

6 February 2009

ENGLISH ONLY

---

**Committee on the Peaceful  
Uses of Outer Space  
Scientific and Technical Subcommittee  
Forty-sixth session  
Vienna, 9-20 February 2009  
Agenda item 5  
Implementation of the recommendations  
of UNISPACE III**

**Promoting greater participation of young people in space  
science and technology**

At the forty-fifth session of the Scientific and Technical Subcommittee, the Working Group of the Whole recommended that member States of the Committee, entities of the United Nations system and other organizations having permanent observer status with the Committee should continue to report on their efforts to promote education and opportunities for greater participation of youth in space-related activities (A/AC.105/911, annex I, para.10). The annex to this document contains the reports received by the Secretariat in reply to Note Verbale CU 2008/117 and Note Verbale CU 2008/118.

**Contents**

	<i>Page</i>
China .....	2
Germany.....	2
Japan.....	3
Turkey .....	7
COSPAR.....	9
SGAC .....	11



## Annex

### **Promoting greater participation of young people in space science and technology**

#### **I. China**

[Original text: Chinese]

China gives a great deal of attention to the education in space science and technology. Relevant courses are offered by numerous universities to provide systematic and scientific education to students in space science and technology. China also attaches a lot of significance to enhance the interest of young people in, and encourage their study and participation in, space science and technology. For instance, together with the Heinlein Foundation in the USA, China held successfully the first “Flying Into the Future – Space Exploration Innovation Contest 2006-2007 in Asia”, and achieved very good results.

#### **II. Germany**

[Original text: English]

##### **DLR School LABS: Where research, school and practical experience meet**

Sharing the enthusiasm for natural and engineering sciences with students and helping teachers to design diversified and practical courses are the main goals of the DLR School Labs. The concept is built around stimulating technical and scientific experiments for secondary school students, primarily on aviation, space and transportation topics, regularly updated to reflect the latest research results. The experiments have been developed by DLR scientists and engineers, and the educators on the School Lab staff can adapt the complexity and extent of the experiments to the level of competence and interest of the students. Also DLR invites teachers to take advanced training, provides them with information material and supports them in integrating the experiences gained in the DLR School Lab into the regular school courses. In modern, well-equipped labs with their high-tech instruments a team of experienced scientists and dedicated university students in natural and engineering sciences are ready to help teachers and school students with their research experiments.

The first School Lab was created in DLRs research centre Göttingen in the year 2000. This initiative rapidly expanded to other field centres. Today DLR counts 6 School Labs. Since 2000 some 27,000 students took part in one day and some 15,000 in half day courses in the labs. Nearly 1800 teachers participated in advanced training. The interest in School Labs continues to grow, meanwhile also resulting in written partnership agreements between DLR and individual schools.

### III. Japan

[Original text: English]

#### **Efforts to promote the education and opportunities for greater participation of youth in space-related activities**

##### **Report by Space Education Center, Japan Aerospace Exploration Agency**

Japan Aerospace Exploration Agency (JAXA), through its Space Education Center, further contributed to the enhancement of space education activities for young people and increased opportunities for their participation in space-related activities in the past year.

While maintaining its primary goal, to effectively use space materials to have positive impact on young people's minds in their individual development process, the Center focused its efforts on strategic development and consolidation of its major activities in the past year. Much progress has been achieved in each of the following major activities, to help more young people become full of curiosity, adventurous spirit and craftsmanship through their engagement in activities that use space materials and that address space-related subjects: (i) school education support; (ii) informal education support; (iii) international activities; and (iv) information dissemination.

#### *1. School education support*

The Space Education Center has brought "space" into more classrooms. The Center has continued to provide customized support to the teachers who have contacted the Center with specific requests for support to address space-related subjects in their classroom activities. After the initial contact, the Center holds numerous consultations with those teachers to articulate their needs, identify goals and develop plans for classroom activities. Once the plan has been developed, appropriate space experts are identified and called upon to help the teacher develop teaching materials. When the classroom activities are carried out according to the plan, the Center sends its staff and appropriate experts to provide on-site support to the teacher. Upon request, the Center also assists the teacher in the evaluation of the results.

The number of classrooms at primary and secondary schools that have received support by the Center has increased by 25 per cent in the past year. The scope of school education support has also expanded to include kindergartens, to organize activities for their pupils to enjoy together with parents.

