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Committee on the Peaceful Uses of Outer Space

International cooperation in the peaceful uses of outer space: activities of Member States

Note by the Secretariat

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I. Introduction

1. At its fifty-fifth session, in 2018, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities ([A/AC.105/1167](#), para. 44).
2. In a note verbale dated 29 August 2018, the Office for Outer Space Affairs of the Secretariat invited Member States to submit their reports by 5 November 2018. The present note was prepared by the Secretariat on the basis of replies received in response to that invitation.

II. Replies received from Member States

Austria

[Original: English]
[31 October 2018]

International space law

The National Point of Contact for Space Law Austria of the European Centre for Space Law of the European Space Agency (ESA) is coordinated by Professor Irmgard Marboe of the Department of European, International and Comparative Law at the Law Faculty of the University of Vienna. Its main objective is the promotion and development of space law and its application in Austria through research and teaching as well as through advisory activities. In addition, its work is focused on raising public awareness of space law, including through the annual publication of the Austrian Space Law Newsletter and the organization of space law-related events and conferences.

An event entitled “The Hague International Space Resources Governance Working Group — Discussion on the 19 Draft Building Blocks” was held at the Vienna International Centre on 13 April 2018 on the margins of the fifty-seventh session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space. On the occasion of the anniversary celebrations of UNISPACE+50, held in Vienna in June 2018, the National Point of Contact for Space Law Austria organized an event entitled “The Moon Village Association contribution to the Moon Settlement” (see www.spacelaw.at).

United Nations/Austria Symposium

From 17 to 19 September 2018, the annual United Nations/Austria Symposium took place in Graz, entitled “Space for the Sustainable Development Goals: stronger partnerships and strengthened cooperation for 2030 and beyond”. The Symposium pursued an interdisciplinary approach and focused on space science and technology as well as space law and policy.

The Symposium is a key event for the space community pursuing sustainable development, seeking to highlight the importance of space for the Sustainable Development Goals. More than 100 decision makers from key stakeholders and participants from 33 countries attended the meeting, together with representatives of user communities. The Symposium was supported by the Office for Outer Space Affairs of the Secretariat; ESA; the German Aerospace Centre (DLR); the Austrian Ministry of Transport, Innovation and Technology; the Federal Province of Styria; the city of Graz; the Austrian Ministry for Europe, Integration and Foreign Affairs; AUSTROSPACE; Joanneum Research; Graz University of Technology; and the National Point of Contact for Space Law Austria (see www.unoosa.org).

Diplomatic Space Breakfasts

The successful series of Diplomatic Space Breakfasts has continued with the support of the Permanent Mission of Austria, the International Astronautical Federation, the European Space Policy Institute and the Graz University of Technology. High-level speakers cover topics including space technology and applications, human space flight, space debris as well as space law, regulation and policy. The target audience is composed of members of the diplomatic missions to the United Nations.

Space education

Through the European Space Education Resource Office (ESERO) project, ESA supports science education in primary and secondary schools. The Austrian office is hosted by Ars Electronica in Linz, with the support of the Austrian Research Promotion Agency and the Austrian Federal Ministry for Transport, Innovation and Technology. This year ESERO Austria celebrated its second anniversary. The main focus is supporting teachers in the task of making science and technology education more exciting with space.

Participants from Austria were allowed to participate in the following international competitions: Advanced Space Academy of the Space and Rocket Center in Huntsville, Alabama, United States of America, and International Space Camp 2018 of the Space and Rocket Center and the National Aeronautics and Space Administration (NASA).

The First Austrian CanSat competition was successfully organized together with the Space Team of the Technical University of Vienna. The winning team took part in the ESA CanSat campaign. The Mission X 2018 Austrian “Train like an Astronaut” kids challenge took place on 8 May with 13 classes. This international school class competition took place for the eighth time, in 2018, in 38 countries around the world for children 8 to 12 years of age. NASA and ESA have developed a series of exercises and lessons for Mission X that provides children worldwide with a great deal of space, exercise and sports, as well as the importance of healthy eating in daily life (see <https://ars.electronica.art/esero/en>).

Postgraduate space education

After a successful first round of the unique postgraduate masters in engineering in space systems and business engineering, called “SpaceTech” and offered by the Graz University of Technology, the second course started in March. As part of a team project, participants are elaborating a concept for flexible small satellites for Earth observation. That activity is supported by ESA and DLR. The next programme will begin in March 2020 (see www.tugraz.at/en/home).

