APRSAF NEWS LETTER

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APRSAF
ASIA-PACIFIC REGIONAL SPACE AGENCY FORUM

www.aprsaf.org

ISRO members of the APRSAF-24 Secretariat

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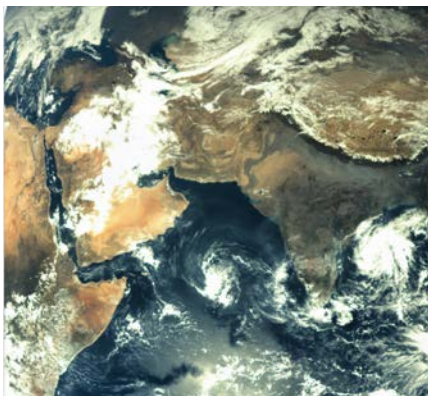

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APRSAF-24

November 14-17, 2017
Bengaluru, India

24TH APRSAF
ASIA-PACIFIC REGIONAL SPACE AGENCY FORUM
INDIA

MAIN THEME

Space Technology for Enhanced Governance and Development

Venue: Sheraton Grand Bangalore Hotel at Brigade Gateway

Co-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)

Supporting Organizations:

India: Indian Society of Remote Sensing (ISRS) Bangalore Chapter
Ministry of Earth Sciences (MoES) (planned)
Department of Science and Technology (DST) (planned)
Antrix Corporation Limited (ACL) (planned)

Japan: Japan Meteorological Agency (JMA)
Japan International Cooperation Agency (JICA)
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

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Registration

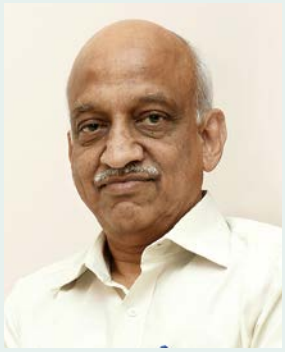
Please visit the following registration website and complete your registration online no later than October 5, 2017:
http://www.aprsaf.org/annual_meetings/aprsaf24/registration.php

Overall Schedule of APRSAF-24 and Related Projects

Date	Event	
11-12 November	Water Rocket Event (Kendriya Vidyalaya, NAL Campus)	
13 November	SAFE Workshop	
	Kibo-ABC Workshop	
	Space Policy Workshop	
14-17 November	**APRSAF-24**	
	14-15 November	Working Group Sessions
	16-17 November	Plenary Session
	Poster Contest	
	Exhibition	
15 November	Evening Session: Space for Future Society	
16 November	Welcome Reception hosted by ISRO	
16 November	Cultural Tour (Bengaluru sightseeing)	

For most updated program of APRSAF-24, please refer to our website:
http://www.aprsaf.org/annual_meetings/aprsaf24/program.php

Message from General Co-chairs



Mr. A. S. Kiran Kumar

Secretary, Department of Space (DOS) of India /
Chairman, Indian Space Research Organisation (ISRO)

Namaste!

The Department of Space (DOS)/Indian Space Research Organisation (ISRO) considers it a privilege and honor to invite you to the 24th session of the Asia-Pacific Regional Space Agency Forum (APRSAF-24), held under the theme "Space Technology for Enhanced Governance and Development," which is scheduled to take place November 14-17, 2017, at the Sheraton Grand Bangalore Hotel at Brigade Gateway, Bengaluru, India. APRSAF-24 will be co-organized by the Department of Space / 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).

APRSAF-24 will bring together leading practitioners in the region as well as stakeholders and relevant entities actively involved in, or interested in, space endeavors and regional collaboration. The ISRO is focused on providing the requisite mechanisms for access to space-based systems with the goal of maximizing benefits to India in terms of the diverse applications of space technology. In 2015, the ISRO organized a national meeting in order to maximize the use of space technology in governance and development. This has resulted in bringing a better focus onto the use of space technology tools for decision-making by government departments. This will be separately demonstrated in a special session, which will benefit the region as well as help in realizing similar systems in the region.

