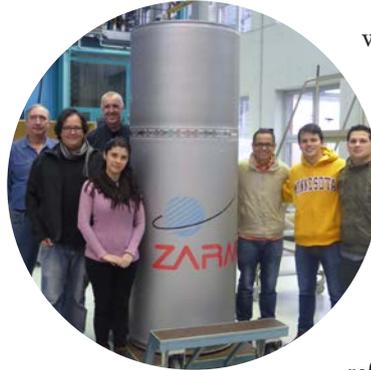
Sochi, Russian Federation, 6-11 November 2016

Hosted by the Roscosmos State Corporation for Space Activities of the Russian Federation, the eleventh annual meeting of ICG and the seventeenth meeting of the Providers’ Forum provided an opportunity for stakeholders to discuss developments in GNSS, review the status of implementation of the ICG workplan and build a GNSS system for civilian use.

Launch of the Federation of the Red Cross and Red Crescent Societies' 2016 World Disasters Report

Vienna, 15 November 2016

The Office co-hosted the launch of the Federation of the Red Cross and Red Crescent Societies' 2016 World Disasters Report, an annual publication addressing disaster risk reduction and crisis management using evidence-based research commissioned by the International Federation of Red Cross and Red Crescent Societies. The use of space-derived data has become a fundamental tool for elaborating resilience strategies in high-risk situations.

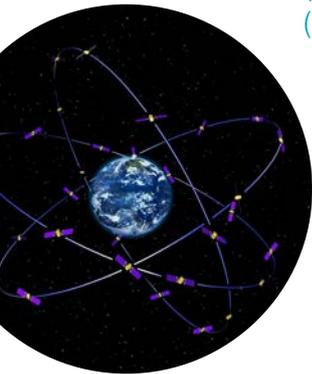


was awarded the fellowship. The aim of their experiment was to compare the data obtained experimentally with a dynamic model of the robotic arm in a reduced gravity environment, within a rotating frame of reference.

Drop Tower Experiment Series (DropTES) microgravity experiment

Bremen, Germany, 27 November-1 December 2016

In collaboration with the Center of Applied Space Technology and Microgravity and the German Aerospace Center, the UNOOSA Drop Tower Experiment fellowship programme offers selected research teams the opportunity to conduct their own microgravity experiments at the Bremen Drop Tower. The series of experiments consists of four drops or catapult launches during which approximately 5 or 10 seconds of microgravity, respectively, are created. In the third cycle of the Drop Tower Experiment Series in 2016, a student team from the Instituto Tecnológico de Costa Rica



United Nations-Nepal Workshop on the Applications of Global Navigation Satellite Systems

Kathmandu, 12-16 December 2016

The United Nations-Nepal Workshop on the Applications of Global Navigation Satellite Systems, organized jointly by the Office and the survey department of the Ministry of Land Reform and Management of Nepal, addressed the use of GNSS for various applications that are able to provide sustainable social and economic benefits, in particular for developing countries. Participants recognized the importance of the use of GNSS technology to improve emergency response to natural disasters and reduce the associated risk and impact to human life. Furthermore, they acknowledged that this required robust information technology and multi-agency cooperation, and interoperability that involved both governmental and non-governmental organizations.



UN-SPIDER

2016 marked 10 years since the establishment of UNOOSA's UN-SPIDER programme. A tenth anniversary conference was held in Vienna from 7 to 8 June to assess UN-SPIDER's activities over the past ten years in four key areas: technical advisory support and institutional strengthening, knowledge management, awareness-raising and outreach, and capacity-building. The conference also outlined strategies and proposed new projects for the coming decade.

From 19 to 22 September 2016, the United Nations International Conference on Space-based Technologies for Disaster Risk Reduction—“Understanding Disaster Risk” was held in Beijing. The aim of the conference was to contribute to the process of producing guidelines for Member States to integrate Earth observation and geospatial technologies to support the Sendai Framework,

especially its first priority: Understanding Disaster Risk.

Throughout 2016, UN-SPIDER continued to work with partners in the implementation of a “Strengthening Early Warning Systems for Droughts” (SEWS-D) project, which aims to incorporate the routine use of drought indicators derived from satellite imagery on the effects of drought on vegetation.