International global navigation satellite systems summer school

The ten-day course — organized by ESA, the Joint Research Centre of the European Commission, the Austrian Institute of Navigation and the Graz University of Technology — was held in Loipersdorf from 16 to 27 July. It covered all aspects of satellite navigation, including the theory of global navigation satellite systems (GNSS), threats to satellite navigation systems, patents and intellectual property and the creation of satellite navigation-based businesses. The main emphasis of the course was the development of a group business project, building on an innovative idea to take in the planning of the product or service, its technical realization and, finally, its marketing to customers.

Summer School Alpbach

The topic of the Summer School Alpbach 2018 was “Sample return from small solar system bodies”. Students at the Summer School were informed about past achievements and current issues. They were invited to propose ideas to study the solar

system's small bodies directly in situ with spacecraft, which would ideally return samples to Earth in order to develop a much wider understanding of these bodies, their properties and what they can tell us about the evolution of the solar system (see www.summerschoolalpbach.at).

Supporting young generations

The Space Generation Advisory Council (SGAC) Space Generation Forum Anniversary Event was held in Vienna, in connection with UNISPACE+50, on 16 and 17 June 2018, and was supported by the Austrian Research Promotion Agency and the Austrian Federal Ministry for Transport, Innovation and Technology. During UNISPACE III in 1999, it was recommended to create, within the framework of the Committee on the Peaceful Uses of Outer Space, a consultative mechanism to facilitate the continued participation of young people from all over the world, especially young people from developing countries and young women, in cooperative space-related activities. That recommendation led to the creation of SGAC in support of the United Nations Programme on Space Applications (see spacegeneration.org/sgf2).

International cooperation to support research relevant to the alpine region

Together with the Austrian Research Promotion Agency, ESA organized "EO4Alps: the Alps from space workshop", which was held in Innsbruck, Austria, from 27 to 29 June 2018. The focus of the workshop was to assess the opportunities for Earth observation research and development as well as downstream activities, which could be the basis for future ESA investments aimed at addressing some of the key information needs relevant to the alpine region (see nikal.eventsair.com).

European Space Policy Institute

The twelfth European Space Policy Institute Autumn Conference, on the theme "Security in outer space: rising stakes for civilian space programmes", was held in Vienna on 27 and 28 September 2018. The Autumn Conference is a yearly Institute event, in which space policy, agency and industry stakeholders come together to discuss issues that affect Europe and the world. Drawing on the findings of a joint research collaboration with the Space Policy Institute of George Washington University, the event included discussions on the ongoing reshaping of European and American approaches to space security issues. Great emphasis was put on the criticality of future short- and long-term policy developments in this area and how to reach the full potential of a transatlantic cooperative approach in this specific field (see www.espi.or.at).

Earth observation for the Sustainable Development Goals

The decreasing cost of satellite data in the past decade, along with the launch of the ESA Sentinel mission, has made Earth observation and geospatial information more attractive than ever for addressing global challenges like poverty, monitoring environmental changes and stimulating economic growth, in particular for developing countries.

GeoVille and its partners from the United Nations Environment World Conservation Monitoring Centre, the UNEP-DHI partnership and DHI GRAS kicked off the project "Earth observation for the Sustainable Development Goals" (EO4SDG), funded by ESA, to support the utility of satellite Earth observation in the 2030 Agenda on Sustainable Development and, in particular, in the Global Indicator Framework adopted by the United Nations Statistical Commission at its forty-eighth session, in March 2017. The aim of the project is to maximize the contribution of Earth observation data to the space sustainable development agenda by producing targeted high-quality indicator-monitoring guidelines and effective outreach material, and by showcasing the usability of Earth observation data in country demonstration studies and in dialogue with United Nations stakeholders. As such, a dedicated case study will be implemented in Uganda, concentrating on

Sustainable Development Goal indicators 6.4.1 (Change in water-use efficiency over time) and 15.3.1 (Proportion of land that is degraded over total land area) (see www.geoville.com).

International cooperation: small-satellite development and operation

In the last decade, a new field of competence has emerged in Austria: the so-called nanosatellites, which are small satellites with a mass between 1 and 10 kg. Increasing expertise in and the development of nanosatellites has also made the formulation of an appropriate legal framework necessary. Consequently, the Austrian Outer Space Act was adopted in 2011 and outer space regulation followed in 2015.

