### Meeting Details

**DATE:**
November 14-17, 2017

**VENUE:**
Sheraton Grand Bangalore Hotel at Brigade Gateway

**ORGANIZERS:**
India:
- Department of Space (DOS)
- Indian Space Research Organisation (ISRO)

Japan:
- Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- Japan Aerospace Exploration Agency (JAXA)

### APRSAF-24 WAS ALSO SUPPORTED BY THE FOLLOWING ORGANIZATIONS:

- Indian Society of Remote Sensing (ISRS) Bangalore Chapter
- Ministry of Earth Sciences (MoES)
- Ministry of Agriculture & Farmers’ Welfare (MoAFW)
- National Space Policy Secretariat, Cabinet Office, Government of Japan
- Ministry of Foreign Affairs of Japan (MOFA)
- Ministry of Internal Affairs and Communications (MIC)
- Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Ministry of Economy, Trade and Industry (METI)
- Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
- Ministry of the Environment (MOE)
- Japan Meteorological Agency (JMA)
- Japan International Cooperation Agency (JICA)
- Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

For further information including APRSAF-24 joint statement, detailed program, presentation materials, and photos, please visit the APRSAF website: [http://www.aprsaf.org/annual_meetings/aprsaf24/meeting_details.php](http://www.aprsaf.org/annual_meetings/aprsaf24/meeting_details.php)
The Department of Space (DOS) India, the Indian Space Research Organisation (ISRO), the Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), and the Japan Aerospace Exploration Agency (JAXA) organised the 24th session of the Asia-Pacific Regional Space Agency Forum (APRSAF-24) from November 14 to 17, 2017, in Bengaluru, India, under the theme “Space Technology for Enhanced Governance and Development.”

The forum was attended by 539 participants from 31 countries and regions, and ten international organizations, including six heads of space agencies and three deputy heads in Asia-Pacific countries as well as high-level officials from governmental institutions in charge of space policy. The attendees shared common issues and interests in the Asia-Pacific region and expressed their expectations of the great contributions of APRSAF toward building a cooperative framework to help solve social issues.

On the first and second day of the forum, all four working groups (Space Applications, Space Technology, Space Environment Utilization, Space Education) discussed cooperative activities to solve societal issues in the Asia-Pacific region, which focused on the advancement of space technology in the region. In addition, as an interdisciplinary activity, the Space Applications Working Group and the Space Education Working Group held a joint session on international cooperation and capacity building, and the Space Technology Working Group and the Space Environment Utilization Working Group held a joint session on capacity building and small satellite development.

The plenary session began with opening remarks by Mr. A. S. Kiran Kumar, the secretary of the DOS and the chair of the ISRO, and by Ms. Mami Oyama, the deputy director general of the Research and Development Bureau, MEXT. On the opening day, the participating countries and international organizations delivered reports on recent major activities and provided information on the trends and the background to their respective national space policies, reflecting the recommendations from APRSAF-23 held last year, and shared information on the challenges facing their countries. In these reports, the participants reconfirmed the importance of international cooperation.

Four panel discussions were held during the main plenary session. In the Heads of Agencies Session, the nine heads and deputy heads of the participating space agencies jointly acknowledged that space technology plays an important role in helping to achieve the United Nations’ Sustainable Development Goals (SDGs) and that through active cooperation among the countries in the region based on their expertise acquired through the various activities taken in each country, national and regional issues can be tackled collaboratively.

In the following the ISRO Session, Indian governmental agencies introduced their success stories on urban development, agriculture, fishery, water resource management, tele-education—all areas in which satellites are used—under the theme of this forum: “Space Technology for Enhanced Governance and Development.”

During the Space Policy Session, panelists shared how their countries are evolving their space policies in response to their individual national requirements, and discussed the possibility of future cooperation in the region.

In the Space Explorations Session, five panelists from space agencies that are already involved in space exploration discussed the expected benefits of space exploration for countries in the Asia-Pacific region, and the potential opportunities for emerging space nations to participate in space exploration. It was confirmed that further discussion and information exchange are to be continued in future international conferences such as the Second International Space Exploration Forum (ISEF2) to be held in March 2018, in Tokyo, Japan.

During the round-table session, participating space leaders commented on the future direction of space activities in the Asia-Pacific region and their expectations toward future APRSAF. The outcomes of APRSAF-24 were summarized in a Joint Statement, which was confirmed by the participants.

The following programs were held concurrently with the annual meeting of APRSAF: Water Rocket Event and Poster Contest for young students which were organized by SEWG, WG Initiative Workshops which was organized by SAWG and SEUWG, and exhibitions. A wide range of age groups from students to professionals participated in these programs and had active communications.