UN-SPIDER also supported Costa Rica and the Dominican Republic in the activation of the International Charter Space and Major Disasters, and mobilized the Italian Space Agency to contribute to disaster response efforts in the Dominican Republic and Haiti as a consequence of the destruction caused by Hurricane Matthew.

Expert meetings

18-19 July 2016: The UN-SPIDER Regional Expert Meeting in the Dominican Republic brought together the partners of the SEWS-D project and representatives of the four Latin American countries where the project is implemented to share information on these advances, lessons learned, and to agree on a plan of work for the next year.

1-2 December 2016: The United Nations-Germany International Expert Meeting on the Global Partnership on Space Technology Applications for Disaster Risk Reduction was conducted in Bonn, Germany. This meeting provided an opportunity for partners to discuss the role that a global partnership established in 2015 could play in promoting the use of space-based technology applications in disaster risk reduction efforts worldwide, and to agree on the terms of reference that shape the global partnership and a plan of action for the coming years.

Missions

27 June-1 July 2016: Institutional Strengthening Mission to Myanmar, a follow-up to a previous technical mission in 2012. The mission included meetings with stakeholders to act on the recommendations of the technical advisory mission and support implementation of the Sendai Framework. As a result of the mission and UN-SPIDER's engagement, the Ministry of Social Welfare, Relief and Rehabilitation of Myanmar established an Emergency Operation Centre that hosts a section dedicated to the use of Earth observation data, and a Satellite Imagery and Research Section.

7-11 July 2016: Expert Mission to Guatemala to continue technical advisory support. UN-SPIDER and the Executive Secretariat of Guatemala's National Coordinating Agency for Disaster Reduction (CONRED) addressed the status of the inter-institutional technical team that was

established in 2012. UN-SPIDER also gave briefings on the SEWS-D project, and provided CONRED with updated maps on drought vegetation indexes.

11-16 July 2016: Expert Mission to El Salvador, which included an official visit by the Director of UNOOSA. UN-SPIDER met with staff from various organizations to discuss the ongoing process of establishing a technical inter-institutional team in El Salvador that could be involved in the generation of space-based information combining satellite imagery with in situ data. UN-SPIDER also provided updated maps on vegetation indexes.

25-29 July 2016: Institutional Strengthening Mission to Lao People's Democratic Republic, a follow-up to a previous technical mission in 2015. The mission experts held meetings with key technical and political stakeholders, ran a training programme on "Space-based technologies exploring the use of Earth observation data and modelling tools in flood risk mapping and flood early warning", and participated in the formation of a voluntary association, LAOGNUM, to address technical issues related to the generation, sharing and dissemination of geospatial information.

Workshops and training

7-11 March 2016: UN-SPIDER contributed to a UNESCO-Intergovernmental Oceanographic Commission training course on "Coastal Hazard Assessment: Applications in Risk Assessment, Management and Mitigation", held in Victoria, Seychelles, to enhance the resilience of communities exposed to tsunamis in the Indian Ocean. UN-SPIDER demonstrated the use of satellite imagery and GNSS to gather information on the exposure of infrastructure, and its combination with in situ data to generate information regarding the vulnerability of different sectors of development.



8-10 March 2016: The “United Nations-India Workshop on Use of Earth Observation Data in Disaster Management and Risk Reduction: Sharing the Asian Experience”, co-organized with the Indian Space Research Organisation, was held in Hyderabad, India. The workshop was an opportunity to share experiences on disaster management using Earth observation data and geospatial technologies for the implementation of the Sendai Framework on Disaster Risk Reduction 2015-2030.

15-16 April 2016: UN-SPIDER co-organized the fourth Association of Southeast Asian Nations (ASEAN) workshop on the “Development of mechanisms for acquisition and utilisation of space-based information during emergency response” with the United Nations Economic and Social Commission for Asia and the Pacific and the Indonesian Space Agency, supported by the ASEAN Coordinating Centre for Humanitarian Assistance on Disaster Management and an expert from the United Nations Institute for Training and Research. The purpose of the workshop was to work with ASEAN countries to conduct a simulation exercise on the procedural guidelines for sharing space-based information during emergency response.