BRITE Constellation

The first two Austrian satellites, BRITE-Austria/TUGSAT-1 and UniBRITE are part of the world's first nanosatellite constellation BRITE (BRiGht Target Explorer). They were launched in February 2013. In addition to the two Austrian satellites, the constellation consists of two Polish satellites and a Canadian satellite. The constellation investigates the brightness oscillations of massive luminous stars. It recently detected a Nova explosion in the star field "Carina" and has a complete measurement record, which will lead to publications in top scientific journals. This demonstrates that demanding scientific requirements can be fulfilled by low-cost small satellites. The two Austrian members of the BRITE Constellation have now been operational for 5 and a half years, more than twice their design lifetime. The excellent condition of the spacecraft will lead to at least two more years of operations and high scientific output. The Austrian BRITE spacecraft are operated by the tracking ground station at Graz University of Technology.

PEGASUS

The nanosatellite PEGASUS became the third Austrian national satellite when it was successfully launched in June 2017. The satellite was developed by a team consisting of representatives of the University of Applied Sciences in Wiener Neustadt, the Space Team of the Vienna University of Technology and the Space Tech Group Austria. PEGASUS was the first satellite to undergo an authorization process under the Austrian national space legislation. PEGASUS is part of the QB50 project, which is coordinated by the Von Karman Institute for Fluid Dynamics in Belgium. The main objective of the project is to conduct atmospheric research in the thermosphere using a network of 50 nanosatellites built by universities and research institutions around the world. The Belgian authorities acted as a diligent facilitator of this complex and multinational project, including through a responsible and coordinated application of Belgian space law. PEGASUS is equipped with a set of Langmuir probes to provide information about essential properties of plasma in the thermosphere, such as the temperature and density of electrons. The results will allow for the improvement of atmospheric models that are used for, inter alia, weather forecasting and assessments of phenomena such as the depletion of the ozone layer.

OPS-SAT

The Graz University of Technology is leading the development of an advanced nanosatellite mission, under contract by ESA, called OPS-SAT. Its main purpose is to demonstrate and validate novel operational procedures and advanced communications protocols for future space missions in which the European Space Operations Centre (ESOC) is highly interested. OPS-SAT will be operated by ESOC. Advanced on-board experiments in the field of radio and optical communications, remote sensing, on-board autonomy and attitude control will be carried out. OPS-SAT will be launched in the second half of 2019.

Passive Reflectometry and Dosimetry

Together with RUAG Space (Austria) and Seibersdorf Laboratories, the Graz University of Technology recently completed the Phase A/B study of a nanosatellite mission called PRETTY (Passive Reflectometry and Dosimetry) under ESA contract. The mission is to demonstrate novel payloads for precise height measurements, which could be used for monitoring of glaciers and sea level, thereby contributing to climate change research. In addition, the radiation environment will be determined by novel low-cost instruments. The mission is to be launched in approximately two years and will be operated by the Graz University of Technology.

Bahrain

[Original: Arabic]
[17 October 2018]

The National Space Science Agency is still being established. It is currently developing the space policy and the Strategic Plan 2019–2023 of the Kingdom of Bahrain and is working to implement a series of educational, training and awareness-raising workshops. It is in close contact with several international space agencies, with a view to benefiting from their experience and cooperating with them to implement a number of projects related to space infrastructure. One of the most prominent current projects of the Agency is on building national capacities and developing a microsatellite for research purposes, in addition to working to establish a ground station and a space data and image-analysis laboratory, thereby contributing to the provision of information to stakeholders at the national level and to inclusive and sustainable development.

Denmark

[Original: English]
[23 October 2018]

Denmark has signed and ratified four United Nations treaties on outer space: the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space; the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space; the Convention on International Liability for Damage Caused by Space Objects (Assembly resolution 2777 (XXVI), annex) and the Convention on Registration of Objects Launched into Outer Space (Assembly resolution 3235 (XXIX), annex).

In accordance with the Danish Outer Space Act (Act No. 409 of 11 May 2016, which entered into force on 1 July 2016), the Minister of Higher Education and Science established a public registry of space objects by 15 November 2016. The registry contains information about space objects launched into Earth orbit and beyond, which are attributable to Denmark as the launching State.

