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**Committee on the Peaceful  
Uses of Outer Space  
Fifty-fifth session**

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648th Meeting  
Friday, 8 June 2012, 10 a.m.  
Vienna

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*Chairman:* Mr. Yasushi Horikawa (*Japan*)

*The meeting was called to order at 10.03 a.m.*

**The CHAIRMAN** Good morning distinguished delegates, I now declare open the 648th meeting of the Committee on the Peaceful Uses of Outer Space.

Distinguished delegates, I would first like to inform you of our programme of work for this morning. We will continue our consideration of agenda item 5, "General exchange of views", and agenda item 6, "Ways and means of maintaining outer space for peaceful purposes". We will also continue and hopefully suspend our consideration of agenda item 8, "Report of the Scientific and Technical Subcommittee on its forty-ninth session".

There will be three technical presentations this morning: by representatives of Japan entitled "Japanese Satellite Challenge to the Global Issues"; by a representative of Switzerland entitled "Clean Me/CleanSpace One"; and by a representative of China entitled "BeiDou: Bring the world and China to your doorstep".

Expert group B of the Working Group on the Long-term Sustainability of Outer Space Activities is meeting this morning from 9.00 a.m. to 11.45 a.m. in meeting room MOE27. It has already started.

This morning, there is also a workshop on the societal impacts of space weather events, from 9.00 a.m. to 1.00 p.m., held in meeting room MOE100 of this building. The workshop is organized by the United States.

During lunch time today, at 1.15 p.m., there will be a handing over ceremony of a BeiDou navigation satellite model in the Mozart Room of the VIC restaurant. The model satellite is a donation by China to the United Nations Office of Outer Space Activities permanent exhibition. The ceremony will be followed by a reception.

Also during lunch time today, from 12.00 p.m. to 3.00 p.m., there will be a meeting of space agency representatives to discuss the draft terms of reference for the Mission Planning and Operations Group. This meeting is convened by representatives of ESA, NASA and the Chair of Action Team 14. The meeting will take place in meeting room MOE27. Are there any questions or comments on this proposed schedule?

*I see none.*

I would also like to inform you that the Secretariat has distributed the Provisional List of Participants in conference room paper 2. Delegations are kindly requested to provide the Secretariat with written amendments to the Provisional List of Participants by Monday, 11 June, so that the Secretariat can finalize it.

Distinguished delegates, I would now like to continue and hopefully conclude our consideration of agenda item 5, "General exchange of views".

The first speaker this morning is the distinguished delegate of Thailand. You have the floor.

**Mr. S. SURIYAWONGSE** (*Thailand*) Thank you, Mr. Chairman. First of all, on behalf of the Thai Delegation, I would like to congratulate you on your election, as well as that of the other members of the Bureau. You have Thailand's full support for your task. We would also like to commend the Committee for the positive achievements during the past year.

It is significant that Thailand's Minister of Science and Technology attended the high-level commemoration of the 50th Anniversary of Human Space Flight on 1 June 2011 in Vienna. The Thai delegation also attended the interesting activities which were organized during the period, especially the special exhibition.

As you may know, last year was a challenging one for Thailand as we experienced one of the worst floods in 50 years. The flood affected millions of

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people, and also caused significant damages throughout our country. It was the most severe flood that has ever occurred during the past 50 years, in terms of flood duration, extensive area of damages, property and lives. To cope with this, the applications of space technology were used intensively, especially the images from various satellites used for the estimation and mapping of the extent of flood areas. The map plays a crucial role not only in the process of flood relief, but also in the provision of compensation and rehabilitation at both national and local levels. For flood relief, high resolution images and other information were used to detect the damaged areas and to provide timely assistance, including water supply, food, medicine, healthcare and other essentials.

Moreover, those images were used to estimate the compensation which had to be paid for damaged areas by comparing pre- and post-inundated areas and calculating the amount of money for their compensation. Satellite images can also be used for rehabilitation planning in various scales including at the provincial, district and sub-district levels. The Government of Thailand and the Thai people appreciate the kind assistance and support from various international agencies and countries during our tough period.

Aside from disaster management, data acquired from the earth observation satellites have been applied with a view to enhancing our sustainability in every aspect; our economic system, society, and environment. Satellite data provides huge benefits for people in Thailand in various fields including agriculture, forestry, fishery, urban planning, environmental monitoring, and of course, disaster management. Satellite images also play an important role in sustainable water management planning which is being conducted in Thailand.

Mr. Chairman, Thailand sincerely appreciates that the United Nations and other international organizations have established forums on space-based disaster management such as the UN-SPIDER, Sentinel Asia, and the International Charter. Through these organizations, satellite images have been provided to disaster-affected countries. However, there still remains some room for improvement, especially in terms of timeliness and the number of satellite images provided.

As we are well aware, during the past decade, national disasters have occurred more often and with more severe impact all over the world. Regarding this, space application has been proven to be one of the most vital tools in disaster management. Thailand,

therefore, encourages the Committee and other relevant organizations to enhance the mechanism in using space-based tools to be more tangible and with immediate response than they have ever been.

Furthermore, to emphasize the significance and recognition of the benefits of space technology in our country, we have often organized and conducted various kinds of activity such as trainings, seminars, workshops, and conferences to transfer knowledge on space and its application, as well as to create awareness of the people in these areas. The targets of these activities include personnel from the public and private sectors as well as lecturers and students in this field. In 2011, we successfully organized 24 basic and advanced courses in geo-informatics applications with 1,200 participants. To create space awareness, 25 activities were held with the participation of over 10,000 attendants. For example, the Youth Space Camp which was participated by approximately 2,000 students from 80 schools in various provinces, and the Geo-informatics Delivery Project which brought the latest geo-informatics technologies in a van that travelled through various areas across Thailand to promote understanding about those technologies amongst the local people. The project is still on-going, with nearly 8,000 people having participated so far. Collaborated trainings, seminars, workshops, or conferences in the fields of space technology with diverse organizations and countries such as the Japan Aerospace Exploration Agency, Wuhan University of the People's Republic of China, and etc. are also undertaken. All these activities have tremendously helped create and increase the awareness of space technologies and applications in Thailand. Moreover, we are playing an important role in the South East Asia Region, under the Subcommittee on Space Applications (SCOSA), by proposing to establish an ASEAN Earth Observation Satellite. We also have substantive collaborations with several countries such as Myanmar, Viet Nam, Laos, China, South Korea, Japan, India, France, and the United States of America.

In the area of communication satellite, under the auspices of the Ministry of Information and Communication Technology of Thailand, we are in the process to launch THAICOM 6: Thailand's new telecommunication satellite. The project is scheduled to be accomplished within the year 2013 — next year. In addition, we have responded to the request from the International Telecommunication Union (ITU), to be in charge of the supervisory authority under the Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Space Assets.

Mr. Chairman, towards the fourth week of November 2012 – this year, Thailand and the Asian Association on Remote Sensing (AARS), will jointly organize the 33rd Asian Conference on Remote Sensing during 26-30 November in Pattaya, Chonburi Province of Thailand. We have also been selected to host the 1st COSPAR Symposium in Bangkok, Thailand during 11-15 November 2013. Furthermore, Thailand and COSPAR will organize a 4-day capacity-building workshop during 4-8 November 2013 back to back with the Symposium. We look forward to welcoming all of you to attend the said activities in Thailand.

Mr. Chairman, Thailand, along with other COPUOS members, reaffirms its commitment to further cooperate in the activities of COPUOS to strengthen its work for the peaceful uses of outer space. Thank you.

**The CHAIRMAN** I thank the distinguished representative of Thailand for his statement. The next speaker on my list is the distinguished representative of the Republic of Korea. You have the floor.

**Mr. H. CHO** (*Republic of Korea*)  
Mr. Chairman. Let me begin by congratulating you on your election as Chair of COPUOS for the period 2012-2013. I am confident that, under your able guidance, our deliberations will prove to be very productive. My congratulations also go to other members of the Bureau on their election.

Mr. Chairman, for more than 5 decades, COPUOS has played an essential role in ensuring that outer space is used for peaceful purposes. The Committee has served as a unique platform at the multilateral level for promoting the peaceful exploration and use of outer space and for increasing international cooperation in space activities.

We welcome that much progress has been achieved in space exploration for peaceful purposes, the development of space science and applications as well as various projects which contribute to international cooperation. In particular, we are pleased to note that cooperation in disaster management and emergency response using space-based services has been enhanced. We hope that cooperation in these areas will be further strengthened.

Two days ago, we had a special event commemorating the 40th anniversary of the LANDSAT programme. Indeed, remote sensing from space has improved our quality of life through monitoring climate change, improving agriculture and

managing natural resources, to name just a few benefits. In order to continue the socioeconomic development of humankind based on space technology, it is essential that we should ensure the long-term sustainability of outer space. My delegation welcomes that the Working Group on the Long-term Sustainability of Outer Space Activities started its work earlier this year, we hope that concrete measures will be proposed to this end.

My Government recognizes the link between sustainable outer space activities and development. The main objective of the present Korea's Basic Space Development Plan adopted this year is to promote the quality of life of our citizens by exploring and utilizing outer space in a sustainable way. The Plan also promotes the framework for Korea's peaceful space activities and related international cooperation.

Mr. Chairman, I would like to move on to share with you Korea's recent efforts at the national, regional and international levels in relation to the work of the Committee.

Currently, we have two satellites in orbit under the Korea Multi-Purpose Satellites, or KOMPSATs series, which contribute to disaster monitoring, land and water management and mapping, among others. KOMPSAT-2, a remote sensing satellite with a 1-meter resolution optical camera, has been in service since 2006. It has provided satellite imagery of regions devastated by natural disaster to aid recovery efforts.

Last month, KOMPSAT-3 was successfully launched from the Tanegashima Space Center in Japan. KOMPSAT-3 is equipped with a high-resolution electro-optical camera. In addition, we plan to launch KOMPSAT-5 which will carry Korea's first Synthetic Aperture Radar payload capable of executing Earth observations under all weather conditions.

Under the Science and Technology Satellites, or STSATs series, the STSAT-3 has been under development since 2006. This satellite will carry instruments to survey the galaxy and measure the temperature changes of the space of the earth. STSAT-3 will be launched later this year.

A space launch vehicle is also of great importance to Korea. Despite the failed launches in 2009 and in 2010, we are working closely with our Russian partner to re-launch the Korea Space Launch Vehicle-1 in October this year, building on the lessons learned from the past failures.

Mr. Chairman, my government has placed great importance on increasing cooperation with our partners. At the regional level, we have actively participated in various regional space activities such as the Asia-Pacific Regional Space Agency Forum and the International Aeronautical Federation Asia-Pacific Regional Group. Of particular note, the Korea Aerospace Research Institute hosted the first General Meeting and Special Conference of the Asia-Pacific Regional Group of the International Aeronautical Federation in December 2011, with the participation of around 200 experts from 13 countries.

Enhancing international cooperation for dealing with natural disasters is an area upon which my government has placed particular emphasis. KARI joined the International Charter on Space and Major Disasters in July last year and now provides satellite images as part of the International Charter activities for disaster monitoring all over the world.

Furthermore, Korea has continued to expand international cooperation with the space community. KARI entered into a partnership with the European Space Agency last year by signing an agreement on tracking and telemetry reception of ESA launch vehicles, utilizing the Jeju Tracking Center in Korea.

Providing international space education and training programmes is another priority area for Korea. KARI invited 24 participants from 16 countries from across the world to its training programme last year, and another 20 participants from 11 countries to this year's programme held last month. The programme offers courses on satellite systems, such as system engineering, satellite assembly, and remote sensing and applications. Based on our experience of building space capacities in a relatively short period of time, we hope that such programmes will make modest contributions to the utilization of space technology for peaceful purposes and to the benefit of all mankind.

Mr. Chairman, my delegation welcomes the multilateral meeting on the development of an international code of conduct for outer space activities held here on Tuesday. We believe that agreement on a set of guidelines for the responsible and sustainable use of outer space can promote transparency and build confidence among nations in regard to their space-faring activities. We hope that productive discussions with the aim of adopting a code of conduct will make tangible outcome.

To conclude, I would like to reiterate my delegation's commitment to the work of COPUOS, and reaffirm that we will cooperate with our partners to

achieve the objectives of the Committee. Thank you, Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of the Republic of Korea for his statement. The next speaker on my list is the distinguished representative of Ukraine. Distinguished representative of Ukraine, you have the floor.

**Mr. M. OSAVOLIUK** (*Ukraine, interpretation from Russian*) Thank you, Mr. Chairman and your colleagues. My delegation would like to greet all participants here at this 55th session of COPUOS. I would also like to greet you Mr. Chairman, and congratulate you on assuming the Chair at this most important meeting and I can assure you that you can count on our full collaboration.

