

## Committee on the Peaceful Uses of Outer Space

*Unedited transcript*

605<sup>th</sup> Meeting  
Tuesday, 9 June 2009, 10 a.m.  
Vienna

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*Chairman:* Mr. Ciro Arévalo Yepes (Colombia)

*The meeting was called to order at 10.13 a.m.*

**The CHAIRMAN.** (*interpretation from Spanish*) Good morning distinguished delegates, I now declare open the 605th meeting of the Committee on the Peaceful Uses of Outer Space.

This morning we will continue our consideration of agenda item 8, report of the Legal Subcommittee on its forty-eighth session and will begin agenda item 9, spin-off benefits of space technology: review of current status. Then we will begin consideration of agenda item 12, space and climate change and 13, use of space technology in the United Nations system. Time permitting, we will also begin our consideration of agenda item 14, use of space-derived geospatial data for sustainable development.

This morning there will be four technical presentations. The first one by a representative of the German Aerospace Centre, DLR. DLR's Earth observation activities for risk and vulnerability assessment. The second by a representative of Japan, entitled: IBUKI. The third presentation will be by a representative of India, entitled: Space technology for climate change studies: the Indian perspective. The final presentation, by a representative of the US, international activities of the American Institute of Aeronautics and Astronautics.

I would also like to remind delegations that they remember to present the Secretariat with corrections to the provisional list of participants, this is CRP.2, so we can finalize that list. This should be done by the end of this meeting.

Distinguished delegates, I have received two requests for the floor, one from Brazil on item 6, UNISPACE III and Nigeria on 7, report of the Scientific and Technical Subcommittee.

I am going to give the floor at this time to Brazil.

**Mr. J. FILHO** (Brazil) (*interpretation from Spanish*) Good morning, thank you Chair. I will be brief. I just wanted to make our position here clear on the idea of promoting the holding of a UNISPACE IV. This is a necessity in our opinion because, since UNISPACE III ten years ago, great change has taken place in space activities. In that decade, new issues, new changes in power and \_\_\_\_ (?) have taken place between the different parties involved. So we really do need a new encounter, a new major gathering to discuss all of the new developments and issues that have come forth since then. So we are very favourable to the idea of holding UNISPACE IV. Thank you.

**The CHAIRMAN** (*interpretation from Spanish*) Let me thank the Brazilian delegation and just to say that I totally adhere to what you said. Thank you.

Nigeria has the floor.

**Mr. B. LOLO** (Nigeria) Thank you Mr. Chairman for giving us the floor to come back to agenda item 7. My delegation commends the Chairman of the Scientific and Technical Subcommittee for the work of the Subcommittee at its forty-sixth session. We also appreciate the painstaking work of the Secretariat in putting together the report as presented to this Committee.

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In its resolution 50/27 of 6 December 1995, the General Assembly endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space that, beginning with its thirty-ninth session, the Committee would be provided with unedited transcripts in lieu of verbatim records. This record contains the texts of speeches delivered in English and interpretations of speeches delivered in the other languages as transcribed from taped recordings. The transcripts have not been edited or revised.

Corrections should be submitted to original speeches only. They should be incorporated in a copy of the record and be sent under the signature of a member of the delegation concerned, within one week of the date of publication, to the Chief, Conference Management Service, Room D0771, United Nations Office at Vienna, P.O. Box 500, A-1400, Vienna, Austria. Corrections will be issued in a consolidated corrigendum.



Nigeria wishes to draw attention to the work of the STSC working group of the whole on the implementation of UNISPACE III and to emphasize that, while a substantial amount of work has been done to implement its recommendations, there still remains ample work to be done particularly in those activity areas with direct bearing to the use of space application techniques for socio-economic development especially in the developing countries.

Nigeria also identifies itself with the work of the STSC working group on the use of nuclear power sources in outer space especially with regard to the guidelines developed to guide activities of States. Nigeria believes that the guidelines could be progressively developed with the possibility of becoming legally binding rules in the future. We are convinced that, in time to come, countries would better appreciate the need for legally binding instruments on NPS. We appreciate the continued efforts of France to put the item, long term sustainability of outer space activities, on the agenda of the STSC. Nigeria welcomes the opportunity offered by this meeting to engage in further consultations on this important matter. Our appreciation is informed not only by the fact that Nigeria played a part in conceptualizing this idea but also because we believe in the necessity to consider all the intricacies and possibilities of long-term sustainability of space activities. Several delegations have identified some of these issues that definitely require further consultations. We look forward to participating in these consultations. Thank you Mr. Chairman.

**The CHAIRMAN** (*interpretation from Spanish*) Let me thank Nigeria for that statement, well worth going back over this item.

Let us now continue with our work on the Legal Subcommittee on its forty-eighth session, item 8, and I have on my list of speakers, Kenneth Hodgkins from the US. You have the floor.

**Mr. K. HODGKINS** (United States of America) Thank you Mr. Chairman. My delegation has noted previously the positive developments in revitalizing the agendas and methods of work of COPUOS and its Subcommittees. The last session of the Legal Subcommittee demonstrated, once again, the encouraging results that have emerged from our efforts. Under the able leadership of its Chairman, Professor Vladimir Kopal of the Czech Republic, the Subcommittee produced a number of highly useful results.

As noted in our statement under general exchange of views, this year marks the fortieth anniversary of the Moon landing, an incredible milestone in the exploration of outer space. It is only fitting to note that COPUOS and its Legal Subcommittee have a distinguished history of working through consensus to develop space law in a manner that promotes space exploration.

The Subcommittee played a pivotal role in establishing the primary outer space treaties, that is the Outer Space Treaty, the Rescue and Return Agreement and the Liability and Registration Conventions. Under the legal framework of these treaties, space exploration by nations, international organizations and now private entities has flourished. As a result, space technology and services contribute immeasurably to economic growth and improvements in the quality of life around the world. Notwithstanding the continued relevance of the space law instruments, many States have not accepted key treaties including some members of COPUOS. The US has encouraged the Subcommittee to invite States to consider ratifying and implementing the four main space law instruments cited above and, of course, it should encourage States that have accepted the core instruments to look at the sufficiency of their nation's laws to implement them.

At the most recent session of the Legal Subcommittee some States called for the negotiation of a new comprehensive convention on outer space. It is my delegation's view that such an approach would be counterproductive. The principles contained in the space law instruments establish a framework that has encouraged the exploration of outer space and benefited both space-faring and non-space-faring nations. It is important that we not lose sight how much has been and continues to be achieved for humanity's common benefit within this framework.

Articles I and II of the Outer Space Treaty establish that the exploration and use of space is to be carried out for the benefit and in the interests of all peoples, that outer space exploration and use are open on a non-discriminatory basis, that there is freedom of scientific investigation in outer space and, that outer space is not subject to national appropriation. The US fully supports these principles and believes that the Subcommittee should undertake activities that support continued vitality of these principles. We remain convinced, in particular that to entertain the possibility of the negotiation of a new comprehensive space law instrument might undermine these principles in the existing space law regime.