By the end of 2016, all Danish satellites previously launched had been registered both nationally and in the United Nations database, and new space objects have been and will continue to be added accordingly after launch (see article 10 of the Danish Outer Space Act).

No Danish space objects were launched in 2017.

Japan

[Original: English]
[2 November 2018]

International Space Station programme

Japan has been actively participating in the International Space Station (ISS) programme for the peaceful uses of outer space since its foundation. ISS is the largest international science and technology cooperation programme ever attempted in the new frontier of space. The participants in the ISS programme are pursuing further utilization of outer space with the aim of bringing benefits to the Earth.

One of Japan's notable contributions to the ISS programme is the Japanese Experiment Module "Kibo". Japan has promoted the utilization of Kibo for maximizing outcomes, and various experiments have been conducted aboard Kibo, including the topic areas of material/physical science, medical science, life science and applied utilization. In addition, Kibo is the only module on the ISS equipped with both a robotic arm and an airlock, and this unique capability allows various outboard projects such as deployment of small satellites.

Japanese astronaut Norishige Kanai, who in June completed a mission aboard the ISS that lasted 168 days, carried out numerous missions for the promotion of health and longevity on Earth by exploiting his background as a doctor. For example, through his engagement in the Japan Aerospace Exploration Agency (JAXA) third mouse habitation mission, 12 mice (half of them lacking the *Nrf2* gene, which is a control factor involved in biological stress defence) were brought back to Earth alive after having been subjected to a microgravity environment to examine medical risks of remaining in space, providing data for future space exploration. These efforts pursued today through the utilization of Kibo are expected to further advance and increase benefits to society. Japan is also contributing to the capacity-building of developing and emerging countries through the utilization of Kibo. The JAXA collaboration with the Office for Outer Space Affairs, known as "KiboCUBE", offers developing and emerging countries the opportunity to deploy CubeSats from Kibo. Kenya's first satellite, which was selected for the first round of KiboCUBE, was successfully deployed from Kibo in May. As the second satellite of the KiboCUBE programme, JAXA and the Office selected Guatemala's satellite "Guatemalan CubeSat" in September 2017, and are now preparing to deploy it in 2019. JAXA and the Office hope to further support the capacity-building of many countries through this programme.

Another example of Japan's remarkable contribution to the ISS programme is the H-IIB Transfer Vehicle (HTV). HTV No.7 (HTV7) was launched in September and carried necessary materials for ISS operation, including new ISS batteries (lithium ion battery cells made in Japan) and experiment equipment from JAXA, the National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA). In addition, HTV7 will demonstrate re-entry technology and cargo recovery function from ISS by means of the HTV Small Re-entry Capsule.

Space transportation

In Japanese fiscal year 2018, the following launch vehicles were launched: H-IIA Launch Vehicle flight No.39 with the Japanese sixth radar information-gathering satellite (IGS) on board; and H-IIB Launch Vehicle flight No.7 with HTV7 "KOUNOTORI-7" on board. The launch of the following launch vehicles are planned: H-IIA Launch Vehicle flight No.40 with the Japanese second Greenhouse Gases Observing Satellite (GOSAT-2) "IBUKI-2" atop a remote-sensing Earth observation satellite "KhalifaSat" (developed by the Mohammed bin Rashid Space Centre in the United Arab Emirates) on board; and Epsilon Rocket flight No.4 (Enhanced Epsilon), with a Japanese RAPid Innovative payload demonstration Satellite 1 (RAPIS-1) on board.

Space exploration

Second International Space Exploration Forum

Japan hosted the second International Space Exploration Forum (ISEF2) in Tokyo on 3 March 2018. ISEF is the ministerial-level forum to discuss the vision of future space exploration programmes and it coordinates global space exploration efforts. ISEF2 participants, including Ministers and Heads of space agencies from 45 countries and organizations, concluded three outcome documents: “Principles for International Space Exploration”, “ISEF2 Joint Statement” and “ISEF Terms of Reference”. In conjunction with this international ministerial-level forum, side events were also held, geared for industry and for young professionals, with the objective of advancing international space exploration. Those events, named “I-ISEF” for industry and “Y-ISEF” for young professionals, were the first attempts at ISEF events and contributed greatly to promoting the involvement of diverse players and global cooperation.