In 2011, in Ukraine, all sorts of measures implementing the National Scientific and Technical Space programme for 2008-2012 were implemented and with our delegation, we would like stress that given the present redevelopment of space activity, the study and use of space must necessarily be conducted on the basis of active international cooperation at the intergovernmental, regional and national levels.

The international activity of Ukraine in 2011 was focused on the development of a cooperation with EU countries, the CIS countries, the USA, Brazil, the near East and Africa as well as the Asia and Pacific. In 2011 we concluded agreements that entered into force with 6 bilateral entities, with Russia, with the Republic of Korea, Indonesia and Peru, inter alia. Especially important was the entry into force in 2011 of an agreement between Ukraine and Russia, with regard to the measures ensuring technological protection in the study and use of outer space, and the establishment and operation of a space and rocket technology agreement on this date: 11 June 2009. The information of this agreement was presented by Ukraine and the Russian Federation under agenda item 9 of the last SNT Committee meeting of the UN.

The Ukrainian organization and institutes in 2011 also actively participated in international space projects, such as Cyclone-4, CSTAR, Landstar, Dnepr and Teresco, GLONASS, in the sphere of aerial and solar energy, we participated in projects in research and experiments in the Russian segment of the ISS as well. Last year we launched 6 launchers made in Ukraine and placed in orbit in 13 spacecraft, including the Ukrainian Sich-2, spacecraft, which is an important step towards the establishment of a national Earth remote sensing space system.

Within this agenda item, we would also like to mention the importance of the preparation of the international code of conduct in outer space. Since 2009, Ukraine has been actively participating in consultations on the preparations of this document. May this year, we handed over our contribution to the EU's external relations unit. We hope that our contribution will be taken on board in the final text of the international code of conduct.

We are sure that indeed the work between the EU and the Institute of the EU on disarmament research with regard to this international conduct, the meeting that was held 5 June this year, in the Vienna International Centre, proved to be important in this regard.

Mr. Chairman, with regard to this agenda item, indeed, once again I would like to refer to the importance of this work on the code of conduct. We have been working on consultations on preparing this document for quite a while since 2009 and we handed over our contribution to the EU and its external relations unit — we hope that our contribution will be taken on board in the final text of the international code of conduct.

The delegation of Ukraine would stress the fact that our country indeed is attached to the following principles and positions: Outer space should be studied and used for exclusively peaceful purposes for the benefit of all countries in the world, especially with due consideration to the needs of development countries. Access to outer space should be implemented on an equitable and non-discriminatory basis, irrespective of the level of scientific, technical and economic development of various countries. Outer space, including the Moon and other celestial bodies, cannot be appropriated by any declaration of sovereignty over them, nor by use or occupation of them nor by any other means. Outer space should be used on the principles of its non-militarization in order to improve living standards and peace on Earth. The growing use of outer space makes it necessary to have enhanced transparency with regard to its use in order to strengthen confidence and to exchange information among all the participants in these activities in outer space. I would like to wish all delegations best work possible in our consideration of agenda. Thank you.

**The CHAIRMAN** I thank the distinguished representative of Ukraine for his statement. The next speaker on my list is the distinguished representative of Germany. You have the floor.

**Mr. R. LÜDEKING** (*Germany*) Thank you, Mr. Chairman. Mr. Chairman, I would like to first of all congratulate you on your election as new Chairman of COPUOS. We are convinced that thanks to your proven experience, the 55th session will be productive. At the same time, we would like to express our sincere gratitude to Ambassador Dumitrii Dorin Prunario for guiding the COPUOS sessions during the last years and the 1 June 2011 celebration of 50 Years of COPUOS and 50 Years of Human Space Flight. We would also like to express our appreciation to Ms. Mazlan Othman and her team at the Office of Outer Space Affairs for their work over the past year and their preparation for this session.

Mr. Chairman, space is a means to an end. We have outlined in some detail in our space strategy, space technology provides infrastructure and services with a view to achieving social, economic and scientific objectives outside the space sector itself; we should make good use of that.

The overarching aim must, at all times, be to continue to improve human living conditions. Space projects will be judged according to the contribution they make to solving the challenges facing global society and whether long-term high-level funding can be expected to bring adequate benefits.

Mr. Chairman, let me give a few concrete examples to demonstrate the importance of space technologies in our daily lives:

Firstly the depletion of the ozone layer. How do trace gases such as nitrous oxides, carbon dioxide and methane influence our climate? These were the questions that German researchers sought to address when, 10 years ago — in February 2002, the European environmental satellite Envisat was launched by ESA. On board of the largest Earth observation satellite ever constructed was the German-Dutch-Belgian “Scanning Imaging Absorption SpectroMeter for Atmospheric CartographY” — I think that is quite a difficult name for it, but it is for short named: SCIAMACHY.

It allowed us to document the extent and effect of major environmentally harmful gases such as nitrogen dioxide, sulphur dioxide and methane. SCIAMACHY and other space-based atmospheric sensors have therefore not only resulted in a dramatically improved scientific understanding of the ozone hole — but also provide policy-makers with information that allows them to identify the need for political action.

The concentrations of ozone-depleting chemicals in the stratosphere are decreasing as a result of their ban in the Montreal Protocol 25 years ago. But air streams are producing some surprising effects. For example, SCIAMACHY and its predecessor, GOME (Global Ozone Monitoring Experiment), were the first to observe an ozone hole above the North Pole. However, it only appeared twice during the whole observation period in the winters of 1996/1997 and 2010/2011.

SCIAMACHY data also show that environmental protection measures really do work and can be observed by satellites. An improvement in the air quality in large parts of Europe was observed, and attributed to the environmental protection measures taken over the past 15 years. In addition, SCIAMACHY has been able, for the first time, to map the global distribution of the greenhouse gases, carbon dioxide and methane, from space. This helps researchers understand where the natural and industrial sources of these greenhouse gases are and how they influence climate change. Systematic observations with SCIAMACHY have helped to investigate these questions and devise countermeasures.

Let me now turn to the second point: robotics. Robotic technologies are a major topic in Germany's space strategy. Two important events have already taken place in Germany this year. The German Government held the "Second National Conference on Space Robotics" in March, in which some 200 high-level experts from the commercial, scientific and political spheres participated. The focus was not only on developments in space technology to support future missions in the Earth's orbit and to explore space, but also on the potential to transfer findings from space robotics to applications on Earth. Consequently, at the Hanover Fair, German Chancellor Merkel and Chinese Prime Minister Wen, jointly viewed a new generation of "human-friendly" robots. DLR's robotics and mechatronics center is a world leader in the development of "soft robotic" arms and has, in collaboration with the Harbin Institute of Technology, built a human-like sensitive five-finger hand. Such technologies lay the foundations for a new generation of robotic production systems, including the systems in the area of elderly care and handicapped persons.

Mr. Chairman, thirdly, space technology has been deployed successfully for humankind to detect environmental parameters to determine public health risks and support the best solution and the best possible spatial allocation of limited resources. Therefore, Action Team 6 on — what I call — "Public Health: the use of space technology to improve public health" was

established in 2001 by this Committee as a mechanism to initiate the implementation of recommendations by the third United Nations Space Conference UNISPACE III.

This year the University of Landau in Germany will organize the AT6 workshop in cooperation with UN-OOSA in Bonn, from 30 July to 1 August 2012. It will focus on spatial public health problems. Preliminary agenda items are spatial epidemiology, spatial logistic optimization of public health response and possibilities for space technology applications to reduce pesticide application.

In this context, we would like to renew the call for Research Fellowships in the fields of Space, Aeronautics, Energy and Transport Research by DLR and the German Academic Exchange Service. More information about this programme can be found on the DLR website.

Mr. Chairman, I have only been able to address a few aspects of our work. My delegation will therefore ask for the floor again under various items on the agenda. I would also like to announce that we will make a presentation under agenda item 15 "Space and water" and let me conclude by inviting you all to the International Air Show, which will take place from 11-16 September this year in the new Berlin ExpoCenter. As you may have heard, the Republic of Poland is the official partner of this Air Show in 2012. Thank you, Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of Germany for his statement. The next speaker on my list is the distinguished representative of Cuba. You have the floor.

**Mr. J. C. MARSÁN AGUILERA** (*Cuba, interpretation from Spanish*) Thank you, Mr. Chairman. As it is the first time that I am taking the floor, my delegation would like to congratulate you on your election of the Chair for the 2012-13 session, and we would like to assure you that we are eager to contribute to the success of this meeting. Through you, I would also like to congratulate Mr. Filipe Duarte and Mr. Piotr Wolanski; First Vice-Chair and second Vice-Chair/Rapporteur. I would also like to take this opportunity, on behalf of my delegation to thank the director of the Office, Ms. Mazlan Othman, for her introductory statement, which has summed up the work of the Office for Outer Space Affairs in 2011 and we appreciate the efforts of the Secretariat in organizing this meeting.

We welcome the interest shown by various countries in the region of Latin America and the Caribbean towards the work done under COPUOS. This is clear evidence of the growing importance that our region attaches to the peaceful use of outer space, aware of the benefits of it to the sustainable development of our peoples. My delegation fully endorses the statement made under this item by the distinguished Ambassador of Ecuador, speaking on behalf of GRULAC.

Mr. Chairman, Cuba's position and expectations are very clear. We support nuclear disarmament as a maximum priority objective and we advocate for the end of the space arms race and for the urgent total elimination of nuclear weapons. We reaffirm the need to move further in negotiating legislation, banning militarization of outer space and the deployment of nuclear weapons in that area. For this, what we need is a constructive dialogue involving this Committee its Legal Affairs Subcommittee, in particular, as well as the Disarmament Conference.

The adoption of such new measures and provisions is a growing need considering the further intent of some powers to militarize space. The danger that the arms race be transferred into outer space is growing. New versions of star wars with antimissile shields and other horrific and terribly expensive plans, threaten us daily, not only for the peaceful use of outer space, but also for the survival of the human race. In that context, my delegation would like to reaffirm, the need to continue strengthening the outer space legal regiment, in order to guarantee harmlessness, security and transparency in space activities.

There are a number of new aspects, such as, for example, private transnational companies or aerospace vehicles, emerging. These do not belong under current legislation. For that reason, we oppose to the manoeuvres of some Western States seeking to reduce the time allotted to the Legal Subcommittee, limiting its work to practical aspects of space development, without focusing on so-called theory, such as the definition and delimitation of outer space, the discussion in the gaps in international space law. These positions hamper negotiations of new legal instruments that can fill the legal gaps on militarization of outer space and they also stand in the way of any progress in the Legal Subcommittee.

Mr. Chairman, my delegation would like to stress the particular importance we attach to the definition of outer space. Current non-definition does not help in any way for security and confidence in the peaceful use of outer space, and thus this must resolved

as soon as possible. Accordingly, we hope that there will be constructive proposals for this in the discussion of the Working Group on this matter.

On the question of the geostationary orbit, we reaffirm that this is a limited resource with growing risk of saturation and its use must be regulated under the space treaties, especially taking into account the needs of developing countries. Cuba acknowledges the importance of the question of long-term sustainability of space activities and its examination under COPUOS, and in that context, we reaffirm our concern regarding the problem of space debris and collisions of space objects with such debris. We believe that the future of space activity, to a great extent, depends on reduction of debris.

We condemn, once again, the expanding network of spy satellites in space, especially from the United States, created with the objective of obtaining information to the detriment of other nations and not for the benefit of humanity — contributing to a great extent — to the generation of space debris.

Mr. Chairman, in Cuba there is more and more importance being attached to space science and their applications, in particular for the forecast of disasters, such as hurricanes, floods, tsunamis, forest fires as well as danger, vulnerability and risks studies, inter alia. And we would like to stress the importance that my country attaches to early warning systems on disasters — this is an area where we have gained a certain amount of experience, especially when dealing with hurricanes, which are becoming more and more frequent and intensive — as well as cooperation between countries in my region.

My delegation acknowledges the valuable contribution of space based disaster management support and we welcome the training in the area of management of natural disaster under UN-SPIDER in 2011 and we are grateful to the Office for Outer Space Affairs for their cooperation. Once again, we urge COPUOS to intensify coordination and cooperation at the international level through training programmes, in particular in developing countries.

In this context, we welcome the initiative of Argentina to offer itself as the venue for the next practical course of the United Nations on space law, 5-9 November this year.

Mr. Chairman, to conclude, I would like to assert our endorsement of the principle of access to outer space in conditions of equality for all States without any discrimination. We reaffirm our conviction

of the need to conserve outer space and preserve it, solely for peaceful purposes, which is a prime element to guarantee the future of humanity. Thank you.