The next session of APRSAF-25, is planned to be held in Singapore in November 2018, and will be co-organized by the Singapore Space Technology Association (SSTA), MEXT and JAXA.

Heads of Agency Session
T he Space Applications Working Group (SAWG) held a successful meeting on November 14 and 15 that was attended by 177 participants from 10 countries and one international organization. The SAWG confirmed the progress of various activities such as the SAFE (Space Applications For Environment) initiative, the Sentinel Asia initiative, forest and agriculture applications, integrated land and water resources applications, atmospheric applications, and GIS and Internet of Things (IoT) platforms. In addition, SAWG participants discussed ways of disseminating knowledge about the benefits of space applications to end-users; enhancing the data-sharing framework and mechanisms of existing systems; sharing the knowledge and technologies gained as fruits of the SAWG’s accomplishments in space applications; and also the new drive of SAFE in enhancing multilateral cooperation in the Asia-Pacific region. The SAWG participants took pleasure in confirming the progress of international and regional projects and initiatives in environmental issues, disaster monitoring and other fields along with other SAWG activities. In particular, the host country session—which addressed space technology and governance through gained experience—demonstrated a way to synergize Earth observations, communication, navigation and emerging technologies for enhancing governance and development.

The following recommendations were recognized and proposed:

1. Promote active contribution from countries that have implemented advanced applications, such as India, for use in agricultural monitoring, water resource management, and disaster management.
2. Implement a virtual satellite-based agromet data and information system (e.g. MOSDAC & JASMIN) by sharing data, information and expertise for the Asia-Pacific region.
3. Share throughout the Asia-Pacific region knowledge on air pollution gained experience—demonstrated a way to synergize Earth observations, communication, navigation and emerging technologies for enhancing governance and development.
4. Encourage and enable the Asia-Pacific region with country-specific data cube initiatives, data portals and analysis-ready data through capacity building; and, where possible, by data-sharing mechanisms.
5. Increase visibility of SAFE prototypes (in the domains of agriculture, water resources, forestry, and the environment) with multilateral involvement to promote regional implementation through the sharing of knowledge, data and methodology. A revised Term of Reference to enable this new direction of SAFE will be established.
6. Establish a strategic plan for Sentinel Asia under the leadership of the Steering Committee and establish a revised work plan for Sentinel Asia to address the total disaster cycle (Step 3) to realize the direction of the Sendai Framework.

For the purpose of an increased expansion of space applications in the Asia-Pacific region, the SAWG will follow these recommendations with its APRSAF partners and hopes to make use of the APRSAF platform to support the Sendai Framework and SDG Goals and be able to report the accomplishments at the next SAWG of APRSAF-25 in Singapore.
REPORTS BY CO-CHAIRS

Space Environment Utilization Working Group (SEUWG)

The Space Environment Utilization Working Group (SEUWG) held a successful meeting on November 14 and 15, 2017, that was attended by 72 participants from 15 countries and 28 organizations. Many different activities regarding space environment utilization and future challenging plans were reported by delegates from 10 of the attending countries (Bangladesh, India, Indonesia, Japan, Korea, the Philippines, Singapore, Thailand, Turkey, and Vietnam). A special joint session in collaboration with the Space Technology Working Group (STWG) was also held with more than 100 participants in order to encourage activities in the development, launch, and applications of micro-satellites, including the use of Kibo Exposed Facilities.

A SEUWG initiative, the Kibo-ABC Workshop, held on November 13, 2017, was attended by 33 participants from 10 countries and 15 organizations. News on preparatory activities and publicity events related to the Asian Try Zero-G 2018 project were reported by Indonesia, Japan, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.

International demand for microsatellite deployment has been increasing, as exemplified by the UN-JAXA collaborative mission for CubeSat deployment, known as KiboCUBE. More than 200 satellites have been deployed from the JEM Small Satellite Orbital Deployer (J-SSOD) of Kibo and the J-SSOD has been attracting global attention. Singapore’s CubeSat SpooQy-1, is to be deployed in 2018 (target) by using the J-SSOD. Indonesia, Malaysia and Thailand all presented CubeSat project plans related to the J-SSOD.

A material exposure experiment project by Malaysia utilizing the Experiment Handrail Attachment Mechanism (ExHAM) is in the process of technical coordination and arrangement. Singapore also expressed an interest in the utilization of the ExHAM.

Given that experiments in microgravity represent unique fields of research, proposals for Kibo utilization from Asian countries, although valuable, were previously limited in number. However significant progress has recently been observed with Indonesia, Japan, Malaysia, and Thailand all having made proposals for space experiments using the Kibo Pressurized Module.