This year, India launched the South Asia Satellite, which provides coverage over Afghanistan, Bangladesh, Bhutan, the Maldives (including India), Nepal, and Sri Lanka. This will provide space-based communications amongst neighboring countries. Such efforts by India are steps toward meeting the objectives of APRSAF and the expansion of space applications for socioeconomic development in the Asia-Pacific Region.

This is the second time that India is hosting APRSAF, and we are confident we will provide the right environment for discovering opportunities for cooperation and collaboration. Future technologies will promise an exciting opportunity to adaptively address the issues of "remaining relevant and responsive to the requirements of global community" from space-based observations.

In this endeavor, I look forward to your active cooperation and support in all the diversified activities of APRSAF and extend a warm welcome to all of you in Bengaluru.

Ms. Mami Oyama

Deputy Director General, Research and
Development Bureau, Ministry of Education,
Culture, Sports, Science and Technology of Japan (MEXT)

Dear APRSAF community members:

The 24th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-24) will be held this November. APRSAF is a historic forum that has continued for more than 20 years since its launch in 1993, and it greatly contributes to the field of space development and utilization in the Asia-Pacific region. I feel very privileged to act as general co-chairperson of APRSAF-24.

The main theme of APRSAF-24 will be "Space Technology for Enhanced Governance and Development." In recent years, global-scale issues such as natural disasters, global warming and climate change have become increasingly severe. Space technologies, such as monitoring and predictions utilizing satellite data, are effective tools in making policy decisions.

It is essential to tackle these issues in order to realize sustainable development, Sentinel Asia, which is one of APRSAF's initiatives, is a good example of this main theme. Sentinel Asia is an international project in which 27 countries and regions are participating. Its aim is the management of natural disasters in the Asia-Pacific region by sharing the earth observation data gathered by several satellites. Sentinel Asia is producing tangible outcomes. For example, data obtained by ALOS-2 were utilized when a huge earthquake struck Nepal in 2015.

This theme is also related to the Sustainable Development Goals (SDGs) that were adopted by the United Nations in 2015. JAXA is tackling the challenges that need to be overcome to achieve SDGs using space technology. For example, JAXA and its partners are working on a project aimed at flood prediction using rainfall data gathered by satellites and in-situ data.

Concerning international space exploration, another field for international cooperation, Japan will host the 2nd International Space Exploration Forum (ISEF2) on March 3, 2018. Japan is preparing for this important forum and is looking to make it an opportunity to construct new international cooperation at a time when various discussions are being held. I hope that many members from the APRSAF community will join ISEF2.

As general co-chairperson, I am greatly looking forward to discussing these issues with members from the Asia-Pacific region at APRSAF-24.

MESSAGE FROM WORKING GROUP CO-CHAIRS

Space Applications Working Group (SAWG)

MR. SHANTANU BHATAWDEKAR
DIRECTOR,
EARTH OBSERVATION SYSTEM, ISRO HEADQUARTERS

MR. KAZUO TACHI
TECHNICAL COUNSELOR / SENIOR CHIEF OFFICER OF
SATELLITE SYSTEM DEVELOPMENT & SENIOR CHIEF OFFICER OF
SPACE APPLICATIONS, SPACE TECHNOLOGY DIRECTORATE I, JAXA

The Space Applications Working Group (SAWG) has fostered enhanced cooperation among space organizations and user agencies in the Asia-Pacific region, as well as with development aid agencies and international organizations, through the promotion of the sustainable operation of space applications. The SAWG initiatives—Sentinel Asia for disaster monitoring and Space Applications for Environment (SAFE)—for environmental applications including agriculture (GEOGLAM-Group on Earth Observations Global Agricultural Monitoring), integrated water and land resource management, are also implemented to better serve end users in the Asia-Pacific region.

The activities of SAWG and the two initiatives are in an advanced phase of maturity as a technical demonstration of Earth observation. The SAWG, to be co-chaired by ISRO and JAXA in Bengaluru, India, provides an opportunity to discuss how to develop value benefit to Asia-Pacific society under regional cooperation and international frameworks such as the Sendai framework, the Sustainable Development Goals (SDGs), and others. Also, there will be discussions on identifying future actions to further the SAWG's goal of capacity development and knowledge sharing in the Asia-Pacific region through training and workshops as well as sharing societal benefits with citizens through the synergistic and integrated application of key and new space technologies such as the integrated use of multiple satellites in Low Earth Orbit (LEO) and Geostationary Orbit (GEO) with Internet of Things (IoT). Fostering enhanced cooperation with participating organizations is critical, and the SAWG welcomes active participation and contribution.