The Center has begun to take pro-active approach in supporting teachers. In 2008, new measures have been introduced to make it mandatory for primary and secondary school teacher to take training courses to renew their teaching licences. Following the introduction of such measures, the Center has strengthened its efforts to have space education training included in those mandatory courses required for licence renewal. In 2008, more than 20 such courses included space education training with support by the Center. The Center has begun also to provide space education training for teachers in making. Collaborations with the university's faculties of education enabled the Center to make future teachers realise at the

earliest stage of their training the effectiveness of using space materials in the classroom teaching to stimulate interest of students in various subjects to learn.

In order to support those school teachers who are overburdened with the teaching requirements per curriculum as well as administrative work, the Center developed teaching materials to help them integrate space subjects into teaching within the existing curricula. The Center developed introductory education materials, which are designed for use by the teachers at the beginning of a curriculum unit to introduce space materials and space-related subjects to stimulate interest of the students in learning more about the subjects covered in that unit. These introductory education materials are now available not only for science courses, but also for homemaking, social science and Japanese language courses.

## 2. *Informal education support*

Using unique programmes and materials that it has developed with the use of space materials, the Space Education Center continues to support informal education carried out by other entities rather than schools outside the formal education curricula. Most of the Center's hands-on education and training activities are being carried out as part of "Cosmic College", which aims to achieve, among other things, the following objectives: (i) to increase interest of young people in science and technology; (ii) to motivate young people to raise questions, think and find solutions by themselves; (iii) to encourage collaborations with others; and (iv) to lead young people to appreciate the importance of life.

The Center has shifted its strategy in convening various Cosmic College courses across the country, covering from kindergarten kids to high school students. During its first year, the Center used to take the lead in planning and organizing the courses with local communities as partners. The Center now plays only a supportive role, transferring the organizer's main responsibilities to the local communities where the courses are held. Convinced that the local communities should be responsible for nurturing their children, the Center gradually succeeded in identifying those local communities that are willing to serve as the main organizers of Cosmic College courses. This allowed for a sharp increase in the space education events held around the country, from 30 events in 2006 to 100 events planned in 2008, without increasing resource requirements of JAXA.

By organizing training seminars for space education leaders and instructors, the Center supports those local communities organizing space education events by making more instructors and lecturers available for their events. The Center organizes Space Education Instructors Seminars around the country throughout the year for those people who are engaged in, or interested in, informal education activities that address space-related subjects. Through those Seminars, the Center aims to transfer its knowledge and skills that are required for instructors of space education activities, such as those relating to the goals of space education, understanding of children's needs, developing activity plans as well as undertaking safety measures. By April 2008, the number of educators and volunteers who were trained as space education instructor increased by more than 30 per cent in two years, to close to 800 trained per year.

To help those interested in organizing space education activities but are not able to afford time to participate in the training seminars, the Center is producing sets of

teaching guides on typical hands-on activities that are carried out in Cosmic College courses. The Center continues its efforts to support parents who are interested in addressing space subjects and using space materials at home as means of communications and tools for interactions with their children. The Center has developed home-learning scientific materials, under eleven themes, such as “Flight”, “Atmosphere”, “Light” and “Sound”.

### 3. *International activities*

In carrying out international activities, the Space Education Center places importance on promoting activities for the benefit of primary and secondary school teachers and children, particularly in Asia and the Pacific. The Center has supported education activities of Asia-Pacific Regional Space Agency Forum (APRSAF) since 2005 and has been serving as the Secretariat for its Space Education and Awareness Working Group since 2006. Consisting of members from 16 countries and 3 international organizations, the Working Group addresses issues relating to: (i) the use of space materials to enhance education for young people; (ii) education and training opportunities for young people in the fields of space science and technology; and (iii) efforts to increase public awareness of the societal benefits and importance of space activities.

Within the framework of APRSAF, the Working Group has organized, as of October 2008, the following activities since 2004: (i) APRSAF Water Rocket Event, in 2005, 2006 and 2007; (ii) APRSAF Poster Contest, in 2006 and 2007; (iii) APRSAF Space Education Forum and Seminar, twice in 2006; (iv) International CanSat Workshop, in 2007; and (v) APRSAF International Water Rocket Education Workshop, in 2008. In conjunction with the fifteenth session of APRSAF (APRSAF-15) to be held in Ha Noi, Vietnam, in December 2008, the fourth APRSAF Water Rocket Event as well as the third APRSAF Poster Contest will be held. During APRSAF-15, the Working Group would address, among other things, educational activities toward the celebration of the International Year of Astronomy, in 2009, as well as new and innovative funding sources to support space education activities.