Exploration missions

JAXA is actively participating in space exploration through various missions. One is the Hayabusa2 mission, which is aimed at exploring the C-type asteroid called “Ryugu” and returning to the Earth in 2020 with samples from Ryugu. In June 2018, Hayabusa2 arrived at Ryugu after its launch in December 2014. In September 2018, the rover carried by Hayabusa2 called “MINERVA-III” succeeded in landing on Ryugu and capturing pictures of the surface. This was the world’s first attempt to succeed in exploring the surface of the asteroid. In October 2018, the robotic lander carried by Hayabusa2 — which was developed by the German Aerospace Centre (DLR) and the French Space Agency (CNES) and named “MASCOT” — was successfully deployed and landed on the surface of Ryugu. The first touchdown and sample retrieval by Hayabusa2 is to be performed in 2019.

In the area of lunar surface exploration, Japan is developing a pinpoint landing technology, which will be established with the Smart Lander for Investigating Moon (SLIM) mission, scheduled to be launched in Japanese fiscal year 2021.

JAXA is collaborating with many international partners in the field of space exploration. For Mars exploration, Japan is developing the Martian Moons Exploration and aims to launch in Japanese fiscal year 2024. It is a cooperative mission between JAXA, NASA, CNES, DLR and ESA. The spacecraft will make close-up, remote sensing and in-situ observations of both Phobos and Deimos and go down to the surface and collect a sample from either of those moons to bring back to Earth.

Space science

JAXA is actively planning and conducting various space science missions. In October 2018, BepiColombo, a joint mission of JAXA and ESA to explore Mercury, was successfully launched by an Ariane-5 rocket from French Guiana and started a seven-year journey to the planet. The spacecraft is scheduled to arrive at Mercury no later than 2025 and start joint observation of the planet using various instruments.

JAXA has started development of the X-ray Imaging and Spectroscopy Mission (XRISM), which is expected to investigate X-ray objects in the universe using high-throughput imaging and high-resolution spectroscopy. XRISM is a collaborative mission with NASA and ESA and is scheduled to be launched in Japanese fiscal year 2021.

Remote sensing

Japan promotes the utilization of Earth observation satellite data through international frameworks such as the Group on Earth Observations (GEO) and the Committee on Earth Observation Satellites (CEOS). JAXA led an Earth observation event in the third United Nations World Conference on Disaster Risk Reduction. Japan

hosted the fifteenth plenary of GEO in Kyoto on 31 October and 1 November, following the eleventh Global Earth Observation System of Systems (GEOSS) Asia-Pacific Symposium in Tokyo, which was held from 24 to 26 October. The GEO plenary focused on how Earth observation would contribute to three priorities — the Sustainable Development Goals, the Paris Agreement and the Sendai Framework for Disaster Risk Reduction — to realize a resilient and sustainable world.

The Global Change Observation Mission (GCOM) is aimed at monitoring global change in climate in order to project the effects of climate change. GCOM consists of two series of satellites: GCOM-W and GCOM-C. JAXA launched GCOM-W in May 2012. GCOM-W observes water cycle-related parameters, such as water vapor, liquid, sea-surface wind speed, sea-surface temperature, sea-ice extent and snow depth. Since its launch in 2012, GCOM-W has monitored the global water cycle, including ice coverage in polar areas, which are vulnerable to changes in climate. GCOM-W detected the lowest coverage of Arctic sea ice on record in September 2012 and Antarctic sea ice in March 2017. GCOM-C was launched in December 2017 to monitor 15 parameters, including aerosols, clouds, vegetation, and land and ocean surface temperatures. Such monitoring data are necessary to enhance accuracy in the projection of future environmental changes.

A number of Greenhouse Gases Observing Satellites (GOSATs) are being jointly operated and monitored by Japan's Ministry of Environment, the National Institute for Environmental Studies and JAXA. The first GOSAT was launched in 2009 and was the world's first satellite dedicated to monitoring greenhouse gases such as carbon dioxide (CO₂) and methane. GOSAT has been accumulating data on the global concentration of greenhouse gases for almost a decade. These data show that the global average of CO₂ concentration increased linearly, reaching a level of 400 parts per million in December 2015. On 29 October 2018, Japan launched the follow-up mission, GOSAT-2. GOSAT-2 monitors the same observables (methane and CO₂), but with higher accuracy across a broader range of locations, including industrial and densely populated areas. In addition, GOSAT-2 will measure carbon monoxide levels in order to estimate local CO₂ fluctuations more accurately and precisely.