20-22 July 2016: UN-SPIDER and the National Emergency Commission of the Dominican Republic conducted a training course on UN-SPIDER Recommended Practices on droughts for members of an inter-institutional team that generates policy-relevant geospatial information to be used in disaster risk reduction and disaster management efforts.

5 September 2016: In collaboration with UNESCO Category 2 Centre for the Asia Pacific region and the International Union for Conservation of Nature, UN-SPIDER organized a workshop on ecosystem-based disaster risk reduction as a side event at the World Conservation Congress in Honolulu, United States.

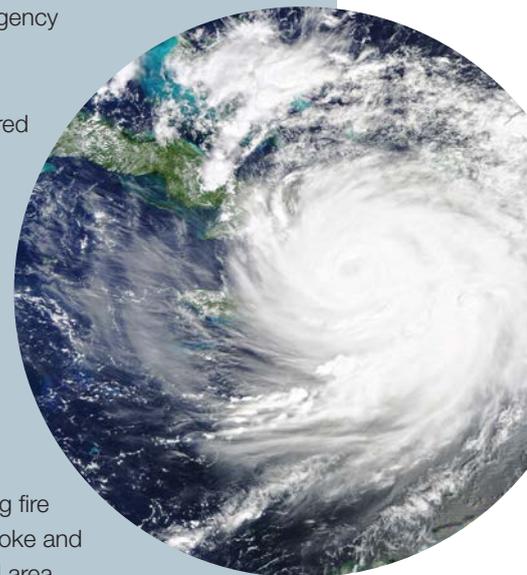
22-27 September 2016: In collaboration with Beihang University, the Asia Pacific Space Research Cooperation Organisation and the National Disaster Reduction Centre of China, UN-SPIDER organized an international training course in Beijing on space-based technologies for flood and drought monitoring and risk assessment. This training was an extended event back-to-back with the United Nations International Conference on Space-based Technologies for Disaster Management “Understanding Disaster Risk”, which was held from 19 to 21 September 2016.

2-5 November 2016: UN-SPIDER organized thematic sessions on applications of science and technology for disaster risk reduction at the sixth Asian Ministerial Conference on Disaster Risk Reduction, New Delhi.