**The CHAIRMAN** I thank the distinguished representative of Cuba for his statement. The next speaker on my list is the distinguished representative of France. You have the floor.

**Ms. F. MANGIN** (*France, interpretation from French*) Mr. Chairman, ladies and gentlemen, dear colleagues, I would like at the outset, congratulate you on your election, along with that of your two Vice-Chairmen and to express our satisfaction that you are presiding the debate at this 55th session of COPUOS. You can certainly on the full and active support of the French delegation in contributing to the debate ongoing in a constructive spirit in order to seek consensus.

I would also like to thank the director, Ms. Mazlan Othman, as well as her whole team at OOSA for the quality of their work in preparing this session of COPUOS as well as those of the two Subcommittees of 2012.

My delegation would like join and fully support in endorsing the statement made by the European Union as a pronounced the last 6 of June by the Rapporteur of the EU in Vienna.

In my national capacity, I would like to add a couple of comments:

France is attached to the Universalization and the improvement of the implementation of the rules and laid down by the space conventions in respect with the 3 major principles, which must regulate space activities. Indeed, we would like to attach important importance to the work of COPUOS and very happy to see the latest reports of the Scientific and Technical, and Legal Subcommittees, documents which are going to be presented to us under items 8 and 9 of the agenda.

Our Committee also plays a very important role in stepping up international cooperation of space activities, encouraging ever more nations to participate in our work and we are especially happy that Azerbaijan has become a COPUOS member.

Secondly, France is particularly attached to the principle of sustainability — long-term — of space activities and supports initiatives related to this. Without this aspect of long-term sustainability, especially given the major risks linked to space debris proliferation, it is the whole entirety of the security of space activities, the integrity of satellites, the ISS and

the men and women on board the ISS, which can be cast in question at any point in time. In other words, it is the very use of space, which is threatened. This is why we fully, and as from the point of origin, support the work of the Long-Term Sustainability of Space Activities Working Group.

Consequently, the initial results of the Working Group and of its 4 extra subgroups present for observations, discussed in parallel to the work of this plenary session, are really expected — with [...] because they are going to be on subjects which are very important, such as space applications for sustainable development on Earth, space debris, space weather or the regulatory aspects having to do with these issues.

I would also like to stress the interest that we have in the quality of the work of this Committee, as a forum insuring general exchange of information on national legislations having to do with the exploration and peaceful uses of outer space. As you know, France has developed specific legislation on this, pursuant to the main UN space treaties on the basis of which any launching operation or orbiting satellite orbit control activity conducted by a French operator and/or from French national territory, must be subject to prior authorization delivered by the French Government, and this after technical input from the National Space Study Centre (the CNES).

With regard to COPUOS, during its last legal subcommittee meeting in March, the work of this Working Group on this particular topic has been finalized and present— with this report of the working group — we have a very, very excellent analysis available to us, which gives us a practical tool that we should use and update during successive sessions.

For this reason, I would like to have Committee to be able to give this as much visibility as possible by presenting it at the 67th session of the General Assembly of the UN.

Mr. Chairman, I would like to also refer to the draft international code of conduct on activities in outer space. From its very beginning, France has been supporting this initiative presented by the European Union, intending to promote through voluntary confidence and transparency measures, to promote the security of space activities; whether they be civilian or military.

The kick-off meeting, which was held last 5 June in Vienna, which comprised 40 countries, allowed us to officially launch the whole multilateral diplomatic negotiation process for this code. During

the meeting, a revised version of the draft was distributed and this document is going to be used as a basis for the work of the upcoming multilateral experts meeting, which is going to be autumn in New York. We hope that at that point we will have as broad participation as possible, ensure, especially in part of COPUOS member States, so that together we can work on the development of a text that could significantly improve the security of space activities.

Mr. Chairman, the thematic issues of COPUOS and very heavy agenda of this Committee and its Subcommittees, for us go indissociably along with consideration of measures having to do with method and organization of our work. This matter has been extensively debated during the last Legal Subcommittee, in particular. We would hope that the debates could be pursued in Committees so that we could finally have a concrete, a practical and a consensual proposal before us so that we can work together to make our progress more efficient. This sort of rationalization – the optimization of our work — is all the more important since the results of the Working Group on the Long-term Sustainability of Space Activities are going to be mobilizing our efforts even more in upcoming sessions. Thank you very much for your attention.

**The CHAIRMAN** I thank the distinguished representative of France for her statement. The next speaker on my list is the distinguished representative of Libya. You have the floor.

**Mr. F. A. BEN ASHOUR** (*Libya, interpretation from Arabic*) Thank you, Mr. Chairman. Mr. Chairman, the Libyan delegation extends to you sincere congratulations upon your election and that of the Vice-Chairmen to preside over the work of this Committee and expresses to you profound happiness and satisfaction at the excellent manner in which you are conducting the deliberations of the session. My delegation wishes to extend to your predecessor and to the Bureau of the last session, our appreciation and respect for the excellent manner with which they conducted the work of the previous session. My delegation is confident that your wisdom and administrative skills and vast experience in the affairs of the Committee will guide us to optimum results. My delegation also presents to the members of the Bureau and to the Secretariat, congratulations, appreciation and satisfaction for the important role they are playing in order to guide the work of the Committee as well for their efforts and we believe all your efforts will help realize the best of the desired results.

Mr. Chairman, the Libyan delegation wishes to express to Ms. Mazlan Othman, Director of UN-OOSA, our great appreciation and esteem for the important role undertaken by OOSA and the valuable efforts deployed in order to enhance international cooperation in the peaceful use of outer space and in assisting developing countries in building their capabilities.

Mr. Chairman, the Libyan delegation underscores the need and importance of enhancing and expanding the horizons of international cooperation in the field of the exploration and utilization of outer space for peaceful purposes and sustainable development to the benefit of all countries and in the interest of all countries, regardless of the degree of their economic, social, scientific or technological development, granting special consideration to needs of development countries, which should also benefit from the socioeconomic benefits resulting from space explorations as well as space sciences and technologies and their applications in the fields of sustainable development and disaster management, food security and other priorities of development, and to reduce dangers and damage resulting from space activities in compliance with the international criteria for security and safety.

In keeping with the declaration of legal principles which govern the activities of countries and the declaration on international cooperation in the field of exploring outer space, as well as the principles and resolutions of the General Assembly and relevant international convention. In this regard, my delegation attaches special attention and importance to the important role played by the United Nations in strengthening international cooperation in the field of the peaceful uses of outer space for the benefit of humanity at large, developing and codifying outer space law and to establish international criteria for space activities in such a way as to contribute effectively to enhancing friendly relations between advanced countries and developing countries, through harnessing such a cooperation to serve the mutual benefits and common interests of all countries. We wish to reaffirm, in this context, the importance of enhancing the role of COPUOS, pursuant to General Assembly recommendations in such a way as to realize the goals and purposes of international cooperation in the fields of exploring and utilizing outer space for peaceful purposes, especially in the field of exchanging and encouraging technical expertise and space technology and space applications between developing countries and advanced countries, as well as capacity-building and providing technical assistance to developing countries.

Mr. Chairman, the Libyan delegation is aware of the importance of international cooperation in order to enhance the rule of international law, including space law, and the need to be bound — a large international scope to be bound by the international legal obligations — in keeping with the principles and rules of international law, the principles of the UN Charter and international conventions, considering that as basic condition to enhance international cooperation in the field of space activities and their utilization for peaceful purposes. The development of international cooperation in regard to building capacities in developing countries and the expansion of the reutilization and use of the UN programme for space applications and the exchange of knowledge and experience, and the increasing support, provided by OOSA and by member countries, in order to enhance cooperation between advanced countries and developing countries, has been a priority which is upheld, specially by the developing countries.

Mr. Chairman, the Libyan delegation deems it necessary to confront the dangers ensuing from the utilization of nuclear power sources in outer space, especially in the geostationary orbit, as well as low Earth orbits, and to resolve all the problems, including the legal aspects of the problem of the collision of space objects powered by nuclear sources and other accidents or emergencies. And to establish binding international criteria to subject space activities to the principle of preservation of life and maintenance of peace and security. My delegation joins those delegations which express their concern at the increase of space debris and the accumulation of even more quantities of debris; we believe it is necessary to exert greater efforts and to give greater attention to this problem and to threat it poses and to intensify efforts in order to activate national and international mechanisms to reduce space debris and to avoid the accumulation of even more quantities.

Mr. Chairman, the Libyan delegation adds its voice to those of member countries in this Committee which deem it important to come to an agreement on a specific definition of outer space aerospace, and the delimitation of both at the international level. This in order to keep pace with accelerating development of outer space technologies, civil aviation and the increasing magnitude of space activities and civil aviation activities. We believe it is important to delimitate outer space and aerospace within the framework of COPUOS and the UN General Assembly. We believe that the definition and delimitation of both outer space and aerospace will lead to defining national liabilities of countries who practice increasing space activities as well as other

international institutions, and it also ensures the sovereignty of countries over their aerospace and this is conducive to an aerospace and outer space environment which is more conducive to space activities and air activities in the future.

In conclusion, my delegation wishes to welcome the admission of new members to this Committee, especially the fraternal country of Jordan — we welcome its admission — and we are confident that its contribution will give greater support to this Committee in the future. In conclusion, I thank you for your kind attention and peace be upon you.

**The CHAIRMAN** I thank the distinguished representative of Libya for his statement. The next speaker on my list is the distinguished representative of South Africa. You have the floor.

**Mr. X. M MABHONGO** (*South Africa*) Thank you Mr. Chairperson. My delegation would like to congratulate you and the new members of the Bureau as you commence your term of office. We have every confidence that under your able leadership we will be able to make significant progress in our deliberations to promote international cooperation in the peaceful uses of outer space, and we assure you of our full cooperation.

We would like to express our appreciation for the work carried out by the Office for Outer Space Affairs, in particular its Director, Dr. Mazlan Othman, and the Secretariat in preparation for this session. My delegation would like to associate itself fully with the African Group statement and would like to make the following remarks:

Chairperson, during the 53 years of its existence, this Committee has played a key role in ensuring that outer space is preserved for peaceful purposes and that the benefits of space activities are enjoyed by all nations. The benefits of space applications are now so ubiquitous that many of us take them for granted.

The number and diversity of space actors is increasing, which underscores the importance of COPUOS as the principal multilateral forum to enhance international cooperation, understanding and trust in the peaceful uses of outer space.

We share the concern of many other delegations that the growing amount of debris in orbit poses a serious risk to space activities and the societal benefits that flow from such activities. In this regard, we believe that the Working Group on the Long-Term

Sustainability of Outer Space Activities has a great responsibility to demonstrate the effectiveness of COPUOS as a multilateral forum for dealing with the challenges of this rapidly evolving space arena, and we are pleased to see that the various expert groups established under this Working Group will continue their work on the margins of this session of the Committee.

We look forward to the best practices guidelines that will be prepared by the Working Group as a pragmatic step to promote the safety and sustainability of outer space activities for all space actors.

My delegation believes that the activities of the Working Group on the Long-Term Sustainability of Outer Space Activities would be enhanced through engagement with the United Nations Group of Government Experts on Space Transparency and Confidence Building Measures, established in implementation of UN General Assembly resolution 65/68 and due to commence its work in July 2012. In our view, these two activities being conducted under the umbrella of the United Nations complement each other and contribute jointly to promote the stability, safety and security of the space environment.

Mr. Chairperson, since the 54th session of the Committee, South Africa has made progress on a number of fronts in space science and technology. Allow me briefly to summarise the most significant developments.

With regards to space missions, South Africa's first national satellite, SumbandilaSAT, which was launched on 17 September 2009, is no longer operational. During its operational phases, SumbandilaSAT acquired about 1,000 cloud-free images that are being used to address various developmental needs. This project also made significant contributions to capacity-building in science, engineering and technology in South Africa.

Regarding ground-based activities in space science and technology, South Africa and its African partners were selected on 25 May 2012, together with Australia, as co-hosts for the Square Kilometre Array (SKA) project. South Africa looks forward to working with our partners in Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia to construct and operate the African component of the SKA. We also look forward to working with Australia and New Zealand, with whom we will build this unique scientific instrument.

During the past year, a number of international space conferences took place in South Africa. The 62nd International Astronautical Congress (IAC), held in Cape Town from 3 to 7 October 2011, was a significant milestone in the development of the African space arena. The recent emergence of a number of African countries as space actors provided fertile ground for engagement with the global space community through the medium of an IAC. A large number of space actors, in Africa and globally, coordinated their activities during the triennium 2009-2011 to build up to this historic first IAC in Africa.