Upon invitation by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Center has participated in the space education workshops organized by UNESCO in developing countries. The Center has introduced water rockets as educational activities and organized hands-on sessions to build and launch water rockets. Following the workshops held in multiple cities of Colombia, in December 2005, Vietnam, in March 2006, and Ecuador, in May 2007, the Center supported the workshops held in Dar-es-Salaam and Arusha, Tanzania, and a regional space camp held in Quito and Ibarra, Ecuador, both in May 2008. The partnership with UNESCO has opened the door for collaborations with developing countries outside the region of Asia and the Pacific, such as Argentina, Brazil, Colombia, Ecuador, Nigeria and Tanzania.

The Center has begun to take a step forward in pursuing collaborations with African countries, taking upon the opportunities provided by Japan International Cooperation Agency (JICA) to receive groups of African science teachers at the Center to provide short introductory space education training sessions. To date, the Center has received three groups in September 2006, 2007 and 2008, and 24 science teachers from nine African countries in total have received introductory space education training.

Cooperation with advanced space-faring nations in space education activities is being pursued mainly through the International Space Education Board (ISEB), which was established in October 2005 to achieve the following objectives: (i) to increase science, technology, engineering and mathematics literacy achievement in connection with space; and (ii) to support the future workforce needs of space programs. The current membership consists of the Canadian Space Agency (CSA), the European Space Agency (ESA), the French Space Agency (CNES), the National Aeronautics and Space Administration of the United States (NASA) and JAXA. Since October 2008, JAXA has been serving as the chair of ISEB.

JAXA, through its Space Education Center, has supported and participated in the following activities of ISEB, mainly for the benefit of university and graduate students: (i) international student programs at the annual International Astronautical Congress (IAC) since 2005 and the Scientific Assembly of the Committee on Space Research (COSPAR) in July 2008; (ii) international student participation in NASA Academy in summer 2008; (iii) technical workshops of “Global Education Network for Satellite Operations” (GENSO) since 2006; and iv) CanSat activities since 2007, including the holding of the international CanSat workshop in Tokyo, in February 2007. Through its support for the above activities, the Center has been able to provide Japanese students with opportunities to: (i) interact with students from other countries and leading space experts and senior managers attending IAC and COSPAR; (ii) contribute to the development of a network of ground stations for university satellites to enhance the continuous operation of their satellites; and (iii) demonstrate abroad their technical expertise and skills in developing and conducting experiments of CanSats.

Through collaborations with the Human Space Systems and Utilization Program Office of JAXA, the Space Education Center provides opportunities for teachers of primary and secondary schools as well as kindergartens in Japan to participate in the annual Space Exploration Educators Conference, held at Space Center Houston, in Houston, Texas, United States of America. The Conference offers opportunities for teachers to learn about and exchange information and experience with using space to teach across the curriculum, not only for science, but also for language, arts, mathematics, history and other subjects. Since 2006, JAXA has been sending three teachers every year to the Conference, to present how space materials are used at schools in Japan and to discuss how to enhance classroom teaching using space.

Through international activities, the Center makes available some of its selected education materials in other languages than Japanese, with the aim of further promoting space education activities particularly in developing countries. In selecting its materials for distribution abroad, the Center places importance on the feedback that it receives from educators and teachers in other countries. One of the successful examples is the “Water Rocket Educator’s Manual” and its accompanying DVD, both of which are now available in English and Spanish. The Spanish version has been produced in cooperation with UNESCO in response to the demand expressed by teachers and educators in Latin American countries.

#### *4. Support for university and graduate students*

While it focuses on supporting primary and secondary school teachers and students, the Center supports space activities carried out by Japanese university and graduate students to the extent feasible within the limited resources. The Center provides

financial and in-kind support to the University Space Engineering Consortium (UNISEC), consisting of more than 420 student members, representing 47 laboratories of 36 universities, and 160 supporting members. UNISEC promotes human resource development in space engineering and technological development for future space applications. Some of their activities include fund-raising to support small satellite and hybrid rocket projects by universities and colleges, search for piggy-back launch opportunities and analysis of launch safety.

The Center is providing education and training opportunities abroad for Japanese university and graduate students by offering scholarships, since 2005, to participate in the nine-week Space Studies Programme and the year-long Master's Programmes of the International Space University (ISU). In summer 2008, the Center also provided a graduate student with the opportunity to participate in NASA Academy, which offers an immersive and integrated multi-disciplinary exposure and training through, among other things, group projects, laboratory research, seminars colloquia, site visits and meetings with prominent space experts, during the period of ten weeks at selected field centers of NASA.