Information resources

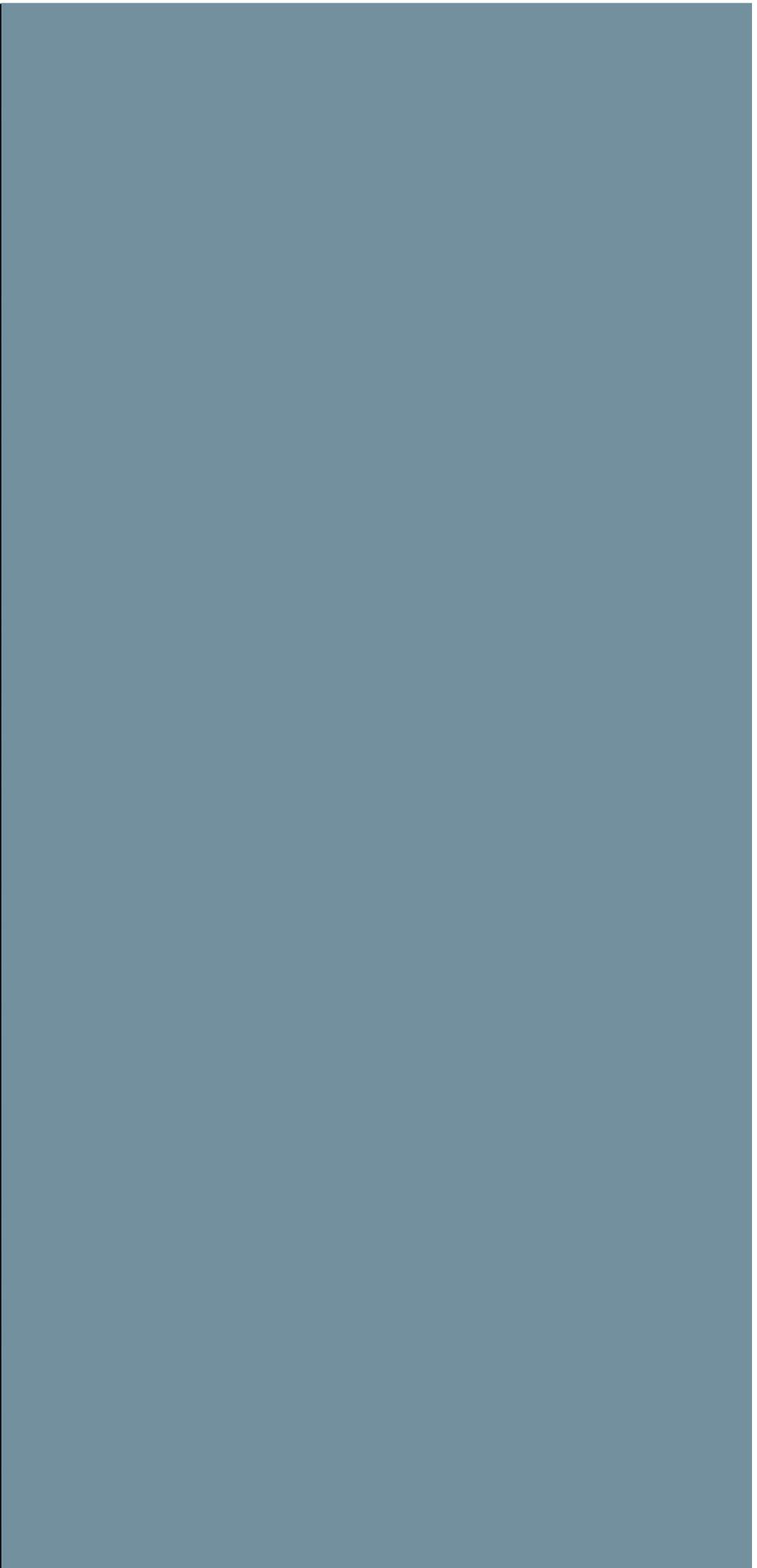
To enhance the usefulness of its Knowledge Portal, UN-SPIDER worked with experts from the Regional Support Offices and Centres of Excellence to develop and incorporate step-by-step procedures for processing satellite imagery to extract particular types of information or to generate specific types of maps useful in disaster risk assessment, preparedness and emergency response efforts.

UN-SPIDER also partnered with the Indonesian National Institute of Aeronautics and Space to publish the booklet “Lessons Learnt from Forest and Land Fires in Indonesia”, which describes the use of remote sensing applications for forest and land fires monitoring, including fire hot-spot monitoring, smoke and haze monitoring, burned area mapping and fire danger rating systems.