The Congress was attended by 2,968 participants from 75 countries and it is worth noting that 550 participants from 13 African countries attended. It is also encouraging to note that students and young professionals made up 19 per cent of all African participants. I would like to take this opportunity to thank all the colleagues present here who attended the IAC 2011 and thereby contributed to its success.

The UN/IAF Workshop on Space for Human and Environmental security was held in Cape Town from 30 September to 2 October. The workshop was attended by 110 participants from 45 countries and produced a series of recommendations for the UN and the IAF to continue working towards developing and implementing activities and pilot projects that would promote the use of satellite data and information products for human and environmental security.

Mr. Chairperson, the 4th African Leadership Conference for Space Science and Technology for Sustainable Development (ALC), took place in Mombasa, Kenya, from 26 to 28 September 2011. The theme of the conference was "Building a shared vision for space in Africa". We would like to congratulate the government of Kenya on their excellent arrangements for the hosting of the ALC conference and to assure them of our support as the current Chair of the ALC.

The main output of the ALC 2011 was the Mombasa Declaration on Space and Africa's Development. This was the first ALC conference to produce such a Declaration, which is essentially an affirmation of the commitment of Africa's space leaders to take concrete and collective action to address a number of needs and challenges in space applications for societal benefit in Africa.

Mr. Chairperson, the delegation of South Africa also extends its congratulations to the United States of America on the occasion of the

40th anniversary of Landsat. The Landsat programme is a truly remarkable achievement, which has had a huge impact in scientific, educational, social and environmental terms. Landsat also contributed to the development of national space activities in a large number of countries. In South Africa, the imagery captured from Landsat benefited our country in the area of agricultural applications such as crop yield, geo-exploration, land cover and land use assessment.

Mr. Chairperson, turning to space law and regulatory matters, South Africa completed the processes for the accession to the Registration Convention and the ratification of the Liability Convention, as well as the establishment of a national registry of space objects within the Department of Trade and Industry. A review of the South African Space Affairs Act has also been initiated. This review will take account of developments in the space arena since the Act was passed in 1993.

With regards to capacity-building in space law, South Africa hosted the first African round of the Manfred Lachs Space Law Moot Court in May 2012. Teams from Kenya, Nigeria and South Africa competed in this round. Nigeria won the African round and will represent the region for the first time at the world final in Naples in October this year.

Chairperson, this concludes my brief review of the progress of space-related activities in South Africa during the past year. In conclusion, let me reiterate that you will have our delegation's full cooperation to ensure a successful and productive outcome of this session. I thank you.

**The CHAIRMAN** I thank the distinguished representative of South Africa for his statement. The next speaker on my list is the distinguished representative of Venezuela. You have the floor.

**Ms. R. ACEVEDO** (*Bolivarian Republic of Venezuela, interpretation from Spanish*) Thank you very much, Mr. Chairman. Mr. Chairman, on behalf of the delegation of the Bolivarian Republic of Venezuela, I would like to congratulate you and the other officers in assuming the Chair of the Committee and I would like to wish you full success here.

With that and for an efficient use of our time, I will give you a concise summary of space activities over the last year. Currently, our national government has, under its responsibility, coordination for space programmes through the Ministry of the People's Authority for Science, Technology and Innovation. Through the Bolivarian Agency for Space Activates

(ABAE), involving first operation and control of the Simon Bolivar satellite — that's the VeneSat-1 satellite programme — including administration of the Earth station for satellite control and the satellite monitoring station in Uruguay. These are operated by 30 national experts trained in the People's Republic of China. Two: construction of the space research and development centres, space programmes, small satellite plant is seeking to generate its own space technology through scientific networks to be integrated into the space sector, fostering research in cross-cutting areas, such as material science, electronics, chemistry, telecommunications, education, computers, geomatics, geophysics, etc. Third: launching and operation of the Venezuelan satellite for remote sensing, Francisco de Miranda, VRSS-1 space programme, with a contract signed with the People's Republic of China on the 26 of May 2011 in the city of Caracas. At present we have 56 Venezuelans participating in the People's Republic of China in the training programme as part of the transfer of technology programme and for development of research for the use space applications, coordinated by the substantive department of the ABAE.

As our national achievements, we have a promotion of cultural values, education and health through the Simon Bolivar satellite with rural telephone, Internet, tele-health, tele-education programmes being broadcast, as well as radio and television broadcasting throughout the national territory. Our footprint over the Caribbean and South America strengthens Latin American and Caribbean integration, as well as international cooperation in our region. Using the VeneSat-1 satellite, to date, we have had 3,263 antennae set at national level, with 3,164,729 users of the satellite Internet service, with 34,815 computers connected in education centres, with a total of 43 health centres in rural areas connected via satellite 2012-2011.

The State institution for telecommunications, CANTV, commercially launched on 28 November 2011 the satellite television service. In its trial phase there were 3,000 kits in the counties of Sucre and La Vega of Caracas, 200 kits in the border districts and 19 kits in shelters as well as 600 in Ciudad Caribia. Two months after the launching of the home TV broadcasting TDH, they had been marketing 11,500 kits hoping that in 2012 there will be more than 100,000 new accounts.

Mr. Chairman, ABAE in 2007-2012 trained a total of 1,938 professionals from Venezuela for the use of space technology and various training programmes, including international courses on remote sensing and GIS in the remote sensing institute of the Republica de

la India (IIRS), as well as the institute for Space Research in Brazil (INPE). A programme to design satellite platforms, Earth satellite control stations, as well as programmes developed jointly with the European Institute ASTRIUM. A Master's in the use of space technology and epidemiology from the institute of higher space studies, Mario Gulich, in Argentina, and satellite platform enhancement with the UK. At the national level, we continue with the national training programme for trainers initiated in 2007 with satellite images, GPS and geomatics.

Now to look at the scientific-technological projects in Earth observation. We have an investigation on prospection of subsoil through gravimetric and magnetic data with satellites applied on Venezuelan territory, as well as the Caribbean region, as well as hotspot and forest fire detection through MODIS imaging. Furthermore, there has been the acquisition and processing of SPOT 4 and SPOT 5 images for free distribution among the State bodies. Since 2007, 47,129 images were acquired with 22,609 granted to State bodies and academia.

Mr. Chairman, now to move on to other areas. ABAE coordinates with various national offices for space technology to be included as a tool for public administration. These include public institutes with the Fundación Venezolana for Seismology (FUNVISIS), National Science Observatory Institute for Civil Protection, Astronomy (CIDA), Research Institutes (IVIC) and various academic institutions.

In 2011 there was the signing of bilateral cooperation instruments with Argentina and Bolivia on training for 25 Bolivian professionals by ABAE for remote sensing. There was also implementation of cooperation programmes with China, India, Brazil and Uruguay.

Finally, my delegation would like to recall that COPUOS, being a subsidiary body of the General Assembly, has clear scientific, technical, legal and political powers to take action on processes to preserve the peaceful use of outer space. Besides promoting cooperation, exchange of information between States, it is of the essence that this Committee foster political debate and coordination with other bodies and mechanisms of the United Nations system, And that in order to generate the necessary international norms to guarantee peaceful use of outer space and for an effective response to the problems raised by current space activities, such as the absence of a definition and delimitation of outer space, the use of nuclear power sources in Earth orbits, space debris, long-term sustainability of space activities, as well as a total ban

on the deployment or use of any type of weapon in outer space. On behalf of my Government, I would like to assure you of our readiness to cooperate, to contribute to a productive debate with the hope that the work at this session will see successful results. Thank you.

**The CHAIRMAN** I thank the distinguished representative of the Bolivarian Republic of Venezuela for her statement. The next speaker on my list is the distinguished representative of Brazil. You have the floor.

**Mr. J. C. ZELNER GONÇALVES** (*Brazil*) Thank you, Mr. Chairman. Mr. Chairman, distinguished delegates, first of all, my delegation would like to congratulate you, Mr. Chairman, on your election for the chairmanship of the 55th Plenary Session of this Committee. May I also extend congratulations to Mr. Filipe Duarte Santos and Mr. Piotr Wolanski — our two Vice-Chairmen — as to Mr. Dumitru-Dorin Prunariu, former Chairman of the Committee, who had the rare privilege to serve the cause of peace in space both as a diplomat and as an astronaut, and to preside the work of the Committee at the occasion of the 50th Anniversary of the First Human Space Flight and to the 50th Anniversary of COPUOS itself.

Let me reaffirm Brazil's appreciation to the Director of UN Office for Outer Space Affairs and our dear friend, Dr Mazlan Othman, and to all other members of the OOSA Secretariat, not only for their support regarding the preparations of our meetings during this session, but also for the hard efforts undertaken to fully engage this Committee at Rio+20 discussions, that are just about to initiate.

My delegation extends the warmest welcome to the countries that have applied to join this Committee: Costa Rica, Jordan and Armenia. Their interest in space issues testifies to the relevance of space in the agenda of developing countries. It is now quite clear that soon enough many more us, developing nations, will become active in all activities related to outer space. We take this as extremely relevant and welcome it.

Mr. Chairman, Brazil subscribes to the declaration made by Ecuador in the name of the GRULAC. On a national basis, Brazil reiterates its full commitment to the principles contained in the United Nations Treaties on Outer Space, celebrated between 1967 and 1979, such as the use of space for the benefit and in the interest of all mankind, the right to free exploration of outer space on an equal basis for all, and

space exploration as a tool for maintaining international peace and security and reinforcing the international rule of law in space through the observation of the United Nations Charter and the space treaties and regulations.

Mr Chairman, this month Brazil will host — a couple of days, actually, after the end of this meeting — the United Nations Conference on Sustainable Development, twenty years after the First Rio Conference. That conference was a momentous event through which the United Nations agreed on the concept of sustainable development which would change the relationship between human beings and the planet they live in. In 1992, the world made a vow to ensure, through sustainable development, dignity and welfare to all peoples without endangering the natural resources or the survival of future generations.

The principles enshrined in the Rio Declaration on Environment and Development of 1992 are still valid today, particularly in relation to the peaceful utilization of outer space, as an indispensable step towards sustainable development.

Indeed, there can be no sustainable development without space. The living standards and welfare of all societies, as much as the realization of the social and economic rights of all human beings, rely more and more on the peaceful uses of space. Economic businesses, scientific research and the basic public services provided by governments require swift and reliable communications, navigation and remote sensing systems that can only be set in place through the peaceful utilization of outer space.

Yet, sustainability requires space and space requires sustainability. There cannot be full enjoyment of the benefits from space technology unless sustainability is taken into account. On the contrary, unsustainable patterns of conduct will impede the operation of space-reliant systems. That would bring about the disruption of economies — telephone and computer networks would be shutdown, aircraft would turn blind, disasters would not be prevented, and access to vital information would be impaired — with severe and tangible consequences for all everywhere.

Mr. Chairman, thanks to the efforts of Dr. Mazlan and the OOSA team, as well as to the support of both the Governments of Austria and, of course, the Brazil, an important side event has been included in the Rio+20 Conference programme on Space and Sustainable Development, to be held on June 19. It will focus on space and health, space and water and oceans for sustainable development and the

role of space in the prevention and mitigation of natural disasters. Brazil is looking forward to it and to the presence of Dr. Othman and yourself, Mr. Chairman, at that event in Rio de Janeiro

Mr. Chairman, for Brazil, the greatest threat to the long-term sustainable development of space activities is certainly the perspective of an arms race in outer space. This delegation believes that in order to prevent this, transparent and confidence-building measures are indeed needed. Most of all, the existing space legal framework must be improved and expanded.

Trends to build on soft law instead of binding international space law are not constructive in our view. Urgency is not a justification to informal arrangements or of a non-legally binding, voluntary basis, made outside the United Nations legal framework. The first and forth General Assembly Committees, the COPUOS and the Conference on Disarmament are the adequate forums for discussion and negotiations on these issues. Brazil is strongly committed to reinforce multilateralism and is convinced that this will not be served through the circumvention of the UN legal system

Of course, negotiations on legally binding international agreements are a long and difficult process but they are the only way to bringing legitimacy into such endeavours. However attractive “fast tracks” or “shortcuts” provided by codes of conduct or any other pieces of “soft law” may seem, in the long run these will be detrimental and shall always lack legitimacy

Moreover, agreeing on a concept of right to self-defence in outer space may ultimately legitimize the militarization of space. Similarly, a code of conduct on long-term sustainability would indirectly reinforce the connection between the agendas of COPUOS and the Conference on Disarmament, increasing the possibility that the stalemate in the work of the CD may contaminate the normal functions of this Committee.

