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**Implementation of the recommendations of UNISPACE III**

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

At the forty-sixth 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.105/933, annex I, para. 8). The annex to this document contains the reports received by the Secretariat.

## Contents

# Annex

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

## I. Germany

[Original text: English]

**Fascinating topics and forward-looking perspectives for students and post graduates at DLR**

Sharing the enthusiasm for natural and engineering sciences with students and Aeronautics, space, transportation and energy research – DLR is working on many topics that are inherently fascinating and socially highly relevant offering forward-looking perspectives in particular for younger staff. DLR's activities range from designing the aeroplane of tomorrow, developing satellites and probes to conduct environmental research or to explore our cosmic neighbourhood, designing transportation systems for the future and further developing renewable energies. In addition, DLR in its role as Germany's space agency develops and implements the German space programme on behalf of the federal government.

The scientific disciplines and the respective job profiles which DLR combines under one roof are multifaceted, ranging from atmospheric research to aerospace medicine, from adaptronics, mechatronics and robotics to planetary research, and from propulsion technology to material physics in space. DLR is involved in numerous national and international programmes and offers younger staff fascinating opportunities as members of the respective project teams. Among others, this concerns the International Space Station ISS, the European Galileo satellite navigation system, the German-Dutch DNW wind tunnel, as well as Europe's largest solar installation in Almería (Spain).

**Opportunities for young research talent at DLR**

In connection with all these research and development activities, DLR offers special opportunities for young academic talent. Students can complete internships at DLR institutes, and they can also prepare their Diploma or Master's thesis there – in many cases even participating in international projects. In addition, DLR regularly invites students to take part in idea contests. Furthermore, students take part in flight campaigns, parabolic flights, or other spectacular projects. Finally, hundreds of doctoral students receive high-level supervision and support at DLR institutes.

**DLR_Graduate_Programme**

Especially for post graduates, DLR offers a comprehensive programme, called DLR_Graduate_Programme, which for instance includes soft-skills trainings such as workshops on project management methods and other qualifying modules for future scientists and managers. Possible next career steps are leading groups of young researchers at DLR institutes, postings abroad, or taking part in sponsorship programmes for post-docs in cooperation with industry.

**DLR_School_Labs**

In order to stimulate youngsters' interest in science and technology-related careers, DLR also addresses school classes offering them, for example, a visit in our DLR_School_Labs. These laboratories, located in eight DLR sites, currently welcome more than 16.000 students per year. In frame of a one-day-visit, school classes are invited to carry out various hands-on experiments tailor-made for youngsters. Additionally, DLR organises teacher workshops and numerous special events for kids and youngsters and provides schools nation-wide with information material.

Together with other events such as summer schools, student workshops etc., all these activities are carried out under the title "DLR_Campus", which stands for a coherent approach of an overall education programme addressing young target groups ranging from elementary school to junior staff.

# II. Japan

[Original text: English]

**Activities of JAXA Space Education Center in 2009**

Japan Aerospace Exploration Agency (JAXA), through its Space Education Center, continued its efforts to enhance and expand space education activities for young people. The following report by the Center reflects major developments in the past year, building upon its achievements as reported to the Subcommittee at its session in 2009 in document A/AC.105/C.1/2009/CRP.5.

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 expanding strategic alliances with entities involved in education, scientific research as well as space activities, including both public and private entities. In addition to school education support, informal education support and international activities, home education support has now become one of the major activities of the Center. Much progress has been achieved in each of those major activities, to help more young people build upon their curiosity, adventurous spirit and craftsmanship through their engagement in activities using space materials and addressing space-related subjects.

**School education support**

The Space Education Center has continued to bring "space" into more classrooms around the country, providing customized support to the teachers who have contacted the Center with specific requests for support to address space-related subjects in their classroom activities. The Center's support is provided to not only regular classroom teaching per school curricula, but also extracurricular activities as well as special activities for integrated learning.

The number of classrooms at primary and secondary schools as well as kindergartens that have received support by the Center has increased by 20 per cent

in the last fiscal year,[1] representing an increase by two-and-half-fold compared to the year of its establishment, in 2005, and benefiting more than 4,000 young people in the past year alone. The Center's support is not limited to classrooms of science. Its support covers various other classrooms, such as those of social science, Japanese language and art.