#### 5. *Information dissemination*

The Space Education Center uses Internet-based services and publications as the tools to disseminate information. The web site of the Center (<http://www.edu.jaxa.jp>) aims to achieve the following objectives: (i) to provide a forum for exchanging ideas and information among educators; (ii) to provide education materials and space images that can be easily downloaded for use in classroom teaching; and (iii) to make available the teaching and learning materials developed through its school education support. Short journals via electronic mail, or "Mail Magazine", are also being issued once or twice a month, taking up space-related topics that may be of interest to young people and circulating the latest news on the Center's activities. The number of subscribers has increased 30-fold in two years, from 30 to close to 1,400. The Center also disseminates paper-based publications on a regular basis, such as news letters circulated to about 15,000 elementary and junior high schools in Japan as well as the quarterly journal, "Door to the Space (Sky)", for 5,000 teachers, leaders and children.

## IV. Turkey

[Original text: English]

### **Activities of TUBITAK on space researches and education**

The Scientific and Technological Research Council of Turkey (TUBITAK) provides full support to space research projects and various activities about space education.

#### 1. *Close and deep space research projects:*

Currently, 32 close and deep space research projects are being supported. TUBITAK National Observatory, situated in Bakirlitepe, Antalya, plays a significant role in the process of carrying out these projects. The Observatory puts its four telescopes (which are 1.5 m (RTT), 60cm and 40cm in size) free of charge into the service of researchers.

In summary, the projects carried out by universities and institutions are: Solar physics, meteor researches, the determination of craters caused by meteor collision in Turkey and the chemical examination of the wastes of the meteors, the designation of chemical and physical characteristics of hot stars, the examination of earth's cosmological structure, the kinematic structure and the dynamic of galaxies, the preparation of catalogues of hydrogen maps of galaxies, the examination of active galactic nuclei, the photometric and photometric examination of double stars, the determination of light curves and radial speed curves.

Within the context of these projects, scholarships are supplied to 94 post graduate and PhD students.

2. *Education activities in the field of space:*

(a) Career Education:

Besides supporting the space research projects, TUBITAK also gives full weight to increasing and improving of education activities. In the year 2008, international and national doctoral programme was started in order to meet the need of qualified manpower that the space field requires. Within the context of this programme, international grants were given to 18 successful students to continue their education in subjects like; satellite systems, satellite ground systems, close and deep space researches, remote sensing, geographic Information systems and data analysis. Also, grants are still given to bright master and doctoral students who continue their education in Turkey.

(b) Education towards primary education, high education and public:

On the other hand TUBITAK provides full support to primary school and high school students, teachers and activities that aim to introduce space sciences to the public. In this context TUBITAK organizes National Observatory Fests each year. In 2008, almost 500 students attended the observation fest organized by TUBITAK Science and Public Office at the TUBITAK National Observatory in Antalya. During this observation fest, workshops, various types of educational facilities, telescopic hatching of clear sky were organized two days long.

Moreover, in the scope of TUBITAK science society activities, workshops have been organized by Observatory of Ankara University to introduce space to high school students in Ankara and the heavenly bodies are observed by the telescopes that have been provided by TUBITAK for the project.

(c) Teacher oriented education:

In the framework of science society activities, TUBITAK supports the training of teachers about space. In 2008, 80 teachers who are working in Istanbul have been trained for a week about the issues of space in the workshop of "The Training of Trainers About Space" which is organized by Sabanci University and supported by TUBITAK.

Regarding to the title of "DEVELOPING COORDINATED, GLOBAL SPACE CAPABILITIES, approval of Turkish Grand National Assembly has been expected for the membership of Turkey to Asia Pacific Space Cooperation Organization (APSCO). TUBITAK SPACE joins to the meetings of APSCO on behalf of Turkey.



## V. COSPAR

[Original text: English]

### **Youth in Space Science**

#### *COSPAR Scientific Assembly Student Program*

COSPAR hosted for the first time at its 37th Scientific Assembly (13-20 July 2008, Montreal, Canada) a Student Program organized by the International Space Education Board (ISEB), although ESA, an ISEB member, funded participation by students in both 2004 and 2006. Designed to complement COSPAR's scientific program, the ISEB, provided subsidy funding for 51 students from Canada, Europe, Japan and the US, constructed and animated an International Student Zone (ISZ), a space located in the poster/exhibition/café area designed to encourage student interaction with peers and mentors and which served as the venue for daily lunchtime presentations by sponsoring agencies, and organized CSA and NASA breakfast meetings and a JAXA "meet and greet" session.

The breakdown of ISEB student funded participation was: 22 Canadian students (CSA), 19 European students (ESA), 5 Japanese students (JAXA), 5 students from the US (NASA). Participation took the form of oral presentations in the regular COSPAR scientific sessions for 54 per cent of the funded students while 44 per cent had accepted posters. The remaining 2 per cent audited scientific sessions. The ISEB Student Program is expected to become an integral part of future Assemblies and will, it is hoped, be expanded to accommodate a wider range of participants.