At its most recent session the Subcommittee began its consideration of a new item on the national mechanisms relating to space debris mitigation measures. This item, which gave member States and observers the opportunity to exchange information on what steps have been taken by States to control the creation and effects of space debris, provides a useful vehicle to continue the important work this Committee has done in the area of space debris mitigation, such as the recent adoption of the UN Space Debris Mitigation Guidelines.

The Subcommittee also continued its work on two items recently added to the agenda. Under the item on national legislation relevant to the peaceful exploration and use of outer space, delegations engaged in an informative exchange of information that will provide insight as to how States oversee their governmental and non-governmental activities in space. In the working group chaired by Professor Irmgard Marboe of Austria, convened for the first time, we were pleased with the level of participation and the high quality of the information presented.

Equally encouraging was the Subcommittee's consideration of the item on capacity-building in space law. Member States and observers had the opportunity to exchange views and efforts underway, at the national and international levels, to promote a wider appreciation of space law. Additionally, we welcome the draft curriculum on space law, developed by OOSA in conjunction with space law educators and representatives of the regional centres for space science and technology education, as an important step in our work to build capacity in this area.

Mr. Chairman, before I conclude, there are two points I would like raise. The first is that, as mentioned by the Director of the Office for Outer Space Affairs, we were saddened to learn that, on 2 May, Eileen Galloway had passed away. She was two days short of her 103rd birthday. Eileen was a highly respected space law policy expert and many of you are familiar with her work and many of you knew her directly. Just to underscore the importance that Eileen had to the work of this Committee and to international cooperation in general, I would like to just say a couple of remarks.

First, Dr. Galloway was instrumental in drafting section 205 of the National Aeronautics and Space Act of 1958 which established NASA but also established the principle that international cooperation would be a fundamental aspect of NASA's work and, as we all know, that has led to a tremendous amount of collaboration over the past 50 years. She served on

nine NASA Advisory Committees and continued to do so until 2003. She had been pivotal in helping to write legislation emphasizing international cooperation and the peaceful exploration of outer space in addition to the NASA Act. Dr. Galloway worked for several decades with this Committee and was instrumental in creating the International Institute of Space Law. She was the Vice President of IISL between 1967 and 1979 and she became the Institute's honorary director after that. Dr Galloway received the NASA public service award in 1987 for her outstanding achievements in advising the Congress on legal and technical aspects of outer space and for further services to the United Nations and other international organizations in helping to develop a rational basis for international space law. Quite amazing, in March of this year, Dr. Galloway wrote a paper on space law for a Moon/Mars programme for Space News. She was quite active right up until her time of death and we all will miss Eileen and we owe a great debt to her for the work that she did in the area of international cooperation and in the area of progressive development of space law.

Mr. Chairman I would also like to turn to the report of the Legal Subcommittee, A/AC.105/935, and specifically to page 34 which is the report of the working group on national legislation. In paragraph 7 (a) there is just one minor point that I would like to clarify. This paragraph was dealing with the seven main issues for discussion in the working group and the first issue was, reasons for States to enact national space legislation and, if I recall, my delegation also wanted to have in that particular point the notion of reasons why States would not enact national legislation. It is a minor point but there are two different questions. One is, what were the reasons States would enact national legislation and there may be some very good reasons why States may not enact national legislation. I am not sure if it is possible to correct this at this time but we would want to make sure that our distinguished Chair, Professor Marboe, has an opportunity next year at the next session of the working group to address that question. We just wanted to make sure that it was not excluded from discussion next year as a result of it not being reflected in the report. Thank you Mr. Chairman.

**The CHAIRMAN.** (*interpretation from Spanish*) Let me thank the United States delegation and even though we do not have Professor Marboe from Austria on the speaker now but she will be speaking about this aspect of the problem which is definitely on the table. These are two elements, even though the document only mentions one of them, and they are both important.

First of all, let me endorse what you said about Ms. Galloway. All of us here have a very clear awareness of the contribution that she made throughout her life, a very long life, and it is very impressive to see that, even at nearly 100, she was still productive so to speak, this was pointed out by the US delegate. I even took the freedom of writing a comment on all of our behalf in the book of honour for her a couple of weeks ago. We would ask that this be reflected in the report that we extend our condolences for the loss of someone who was such an eminent figure. Thank you to the US delegate.

I have had requests from two delegations on this topic. Brazil first and then Chile.

**Mr. J. FILHO** (Brazil) (*interpretation from Spanish*) Thank you Chair. Could we not speak a little bit more about Ms. Galloway. I met her in the 80s and it seems appropriate for us to spend some time in her memory at this time. She was a very positive, very intelligent, very talented, very energetic, person, who dedicated her life in performing exceptional work for the international community on space law. I remember her work on the Moon Agreement which is certainly one of the greatest achievements in this field. We would like to pay special tribute and perhaps ask that this session of COPUOS be dedicated to Dr. Eileen Galloway as a gesture. Thank you.

**The CHAIRMAN.** (*interpretation from Spanish*) I thank the delegate from Brazil. Let us dedicate our thoughts and our work in the Committee working on the legal issues here to her memory.

I give the floor to Chile.

**Mr. R. GONZÁLEZ ANINAT** (*interpretation from Spanish*) Thank you Chair. Obviously I join others in this tribute. This is a true loss indeed but, in that same spirit, in the dynamism you want this body to have, we should again make it clear that the Committee cannot be the hostage of the technical presentations. We are here to talk about policies, our main function is to negotiate here. We have really got to think about how we can do this next year, how the technical presentations can be done in such a way that they do not have predominance over our own work here.

Just one remark on the remarks of the United States delegate concerning the omission in the document on space law from Dr. Marboe of Austria last year. Obviously we are not opposed to having the point made by the United States reflected here, that is the right of all delegations to have their point of view presented, but a country that denies considering the

possibility of having general space legislation is like a surgeon who refuses to operate in the operating room. Thank you.

**The CHAIRMAN.** (*interpretation from Spanish*) Thank you Chile. Any other delegation wish to take the floor? Distinguished delegate of the Czech Republic.

**Mr. V. KOPAL** (Czech Republic) Thank you very much Mr. Chairman. The reason why I applied for a brief intervention was similar as that of my friend Raimundo González. I would also like to join those who remembered us about the passing away of Ms. Eileen Galloway. I am doing it particularly for one reason. I have known her and engaged our contacts almost 50 years ago. It was at the Astronautical Congress that was held in 1960 in Sweden, in Stockholm. She was sitting there and, at that time, not too many participants attended the space law colloquia, it was still a relatively small group, and she was sitting there and immediately drew my attention to recognize her and to learn who she really was. She was sitting together with Professor John Cobb Cooper, another outstanding space lawyer of the United States. Then we engaged our contacts and maintained them for, as I already told you, five decades. From time to time we exchanged letters, including our notes and opinions about questions of our common interest in space law, but she always added one paragraph at the end of her letter in which she made a joke and her humour was directed to herself and she was usually calling herself as, a girl like me, and it was even when she was 80, 90, even 100. I remember very well that we were sitting, in 1986, in the working group on remote sensing and that it was just the day of her 80th birthday and, at that date, the consensus was reached on the principles on remote sensing. Recently, I sent her still my best wishes and also those of my wife, who also knew her very well, and it was just two days before her passing away. This is why I wanted to say something about her and I believe that all of us have recognized her great merit for the development of international cooperation in outer space. She was an important adviser of the then majority leader of the Senate and, later on, Vice President of the United States, Lyndon Johnson. We also have fully recognized her great input in the development of international law of outer space at the non-governmental level in the International Institute of Space Law. Thank you very much.