No code of conduct based on higher technical standards thresholds would also be acceptable, for it would consolidate a situation with a few “haves” and several “have-nots”, bringing to multilateral fora on space a structural deformation similar to that existing in the NPT.

Brazil understands that a code of conduct regarding long-term sustainability might serve as a possible confidence-building measure. However, in

order for it to be legitimate, any such initiative should take place within the framework of the UN proper instances, either, for instance, the Group of Governmental Experts or the Conference of Disarmament or the Legal Subcommittee of COPUOS.

Mr. Chairman, on the occasion of the 40th anniversary of the Landsat, Brazil congratulates the United States and is extremely pleased to acknowledge the remarkable achievements of this programme and the contribution it has provided to all nations. It is reassuring to realize that the approach adopted by Brazil and China in the distribution of images of the CBERS satellites on a free basis has influenced, to some extent, the decision taken by the United States to give open access to Landsat data. This policy is a contribution to the implementation of principle 10 of the 1992 Rio Declaration on Environment and Development.

Mr. Chairman, with regard to the future work of this Committee, my delegation congratulates the Secretariat for the contributions to Rio+20, such as contained in document A/AC.105/993. This delegation would also like to endorse the views previously expressed by the distinguished delegation of Austria, in the sense that next sessions of COPUOS and its subcommittees should incorporate in its agenda the conclusions that will emerge from negotiations at Rio+20.

Similarly, Brazil welcomes the views contained in document A/AC.105/L.278, entitled "Towards a United Nations space policy", submitted by Ambassador Ciro Arevalo Yepes, chair of COPUOS for the period 2008-2009. This document contains a solid basis for future discussions, founded on the observance of the rule of law in space, on the democratic and egalitarian access of all nations to space and on the peaceful cooperation aimed at sharing the benefits of space.

Finally, let me end up this intervention by indicating support for the idea of starting a debate on the necessity for convening a Fourth United Nations Conference on the Exploration and Peaceful Uses of Outer Spaces (UNISPACE IV), an issue which is also proposed in that document. In Brazil's view, the times seems ripe for that important debate. Thank you, Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of Brazil for his statement. Distinguished delegates, I would like proceed to the general exchange of views from observers. The first speaker on my list is the distinguished delegate of the

International Telecommunications Union. You have the floor.

**Mr. F. RANCY** (*International Telecommunication Union*) Thank you, Mr. Chairman. Let me first congratulate you and your two Vice-Chairs for your election. Thank you for the opportunity for the ITU to take the floor during this meeting of your Committee. It is a privilege for me to be with you in Vienna for the first time to speak to the session of the UN COPUOS on behalf of the International Telecommunication Union, which has been both a long term observer and strong supporter of your activities. I am especially pleased to be able to speak on a subject which is dear to my heart and to which I have devoted a large part of my career, including my current position as Director of the ITU Radiocommunication Bureau, which is in charge of the management of orbit and spectrum resources — an area which is also of significant importance in your deliberations.

Ladies and gentlemen, as the UN specialized agency and focal point for telecommunications, ITU seeks to ensure "the rational, equitable, efficient and economic use of the radio-frequency services, including those using the geostationary-satellite orbit and other satellite orbits". Within this mandate, ITU manages the international radio-frequency spectrum and satellite orbits. It is the international forum where the rights and obligations of member States, in obtaining access to these resources, are discussed and agreed. ITU also carries out the vital work of recording frequency assignments and orbital positions in the Master International Frequency Register and processing satellite filings to ensure that orbital positions and frequencies are compatible, so that satellites can be operated in an interference-free environment.

As many of you are aware, as a result of an increasingly intensive use of spectrum/orbit resources, it has become increasingly difficult to obtain suitable resources and to coordinate them in a way to ensure interference-free operation. As a consequence, it is getting harder to ensure the exclusion of interfering signals from neighbouring countries and neighbouring systems, which is a very serious risk to service delivery and to the multi-million dollar investment that each and every satellite deployment represents.

It is not an exaggeration to say that efficient use of spectrum and orbit resources is one of the most crucial challenges facing the international community in its efforts to promote ICT development and achieve the connectivity access targets set by the World Summit on the Information Society.

Distinguished delegates, the recent 2012 World Radiocommunication Conference (WRC-12), held in Geneva for four weeks, in the last January and February, gathered a record number of participants, with more than 3,000 delegates representing 165 ITU Member States and 100 observers from the private sector and international organizations, including Ms. Othman, Director of the Office for Outer Space Affairs. This conference successfully addressed the 33 items on its Agenda. All decisions were taken in full consensus, without any vote, illustrating once again the success of the multi-stakeholder approach used by the ITU in the preparation and decision-making of all its conferences.

Among the agenda items addressed by the conference, the main issue in relation to satellite communications, was the situation of apparent congestion of spectrum/orbit resources resulting from the existence of rights which are not being used in practice. The conference's greatest breakthrough in this regard is to have taken steps to prevent this type of situation from occurring in the future. First of all, by establishing a minimum period of three months of operation in order to consider that a satellite network has been brought in service and its rights are confirmed. Secondly, by requesting the ITU Radiocommunication Bureau to enquire on situations where the same satellite may have been used to maintain the rights of inactive networks at various orbital locations by "jumping" from one orbital location to another. This has been common practice in the past and this is something we are now taking steps to avoid.

Regarding the interest of UN-COPUOS in Small Satellite Programmes for Sustainable Development and Basic Space Technology Development related to nano and pico-satellites, I am pleased to report that WRC-12 adopted a new resolution 757 on the Regulatory aspects for these satellites, and this resolution invites ITU-R — the radio sector of the ITU — to examine the procedures for notifying space networks and consider possible modifications to enable the deployment and operation of these nano and pico satellites, taking into account their short development time, their short mission time and their unique orbital characteristics, and I am requested by this resolution to report on these studies at the next World Radio Conference, which will take place in 2015.

On another issue, the Conference addressed recent and repeated cases of intentional harmful interference concerning satellite transmissions and the Conference reaffirmed, in this respect, that such cases

represent infringements to the ITU Constitution, Convention and Radio Regulations, and that Member States under whose jurisdiction the signals causing this harmful interference are transmitted — these Member States have the obligation to take the necessary remedial action.

The results of WRC-12, in this regard, are encouraging for the satellite industry. The new regulatory provision adopted to resolve the current difficulty will be further reviewed at the next conference in 2015 and strengthened, if necessary. Moreover, nine out of the eighteen WRC-15 agenda items will consider additional allocations to satellite services and specific uses within these services, such as International Mobile Telecommunications, unmanned aircraft systems and Earth stations on board vessels. Much of the attention of WRC-15 and its preparations will therefore focus on responding to the spectrum requirements of satellite services.

I would like also to bring to the notice of UN COPUOS 2012 delegates a recent developments related to the possible role of ITU as the Supervisory Authority for the future international registration systems for space assets under the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets, which is a Space Protocol, which was recently agreed by the Diplomatic conference held in Berlin last February and March.

I know that many of you have been involved in developing this space protocol at UNIDROIT from the very beginning, and its adoption may be also regarded as your success. The next step for the implementation of this protocol is to set up the Preparatory Commission for the Establishment of the International Registry for Space Assets by the end of this year. In this respect, ITU continues to express its interest to become the Supervisory Authority, noting that the final decision in this regard should not be prejudged and will be taken the ITU Plenipotentiary Conference in 2014.

Ladies and gentlemen, since the birth of the very first commercial satellite systems in the 1960s, ITU has been performing the technical and regulatory coordination and oversight functions essential to the growth of the satellite industry in close cooperation to your Committee and the UN Office for Outer Space. In this regard, the ITU Radiocommunication Bureau is supporting the activities of the International Committee on GNSS (ICG), and with other UN organizations we take an active part in the UN Inter-agency Meeting (IAM) on Outer Space activities. We appreciate the new initiative of UN COPUOS on the long-term

sustainability of outer space activities, and hope that our input document to the working group meeting will assist you in your efforts to find a solution. I can guarantee that you can count on the support and assistance of ITU and its Radiocommunications Bureau to achieve your goals. Let us all work together for the efficient and equitable use of spectrum and orbit resources by all countries. I wish you every success in your endeavours. Thank you very much, Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of the International Telecommunication Union for his statement. The next speaker on my list is the distinguished representative of the European Space Agency. You have the floor.

**Mr. F. NORDLUNG** (*European Space Agency*) Mr. Chairman, the European Space Agency (ESA) would like to take this opportunity to congratulate you on your election as Chair of this Committee. We are confident that under your very able guidance and leadership, this Committee will achieve important work. ESA would also like to express its gratitude to your predecessor, Mr. Dorin Prunariu, for his crucial contribution to the work of this Committee. We would also like to thank the Director of the Office of Outer Space Affairs, Mrs Mazlan Othman and the entire office, for their central work and their valuable support to the work of this Committee,

Mr. Chairman, in my statement, I shall take an opportunity to address the main achievements of ESA since the last meeting of this Committee in June 2011.

Over the past year, ESA continued to deliver successful missions. All of these achievements have been made possible thanks to the vision and commitment of ESA Member States. On behalf of the ESA Director General, I would like to take the opportunity of this statement to thank the 19 ESA Member States for their sustained support and investments, which were instrumental in delivering these successes.

In the domain of launchers, the past year underscored again the success of Ariane 5 in providing reliable and world-class services for multiple European and international institutional and commercial customers. Ariane 5 is a major instrument of access to space not just for Europe but for the entire international space community.

Mr. Chairman, on 21 October 2011, a historical step was taken. A Russian Soyuz launch vehicle was launched for the first time from the

European Spaceport in French Guiana. It launched the first two operational satellites for Europe's Galileo global navigation satellite system. This historic first launch of a genuine European system like Galileo was performed by the legendary Russian launcher that was used for Sputnik and Yuri Gagarin, a launcher that will also, from now on, lift off from Europe's Spaceport. It was also a noteworthy event since it was the launch of the first two Galileo In Orbit Validation satellites. These two historical events are also symbols of cooperation: cooperation between ESA and Russia, with a strong essential contribution of France for a first Soyuz launch from a site outside of the Baikonur in Kazakhstan or Plesetsk in Russia; and cooperation between ESA and the European Union, in a joint Galileo initiative with the European Union. It is recalled that Soyuz is a medium size vehicle, complementing ESA's launcher Ariane 5. Launching from close to the equator allows Soyuz to offer improved performance to carry up to 3 tonnes into the Geostationary Transfer Orbits.

The next two of ESA-procured Galileo satellites, completing the In Orbit Validation phase are currently scheduled for launch this autumn, again on a Soyuz from French Guiana.

On 13 February 2012, another first occurred. The first European VEGA launch vehicle lifted off from its new launch pad in Europe's Spaceport in Kourou and conducted a flawless qualification flight, releasing nine satellites into orbit. This first flight marked the culmination of nine years of development by ESA and its partners, namely the Italian space agency and ELV — the prime contractor for developing the vehicle. This programme was supported by seven ESA Member States: Italy, France, Belgium, the Netherlands, Spain, Sweden and Switzerland. Designed to provide Europe with a safe, reliable, competitive and efficient launch capacity for a variety of payloads, VEGA is compatible with payload masses ranging from 300 kg to 2,500 kg, depending on the type and altitude of the orbit required. The payloads launched by the maiden flight of VEGA consisted of two Italian satellites: the Italian Space Agency LARES laser relativity satellite and the University of Bologna's ALMASat-1, as well as nanosatellites provided by European universities, in particular from Italy, Romania, Hungary, Poland, France and Spain.

With Soyuz and VEGA, Europe has now a family of launchers available at the European spaceport, which covers the full range of launch requirements, from small science and Earth observation satellites to the largest missions like ESA's Automated Transfer Vehicles bringing cargo to the

International Space Station or the largest telecommunications satellites in the market.

ESA's scientific programme is stronger than ever before with using science being produced with existing missions and future missions in development. For example, Mars Express, in orbit around Mars since several years now, continues to return a steady stream of scientific data about the red planet, and in particular a strong evidence that there was once an ocean covering part of Mars. Using its radar, it has detected sediments reminiscent of an ocean floor within the boundaries of previously identified ancient shorelines on Mars. ESA's Venus Express and Proba-2 missions, together with the ESA-NASA SOHO, Japan's Hinode, and the Hubble Space Telescope monitored Venus and the Sun during the very recent transit of Venus on 5-6 June this week. ESA's Venus Express is the only spacecraft orbiting Venus at the moment and while the transit is being watched from Earth, it too is using light from the Sun to study the planet's atmosphere. As sunlight filters through the atmosphere it reveals the concentration of different gas molecules at different altitudes.