The Center has continued to take a pro-active approach in supporting teachers. In order to ensure that the teachers take initiative and play a central role in bringing space into their classrooms, the Center strengthened its collaborations with boards of education across the country to actively promote training for teachers in space education. The target audience includes future teachers as well through its collaborations with universities' faculties of education. In the last fiscal year, 1,420 teachers benefited from the training opportunities provided by the Center in collaboration with boards of education and faculties of education.

In view of the recently revised curriculum guidelines issued in March 2008 for implementation by elementary schools from 2011 and by junior-high schools from 2012, which further enriches the science and math contents, the Center is doubling its efforts to support teachers in taking up newly introduced or expanded science-related subjects in an effective manner, using attractive space materials to stimulate interest of students and enhance their understanding of the subjects taught.

**Informal education support**

Using the unique programmes and materials that it has developed, 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 in support of informal education are being carried out as part of "Cosmic College" courses, covering kids and students from kindergarten to high school.

The Center has been successful in gradually shifting the responsibilities as the main organizers of those "Cosmic College" courses to the local communities that host them. This allowed for a continuous increase in the space education events held around the country, from 103 events in Fiscal Year 2008 to 125 events planned in Fiscal Year 2009, representing an almost seven-fold increase compared to Fiscal Year 2005, without much increase in the 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 Space Education Instructors Seminars organized by the Center around the country aims to transfer its knowledge and skills that are required to organize space education activities for young people, such as those relating to the goals of space education, understanding of children's needs, developing activity plans as well as undertaking safety measures, to any individuals interested in informal space education activities. The Center also started to offer advanced courses for those individuals who have gained some experience in organizing space education events.

[1] Japanese fiscal years starts on 1 April and ends on 31 March each year.

In supporting local communities in organizing space education events on a continuous basis, the Center produces sets of teaching guides on typical hands-on activities such as those of the “Cosmic College” courses and provides education materials upon request.

**Home education support**

As natural evolution of its support for informal education through collaborations with local communities, the Space Education Center has increased its efforts to bring space home. Its support for home education is provided mainly through its collaborations with Kodomo-Uchu-Mirai Association (KU-MA)[2] in organizing “Space Schools for Families”, for participation by parents and children together.

The programme of “Space Schools for Families” consists of a several gatherings throughout the year, called “schoolings”, where the participating parents and children learn together about various space-related subjects and conduct basic experiments, and the homework to be done between the schoolings, using the learning materials distributed during the schoolings. While similar to the programme of regular schools, this programme is unique in providing opportunities for the parents and their children to share time together at home to discuss space-related topics and to conduct experiments as homework. Indicating the success of this new effort, the Center continues to receive words of appreciation from a number of parents who have now found common subjects to talk about and something to enjoy together with their children.

**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 continues to support education activities of Asia-Pacific Regional Space Agency Forum (APRSAF) as the Secretariat for its Space Education and Awareness Working Group.

The following activities have been, or are being, organized in 2009 as a result of the recommendations of the Working Group made at its last meeting, held in Ha Noi, Vietnam, in December 2008: i) Fifth Water Rocket Event, to be held in Bangkok, Thailand, in January 2010; ii) Fourth APRSAF Poster Contest, held under the theme “Our Universe – Great Discoveries”; and iii) Space Education Seminar on “Bringing Astronomy, Space Science and Technology and Their Applications into Classrooms”, held in Katubedda, Moratowa, Sri Lanka in September 2009.

As part of its efforts to ensure that its space education activities contribute to the relevant initiatives of entities of the United Nations system and other international organizations, the Working Group selected the theme for the Fourth Poster Contest in view of the celebration of the International Year of Astronomy, in 2009. Using the entries submitted to the last Poster Contest, held under “Wonders of the Universe”, and with funding provided by the Space Education Center, the Working Group

[2] “Kodomo”, “Uchu”, “Mirai” mean “Children”, “Space”, “Future” in Japanese language.

produced a calendar for the year 2009 as its contributions to the celebration of the Year.

The Working Group is making efforts to contribute to strengthening inter-regional cooperation through space education by making it possible for countries of other regions to benefit from the educational activities of APRSAF. As a first step toward that goal, the teams from Colombia and Ecuador are being invited to participate in the Fifth Water Rocket Event.

During APRSAF-16, the Working Group would address, among other things, some new issues, such as effective uses of satellite images for schools and ways and means to effectively exchange space education materials.