**The CHAIRMAN.** (*interpretation from Spanish*) Thank you very much for sharing that personal remembrance. I know that you lived through very many important moments, as she did, and your remarks pay great tribute to her.

The next speaker, Saudi Arabia. You have the floor.

**Mr. M. TARABZOUNI** (Saudi Arabia) (*interpretation from Arabic*) Mr. Chairman, my delegation should like to thank Mr. Kopal for having chaired the Subcommittee on legal matters during its forty-eighth session. My thanks also go to those who helped him in his role. We would like to endorse, very strongly, the views expressed by the previous speakers this morning when they endorsed the report of this Subcommittee, its report on its forty-eighth session. We would like to support all recommendations contained therein.

Mr. Chairman, I would like to clarify one point namely, in paragraph 70 of this report, there are very important items indeed and we have to use these points when we set about to define and delineate outer space. My delegation would like to support the objective of capacity-building in outer space legislation. We would like to request the two delegations of France and Greece to give us some information concerning the ways and means of having access of law students to fellowships in France and Greece, as it was stated during the forty-eighth session of the Subcommittee.

Mr. Chairman, I would like to draw your attention to paragraph 191 which is relevant to the inclusion of a new agenda item on the agenda of the forty-ninth session of the Subcommittee. This issue is related to establishing some guidelines as far as dissemination of space images are concerned. The use of the web in the dissemination of these images. We believe that this is indeed an intrusion, a gross intrusion into the sanctity of private lives of citizens and it is also a gross violation of the sovereignty of member nations and their own security.

Thank you Mr. Chairman.

**The CHAIRMAN.** (*interpretation from Spanish*) I would like to thank the Saudi Arabian delegation for that statement.

I have three speakers on my list. Russian Federation, Nigeria and Indonesia. First of all, Russian Federation.

**Ms. L. KASATKINA** (Russian Federation) (*interpretation from Russian*) Thank you very much Mr. Chairman. Dear delegates, colleagues, the Russian Federation attaches great importance to the development of multilateral cooperation in the exploration and utilization of outer space. As we all know, both cooperation and interest in this subject are

growing around the world, given the growing dynamism of space activities and the broadening of their scope. Light is being shared more clearly on inconsistencies and, in certain matters, shortcomings, in existing legal basis for our cooperation. This urgently requires that interested parties develop a future balanced approach to international space law and that they ensure that the results of space exploration be used to the benefit of all countries and that we promote sustainable socio-economic development and maintain international peace and security.

In this connection, I should like again to draw your attention to the Russian initiative on comprehensive convention on space law. A leading role in this process should be played by COPUOS and its Legal Subcommittee being the authorities which are the best fora for decisions and discussion of issues in space law. With respect to the results of the Legal Subcommittee's work, I should like to note the significance of the activities of the working group in this area especially the meetings having taken place in March and April of this year at the Legal Subcommittee's forty-eighth session and its discussion of the future accession to the Moon Treaty Agreement. In these areas, as you know, Russia is an active supporter of the idea of adapting the agreement to present day requirements and to the level of development of international law. We actively support continuing the examination of issues dealing with the definition and delimitation of space and we are in favour of determining criteria for this delimitation. At the forty-eighth session of the Legal Subcommittee, we would like to draw your attention to the initiative that we brought forward at the Subcommittee's meeting on the aerospace/outer space border at a level of 110 kilometres.

In conclusion, I should like once again to draw your attention to the results of the joint work of the experts of IAEA and the Scientific and Technical Subcommittee, the results of which allowed for us to adopt a foundation document on the insurance of safety and the use of nuclear power sources in outer space. A technical and legal consensus were reached. Thank you very much for your attention.

**The CHAIRMAN.** (*interpretation from Spanish*) Thank you to the delegate of the Russian Federation. Thank you very much Madam for your statement in which you reiterated the Russian Federation's proposals on a number of agenda items.

With respect to the statements I would now like to call Nigeria to the floor. You have the floor Mr. Bulus Lolo.

**Mr. B. LOLO** (Nigeria) Thank you Mr. Chairman. I would like to preface my remarks with a modest tribute to Eileen Galloway and, in doing this, to convey Nigeria's condolences to the United States. Indeed her work and \_\_\_\_ (?) agenda item go together. She has left her footprints in the sands of time and we believe that the work of this Committee will benefit from her thoughts that are written. May her soul rest in peace.

Mr. Chairman, we commend the Chairman and Bureau of the Subcommittee for a successful work they did during the forty-eighth session. We would also like to commend the Secretariat for putting the report for us. At the forty-eighth session of the Legal Subcommittee one of the items on the agenda was capacity-building in space law. The Subcommittee had before it a preliminary draft education curriculum on space law put together by a group of experts including initiatives of member States to build capacity in space law. The Subcommittee also had before it a directory of education opportunities in space law. Nigeria welcomes the steps taken so far including the plans to use regional centres for space science and technology education for capacity-building in space law. However, in adopting this report, the Committee should note in particular, paragraphs 125 and 126 that relate to the need for adequate support for the regional centres through provision of expertise to teach space law as well as material and financial resources if they are to effectively take on this additional responsibility. Thank you Mr. Chairman.

**The CHAIRMAN.** (*interpretation from Spanish*) Thank you very much to the representative of Nigeria for having emphasized the capacity-building issue. Thank you very much to the delegate from Nigeria.

Indonesia now has the floor.

**Mr. B. KOESOEMANTO** (Indonesia) Thank you Mr. Chairman for giving my delegation the chance to express its view on the report of the Legal Subcommittee on its forty-eighth session.

Allow me to take this opportunity through you, Mr. Chairman, to thank Mr. Vladimir Kopal of the Czech Republic for chairing the forty-eighth session of the Legal Subcommittee. It was only under his able leadership that the Subcommittee was able to achieve a fruitful outcome.

Our sincere appreciation also goes to the Secretariat for their support during the Legal Subcommittee's work. My delegation would like to reiterate its commitment to further contribute to the work of the Subcommittee in the future.