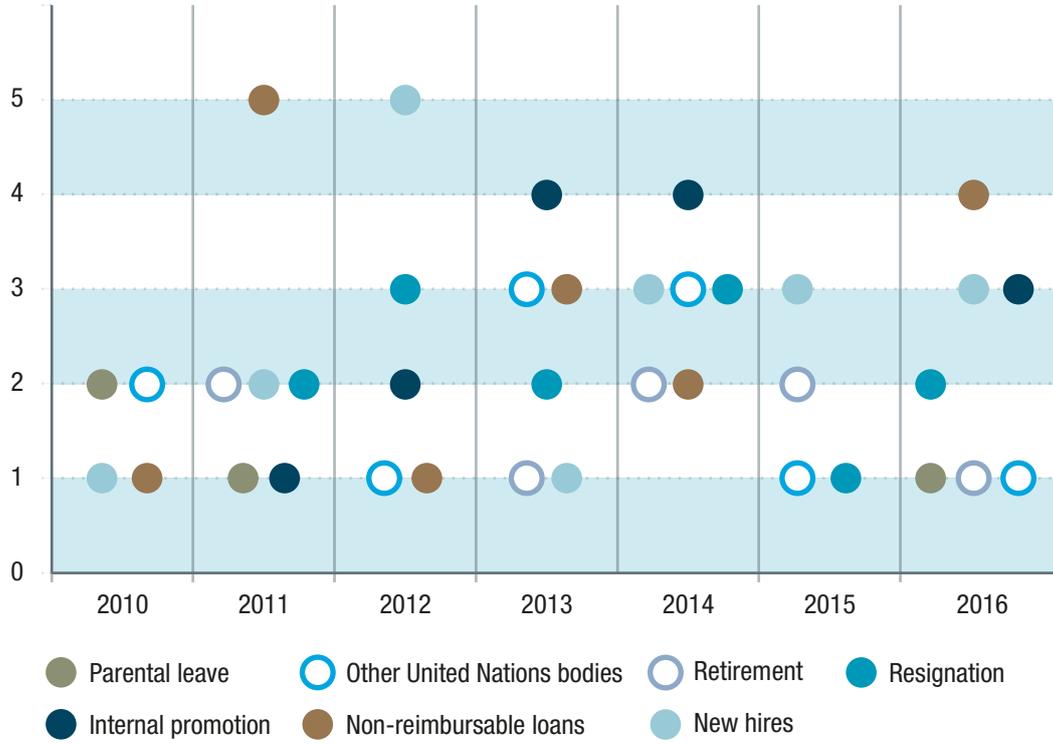


An aerial night photograph of a city, showing a dense grid of streets illuminated by streetlights, creating a complex pattern of orange and yellow lines against a dark background. A prominent river winds through the center of the city, reflecting some of the lights. The overall scene is a high-angle, top-down view of an urban landscape at night.