#### *COSPAR Scientific Assembly Grants for Young Scientists*

In addition to the students participating in the ISEB program, COSPAR regularly provides support for young participants at a range of scientific meetings. For example, in 2008 COSPAR provided partial support ranging from €250 to €1500 to 84 young participants of its 37th Scientific Assembly. The support, which is in addition to that provided to senior scientists, was distributed in 2008 to young scientists based at the time of application in the countries indicated in the following list: Australia (1 participant), Belgium (1), Brazil (3), Bulgaria (1), Canada (2), China (7), Czech Rep. (1), Finland (1), France (4), Germany (5), India (12), Italy (6), Japan (5), Mexico (3), Netherlands (4), Pakistan (1), Poland (2), Russia (13), South Korea (1), Sweden (1), UK (2), USA (8).

#### *COSPAR Capacity Building and Fellowship Programs*

In addition to the above support, COSPAR continues to organize and fund its highly successful series of Capacity Building Workshops for young scientists. Twenty to thirty young scientists and students take part in each workshop. The workshops are intended to enhance the scientific capability of developing countries by meeting the following objectives:

- (i) to increase knowledge and use of public archives of space data in order both to broaden the scope of research programs in developing countries and also to ensure that scientists in them are aware of the full range of facilities which are available to them and which are also used by scientists in the developed countries,

(ii) to provide highly-practical instruction in the use of these archives and the associated publicly-available software so that participants on returning home can readily incorporate them into their research programs, and

(iii) to foster personal links between participants and experienced scientists attending the workshops to contribute to reducing the isolation often experienced by scientists in developing countries.

Since 2006 COSPAR has organized its sixth, seventh, eighth, and ninth Capacity Building Workshops. The workshops were:

- Regional Workshop for Space Physicists from Central and Eastern Europe: Solar-Terrestrial Interactions: Instrumentation and Techniques (STIINTE), 4-16 June 2007, Sinaia, Romania,
- Regional Workshop on Planetary Science, 23 July-3 August 2007, Montevideo, Uruguay,
- Regional Workshop on Space Astrophysics with the Swift, Chandra, and XMM/Newton Missions: A High-Energy Data-processing School for Young Physicists and Astronomers from North Africa and the Middle East, 19 January-1 February 2008, Alexandria, Egypt, and
- Regional Workshop on Space Optical and UV Astronomy, 1-14 June 2008, Kuala Lumpur, Malaysia.

In light of the success of the capacity building workshops, the COSPAR Bureau adopted a proposal to create on a two year trial basis a follow-on fellowship program open to young scientists who have been participants at one of the COSPAR capacity building workshops to enable them to build on skills gained at the workshop. The program, at least in its initial period, provides for visits of two to four weeks for the purpose of carrying out joint research in a select number of laboratories which collaborate with COSPAR in providing the fellowship program. The aim is to arrange 10-15 fellowships per year.

Although evidence is necessarily anecdotal, it appears that the capacity building workshops are having a real impact, with a growing number of alumni able to further careers in space research, and an ever-expanding network of professionals who have served as tutors.

#### *COSPAR Outstanding Paper Award for Young Scientists*

COSPAR awarded for the first time in 2008 its new Outstanding Paper Award for Young Scientists. This award is for scientists under the age of thirty-one who successfully submit a paper for publication in *Advances in Space Research*, COSPAR's flagship scientific journal. It had been thought that there would be few eligible papers because of a strict requirement for at least five eligible papers in each domain covered by the Committee's Scientific Commissions and Panels. In the end, 169 eligible contributions were considered, and fifteen young authors were selected to receive the first batch of Outstanding Paper Awards.

## VI. SGAC

[Original text: English]

SGAC, as a youth organisation, is very active in promoting the greater participation of young people in space sciences and technology. We organise the annual Space Generation Congress, which is held in conjunction with the IAC, and brings together youth from all over the world to discuss and work on various projects.

For 2009, the International Year of Astronomy, SGAC is working on a project to distribute astronomy kits to youth worldwide. SGAC's various working groups and projects (<http://www.spacegeneration.org/projects>) involve youth in important issues encompassing development goals, education, outreach, space exploration and space policy.

In particular SGAC is supporting Yuri's Night, the worldwide celebration on April 12, of the first man in space -Yuri Gagarin, and World Space Week. Many of our members organise events and promote space in their local environments, including presentations at schools. SGAC also provides the opportunity for members to attend UN Workshops on behalf of SGAC.

---