Mr. Chairman, while welcoming the report of the Legal Subcommittee, my delegation would like to draw your special attention to the issue of definition and delimitation of outer space. As we know, we have gone through more than 40 years of debate, discussions and exchange of views of this issue. Indonesia's position remains that the definition and delimitation of outer space are vital to ensure legal clarity and certainty in our outer space activities. As we have stated during the previous Legal Subcommittee as well as in our general statement during the second day of this Committee, my delegation is strongly of the view that the time has come for us to try to achieve minimum consensus or compromise on this issue through a more realistic approach, such as focusing on certain aspects of terminology. In light of this purpose of making progress and achieving maximum agreed principles, my delegation is of the view that it is a very opportune time for us to initiate a forum for informal, inclusive and open-ended discussions among experts both on the legal aspects as well as on scientific and technical aspects aimed at focusing on building common ground, rather than differences, in a coherent and comprehensive manner.

My delegation is fully convinced that the outcome of such a meeting would contribute substantially to formal deliberations within the context of the upcoming Subcommittee. In this regard my delegation will prepare a draft proposal, if deemed necessary, in due time.

In concluding my statement, Mr. Chairman, my delegation is of the view that ensuring the peaceful nature of outer space to providing legal certainty in outer space activities should remain one of the core goals of the work of this Committee. In this context, I assure you, Mr. Chairman, of my delegation's firm support in achieving this goal. Thank you.

**The CHAIRMAN.** (*interpretation from Spanish*) Let me thank the distinguished representative of Indonesia. That would be a very welcome initiative that you just announced to this Committee. This is a part of the dynamism that you described that is necessary.

The next speaker is Iran. You have the floor.

**Mr. A. TALEBZADEH** (Islamic Republic of Iran) Mr. Chairman, thank you very much. I would like to take this opportunity to thank again Professor Kopal for the very good report and I would like to support the deliberation of Saudi Arabia. The Islamic Republic of Iran is aware of the substantial contribution of the satellite \_\_\_\_ (?) of all humankind and in socio-economic development of all countries. However, it is a matter of great concern that, at the same time, misuse and irresponsible dissemination of the satellite images to the world like that. \_\_\_\_ (?) irreparable damage of human society and \_\_\_\_ (?) national security at \_\_\_\_ (?). My delegation believes that it constitutes a challenge to all human society \_\_\_\_ (?) requires an appropriate collective response by the international community. To that end, the issue of regulation of dissemination of satellite images \_\_\_\_ (?) by the \_\_\_\_ (?) of military and relevant to be adequately \_\_\_\_ (?) international organization and UN agency, in particular the Committee on the Peaceful Uses of Outer Space. Thank you.

**The CHAIRMAN** (*interpretation from Spanish*) We thank the distinguished delegate from Iran, upcoming Chair of the Legal Subcommittee, for that statement.

I give the floor to Brazil, then Pakistan, then Colombia.

**Mr. J. FILHO** (Brazil) (*interpretation from Spanish*) Thank you Chair. As the chair of the working group on the definition and delimitation of outer space during the last meeting of the Legal Subcommittee, please allow me, Chair, to mention a few points.

First of all, let me extend a warm salute to the Indonesian delegation who just spoke on their decision to make a proposal in this field very soon. I would also like to reiterate perhaps the most important conclusion of the work we perform which is an appeal to all States and their governments to answer two questions and I am asking for your permission to read this out in English.

Does your government consider it necessary to define outer space and/or to delimit aerospace and outer space given the current level of space and \_\_\_\_ (?) activities and technological development in space and application technology? Please provide a justification for the answer.

Does your government consider another approach to \_\_\_\_ (?) this issue? Please provide a justification for the answer.

I would make an appeal here to all delegations that they attempt to respond to this because these are fundamental questions for future work.

Second point is this. The possibility of holding a workshop on this topic, the delimitation of space \_\_\_\_ (?) symposium that the International Institute of Space Law organizes, usually before the beginning or in first days of the Legal Subcommittee's session. The idea here has got so much support from delegates, it is very important that this question, as I said, really be concretely achieved.

First allow me to say that, during the meeting of the working group on the definition and delimitation of outer space, during its last session, was a very pleasant surprise because the debates and discussions that took place were really a great achievement. Thank you.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much Professor for that statement in which you highlighted two important points in the capacity as chairman of that working group, the definition and delimitation of outer space. The first is to try to attempt to respond and to make an appeal to member States to answer these two crucial questions because on that basis that we will be able to advance on the question.

Secondly, the very clear issue of the symposium that is organized and of course you being a member of the International Institute of Space Law you have greater force for this proposal. Therefore work on this appeal you have made to the room and we think there will be some reaction to this. Thank you very much.

Now I give the floor to Pakistan.

**Mr. I. IQBAL** (Pakistan) Thank you Mr. Chairman. Space Law is important to all of us, we would like to see more activity such as capacity building of the developing countries through training both short and long term. Certain issues which have highlighted by Saudi Arabia about the intrusiveness of high resolution remote sensing data needs to be looked into and appropriate safeguards provided to sovereign nations. Thank you.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you Pakistan.

Colombia.

**Mr. J. OJEDA BUENO** (Colombia) (*interpretation from Spanish*) Good morning Chair,

thank you. Let me thank the working group of the Legal Subcommittee, led by Professor Kopal, very productive work under his excellent leadership and to Professor Marboe as well, who gave us very satisfactory results.

Obviously the nature of law here, especially international law, is always evolving and it can never keep pace with technology so our role is to try to continue legislating in terms of our interests here.

The Colombian delegation was very interested in the observation made by the US delegate, Ken Hodgkins, on how a single space law in a kind of comprehensive or global space law would affect existing principles of space law.

We also paid close attention to the proposal, on the opposite side, from China and the Russian Federation and the need of an integral legal instrument. The debate which I am sure will occupy much of our time in upcoming sessions of the Legal Subcommittee, it is an open question and it can be enriched by the conclusions of UNISPACE III and the ways in which things have developed over the last ten years. There are more technical questions that have been brought up before the Subcommittee, it is obvious here that again that law is lagging behind technology. New concepts such as sustainability and others, which are going to part of our upcoming agenda, probably deserve close legal attention because these are new realities, new ways of observing space. The agenda \_\_\_\_ (?) sustainability, one of the principle ramifications here was the precautionary principle.

This is a heritage which we, in the legal area, have to adopt. It is progress in international law when we talk about best practices, in scientific and technical terms, we also have to try to see what the best practices are and the other best practices in other legislation and international treaties.

We would like to thank China and Italy who expressed their interest in including national legislation in the curriculum which, as is provided for \_\_\_\_ (?), will be taken to the different regions when we train legal experts.

We move on to a field which has to do with the scientific and technical side. For Colombia and for other developing countries, the reports made by the United States and France on their activities in space debris mitigation and other technical questions, a way to generate confidence in institutions we participate in. This is why we believe that the national reporting is of great importance, both technically and legally. This is a

commitment of each country to be done in each one of the topics of interest to us. This has to do with the legal field because we are talking about parameters on how reporting should be done and we are talking about the technical side because change here is very fast in nature.

Just a few observations then from the Colombian delegation and that our thanks to the other delegations for their remarks, which always enrich the debate. Thank you.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you Colombia. I now give the floor to Syria.