The European Space Agency's Herschel far-infrared and sub-millimetre space observatory and the Planck space telescope are two of the most ambitious and technologically challenging missions ever conceived and built in Europe. Herschel, equipped with the largest mirror ever launched into space (3.5 m diameter) and three advanced scientific instruments, and a complex cryogenic system to keep the instrument detectors at temperatures close to absolute zero is observing a mostly uncharted part of the electromagnetic spectrum in order to study the birth and the evolution of stars and galaxies. Planck, featuring two highly sophisticated instruments and a passive-active cooling system, is mapping tiny irregularities in fossil radiation left over from the very first light in the Universe — the so-called Cosmic Microwave Background — emitted shortly after the Big Bang. These two missions are bringing a wealth of data leading to a completely new understanding of our universe.

The powerful influence of the Sun and the nature of the mysterious "dark energy" motivated ESA's selection of its next two science missions. The Solar Orbiter and Euclid were selected on 4 October 2011 by ESA's Science Programme Committee for implementation, with launches planned, respectively in 2017 and 2019. These two missions are medium-class missions and are the first in ESA's Cosmic Vision scientific programme spanning between 2015 and 2025.

Solar Orbiter will venture closer to the Sun than any previous mission. It is designed to make major breakthroughs in our understanding of how the Sun influences its environment, in particular how the Sun generates and propels the flow of solar wind. Solar Orbiter will continue a long tradition of European Solar missions, including Helios 1 and 2, Ulysses, SOHO, all in partnership with NASA, as well as ESA's Cluster and PROBA-2.

Euclid is a space telescope designed to map out the large-scale structure of the Universe with unprecedented accuracy. The observations will stretch across 10 billion light years into the Universe, revealing the history of its expansion and the growth of structure during the last three quarters of its history. One of the deepest modern mysteries is why the Universe is expanding at an ever-accelerating rate. This cosmic acceleration is driven by something that astronomers have named "dark energy" to signify its unknown nature. By using Euclid to study its effects on the galaxies and clusters of galaxies that trace the large-scale structure of the Universe, astronomers hope to be able to understand the exact nature of dark energy.

On 2 May 2012, the Jupiter Icy moon Explorer was selected over two other candidates as the first Large-class mission of the Cosmic Vision programme. It will be launched in 2022 and the mission will be dedicated to detailed observations of Jupiter's atmosphere and magnetosphere, and the Jupiter interaction with the Galilean moons, namely the volcanic Io, the icy Europa and the rock ice, Ganymede and Callisto.

In April, after nearly a year and a half of operations, the ESA CryoSat mission has yielded the first seasonal variation map of Arctic sea-ice thickness. These results were presented at the Royal Society in London. In June of last year, the first map of Arctic sea-ice thickness was unveiled, using CryoSat data acquired between January and February of that year. In April of this year, the complete 2010-2011 winter season data have been processed to produce the seasonal variation map of sea-ice thickness. This is the first map of its kind generated using data from a radar altimeter and at such a high resolution compared to previous satellite measurements. ESA and NASA have been collaborating to perform coordinated validation flights directly under CryoSat's orbit over the Arctic, gathering data to ensure the accuracy of the satellite measurements.

The launch of the Soil Moisture and Ocean Salinity mission in November 2009 opened up a new

era of monitoring Earth using new remote-sensing techniques. The satellite is capturing images of brightness temperature. These images correspond to microwave radiation emitted from Earth's surface and can be related to soil moisture and ocean salinity. This mission is confirming that the variability in soil moisture and ocean salinity is a consequence of the continuous exchange of water between the oceans, the atmosphere and the land — a process called Earth's water cycle.

On April 8 2012, just weeks after celebrating its tenth year in orbit, communications with the ENVISAT remote sensing satellite was suddenly lost. Following several attempts to re-establish contact and the investigation of failure scenarios, the end of the mission was declared in early May. ENVISAT had already been operated for twice its planned lifetime and with ten sophisticated sensors, ENVISAT observed and monitored the Earth's land, atmosphere, oceans and ice caps, delivering over a thousand terabytes of data. An estimated 2,500 scientific publications so far have been based on this information, furthering our knowledge of the planet.

On October 4 2011, a public-private partnership contract was signed between ESA and the European company, Astrium, to development of a European satellite system that will speed up the transmission of large quantities of data beginning in 2014. The initiation of this public-private partnership for the European Data Relay System demonstrated ESA's capability to pull together resources and know-how from several partners under an efficient and operational scheme.

ESA's continued, in the context of the International Space Station partnership, different activities. On March 23 of this year, the third ESA Automated Transfer Vehicle named Edoardo Amaldi, was launched by Ariane 5 from French Guiana. This was the heaviest payload ever launched by an Ariane 5. The docking to the ISS of the 20-ton ATV occurred on 29 March, with a precision of 6 cm. Like its predecessors, the ATV-3 had a multifaceted mission. It is still in orbit, it is a space tug loaded with 3,50 kg of propellant to re-boost the Station's orbit and compensate for the natural decay in altitude caused by atmospheric drag. ATV also provides attitude control when other spacecraft are approaching the Station.

As a space tanker, it delivered 860 kg of propellant, 100 kg of oxygen and air, and 280 kg of drinking water. As a space freighter, it carried 2,200 kg of dry cargo. During the five months in orbit, ATV provides temporary space module of 45 cubic metres,

thus being an extra crew quarters on the orbital outpost. At the end of its mission, scheduled for 27 August, ATV-3 will separate from the Station and re-enter the Earth's atmosphere.

On 21 December 2011, ESA astronaut Andre Kuipers took off from Baikonur on his way to the International Space Station, together with an expedition crew. As a flight engineer, he is the prime crewmember responsible for the rendezvous and docking operations of the ESA ATV Edoardo Amaldi. More than 25 European experiments were carried out so far during Andre's mission in orbit, covering a range of disciplines in human research, fluid physics, materials science, radiation research, biology and technology. In addition, Andre conducted about 20 experiments for NASA and JAXA. During his mission, he invited children to become involved in a wide range of educational activities about biodiversity and the effects of climate change on Earth. Science demonstrations were beamed from orbit to classrooms across Europe.

Mr. Chairman, on the institutional level, the past year has also been extremely active. ESA has strengthened its cooperation with the European Union to enable the European Union to use space as a tool to achieve its objectives and support its policies. In that context, the Framework Agreement between ESA and the EU has been renewed and will enforced until 2016. The focus of this cooperation has been on the implementation of two flagship programmes, namely Galileo and the Global Monitoring for Environment and Security.

In October of last year, ESA invited 10 more countries to participate in meetings of its Council. The Council is ESA's main governing body. Each of the 19 current Member States is represented at the Council and has one vote, regardless of its size or financial contribution. Delegations from 10 EU Member States that are not members of ESA now have the opportunity to sit as observers for agenda items of common interest to ESA and the EU. So, in that context, ESA's Council decided in June 2011 to grant observer status to the following 10 EU Member States: Bulgaria, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, the Slovak Republic and Slovenia.

The increased number of delegations in ESA's Council indicates a growing willingness among European states to invest in space programmes. Finally, it is recalled that Romania became ESA's 19th Member State at the end of last year and that discussions for accession to the ESA Convention took place with Poland.

Mr. Chairman, this was a summary of the main achievements since the last meeting of the Committee. ESA is currently preparing a new round of critical programmatic decisions, which are expected to be taken during an upcoming ESA Council meeting at the ministerial level in November this year. We are looking forward to report on these decisions at the next meeting of this Committee. Distinguished delegates, Mr. Chairman, thank you for your attention.

**The CHAIRMAN** I thank the distinguished representative of the European Space Agency for his statement. Distinguished representative, kindly reminded that the statement is limited to within 10 minutes in length. I appreciate your cooperation.

Are there any other delegations wishing to make a statement under this agenda item at this time?

*I see none.*

Shall we continue and conclude our consideration of agenda item 5, "General exchange of views" this afternoon.

Because of the time constraint, we will continue and conclude our consideration of agenda item 6 "Ways and means of maintaining outer space for peaceful purposes" this afternoon.

Distinguished delegates, we now proceed to the report of the Scientific and Technical Subcommittee on its 49th session, agenda item 8. Distinguished delegates, I would now like to continue and hopefully suspend our considerations on agenda item 8 "Report of the Scientific and Technical Subcommittee on its 49th session". The first speaker on my list is the distinguished delegate of the Czech Republic. You have the floor.

**Mr. L. PEREK** (*Czech Republic*) Thank you, Mr. Chairman. Mr. Chairman, distinguished delegates, may I first express our thanks to the Director of the Office of Outer Space Affairs, Mrs Mazlan Othman, for overcoming all the problems connected with the installation of the new server. It seems that the continuation and updating of the Online Index of Objects Launched into Outer Space was in danger of considerable delay but her efforts and efforts of Mr. Robert Wickramatunga, who is responsible for updating the Online Index, the delay was minimized. The Online Index is now back in operation and fulfils its role as an authoritative index of space objects.

Mr. Chairman, at the last session of the Scientific and Technical Subcommittee my delegation

gave a presentation on the Actual Situation of the Geostationary Orbit. A comparison of the nominal positions of radio space stations, called space networks in the terminology of the International Telecommunication Union, with actual positions of satellites has shown that a certain percentage of space networks had no spacecraft at those positions and thus was not able to operate at all. Had the unused radio space stations been suspended, or the relevant proposals deleted, the overcrowding in the geostationary orbit would have been lessened to the benefit of all users of the geostationary orbit. We noted several references to the efficient use of the geostationary orbit in the Report of the Legal Subcommittee of its session earlier this year as well as remarks made in the general debate this morning.

Our study was restricted to space networks which enjoy international recognition and protection against harmful interference by being notified in the Master International Frequency Register. We noted also that this Master International Frequency Register was mentioned by the distinguished delegate of the International Telecommunication Union just a few minutes ago. He mentioned also the problem of rights not being used and this is exactly the topic of our study. Our study dealt with the time span of the absence of spacecraft from relevant orbital positions; this span of absence was between one and five years. An absence of one year may be caused by the requirements of sophisticated technology of launching geostationary satellites, but an absence of three to five years raises questions of efficiency of use of the orbit even if all requirements of the International Telecommunication Union were met. Long absences are not restricted to a few specific administrations. It is rather a general effect concerning a fairly large percentage of users of the geostationary orbit. Moreover, changes in spacecraft population occur frequently. Every year some 20 to 30 new satellites are put into service while a similar number of satellites are taken out of service. It means that the absence of 13 to 15 per cent is a general well established fact. The correction of the situation, however, in any individual orbital position would require an updating to a very recent date and, in some cases, could not be implemented without the voluntary cooperation of administrations which own satellites at the nominal positions in question.

Without going into technical details of the study which is now accessible at the website [www.geostationary.cz](http://www.geostationary.cz) in a version updated to the beginning of this year, my delegation proposes to the Committee to adopt the following call addressed to the users of the geostationary orbit; I am referring to

document A/AC.105/2012/CRP.17. And the call goes this way:

“The Committee calls on users of the Geostationary Orbit to revise their space networks with a view to suspend or remove those networks from the Master International Frequency Register of the International Telecommunication Union which have not been recently used and might not be used in the immediate future.”

Mr. Chairman, we do not propose any obligatory measure. On the contrary the call is addressed to all users of the orbit who are the highest authorities in deciding to keep or not to keep their space networks on the ITU Register. If the number of unused space networks is reduced, all users would benefit from mitigating the adverse effects of the overcrowding of the geostationary orbit. Thank you, Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of the Czech Republic for his statement. The next speaker on my list is the distinguished representative of Indonesia. You have the floor.

**Mr. S. DAMANIK** (*Indonesia*) Thank you, Mr. Chairman. Indonesia welcomes the issuance of Space Debris Mitigation Guidelines and hopes respectful states to be able to immediately implement them in accordance with their own national mechanism.

There should be openness of data and information of decaying space debris for the purpose of disaster mitigation. Space debris that have been saturating become serious matters for the development of space technology, so Indonesia urges the Committee to establish any means to limit and eliminate space debris, including the prohibition of any test used for satellite destruction. The matter of space debris in GSO also needs to be taken into consideration much more seriously.

Mr. Chairman, Indonesia considers that promoting space weather observation and anticipating the impact are very important. To support such efforts, Indonesia will be the host of the International Space Weather Initiative School next September in collaboration with SCOSTEP, ISWI, and Kyushu University of Japan. I thank you Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of Indonesia for his statement. Now we proceed to the observer statements. The next speaker

on my list is the distinguished representative of the International Astronautical Federation. You have the floor.