Thailand reported that the 3rd Space Environment and Kibo Utilization Workshop (SEKUW) was successfully conducted as an SEUWG activity with around 90 participants from 36 organizations in Bangkok, Thailand in February 2017. As a result, an Announcement of Opportunity and feasibility study of the proposals were initiated in Thailand.

After fruitful discussions, we adopted the recommendation: “To further encourage the acceleration of preparation and feasibility study in each country towards the realization of Kibo utilization.” We expect an expansion of activities and a variety of benefits from the utilization of Kibo for the Asia-Pacific region.

Space Education Working Group (SEWG)

The SEWG annual meeting attended by 90 participants from 13 countries. At the Space Education Working Group (SEWG) annual meeting, delegates from 10 countries presented highlights of their space education activities conducted over the past year. Four countries shared their educational materials and ten additional presentations on various space education activities were delivered. Panelists from Malaysia, the Philippines, and Thailand reported on the outcomes of their previous Space Education Seminars for Educators and an active discussion was conducted among the panelists and participants regarding the importance of the training of educators. A joint session with the Space Education Working Group was held under the theme of human resource development and four presentations were delivered.

The 13th APRSAF Water Rocket Event was held on November 11, and 12, 2017, with the participation of 56 students and 21 educators and 15 observers from 12 countries. First prize was won by a student from Sri Lanka.

The 12th Poster Contest was held under the theme “United Through Space” and received 36 entries from 12 countries with 188 votes being cast. A student from Thailand won the Best Poster Award.

The SEWG adopted the following recommendations:

1. To further promote educational activities, using space as a method that will be beneficial for the human resource development of the next generation. In order to do so, to continuously provide opportunities, tools and information to teachers and educators through seminars, hands-on events and websites;
2. To continue to conduct the Water Rocket Event, Poster Contest and other self-initiated educational programs in Asia-Pacific countries, as means of generating young people’s interests in space and nurturing their creativity and innovative thoughts;
3. To enhance collaboration across Asia-Pacific countries in promoting space education activities through joint space education programs, and sharing best practices and methods throughout the region;
4. To support privately initiated efforts and activities in promoting space education in the Asia-Pacific region;
5. To broaden the scope of space education to human resources’ capacity building in the region using conventional and modern methods, and taking advantage of present-day IT technologies that would encourage future generations to pursue space related careers.
The 24th session of the Asia-Pacific Regional Space Agency Forum (APRSAF-24) was successfully held in Bengaluru, India, from November 14 to 17, 2017, under the theme “Space Technology for Enhanced Governance and Development.”

APRSAF is an open forum for those who have interest in cooperation in the field of space activities in the Asia-Pacific region. The forum welcomes participation from space agencies, governmental bodies, international organizations, development aid agencies, research institutes, and universities, and also encourages further participation from the private sector, which is expected to become a significant player in the field of space activity. The activities of the various Working Groups (WGs) and initiatives throughout the years have resulted into notable regional cooperation, which makes APRSAF as a sustainable forum.

The participants recognized and shared the following key points during APRSAF-24:

1. Space Technology for Enhanced Governance and Development
   Space technology is a useful tool for solving various social issues and it can be used for effective decision-making. In promoting space applications, it is important for space agencies to partner with user ministries, organizations and development aid agencies so that the information from the satellites will be analyzed and interpreted for specific purposes, disseminated to users through enhanced mechanism of data sharing among the existing systems, and incorporated into operational work and processes of government and other partners, leading to real actions being taken toward solving social issues.

2. Contribution of space technology to achieving SDGs
   Space technology can have a major role in achieving the 17 goals of Sustainable Development Goals (SDGs) by contributing to solving regional issues such as disaster risk reduction, water resource management, and agricultural management. Through the active cooperation among the countries in this region based on their expertise acquired through the multifarious activities taken in each country, national and regional issues can be tackled collaboratively.

3. Improvement of regional space capability
   It is our common benefit to improve regional capability in space technology. We recognize the importance to support and enhance the higher educational programs and space technology application workshops available in our region with the aim of promoting education and capacity building to nurture higher-level engineers and researchers. We also support the idea to build a scheme to initiate discussions for future collaborative activities to jointly develop innovative small and cube satellites with the aim of providing the new solutions to the global and social issues we face.

4. Importance of high-level meetings
   We believe that it is important to have opportunities for the heads of space agencies as well as high-level stakeholders who are in charge of space policy to regularly gather and exchange views so that they can share the common issues and interests of our region. We expect that such regular interactions will further develop cooperative opportunities that will lead to addressing various social issues in our region.