**Mr. O. AMMAR** (Syrian Arab Republic) (*interpretation from Arabic*) Thank you Mr. Chairman. First of all I should like to thank the chairman of the Legal Subcommittee as well as all of the participants who contributed to the work of the forty-eighth session of the Legal Subcommittee and to the drawing up of its report.

I would like to share two comments with you on this subject. There is no doubt that we have made significant progress in the technical area, nevertheless it remains true that there is a very clear need for us to deepen our knowledge in space sciences. I believe that our Committee, and the United Nations in general, is called upon to make greater efforts in order to spread knowledge about outer space and the obligations of UN member States in this area by holding regional meetings as well as by supporting seminars held at the regional or national level.

I should like also to comment on a remark made by the honourable delegate of Saudi Arabia regarding the importance of conserving the sovereignty of States when discussing high definition satellite imagery that can fall into the hands of other States or persons and to echo the need that he pointed out for insurance of security issues in this area. Thank you very much.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much for those remarks and in particular those with the curriculum which we think is going to be very important tool in this regard.

I give the floor to Venezuela.

**Mr. R. NAVARRO** (Bolivarian Republic of Venezuela) (*interpretation from Spanish*) Good morning. We are very pleased to see the progress made in the report of the Legal Subcommittee on its forty-eighth session and hope it will continue such

constructive debate and discussion on these different items as well as including other areas that are associated with its purview in order to consolidate the peaceful uses of outer space.

On this basis, and along the lines of our position, we would ask COPUOS to strengthen its interaction between the two Subcommittees, STSC and Legal. Generally speaking, we think it is indispensable to elevate and promote international binding legal norms on such critical issues that directly affect us and which also are a danger to the goal of peaceful uses of outer space.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you Venezuela. This brings us to the end of our debate for now. We hope we will be able to continue and conclude item 8, report of the Legal Subcommittee on its forty-eighth session, this afternoon.

Now we come to spin-off benefits of space technology: review of current status, this is item 9 of the agenda and the first speaker is James Higgins from the United States.

**Mr. J. HIGGINS** (United States of America) Mr. Chairman, the United States takes great pride in sharing the fruits of aerospace research and development efforts bringing the benefits of technologies born in space and in the skies back down to Earth. Often understated, these innovations have been successfully spun off to private industry and made available to people around the world. The United States is once again pleased to share a few examples with the Committee.

Optics technology, originally developed for space applications, is now being used to detect vision anomalies in young children. Collaborating with research ophthalmologists and optometrists, NASA scientists adapted optics technology for eye screening methods using a process called photo refraction. During critical and field tests the camera system prototype was used to test more than 1,600 schoolchildren in Alabama. While there were only 111 of those children failed the traditional eye chart test, the photo refraction screening system found abnormalities in 507 children. A private company in Alabama now markets this system to paediatricians and family doctors with widespread distribution of screening services to school systems and other organizations with large numbers of children. The system is now used by medical practitioners in more than 20 States in the United States and it has accounted

for the screening of more than three million children in schools and day care centres.

A second example, NASA's Controlled Ecological Life Support Systems programme, conducts research to address basic needs of astronauts to meet stringent payload and power usage restrictions and minimize space occupancy by developing living regenerative ecosystems that will take care of themselves and their inhabitants. The experiment from this programme evolved into one of the most widespread NASA spin-offs of all time.

A method for manufacturing an algae-based food supplement that provides the vital nutrients previously only available in breast milk. NASA research discovered a strain of algae that produces DHA, a substance naturally found in the human body, it plays a key role in infant development and adult health. A company in Maryland now manufactures this supplement and it can be found in more than 90 per cent of the infant formulas sold in the United States as well as those sold in more than 65 countries around the world. It is estimated that over 24 million babies worldwide have consumed these nutritional additives which are integral to their learning ability, mental development and visual acuity. For adults, the nutrient supports the prevention and management of cardiovascular disease.

Providing astronauts with clean water is essential to space exploration to ensure the health and well-being of crew members away from Earth. NASA constantly seeks to improve the process of filtering and re-using waste water in closed loop systems. Subsystems use nanotechnology to clean waste water and minimize the amount of drinking water carried on a space mission. A private company, with a grant provided by NASA, designed a filtration system using carbon nanotube filters with low energy and low space requirements. Subsequent testing by the US Environmental Protection Agency-certified facilities, showed that this Nanomesh removed 99 per cent of bacteria and endotoxins, such as E.coli and Salmonella from the water. A commercial version of the carbon Nanomesh was released as the WaterStick.

Operating as simply as a straw and almost as small, the WaterStick cleans about 200 millilitres of water per minute, simply using water pressure and gravity, without electricity, heat, environmental impact, or chemical additives. The ease and portability of the WaterStick makes it useful for a variety of applications in which access to clean water and electricity are restricted, such as remote locations or disaster areas.

For another example, one of the basic nanotechnology structures, the carbon nanotube, is a graphite sheet, one atomic layer thick, that is wrapped on itself to create an extraordinarily thin strong tube. Although discovered more than 15 years ago, their use has been limited to the complex, dangerous and expensive methods of production. Researchers at the NASA Goddard Space Flight Center discovered a simple, safe and inexpensive method to create single walled carbon nanotubes without the use of a metal catalyst.

Benefits of this process include lower manufacturing costs, a more robust product in a simpler, safer process, that produces higher purity nanotubes. A company in Texas now plans to use this new process to make high quality, low cost carbon nanotubes, for commercial applications. NASA's improved production method will increase the prevalence of carbon nanotubes in the areas of medicine, microelectronics, scanning microscopy, materials and molecular containment.

Protecting astronauts from temperature extremes, ranging from -455° Fahrenheit to 2300° Fahrenheit, is the ultimate goal of NASA research on thermal barriers and insulation, for both crew clothing and spacecraft materials. NASA has engaged in extensive efforts developing and refining fire resistant materials for use in vehicles, flight suits and other applications demanding extreme thermal tolerances.

Much of this effort has been in the area of high temperature stable polymers. In the 1970s, NASA contracted with a company in New York to develop a line of polymer textiles for its various space applications. These products have been instrumental to space flight, seeing application on the Apollo programme, Skylab and numerous space shuttle missions.

Since the mid-1980s these polymer products have undergone a steady evolution into countless military and civilian applications. They have established a distinct profile and reputation in the fire retardant materials industry. Polymer fabrics have been adapted to flame-resistant workwear for firefighters, electric utilities and the petrochemical industry and for automotive braking systems and fire blocking layers for aircraft seats, among many other applications.

New developments will see these polymer fabrics used at high temperature separation membranes that increase efficiency in ethanol production and separate carbon dioxide from natural gas for carbon

dioxide sequestration and will also be used in hydrogen fuel cells.