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. Since December 2005, the Center has introduced water rockets as educational activities through UNESCO space education events held in Colombia, Ecuador, Peru, Tanzania and Vietnam. In 2009, the Center supported the workshops in Salinas and Puerto Ayora, on Galapagos' Isla Santa Cruz, Ecuador, as well as those in Lima, Peru. The partnership with UNESCO has also opened the door for collaborations with other developing countries outside the region of Asia and the Pacific, such as Argentina, Brazil and Nigeria.

Cooperation with advanced space-faring nations in space education activities is being pursued mainly through the International Space Education Board (ISEB). In addition to the Canadian Space Agency (CSA), the European Space Agency (ESA), the French Space Agency (CNES),[3] the National Aeronautics and Space Administration of the United States (NASA) and JAXA, which are current Members of ISEB, the Victorian Space Science Education Centre of Australia joined ISEB as its Associate Member. From October 2008, JAXA served the one-year term as chair of ISEB. ESA currently serves as its Chair. In 2009, JAXA, through its Space Education Center, supported and participated in the following activities of ISEB, mainly for the benefit of university and graduate students: i) international student programs at the sixtieth International Astronautical Congress (IAC), held in Daejeon, Republic of Korea, in October 2009; ii) international student participation in NASA Academy in summer 2009; and iii) technical workshops of “Global Education Network for Satellite Operations” (GENSO).

Resulting from the collaborations with the Human Space Systems and Utilization Program Office of JAXA, the Space Education Center continues to provide 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. For the next Conference, to be held in February 2010, JAXA is supporting the participation of three junior-high school and elementary school teachers of science

[3] Cenre National d’Études Spatiales

and English language, not only by covering the cost of their travel but also by providing technical support and advice on their presentations at the Conference.

**Development of education materials**

Through all its main activities, the Center continues to develop education materials using attractive space resources. As of the end of the last fiscal year, the Center had developed 33 education materials.

In the past year, the Center has strengthened its efforts particularly to promote the use of space materials in text books and their supplementary learning materials for use by schools. The Center continues to receive requests from textbook companies for space images and data. In the last fiscal year, 12 materials provided by the Center were taken up in textbooks or their supplementary learning materials.

**Expanding strategic alliances and footholds**

Being well aware of the limit on its manpower and financial resources, the Center is increasing its efforts to expand strategic alliances with entities involved in education, associations and groups supporting community activities, as well as groups of volunteers with a view to establishing strategic footholds of space education activities across the country. The strategic foothold would serve as the main promoter of space education activities in its region. Currently, there are eight universities, as well as boards of education, faculties of education, study groups of education or community centers that have concluded agreements with the Center to serve as the strategic footholds, in Hokkaido, Aomori, Akita, Ishikawa, Tokyo, Nagano and Shimane prefectures.

In addition, the Center is actively seeking strategic partnership with national research institutes, such as National Astronomical Observatory of Japan (NAOJ) and Japan Agency for Marine-Earth Science and Technology (JAMSTEC), as well as industries, to further expand space education activities across the country. In the past year, for example, the Center’s partnerships with private industries included those with Panasonic and Discovery Channel to jointly organize Cosmic College courses.

# III. Thailand

[Original text: English]

Thailand through GISTDA has made efforts to promote the education and opportunities for greater participation of youth in space-related technology as follows:

(1) Awareness project on space technology and geo-informatics for school children in Thailand that aims at promoting and encouraging them to understand and develop their skills. There is a series of activities namely youth camp, training, project formulating, monitoring and competing. There are 931 trained children in 2009.

(2) Poster contest for children aged 8-11 years under the theme “Our Universe – Great Discoveries”. The project has 2 levels of participation. First is a campaign in Thailand to select the 3 best posters and later send them for a competition at the 16th session of Asia-Pacific Regional Space Agency Forum (APRSAF-16) which will be held in Bangkok during January 26-29, 2010. The three best posters will be selected and awarded. The project aims at encouraging the children in the region to explore their creativity, expand their imaginations and express their dreams of discovering the unknowns of the universe. It also contributes to the celebration of the International Year of Astronomy in 2009 under the theme “The Universe – Yours to Discover”.

(3) In addition GISTDA will launch Caravan project using mobile vehicle, and GIS Tool Kit for School soon. The projects aim at increasing awareness of space technology and geoinformatics of the general people and youth. GIS Tool Kit for School project aims at enabling teachers and students to develop and update GIS learning media.