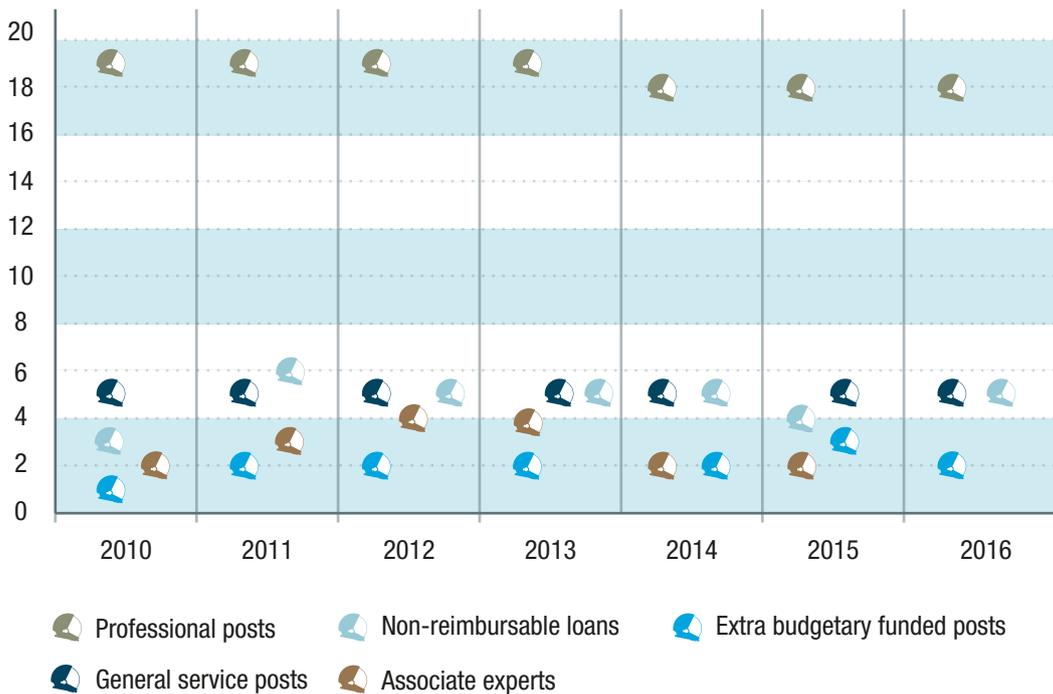
Administrative information



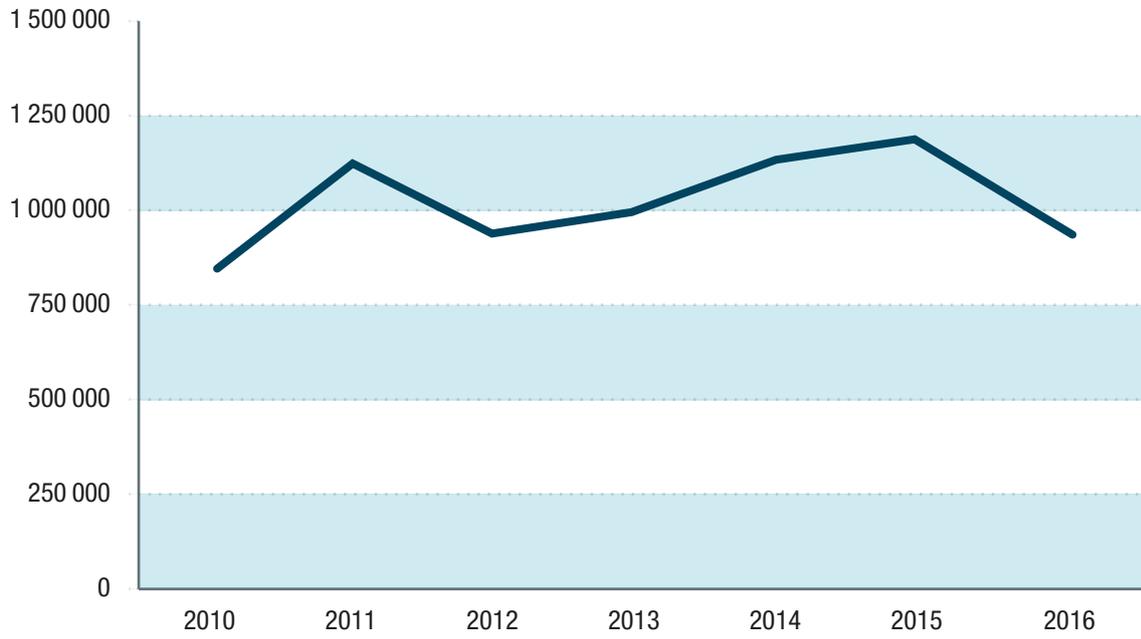
Staff movement



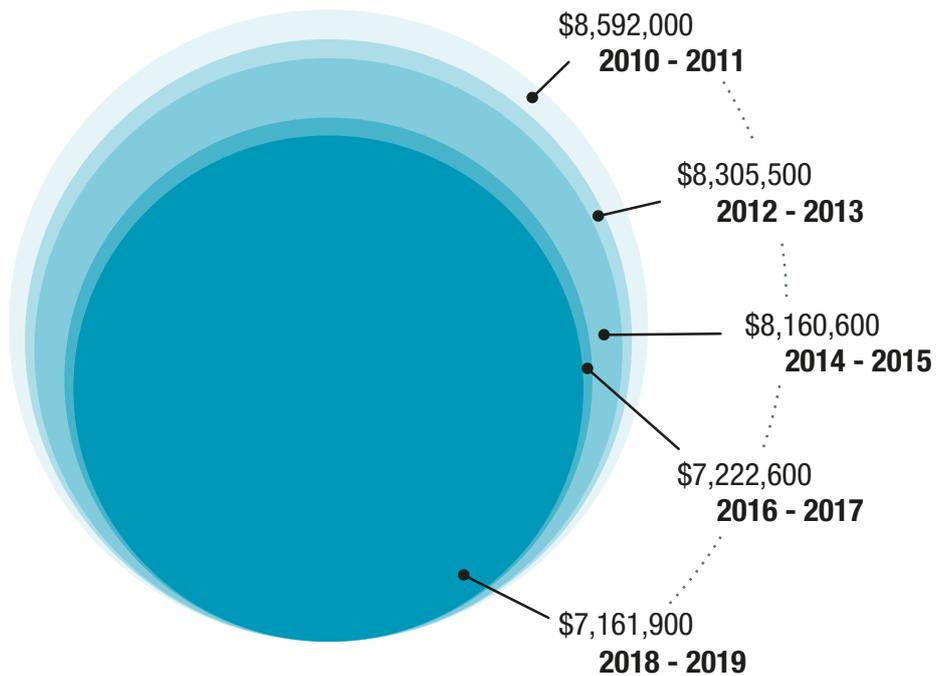
Composition of the Office, type of post



UNOOSA voluntary cash contribution (US\$)



UNOOSA regular budget





■ The United Nations Office for Outer Space Affairs (OOSA) is responsible for promoting international cooperation in the peaceful uses of outer space and assisting developing countries in using space science and technology.