Space research continues to improve and revolutionize our lives as NASA research has spun off into tangible and remarkable benefits for all. Our resolve to improve the quality of life on Earth and benefit humankind provides the impetus to develop and disseminate these technologies. The handful of examples I have highlighted are the direct result of the United States government civil space programme dedicated to active and productive collaboration with private industry and academia. Additional information about these and many other interesting spin-offs is provided in a brochure on NASA spin-off efforts and a copy of NASA's publication, Spin-off 2008, which have been made available to all member State delegations in their mailboxes. Thank you Mr. Chairman.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you to the delegate from the United States for sharing the spin-offs of science and technology here. DHA, among other developments, is very fascinating and very important for healthy development of children and potable water as well. One of the main challenges that we face and here we do see how space technology can help us solve these problems. Thank you.

The last speaker on agenda item 9 is Kazushi Kobata from Japan.

**Mr. K. KOBATA** (Japan) Mr. Chairman and distinguished delegates, on behalf of the Japanese delegation I am pleased to present to you some examples of Japan's spin-off efforts in the field of space technology at this session of COPUOS.

To begin with, the Japan Aerospace Exploration Agency, JAXA, has established the Industrial Collaboration and Coordination Center in order to strengthen the competitiveness of the Japanese space industry and enhance space utilization. This department is predominantly in charge of the spin-offs, that is, technology transfer, various space technologies and patents, and intellectual properties accumulated by JAXA for industry use.

It is expected to boost the level of cooperation among public, academic, and private sectors, according to the Japan basic plan for space policy.

During the last session of COPUOS, Japan introduced a couple of spin-off examples such as the general refuse disposal facilities, which was an

application of the recycling technology of organic waste in space.

Apart from that, we would like to offer an illustration of an upcoming spin-off, the crystal creation experimental equipment and service for dual use in ground and space. The technology for this equipment was derived from the protein crystal creation equipment in the International Space Station. The high resolution equipment is sold as an experiment kit and contributes to basic analysis for the R&D of new medicine such as Alzheimer's disease.

Furthermore, at this moment, Japanese astronaut Koichi Wakata is contributing to the experiment, Bisphosphonates, a kind of medicine as a countermeasure to space flight induced bone loss, which is collaborative research between JAXA and NASA. During the weightless conditions of orbit, the process of losing bone density is accelerated to about 10 times that of a person with osteoporosis.

This experiment makes it possible for us to obtain the medical data regarding bisphosphonates specifically the effectiveness of the antiresorptive drug for bone loss, in a short amount of time. These experimental results are expected to contribute to the research of medical health care for the elderly.

In addition, Mr. Wakata is also conducting an experiment, high definition television transmitting system, HDTV, and Validation Of On-Orbit Digital Holter Electrocardiogram, ECG, monitoring. These results are expected to be applied to the development of remote monitoring technology in the field of remote medical care in distant places or in specific environments.

These are just a few examples of Japanese space spin-off efforts. Aiming to reap comparable spin-off benefits, JAXA has undertaken various supportive activities such as the promotion of licensing by business-academia collaboration coordinators who support the commercialization of technology based on JAXA's licensing promotion system and extending venture business support programmes and opening up JAXA's R&D facilities to private companies in order to support their commercialization plans.

JAXA has established JAXA Cosmode Project as the JAXA's space brand. This is to promote the utilization of space technology and its results by direct support from JAXA and also to encourage private companies to enter into the commercial space business market and include the commercialization of these

products. These activities are expected to lead to future generations of successful spin-off results.

Japan is of the belief that the spin-offs from space technology will advance economies through the production of new innovative technology thereby contributing to an improvement in the quality of life. Spin-off benefits from space technology constitute one of the main issues of the space policy of Japan in the space basic plan and we intend to further promote spin-off benefits. Thank you for your attention.

**The CHAIRMAN** (*interpretation from Spanish*) Let me thank the delegate from Japan for also sharing these spin-off benefits of space technology with us. Telemedicine is something that is really central to the theme of spin-off benefits but it is not just that there are even broader ramifications as we see here, for example, the medicine that is being developed for bone loss. Thank you very much for your participation.

We can begin 12 now which is climate change. For the time being let me give the floor to Germany and Japan, but first let me mention that we have two documents that you can consider under this item, CRP.6, which is an information document from the Secretariat, called space and climate change. The second is CRP.5, also called space and climate change, a contribution from WMO and from the Global Climate Observation System's secretariat. These are the two documents under agenda item 12.

Let us begin with the distinguished representative of Germany, Marschall von Bieberstein.

**Mr. J. MARSCHALL VON BIEBERSTEIN** (Germany) Mr. Chairman, the inclusion of item 12, space and climate change, into the agenda of COPUOS corresponds with one of the most important tasks of this Committee namely, to focus on ways and means to deal with the substantial threat to humankind by applying space-based technology. One such threat derives from changes in the Earth's climate. Germany, since many years, has been at the forefront of global initiatives in this regard. In line with its engagement Germany increasingly seeks to improve her space-based capacities to analyse factors in developments which induce changes to the Earth's climate.

Let me give you an example of a project which the German Aerospace Centre, DLR, has started to implement recently. Following the loss of an iceberg on the Antarctic Wilkins Ice Shelf, the northern ice front is now becoming unstable. The first icebergs broke off at this point on 20 April 2009. This was

observed by scientists using the TerraSAR-X Earth observation satellite operated by the German Aerospace Centre in cooperation with glaciologists at the University of Münster's Geophysics Institute. The TerraSAR-X images from 23 and 25 April 2009 showed these calved icebergs. These icebergs are breaking away at the failure zones which have gradually formed over the past 15 years. The high resolution of TerraSAR-X satellite, enables to observe the formation in the Wilkins Ice Shelf down to the range of approximately 100 metres. This information enables glaciologists to describe distortion more precisely with the help of models. Uniform cracks are very narrow during the initial stages and are therefore not visible on images taken at a lower resolution such as those supplied by the older generation of satellites. To reconstruct the chronological sequence of events the kind of high resolution images supplied by TerraSAR-X are necessary. Through an analysis of the chronological development leading to the point where cracks start to appear, an insight into the stress conditions \_\_\_\_ (?) in the ice can be gained.

Since it started work in 2007, the German Earth Observation Satellite, TerraSAR-X, has been supplying scientists with a range of images of the Wilkins Ice Shelf. It is in particular the combination of high resolution TerraSAR-X images and the more frequent lower resolution images taken by the European Earth Observation Satellite, ENVISAT, which has provided such a substantial step forward for science, enabling to gain unique insight into the process of disintegration of an ice shelf. The Wilkins Ice Shelf is a focal point of the Antarctic Background Mission set up by DLR. The aim of this is to observe changes in the Antarctic ice shelves and to seek to classify the root causes on the basis of all the collated information.

Mr. Chairman, I would like to announce that, as mentioned within our statement during the general exchange of views, we will make a presentation under this agenda item on Earth Observation Activities for Risk and Vulnerability Assessment, later this morning. Thank you Mr. Chairman.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much for having referred to the work underway on the Antarctic platform. We will certainly be very interested to hear the presentation that you will make.

We will now give the floor to Japan.