**Mr. G. BRACHET** (*International Astronautical Federation*) Thank you, Mr. Chairman. Mr. Chairman, distinguished delegates, IAF would like to make the following statement on item 8 of the agenda and this relates to the topic of the IAFs Symposium which is planned to be organized during the 50th session of the COPUOS Scientific and Technical Subcommittee in February 2013.

The International Astronautical Federation hopes that the symposium, which traditionally takes place on the afternoon of the first day of the session of the COPUOS Scientific and Technical Subcommittee, be devoted to the following topic: “Overview of studies and concepts for Active Orbital Debris Removal”.

This Symposium would include 4 to 5 presentations covering the various aspects of Active Debris Removal, from technical feasibility to potential legal issues, but a significant time allocated for discussion and to entertain questions from the COPUOS delegations.

The IAF believes that this symposium would be an excellent opportunity for delegations of COPUOS Scientific and Technical Subcommittee to be informed of the valuable concepts and studies being made on active debris removal that are being considered by various space agencies and industrial companies. It would thus contribute to the work of the experts groups under its Working Group on Long-Term Sustainability of Outer Space Activities. Thank you, Mr. Chairman.

**The CHAIRMAN** I thank the distinguished representative of the International Astronautical Federation for his statement. Distinguished delegates, we have the proposal by the International Astronautical Federation on the topics of the symposium to be held during the 50th session of the Scientific and Technical Subcommittee in 2013. If there are not objections, I take it that the topic of “Overview of studies and concepts for Active Orbital Debris Removal” is agreed.

*There is no objection. Now, it is so decided.*

I would like to inform delegations that I have received a request from the Chair of the Working Group on Long-term sustainability of outer space activities to address the Committee next week in order to provide an update on the progress of work of the expert groups of that Working Group. If there are no

objections, I take it that the Committee invites the Chair of the Working Group to address the Committee under agenda item 8 next week.

As I see no objections, we have therefore suspended our consideration of agenda item 8 "Report of Scientific and Technical Subcommittee on its forty-ninth session" pending the statement by the Chair of the Working Group on Long-term sustainability of outer space activities next week.

Distinguished delegates, I would now like to proceed with the technical presentations. Presenters are kindly reminded that technical presentations should be limited to 15 minutes in length.

The first presentation on my list is by Mr. Takaaki Iwasa and Ms. Midori Murayama of Japan entitled "Japanese Satellite Challenge to the Global Issues". You have the floor.

**Mr. T. IWASA, Ms. M. MURAYAMA** (*Technical presentation*) Thank you very much, Dr. Chairman and distinguished delegates. The advancement of observation satellites, ALOS, was launched on January 20 2006 and observed 6.5 million scenes for 5 years. Now, JAXA is developing the improved successors: ALOS-2 with synthetic aperture radar (SAR), and ALOS-3 with optical sensor. ALOS-2 will be launched next year and JAXA plans to launch ALOS-3 in 2015, at the earliest.

The ALOS is aimed at obtaining data useful for land use, disaster monitoring, and resource exploration, environmental monitoring as well as land information to produce 1:25,000 maps on a global basis.

When the Great East Japan Earthquake hit Japan in 2011, the ALOS took some 400 images over disaster-stricken areas to provide information to all organizations concerned.

The International Charter "Space and Major Disasters" was propounded in 1999. JAXA joined the initiative officially in 2005, and established a cooperative system that involves the provision of observation data from ALOS.

Currently, the initiative is made up of an international cooperative framework that involves 13 organizations, including space agencies such as ESA, CNES, CSA from Canada, ISRO from India, NOAA and USGS from the United States, CONAE from Argentina, DMC from the United Kingdom,

CNSA from China, DLR from Germany, KARI from the Republic of Korea, INPE from Brazil and JAXA.

As I introduced Sentinel Asia, I will skip this slide.

JAXA has collaborated with GISTDA in activities relating to flood counter measures in Thailand. JAXA implemented the ALOS data application validation training programme for a 5-year period from December 2003 in collaboration with GISTDA.

ALOS has the Phased Array type L-band Synthetic Aperture Rader, or PALSAR. Due to its long wavelength, PALSAR can penetrate vegetation and enables day-and-night and all-weather land observation. Therefore, ALOS can distinguish vegetation varieties clearly, which is helpful, especially to monitor subtropical forests.

Two pictures on the above are images of forest in the Rondonia area, Amazon. On the left is an image of the forest in 1996, which was taken by the Japanese Earth Resource Satellite-1, or JERS1. To show the fluctuation in the area of the forest, an image taken in 2007 by ALOS is put on the image taken by JERS-1, which is on the right. The red indicates the area deforested during the 11-year period, showing that deforestation was increasing.

Three pictures below are images of paddy fields in Japan, taken by ALOS. No. 1 is an image of the rice-planting season, No. 2 of the rice-growing season. Putting No. 1 on No. 2, No. 3 shows distinction between paddy fields with growing paddies in blue and fallow fields in yellow.

ALOS had contributed to forest preservation and crop estimates to addressing climate change and food security.

ALOS-2, planned to launch next year, on board PALSAR. Compared to ALOS, ALOS-2 will improve two capabilities: observation frequency and spatial resolution. The observation frequency of ALOS-2 will be improved by greatly expanding the observable range of the satellite up to about 3 times, as well as giving ALOS-2 a right-and-left looking function.

PALSAR-2, mounted on ALOS-2, will have a spotlight mode (1 to 3 m resolution) and a high resolution mode (3 to 10 m resolution). It will allow comprehensive monitoring of disasters by providing users with more detailed data than ALOS.

JAXA plans to launch ALOS-3 in 2015, the earliest. ALOS-3, with optical sensors, also improves spatial resolution and observation frequency.

ALOS-3 can facilitate understanding of the traffic infrastructure and situation in residential areas, and thereby contribute to the prevention of secondary disasters by extracting information on the possibility of passing through roads and areas affected by liquefaction. In addition, the satellite also contributes to recovery and reconstruction for the disaster by estimating the volume of rubble, and the damage to buildings. ALOS-3 can identify the scattered conditions of ships and cars as a result of the tsunami, which the ALOS-1 is unable to identify clearly.

Finally, this is another example of improvement in ALOS-3. The left image was acquired by ALOS-1 in January 2009. And the right one is a simulated image using an airborne image with consideration for ALOS-3's image acquisition performance. Each image captures Yokohama-city in Japan. In the right image, you can read vehicles and the detail of buildings, thanks to the improved resolution. In addition, by improvement of Signal to Noise ratio and dynamic range, you can see low contrast targets more clearly, like road markings and the pattern of the building surface.

I believe that both new satellites; ALOS-2 and ALOS-3 will contribute to disaster monitoring internationally by providing more detail data through a bilateral or multilateral scheme.

Ms. Murayama will mention other satellites. Thank you very much.

Now, let me explain about GOSAT and its contribution to climate science and policy development. First, I would like to briefly touch on the history of greenhouse gas monitoring from space. Listed here are the sensors on board the pioneering environmental monitoring satellites: SCIAMACHY, AIRS, TES, IASI. The data collected by these sensors were utilized for estimating atmospheric greenhouse gasses. The challenge, however, is that these sensors did not have sufficient sensitivity to the changes in greenhouse gasses near the surface, features essential in global carbon monitoring. To meet this specific challenge, GOSAT was launched in January 2009. The objectives of the GOSAT project are to obtain the global distributions of greenhouse gas concentrations under temporal variations to improve the accuracy of carbon flux estimates on a sub-continental scale and to develop technologies for future satellite missions.

GOSAT carries 2 sensors: TANSOFTS, the main sensor, is a spectrometer for collecting infrared adsorption spectral of CO<sub>2</sub> and CEU. TANSOCAI, an imager, is for detecting cloud and aerosol contamination within the TANSOFTS's field of view. GOSAT has a 3-day repeat cycle. Since June 2009, GOSAT has been obtaining the data seamlessly. These charts show the monthly distributions of column CO<sub>2</sub> concentrations for the first observation year. The summer months are shown on the left and the fall, winter and spring months are presented on the right. The north-to-south concentration gradient and the seasonal change are clearly visible in these figures.

Several research teams in the world are now estimating greenhouse gas concentrations using GOSAT's data. Shown in this slide are XCO<sub>2</sub> concentrations for April 2010 estimated by NIES, NASA/ACOS team, SRON/KIT and University of Leicester. All four results were shown to agree well at the ground-based reference data sites.

For checking data quality and validity, the retrieved greenhouse gas concentrations are compared with ground-based reference data. The reference data consist of data obtained in the network of the ground base FTS, the TCCON and aircraft measurements, such as the CONTRAIL project. We can reduce uncertainty in regional cover flux estimates by adding satellite data to the ground base monitoring data. An thus, we have estimated 64-regional monthly CO<sub>2</sub> fluxes and will release this summer as the GOSAT Level 4 product. Other groups in the world have also estimated CO<sub>2</sub> flux using GOSAT's data. Shown here is the distribution map of surface CO<sub>2</sub> flux for July 2009, prepared by NIES, SRON, LASCE and the University of Edinburgh. These results are now inter-compared within the framework within the framework of the TransCom research group. We expected, through research works, space-based CO<sub>2</sub> flux estimation studies will accelerate and advance further for assessment and early warning of critical change of the global carbon cycle.

Having the success of the GOSAT mission, Japan started the development of GOSAT-4 missions. Through continuing GOSAT missions into the future, we believe that we can contribute to the following: first, further elucidating the global carbon cycle through providing researchers with high quality greenhouse gas observational data. This will lead to improving the quality of future climate change predictions. Second, detecting weather changes in the climate system at their early stages. Although this is a very challenging task, the information obtained will be very valuable for identifying subtle changes taking

place in the global environment. Third, monitoring greenhouse gas reduction efforts. This can be a major contribution to climate policymaking and implementation and under UNFCCC with respect to monitoring and evaluation of CO<sub>2</sub> emissions.

To realize this task, international cooperation is necessary. Establishing a platform for data inter-comparison and verification is one example. Such mutual cooperation will improve the reliability of satellite greenhouse gas data and accessibility of observational data. Finally, as my closing, I would like to invite all of you to the GOSAT seminar at the Rio+20 on Thursday 21 June, at the Japan pavilion in Athlete park, Rio de Janeiro, where the latest on space-based monitoring of greenhouse gases and its contribution to climate science will be presented. Thank you for your attention.

**The CHAIRMAN** Thank you, Mr. Iwasa and Ms. Murayama for your presentation. Are there any delegates with questions for the presenters?

*I see none.*

The second presentation we will hear this morning is by Mr. Volker Gass of Switzerland on “CleanSpace One”. You have the floor.

**Mr. V. GASS** (*Technical presentation*) Thank you, Mr. Chairman, distinguished delegates. It is for us a privilege to be here, to present our activities, that we do in Switzerland about the mitigation of space debris and, myself, I am the director of the Swiss Space Centre, that is host to the École polytechnique fédérale in Lausanne.

Just to give you a very brief overview of who we are. The Centre was created in 2003, with the objective to federate the need, the resources and opportunities to strengthen the purposes of the actors in space of Switzerland, mainly coming from academia, industry and institutions. This is in support of the space policy of Switzerland, which is clearly to develop the quality of life of the citizens, to have a permanent commitment to space exploration, as well as to have significant input contribution that Switzerland can be a reliable and competitive partner in the space world.

The role that we have in the Swiss Space Centre is to network institutions, industry and academia to facilitate access of scientists to space, to provide education and training and — very importantly — to promote public awareness of space programmes.

Briefly, what we have been up to, in 2009 Switzerland launched its first satellite: the SwissCube. It was an interaction of 200 students, 15 laboratories, lots of universities and engineering schools, and after 3.5 years of development, the satellite was put into orbit and is, since September 2009 there, and is still functioning. The purpose of this unit is to take pictures of the night glow phenomena and is getting controlled by a ground station that is accessible to university students, where they can practice what is like to operate a satellite.

By building this satellite, we started to have a unit in space and, obviously, we saw at that point that we are going to have soon a debris in space when the satellite does function anymore. In 2009, we also launched internally the Clean-mE project, which was to develop technologies, in ways to mitigate the debris. I will not present this Clean-mE project in detail, but in February, we decided to launch the mission, CleanSpace-1. To launch it on the ground with the objective to go and clean up the small, small part of space that we may potentially contaminate once our satellite stops working. We have the mission that we are planning to do is to insert ourselves into orbit to determine where our target, the Swiss satellite, to conduct a rendezvous to approach and grab the satellite and then to make a controlled de-orbit of it. The way we want to do it, we have represented it in a short animation that I am showing you (If you could dim the lights a little bit more). We have the SwissCube that is in orbit and the chaser satellite, CleanSpace One, inserting itself behind SwissCube. At this point, making the positive identification — and I will come back to that. We deploy a soft grappling system because we have to go with the fact that probably the target is not going to be cooperative anymore. Once we hold the system together, stabilize the joint spacecraft, we plan to do a controlled de-orbit. Thank you for the video. Going back to the presentation.