JAXA is also promoting international cooperation regarding the utilization of satellite data for climate change. Last December, JAXA initiated cooperation with ESA, CNES and DLR with regard to the remote sensing of greenhouse gases and related missions as a means of supporting the implementation of the Paris Agreement.

International Committee on Global Navigation Satellite Systems

Japan has continuously and actively participated in activities related to the International Committee on Global Navigation Satellite Systems (ICG). In particular, Japan helps to promote the utilization of multiple GNSS constellations by supporting Multi-GNSS Asia, which was established in September 2011.

The ninth annual conference of Multi-GNSS Asia was held in Jakarta from 9 to 11 October 2017. The conference was jointly organized by JAXA, the Indonesian National Institute of Aeronautics and Space (LAPAN), the Building European Links toward South-East Asia in the field of EGNSS project, GNSS.asia and Quasi-Zenith Satellite System Services. The conference was supported by ICG and the International Global Navigation Satellite Systems Service.

Japan has been promoting the Quasi-Zenith Satellite System and the Multi-functional Transport Satellite (MTSAT) Satellite-based Augmentation System (MSAS). Japan hosted the twelfth meeting of ICG and the nineteenth meeting of the Providers Forum in Kyoto.

Asia-Pacific Regional Space Agency Forum

The Asia-Pacific Regional Space Agency Forum (APRSAF) was established in 1993 to enhance space activities in the Asia-Pacific region. Space agencies, governmental bodies and international organizations, such as United Nations

agencies, as well as companies, universities and research institutes from over 30 countries, regions and international organizations take part in APRSAF every year. It is the largest space-related conference in the region.

The twenty-fourth session of APRSAF (APRSAF-24) was held in Bengaluru, India, from 14 to 17 November 2017, with the theme “Space technology for enhanced governance and development”. The session was attended by 539 participants from 31 countries and regions. Participants included representatives from 10 international organizations, including six heads of space agencies and three deputy heads in Asia-Pacific countries, as well as high-level officials from governmental institutions in charge of space policy. The attendees shared issues and interests common in the Asia-Pacific region and expressed their expectations of the great contributions of APRSAF toward building a cooperative framework to help solve social issues.

In 2018, the twenty-fifth session of APRSAF (APRSAF-25) is to be held in Singapore from 6 to 9 November, with the theme “Innovative space technology for evolving needs”.

Netherlands

[Original: English]
[5 November 2018]

Space activities in the Netherlands: 2018

Recent policy developments in the Netherlands:

- The new coalition Government has allocated an extra 40 million euros for space activities in the Netherlands. These funds will be used for the construction of an international meeting facility in the European Space Research and Technology Centre (ESTEC) facility of the European Space Agency (ESA) and for participation in ESA programmes.
- The construction of an international meeting facility in ESTEC is part of a combined effort of the Government, regional authorities and ESA to develop the Space Campus Noordwijk as an open innovation hub for space activities. National and regional authorities will contribute 26 million euros to this development.
- An evaluation of space policy in the Netherlands in the period 2012–2016 showed that the gradual transition in which the downstream sector and the applications of space were being promoted, had been successful.

Governance

The Netherlands has a long track record of involvement in European space activities and has collaborated on international space activities since the 1960s, including as a member of the European Launcher Development Organization and the European Space Research Organization. The country is a founding member State of ESA, having ratified the Convention in February 1979. Since 1974, the country has belonged to the group of spacefaring nations. The first national astronaut flew into space in 1985.

The country has ratified all five United Nations space treaties and the International Telecommunications Union (ITU) Constitution and Convention. Since 1977, it has been a member of the Committee on the Peaceful Uses of Outer Space. The Netherlands is a signatory to several international export control and missile proliferation regimes such as the Comprehensive Nuclear-Test-Ban Treaty, the Missile Technology Control Regime, the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, and the International Code of Conduct against Ballistic Missile Proliferation. The country is a member of the European Union and the European Organization for the Exploitation of

Meteorological Satellites (EUMETSAT) and is a founding member of the North Atlantic Treaty Organization. The country hosts ESA ESTEC.

The responsible governmental entity for advising upon and realizing the Dutch space policy is the Netherlands Space Office (NSO), for which the Ministry of Economic Affairs and Climate Policy has a coordinating responsibility. The Ministry of Education, Culture and Science; Ministry of Infrastructure and Water; the Netherlands Organization for Scientific Research; and other ministries also implement their space programmes through NSO. The director of NSO reports to the steering committee of these ministries. NSO implements its functions mostly through ESA contributions and national programmes.