**Ms. C. SHIMAZU** (Japan) Mr. Chairman, distinguished delegates, on behalf of the Japanese

delegation I am pleased to have the opportunity to address the fifty-second session of COPUOS.

We believe that the goal of this agenda, proposed by India, is to discuss the contribution of space activities to the issue of global climate change, including food security.

I would like to introduce Japan's activities toward contributing to prevent global warming and also to the advancement of agriculture and fishery by using satellite technology.

First, concerning the issue of global climate change and other global environmental issues, Japan had played a leading role in the establishment of Group on Earth Observations, GEO. As the next step, Japan, with international cooperation, intends to implement the observation of greenhouse gases, climate change and global water circulation monitoring toward the establishment of Global Earth Observation System of Systems, GEOSS.

Regarding global water circulation monitoring, we will introduce Japan's related activities in agenda item 11, space and water.

To prevent global warming, reducing greenhouse gases emissions, such as carbon dioxide, CO<sub>2</sub>, was agreed to at the Kyoto Protocol but, so far, we have not had the means to measure the concentration distribution of the greenhouse gases correctly. There are now only about 280 ground observation points in the world.

The greenhouse gases observation satellite, IBUKI, which was launched by JAXA this past January, can accurately observe the global greenhouse gases concentration distribution by taking measurements in 56,000 spots of almost the entire surface of the Earth every three days with high precision sensors.

IBUKI has done its initial check of the equipment and has taken the initial measurements of carbon dioxide and methane concentrations for clear-sky scenes over land. A press release including this was issued on 28 May. It should be acknowledged that the current analysis is based on uncalibrated data but the calibration and validation of the data is being done now. IBUKI will start its planned observation this August. The data and corresponding analyses will be made available to the registered general public around the world free of charge.

We will give a technical presentation about IBUKI under this agenda item during this morning's session.

Moreover, by utilizing the advanced land observation satellite, Daichi, a method to evaluate the amount of greenhouse gases emission has been developed and a trial detection of the forest degradation index, which demonstrates the increasing concentration of CO<sub>2</sub> by deforestation, is underway.

The target of these activities is to contribute to the development of effective countermeasures to global warming as the next step of the Kyoto Protocol, through the establishment of accurate estimation methods of greenhouse gases concentration distribution, which includes many contributing factors such as emission, flow and absorption of those gases.

Mr Chairman, next I would like to share information about our efforts to facilitate the food supply in Japan.

As for the advance of agriculture, using the analysis of the satellite images, it is possible to estimate the growth status of grains, such as rice, and the quality of contents, such as protein, moisture, and so on. The test operations have partially begun in Japan. Our next step is the sophistication of farm management by improving estimation accuracy.

Regarding the advance of coastal fishery, we have set a goal to upgrade the forecast accuracy of red tide occurrence, which is harmful to coastal fishery and aquaculture, by using high resolution optical sensors on satellites.

With regard to the advance of deep sea fishery, some trial uses of satellite observation data have begun to track characteristics such as sea-water temperature, current, and ocean colour. Though it now can recognize oceanic condition only for a wide area, in the future it aims to recognize more localized fishery conditions through the improvement of the spatial resolution of the satellite sensor.

Additionally, we intend to implement a system which would allow easy access to satellite data, improve the productivity of fisheries, and support the efficient operation of fishing vessels.

Mr. Chairman, Japan intends to contribute to the advancement of food production in the Asia region by utilizing land and sea observation satellite systems for agriculture and the fishing industry.

Thank you for your attention.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much to Ms. Shimazu for this statement and now we have one intervention from Chile. Chile you have the floor.

**Mr. R. GONZÁLEZ ANINAT** (Chile) (*interpretation from Spanish*) Thank you very much Mr. Chairman. I should like to address some very practical issues related to our area of interest. First of all we spoke here of the fact that we need a closer cooperation between the Committees. I believe that we need to consider that, if we do have the possibility for the Chairman to participate in the Committee on Sustainable Development and if the Chair of that Committee could come and inform us, this without any prejudice to an information mechanism. My point is that we cannot continue to work in parallel on an area of such great importance with such vast repercussions.

I should also like to make a contribution to enrich the French proposal. Sustainability is, of course, an essential element for sustainable development and we must solve one of the essential tasks in this area. Let me recall to you, Mr. Chairman, that a few years ago without success, we explained the importance of establishing common subjects for legislation, taking into account all of the matters in international space law which would draw together all of the legal documents in this area, as is the case in the technical area, it is not expedient for us to work on a number of fronts in parallel in international space law. In 2004, I believe it was, we devoted our attention to this subject.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you to the ambassador for this proposal. That is quite useful what you have suggested, the Committee on Sustainable Development, we have seen quite clearly, is an important body and we should pay attention to its work. This proposal, this idea that the chairs of these two committees inform the other committee of the work ongoing in their committee, this is a good idea, not only as regards myself but also for future chairs of this Committee. There is a very strong link between our areas of interest. I do not think there will be any objections, on the part of the Secretariat, to placing this proposal as an official suggestion of the Committee.

Let us now, since our time is fairly short, turn to the technical presentations if there are no further statements. We will listen to the presentation from the German Aerospace Centre, which will be given by Mr. Taubenboeck, on DLR's earth observation activities for risk and vulnerability assessment.

**Mr. H. TAUBENBOECK** (Germany)  
[Presentation: DLR's Earth Observation Activities for Risk and Vulnerability Assessment]

**The CHAIRMAN** (*interpretation from Spanish*) It is rather we who should thanking you for that excellent presentation from the DLR on earth observation activities for risk and vulnerability assessment, something which is very necessary of course for our projections. I recently visited DLR a couple of months ago and was very impressed by the work they did and thanks to the efficient work of Annette, who is in the back. We are very much impressed with the excellent work you are doing, if we have a little extra time it would be interesting to have some questions and answers on this.

Next technical presentation is by Kazuhiro Miyazaki to whom I am going to give the floor. He is going to be talking about IBUKI, greenhouse gases observing satellite. You have the floor Sir.

**Mr. K. MIYAZAKI** (Japan) [Presentation: Overview of IBUKI, the Greenhouse Gases Observing Satellite (GOSAT)]

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much to the distinguished delegate from Japan. When we make observations on the technical presentations we always have to say, how could we possibly do without such excellent presentations as this one and the others. The measures taken to protect the environment and to fight greenhouse gases are of vital importance and monitoring them, globally, is a fact that no one can deny the need for that. This is a very important contribution that is being made by the IBUKI satellite. We have the conference of parties that is going to meet in Copenhagen in December of this year and these are all avenues that work along the lines of what we hope the Committee will play, this kind of important role in the theme of space tools for fighting climate change.

We are going to have questions later and I would ask our vice-chair, who is an expert in this field, that at the end, he give us some remarks and reflections on that aspect.

Let us continue with the next presentation Mr. Gowrisankar speaking on studies on climate change and an Indian perspective on this. Thank you, Sir.