5. Advancement of APRSAF activities
   The area of interest at APRSAF has been expanded from space technology applications such as remote sensing, to space exploration at and beyond Low Earth Orbit. Considering that the Asia-Pacific region accounts for more than two-thirds of the world’s population and features a wide diversity of geography, climates, and people, our efforts in this region under the APRSAF framework will have a great influence on global society and the Earth. Therefore, it is important to connect our regional interests gathered at APRSAF to global efforts such as the SDGs adopted at the United Nations, and the international space exploration program to be discussed at the 2nd International Space Exploration Forum (ISEF-2) as well as the efforts made by the Group on Earth Observations (GEO).

APRSAF-25 is scheduled to be held in Singapore in 2018.
Space for Future Society
The session aimed to collect ideas and discuss how aerospace technology, such as Solar Power, Global Navigation Satellite System (GNSS) and Remote Sensing, can contribute to future society. Through the session, the attendees discussed themes on topics such as smart systems for energy management, transportation, healthcare, disaster reduction, agriculture, and industry.

Water Rocket Event
The Water Rocket Event was held on November 11 and 12 at the Kendriya Vidyalaya, NAL Campus. On the first day, the students introduced their team and country, on the following day, the students constructed their water rockets with materials distributed on site and competed the launch distance. Additionally, a workshop for educators was held to exchange information on space education such as current approach, programs, and experiences. During the two-day event, the students interacted with each other.

Poster Contest
The twelfth APRSAF Poster Contest for schoolchildren aged between 8 and 11 years old was held under the theme “United Through Space” in conjunction with APRSAF-24 at the same venue. Among 36 posters from 12 countries, a total of five posters were awarded prizes, including one Best APRSAF Poster Award. For details and a Poster Contest Calendar showing all 36 posters, please visit the link below:
http://www.aprsaf.org/working_groups/se/

APRSAF Exhibition

Space Policy Workshop
The workshop was jointly organized by the University of Tokyo Graduate School of Public Policy, Japan, and the National Institute of Advanced Studies (NIAS), India, on November 13, 2017. Through the workshop, attendees shared views on matters such as desirable approaches to space exploration.
In this column, APRSAF community members take turns to provide their comment on APRSAF. In this issue, Mr. Jonathan Hung, president of the Singapore Space and Technology Association (SSTA) provides a message as one of the host organizations of the next APRSAF annual session.

APRSAF-25 will be convened in Singapore come November 2018. It is an exciting period for Singapore as we work closer with our regional partners in space developments, and take this excellent opportunity to build stronger relationships.

The Singapore Space and Technology Association (SSTA) is proud to partner MEXT and JAXA on this initiative as we see the various APRSAF working group topics and side events as crucial building blocks in a sustainable space ecosystem. Tackling climate change, environmental monitoring, remote sensing applications and effective space utilization are all highly relevant to the advanced society in which we live in.

It is timely too, as we focus our theme on innovation, as the world has certainly changed for us. Rapid adoptions in technology, IOT-centric enterprises and smart manufacturing solutions are vectoring us well into the Age of Intelligence. The satellite / space industry is fast-moving into this Space 4.0 era, and we need to address and strategize how we, as space-faring Asian countries, can stay relevant.

Over the past 24 years, it is clear that our space agency chiefs have remained steadfastly committed in ensuring the APRSAF platform remains vigilant to change. We hope that this 2018 jubilee year of APRSAF in Singapore will move the event to greater heights, engaging a wider pool of technical experts, academia, government and industry. The Singapore event also hopes to attract a growing pool of start-ups that are breaking new ground in satellite-related technology, and this perhaps will provide more impetus for us to stay ahead of the technology curve.

A final pillar that SSTA and Singapore hopes to strengthen at APRSAF-25 will be education and talent outreach activities. The Asia-Pacific countries all have good domestic space education programmes that will benefit from a collective and collaborative effort. We must continue to nurture our youth, promote Science and Engineering, and we see space as a true catalyst for such efforts that will certainly advance all our nations’ economies.

Once again, I look forward to welcoming all of you to Singapore in November 2018, and to a successful APRSAF-25.

MESSAGE TO APRSAF COMMUNITY MEMBERS

APRSAF-25 to be held in Singapore in November 2018

As mentioned in the message from Mr. Jonathan Hung, president of SSTA, the next APRSAF annual meeting (APRSAF-25) will be held in Singapore. Since the eighteenth meeting was held there in 2011, this means the country will be hosting the meeting for the second time. Updates will be posted on the APRSAF website, and will be circulated through our News Mail as well. To subscribe to our News Mail, please complete the subscription form at: https://www.aprsaf.org/newsmails_newsletters/form/

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We welcome your updates on space-related activities and also your comments and suggestions to the APRSAF Secretariat.

For further information about APRSAF, please visit http://www.aprsaf.org