The Netherlands adopted a national space law (Space Activities Act) in 2006; it came into force in 2007. A permit is needed to launch, manage and keep satellites in place from the Netherlands or from a Dutch ship or aircraft. One must apply to the Radiocommunications Agency for this permit. Space objects that fall under Dutch jurisdiction must be registered.

For seven Dutch satellite operators, the Radiocommunications Agency acts as the “notifying administration” with respect to ITU filing rights for satellite networks. In April 2018, the Agency granted a licence to the private company Hiber BV for tracking, telemetry and command operations from the Netherlands for their aimed small-satellites constellation network in low Earth orbit. This brought the number of licensees under the Dutch Space Activities Act to five. In total, these five licensees operate 15 Dutch satellites: 10 geostationary orbit satellites and five low Earth orbit satellites.

Space policy in the Netherlands

In 2017, the Netherlands allocated 128 million euros to space activities. The bulk of this (84 per cent) was allocated to international organizations: 65 per cent to ESA and 18 per cent to EUMETSAT. The programmes for science, launchers, Earth observation, satellite communication and technology development are the main ESA priorities for the Netherlands.

Important national activities and recent policy initiatives include the creation of the Satellite Data Portal in 2012. The main purpose of the Portal today is to offer the user community data complementary to Copernicus satellite data, and to develop national downstream capabilities. The Portal contains Earth observation data covering the territory of the Netherlands from several commercial satellite missions and provides free access to national actors for civil and commercial use.

Since 2013, NSO has been running the programme Geodata for Agriculture and Water (G4AW) on behalf of the Ministry of Foreign Affairs. This programme funds projects and partnerships in developing countries (26 eligible countries), focusing on the development of satellite-based information services for food producers, including in the areas of agriculture, cattle breeding and water management. With a budget of 60 million euros, the programme is aimed at supporting 4.5 million smallholder food producers by 2021. The Netherlands cooperates closely with the Food and Agriculture Organization of the United Nations in making data on water productivity in agriculture available.

The Netherlands (with European partners in the Copernicus programme) was instrumental in the technical development of the TROPOspheric Monitoring Instrument (TROPOMI). With a resolution of 7 kilometres by 7 kilometres, the instrument provides unprecedented data for scientific research and worldwide air-quality monitoring at city level on a daily basis. The instrument was developed with input from the scientific user community (e.g., the Royal Netherlands Meteorological Institute), public institutions (e.g., the Netherlands Institute for Space Research and the Netherlands Organization for Applied Scientific Research) and various private companies.

Commercial activities: the full value chain

The Netherlands space industry has strong capabilities in several industry segments, including manufacturing subsystems and downstream applications.

The space manufacturing sector provides subsystems (e.g., instruments and solar panels) and components (e.g., sensors) to European satellites and launchers (e.g., structures and igniters). Several companies in the Netherlands are also important actors in the growing industry involving small and very small satellites (e.g., CubeSats), as prime, subsystem and launch service providers. From design, development and testing, to launch opportunities and operations, the Netherlands has become a one-stop shop for small-satellite technology.

Important downstream/value-adding activities include Earth observation, products and services for precision farming, infrastructure modelling (e.g., pipelines and deformation) and water management, and navigation (e.g., GNSS devices). Also, a number of satellite operators have ground stations (e.g., Inmarsat) or their main office (e.g., SES Networks and Leosat) in the Netherlands.

The Netherlands space industry association, SpaceNed, estimates that the space industry generates annual turnover worth some 600 million euros.

Uruguay

[Original: Spanish]
[29 October 2018]

Global Space Applications Conference

The Global Space Applications Conference (GLAC 2018) was held in Montevideo from 21 to 23 May 2018.

GLAC 2018 was jointly organized by the International Astronautical Federation (IAF) and the Centre for Research and Information on Aeronautics and Space of Uruguay, which has been a member of IAF since 1985.

The Conference was declared of national interest by the Office of the President of the Republic.

On the morning of 21 May, before the opening of the Conference, a seminar organized by the Space Generation Advisory Council and IAF was held. Participants included young students and professionals from all over the world who were given the opportunity to take part in training in space applications and their political aspects. During that seminar, prominent space experts gave talks and showed great enthusiasm for the involvement of the young people. The President of IAF, Jean-Yves Le Gall, expressed his desire to see a growing number of young people from South America involved in space-related activities. The participants in the seminar also had the privilege of hearing the Russian cosmonaut Sergei Krikalëv share his experiences as an astronaut.