The spacecraft has 3 main elements. The one is the robotic grappling system. The second very important issue is the propulsion system, obviously, that had a control and command system, as well as communication. What are the challenges that we are today facing? First of all, it is to have control orbit insertion, the altitude control, to miniaturize the propulsion system and then to have a positive identification of the target space craft, because — obviously — there is no way that we want to take the risk and to take the wrong spacecraft out of orbit. If there is any doubt about the identification, the mission will be aborted. As we built the first spacecraft, we will base ourselves on image recognition to identify clearly — there some marks on it that are unique to our

spacecraft — in this case, if the spacecraft is still partially cooperative — there is a good chance of that — we will identify additionally by the beacon that is also unique and is emitting a signal. Once it is identified, and we get this communication down to the ground, also miniaturized, we plan to do a soft grappling that can be a precursor to taking care of and catching the breeze of the size between 5 cm and 20 cm of significant length. Then we will have to stabilize the two elements that are joined together and have the controlled de-orbit.

Collaboration that we currently plan is based on activities done in Switzerland in the robotics system, the engineering, the OCS, the optics, manufacturing and electronics. However, we were extremely open — this is an academic project — and we were extremely open to all international collaborations, so any institution and organization that is of good faith and willing, can contact us and join us because the point is not that we Swiss get our first satellite out of the orbit, but is that we can set the tone, set the space and this is the clear objective of our project. It is to demonstrate that for university satellites and — there are quite a few of them up there — it is possible to remove them and it is reasonable in price. The second main objective is to heighten public awareness, also of the general public and not only the space community. The third objective is to have extremely strong student involvement so that young engineers that will go out in industry, working in space or in non-space, are aware that they cannot develop hardware and forget about the recycling of the hardware once it is finished its useful life. We will collaborate strongly between laboratories and industry and general costs that we estimate from today's perspective is roughly 10 million Swiss francs, including launch and operations. Thank you very much for your attention.

**The CHAIRMAN** Thank you, Mr. Gass for your presentation. Is there any delegate who has questions for the presenter? Yes, distinguished delegate of the United States of America. You have the floor.

**Mr. HIGGINS** (*United States*) Thank you, Mr. Chairman. I would like to ask Professor Gass, when you are considering the launch for this recovery or return vehicle, would this be a primary payload or a secondary payload on launch.

**Mr. GASS** (*Switzerland, Technical presentation*) Thank you for the question. We are considering this as a secondary payload as a launch for the moment.

**The CHAIRMAN** Thank you, Are there any other questions. I see none. If you have a question, please ask separately after this session. The third presentation for this morning is by Ms. Lu Jun of China on “BeiDou: Bringing the World and China to Your Doorstep”. You have the floor.

**Ms. L. JUN** (*Technical presentation, interpretation from Chinese*) Thank you, Mr. Chairman. Ladies and Gentlemen, the title of my presentation is “BeiDou: Bring the World and China to Your Doorstep”. My name is Lu Jun and I come from the China Satellite Navigation Office.

My presentation will be in three parts. The first part is the progress report on the international report, in the case of BeiDou system progress. I would like to talk about the China satellite navigation conference and also involvement in the activities related to ICG.

Part 1: the progress in the developing construction of the system. The development is in 3 phases. Phase 1 we'll build the pilot system, which will cover active and passive navigation services. Phase 2 and phase 3 will be building global navigation system. In phase 2, it will cover China and neighbouring regions. Phase 3 will cover global services and its passive positioning system, which is analogous to Galileo, etc. The BeiDou system consists of three parts: one is space constellation; the second is ground control segment and; user terminals.

Space constellation is again in three phases, which is shown in the top pictures. On the left is the 3 IGS satellites. The picture in the middle is the regional service system consisting of GEO MEO and inclined GSL satellites. On the far right is the entire global system consisting of 5 GEO satellites, 13 non-GEO satellites, including 27 MEO and 3 IGSS satellites. On the ground control segment consist of some ground stations and user terminals including BeiDou user terminals and those that are compatible with other systems. These compatible terminals, we hope, will be able to be deployed at low-cost user terminals for better service access.

This is the BeiDou navigation satellite demonstration system, consisting of 3 GEO systems. The picture shows how they were launched and they can send signals and receive PNG signals and this has already been completed and has already been launched and has reaped very good social and economic benefits. This is the global oriented constellation consisting of GEO MEO and inclined GSL satellites.

In 2011 we launched 3 BeiDou satellites. To date, this year, so far, we have launched 3. These pictures show how they were launched and the dates of the launches. We have a total of 11 satellites all operating in orbit today. The launches, since 2000, two of them have been de-orbited at the expiration of the service life and 11 are working and 1 is undergoing test and another is being maintained in orbit. This is the stages of operation of BeiDou satellites to date.

On the 27 September 2011, the Council Information Office convened a press conference announcing to the world that we will be initiating our initial service of the BeiDou system. You see the director of my office, and the director of the Space Department of the Manufacture of the BeiDou system. At the press conference, we issued two reporting documents. One is the development of BeiDou navigation satellite systems, which is also called the "Blue paper". The Blue paper was updated last month and we have published V2.0. BeiDou document is Interface Control Document of BeiDou Navigation satellite system containing some basic parameters of space signals, manufacturers and research institutions involved in the development of receivers of BeiDou system. Regarding our operational capability, we covered the area from 84 degrees West to 160 degrees East from 55 degrees South to 55 degrees North, positioning accuracy horizontally 25 metres, vertically 30 metres. Velocity accuracy is 0.4 metres/second and timing accuracy is 50 nanoseconds. The map shows the current coverage.

Since we provided the demonstration operation, the system has been working very stably and the constellation performance has improved markedly and the user experience of the PNT service has been enhanced. The chart on the left is the coverage at the time of announcement. On the right hand side you will see that as the constellation expands, the service performance has been enhanced.

What can we offer by 2020? 4 types of services: open service, short message, [...] and wide area differential service. Regarding the global services, the open service, we will provide position accuracies of less than 10 metres, velocity accuracy of less 0.2 metres/second timing accuracy of -20 [...] for a wide area differential service, the accuracy will be even better and regarding the application, popularization, industrialization, we'll be building while we use them. We use usage to promote the development and industrialization. In other words, in the course of construction, development will be stepping up research on the fundamental chips and modules will be conducting a lot of demonstrations in different sectors

and regions, so as to catalyse large-scale deployment and usage. We will also be accelerating construction at BeiDou ground base augmentation system so as to be able to use CM level and sub-metre level services. We also want to cover the entirety of China, make an ubiquitous system.

Here we see the progress in the R&D of chips and terminals. At the moment, [...] chip has [...] chip it has already been installed in vehicle mounted terminals. You can see the OEM board chip and antenna that have already been developed. We have also paid close attention to the applications in civil aviation, which places a premium on safety. We have done some airborne tests, we also hope that we can work on the international civil aviation standards to carry out some R&D.

In the sector of transportation, we have focused on delivering some critical transportation management and administration system. It can collect traffic information, prevent fatigue driving, monitor dangerous goods. Fatigue driving prevention can also improve safety level and we can also improve the efficiency of transportation. In some specialized areas, such as surveying and mapping, we attached great importance to our high precision receivers, whose position is improving all the time. We also conduct some tests of the service accuracy levels and we proved that we can reach sub-metre accuracy level.

Weather and climate are very much under the spotlight these days and we can help with atmosphere, ocean, space monitoring and early warning demonstration. For example, we can release high altitude balloons, we can monitor ionosphere and water vapour monitoring. We can also monitor sea breeze and waves so as to enable meteorological disaster early warning and information dissemination.

In the course of development and application, we are actively promoting international cooperation, which is based on openness and mutual benefit and win-win results. We have carried out GNSS compatibility and interoperability and frequency coordination with other GNSS systems. We are also actively participating in all activities of ICG, the International Committee on GNSS. We actively promote the merger of BeiDou — or the integration of BeiDou — into the big family of international centres and the big family of international GNSS.

These are snapshots of events related to international cooperation, such as our attendance at conferences; our attendance at negotiations. This picture shows our negotiations with Japan, with Galileo

system, to explore ways and means of integrated cooperation to provide better service for users. On the other hand, we also want to initiate and promote some international initiatives, such as the IGMAS initiative (International GNSS Monitoring and Assessment Service) through our GNSS system and through international cooperation we can share resources so that our users can have more reliable and better services.

Regarding BeiDou applications, we hope that BeiDou and other GNSS systems can get users better experience so that users can participate in the early process. The frequency resources is very limited. We support the broadening or the widening of the new spectrum available for GNSS. At the same time we have conducted some intergovernmental cooperation this picture shows the contract signing meeting between China and Pakistan. We have established areas in which we can conduct cooperation with follow-up plans.

These are pictures of our participation in international exchanges. The part of my presentation is on the China Satellite Navigation Conference. We have already had 3 Conferences focusing on academic, technological and theoretical innovations such as experience exchange, information exchange and outlook of scientific development of GNSS. These are the pictures of the first session that took place in 2010. Over 1,100 participants took part in the conference. In the second CSNC we had more than 1,600 participants, with 582 technical papers published. Some enterprises and research institutes also brought exhibits.

Last month, the third conference was held in Guanzhou city, the theme was “BeiDou going to application” aimed at perfecting our system capacity, evaluating the system applications and linking industry with technology. There was further increase in the headcount. There were 2,000 participants from nearly 100 organizations at this conference. We also promoted our cooperation with other agencies, for example CSNC and America’s ION had a joint panel. We also invited providers to the event to give update on their system development and service provision. We also invited a surveying negotiation representative. We also had some side events devoted to different topics, which shows the internationalization of the event. Next year, the same conference will take place in central China, in Wuhan City of Hubei Province. It will take place in May of next year. We invite you to that event.

Regarding the International Committee on GNSS, again, we actively attend this event, so we are a member of ICG since 1999. We have been actively

supporting the Vienna Declaration and the work of Action Teams since its inception, Including the 6th plenary meeting and 8 Provider’s Forum meetings. We also discussed key considerations of the future of ICG across a spectrum of areas. We are sending experts as the Chairman of the working work. As ICG evolves, we have a key agenda item about the future evolution of ICG. We are very interested in this topic and we hope we can contribute to this discussion. This year, China was honoured to host the 7th meeting, which will take place in November in Beijing. We hope that some of you will be able to attend this conference, Together with providers.

This is the draft agenda at the second prep meeting of the 7th conference of ICG. This agenda was adopted. The event will take place at the Beijing International Convention Centre next year. For this conference we will be organizing some tourist visits and site visits. The delegates can visit the China Academy Aerospace Electronics Technology and the China Academy of Space Technology for have first-hand experience of the navigation assessment system development. Delegates will also be taken to the famous Summer Palace in Beijing to visit the royal imperial gardens. We, as the host country, have created this dedicated webpage: [www.icg2012.org](http://www.icg2012.org). BeiDou and China thank you for your attention and please come to China. Thank you.

**The CHAIRMAN** Thank you, Ms. Lu Jun for your presentations. Are there any delegates who have questions for the presenter? Since time is limited, if you have any questions, please contact directly with Ms. Lu Jun. I will shortly adjourn this meeting. Before doing so, I would like to inform delegates of our schedule of work for this afternoon.

We will meet promptly at 3.00 p.m. At that time, we will continue and conclude our consideration of agenda item 5, “General exchange of views” and 6 “Ways and means of maintaining outer space for peaceful purposes”. We will begin our consideration of agenda item 9 “Report of the Legal Subcommittee on its fifty-first session”, agenda item 12, “Space and water”, and agenda item 13, “Space and climate change”.

There will be two technical presentations this afternoon: by a representative of Austria entitled “Scientific and Technical Activities on Space Weather in Austria” and by a representative of Japan entitled “GCOM-W1 ‘SHIZUKU’, Global Change Observation Mission 1st — Water”.

Also, Expert group C of the Working Group on the Long-term Sustainability of Outer Space Activities is meeting this afternoon from 2.00 p.m. to 6.00 p.m. in meeting room MOE19.

Are there any questions to this proposed schedule?

*I see none.*

Delegations are now cordially invited to attend a handing over ceremony of a BEIDOU navigation satellite model in the Mozart Room of the VIC restaurant, starting now at 1.15 p.m. The model satellite is a donation by China to the United Nations Office of Outer Space Affairs permanent exhibition. The ceremony will be followed by a reception.

*This meeting is adjourned until 3.00 p.m. this afternoon.*