**Mr. D. GOWRISANKAR** (India)  
[Presentation: Space Technology for Climate Change: India's Initiatives]

**The CHAIRMAN** (*interpretation from Spanish*) Let me thank Mr. Gowrisankar for that very interesting presentation on the Indian experience in this field of environmental protection using this kind of technology.

We do have some time to take questions and answers, so we will.

The last one is the presentation by Mark Maurice from the United States entitled: international activities of the American Institute of Aeronautics and Astronautics. You have the floor.

**Mr. M. MAURICE** (United States of America)  
[Presentation: International Activities of the American Institute of Aeronautics and Astronautics]

**The CHAIRMAN** (*interpretation from Spanish*) Let me thank Mark Maurice, International Vice-Chairman of the American Institute of Aeronautics and Astronautics for that very interesting presentation on this international network and the interaction that COPUOS members can have with this significant network set up by the AIAA. Thank you very much Sir.

Now, we do have time for questions and answers and perhaps we can have some on climate change and the different themes we have dealt with. First I want to give the floor to the second Vice-Chairman, Filipe, who is going to clarify things with a few of his ideas on this important topic.

**SECOND VICE-CHAIRMAN** Thank you Mr. President. I would like to thank the very interesting presentations that were made regarding climate change and also on risk and vulnerability assessment. It is important to stress that climate change is really one of the outstanding environmental risks of this century and there are still quite a number of uncertainties especially regarding climate projections for the future. The space technologies and space observations have contributed to the reduce these uncertainties and will, very surely, contribute in the future to produce these uncertainties as regards modelling and the future projections of climate and therefore impacts and adaptation measures.

If we just mention the observations that were made by various satellites, in particular by NASA, as regards the extent of Arctic oceanic ice which is a particularly sensitive region of the world and many others.

Regarding the very interesting presentation of Mr. Miyazaki, this greenhouse gases observing satellite

will give the possibility to map the sources and sinks of CO<sub>2</sub> and CH<sub>4</sub>. Of course these gases are well mixed in the atmosphere, each of these molecules stays in the atmosphere on average for quite some time in the order of many decades, even 100 years, but there are local sources and local sinks and this satellite gives the opportunity to localize these sources and sinks.

I just have a question. To what extent, even the future calibration and validation of the observations made through this satellite, would it be possible to make an estimate, at a national or regional scale, of local emissions including sources and sinks? This would be a very important contribution as regards mitigation, as regards reducing greenhouse gases emissions. Thank you.

**Mr. K. MIYAZAKI** (Japan) Thank you very much for your comment and question. The question is to what extent the measured distribution of greenhouse gases. Each measurement point, as I said, only 1.5 kilometre but there is an uncertainty where will include because a whole global observation will be taken every three days so the measurement is not \_\_\_\_ (?) measurement and also, during the three days, the gases probe can be one of the uncertainties so we cannot discuss the correct distribution from the map. We need to carefully think how we can use this distribution, that is a very important point. First step will be to \_\_\_\_ (?) regional distribution. To get such distributions should be the first step and after we calculate and after the calculation we need to discuss how we can do this \_\_\_\_ (?). As I said, in this moment, this data and map I showed is from the data, not uncalibrated data, so we need to be careful to treat these data. It is a very distorted question but one of the most important points in discussion. Thank you very much.

**SECOND VICE-CHAIRMAN** Thank very much for your answer, this is, as you said, just a beginning and it is a very important step. It will be a breakthrough if, coupled with the distribution that one obtains from the satellite, we also have models for the flux of greenhouse gases, one can make estimates at a national and regional level.

**The CHAIRMAN** (*interpretation from Spanish*) Now, I do not know if any delegation wants to take the floor and make some remarks on these topics? I see Colombia does. You have the floor.

**Mr. J. OJEDA BUENO** (Colombia) (*interpretation from Spanish*) Thank you and I will be brief because I know that everyone is getting a little bit tired and we are getting close to lunch. Just to thank the Secretariat for preparing these two documents which

provide an excellent account of the excellent and productive cooperation that exists between the United Nations.

Looking at page 3 of CRP.6, this works along the lines of what we have always supported in Colombia, the idea of one UN and it is in this context that we have also asked for cooperation by other permanent observers to this Committee and we regret that we do not have the distinguished representative of ILO at this time who we think should be here as permanent representative and a fixture here. I do not know if we could ask the Secretariat to take note and to ensure that there are the necessary means put at disposal so that throughout ITU could be here on a permanent basis for this. That is what we understand by one UN.

I would like to thank Mr. Miyazaki and the distinguished colleague from India for those presentations which show that, no matter how far we go in outer space, we always have to come back to Earth. We are very aware of what was stated by Joachim on the vulnerability of existence on this planet and how space technology can help mitigate and prevent disasters from happening.

On this point, we would like to raise a question that maybe not be answered here. What is the role that COPUOS could play in this scheme of sustainability of development in space activities which, we understand, go hand-in-hand? I say this because when we listened to the Japanese presentation on how the IPCC, Intergovernmental Panel on Climate Change, when they were mentioned by the delegation this is a representation of States that want to contribute to better use of space technology for that end. We think that we have a tool here that IPCC uses every year in its report. It is a tool which allows UNEP to produce a yearly publication, this is the Global Environmental Outlook, and this comes from all of the countries' contributions, they are able to draw up a panorama of the state of the environment. I really think we should do something to see whether or not this Committee could not make a similar contribution, maybe publishing a periodic document where we would give account of the space activities of our member countries.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you Colombia. We are coming toward the end of the Committee's meeting but let me just go over this afternoon's agenda.

We will meet back promptly at 3 p.m. to continue and conclude our work on agenda item 8, the Legal Subcommittee, forty-eighth session. Spin-off

benefits of space technology, agenda item 9. Agenda item 12, space and climate change. We will begin agenda item 13, use of space technology in the United Nations system and item 14, international cooperation in promoting the use of space-derived geospatial data for sustainable development.

We will have four technical presentations. The first from the United States entitled: collision between Iridium and Cosmos satellites. The second one will be consequences of the collision of Iridium 33 and Cosmos 2251. The third one, by a representative of Chile, entitled: FIDE, the international space show and, one by the representative of the earth observation group, this will be operational use of space-derived geospatial data: the key role of GEOSS.

Let me wish you a very pleasant lunch, we will meet promptly at 3 p.m.

Sorry, France has asked for the floor.

**Mr. M. HUCTEAU** (France) (*interpretation from French*) Thank you Mr. Chairman. I will be very brief. I just would like to inform all delegations that the informal consultations will take place in Conference Room VII at 2 p.m. in order to finalize our proposal for the text to include in the report of the plenary on long-term viability of activities for the STSC.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much. We have taken note of that. Anyone else wish to take the floor? Austria has the floor.

**Mr. G. SCHLATTL** (Austria) Our delegation would like to remind the other delegations to indicate their participation for the Heurigen and most preferably via the small sheet of paper indicating the name of the participant. Thank you very much.

**The CHAIRMAN** (*interpretation from Spanish*) Thank you very much. I suspend the session.

*The meeting closed at 12.57 p.m.*