The opening ceremony of the Conference was held in the afternoon. Among the participants were the Minister of Defence, Jorge Menéndez; the Director for the Promotion of Agricultural Information Systems of the Ministry of Livestock, Agriculture and Fisheries, Amalia Álvarez; and Marta Gaggero, representing the Centre for Research and Information on Aeronautics and Space, which hosted the event. Speakers included the President of IAF, Jean-Yves Le Gall, and the President of the German Aerospace Centre (DLR), Pascale Ehrenfreund, while the Executive Director of IAF, Christian Feichtinger, acted as master of ceremonies.

In his speech, Mr. Menéndez highlighted the special importance that space applications had for the agricultural sector in Uruguay, considering that sector to be the most important in the country. The President of IAF said in his statement that it was now clear to all that launching satellites into orbit could bring tangible benefits

to people on Earth, and that remote sensing of the Earth, satellite telecommunications and satellite navigation systems could play an essential role in reducing the risk of disasters and providing accurate information in a timely manner.

The first plenary session, on the topic of space applications for socioeconomic growth, was preceded by a speech by Fernando Brum, President of the National Agency for Research and Innovation, who described innovation as an important factor in achieving economic growth in a country.

The presidents of the main space agencies, namely those of Argentina, Brazil, France, Italy and Mexico, participated in the plenary. During that first session, it was highlighted, among other things, that some countries lacked sufficient financial resources to conduct even the most basic space activities; nevertheless, the enormous advances that had taken place in the past decade were acknowledged. Emphasis was placed on the need for dialogue with Governments, in order to identify the needs of populations and raise awareness of the fact that acquiring space technology was not a waste of money, but an investment in increasing and improving production.

It was affirmed that collaboration between organizations had become essential in enabling emerging countries to access the benefits brought by space applications. The importance of finding the right balance between the national interest and international cooperation was also underscored.

The importance of the relationship between Latin American countries and Europe was noted. In that regard, the Italian Space Agency and IAF are working on a major regional project: the International Space Forum at Ministerial Level, to be held in Buenos Aires on 1 November 2018.

The following topics were addressed in the subsequent plenaries: space for more effective agricultural and maritime activities; space for integrated risk management; space technologies for the detection and study of climate change; the preservation of natural resources through the use of space-based technologies; and democratizing space data. Each plenary addressed the legal aspects of the issues raised.

Experts from Argentina, Austria, Colombia, France, Germany, Mexico, South Africa, Ukraine, the United Arab Emirates, the United Kingdom of Great Britain and Northern Ireland and the United States of America, as well as the European Space Agency, took part in those plenaries.

The presentations highlighted, for example, the need to produce more food and energy for a growing population of more than 7 billion people. It was said that in the face of that situation, observation of the Earth was a tool that helped to better monitor food resources.

From the discussions that took place, it was clear that the use of space applications needed to be a joint effort made by all spacefaring nations to overcome the challenges faced in various areas of activity, such as transportation, agriculture, navigation and security. In that respect, it was very important for developing nations to have unrestricted access to space data.

The Conference concluded with a positive outcome and “an enormous amount learned” on the key topics surrounding space applications. The participants were able to learn how space was currently being used around the world to promote socioeconomic growth and how it would be used in the future.

Additionally, experts highlighted the need for Latin America to strive for the creation of a regional space agency to develop the space capabilities of countries in the region. The formation of such an alliance would be of great benefit, enabling them to pool their resources and operate at the international level.

The Conference provided participants with details of the activities being carried out by space agencies and industries in the area of space applications and also provided an opportunity to learn about the activities of countries such as Uruguay, which, despite not possessing space technology, utilized satellite data nonetheless.

A total of 182 delegates from 24 countries took part in the Conference. Participants left with a clearer understanding and increased knowledge, with respect to the future of space applications and the concrete benefits that such applications bring to our day-to-day lives.

The Conference was of great importance to Uruguay — not only because it was the first time that Uruguay had hosted such an event or that such an event had been held in Latin America — but also because the Conference brought those that possess space technology and those that utilize it closer together, providing an opportunity to seek new ways of cooperating.