We are looking forward to seeing you in Bengaluru to discuss the latest space applications supporting a safe and prosperous Asia-Pacific region.

Space Technology Working Group (STWG)

DR. MYLSWAMY ANNADURAI
DIRECTOR,
ISRO SATELLITE CENTER (ISAC)

MR. RYOICHI IMAI
VICE PRESIDENT /DIRECTOR GENERAL OF
RESEARCH AND DEVELOPMENT DIRECTORATE, JAXA

The Space Technology Working Group (STWG) aims to enhance and support space technology development in the Asia-Pacific region by exchanging information among experts from space agencies, academic institutions and private sectors in the region.

In APRSAF-24, the STWG will exchange information and discuss the topics below based on a previous STWG recommendation. In addition, we expect participants to actively engage in the discussion to promote future collaborative activities on small satellites, which will be proposed by us.

Through these exchanges, the STWG would like to enhance solidarity in the region and trigger a rise in the momentum toward even fuller cooperation.

- Recent trends in technology development for satellites
  Governments, institutes and space agencies are mainly expected to present information on their own nations' current trends in space technology development, with the main topics being: (a) The current and future space technology development roadmap and its function; and (b) Advanced, cutting-edge and innovative technologies (such as satellite bus, devices, components or relevant facilities).

- Capacity building
  Focusing on capacity building at the "higher education" (university or working engineer) level, relevant educational entities such as national institutes or universities are expected to present their capacity-building programs.

- Industry participation for innovation
  Industries including small and medium enterprises, and/or governments, institutes and space agencies that support such industries are mainly invited. Presenters will be expected to introduce advanced, cutting-edge, and innovative technologies that are expected to be applied commonly or to solve common technological barriers in the region.

- Space debris
  This session will share space debris countermeasures that governments, institutes or space agencies in the region are taking. Nations that launch satellites, and institutes or agencies from spacefaring nations are most welcome at this presentation.

- Collaborative development of small satellites in the Asia-Pacific region
  We will propose collaborative activities on small-satellite development under the STWG, which aims to pool the great capacities of various entities and create a new concept satellite with innovative technologies.

Space Environment Utilization Working Group (SEUWG)


DR. SEETHA SOMASUNDARAM
PROGRAMME DIRECTOR,
SPACE SCIENCE OFFICE, ISRO HEADQUARTERS

MR. FUMIAKI TANIGAKI
ASSOCIATE SENIOR ENGINEER,
JAPANESE EXPERIMENT MODULE (JEM) UTILIZATION CENTER,
HUMAN SPACEFLIGHT TECHNOLOGY DIRECTORATE, JAXA

The Space Environment Utilization Working Group (SEUWG) aims to encourage countries in the Asia-Pacific region to utilize the Japanese Experiment Module, also known as "Kibo" (which means "hope" in Japanese), currently onboard the International Space Station (ISS). The Kibo Module is a human space facility that provides unique research capabilities in a microgravity environment. Various scientific and engineering research activities are conducted on Kibo to take advantage of the exceptional environment offered in the fields of life science, medical science, materials science, space environment monitoring, astronomical observation, Earth observation, and demonstrations of advanced technologies.

One key capability of the Kibo module is small-satellite deployment using the JEM Small Satellite Orbital Deployer (J-SSOD), which started in 2012. Almost 200 satellites have been deployed from Kibo, and the deployment system has been attracting global attention as a new space transportation system for satellites.

The Kibo module includes an exposed facility designed for various research projects including the development and testing of new materials. The Experiment Handrail Attachment Mechanism (ExHAM) provides easier and more frequent opportunities for small-sized technical demonstrations or experiments (e.g. material exposure, and small device tests for satellite development).

The unique and unparalleled capability onboard Kibo is currently gaining wide attention from Asia-Pacific nations.

For the SEUWG, presentations on current activities and interesting utilization ideas/proposals are welcome for submission to the working group. Topics of space environment utilization other than Kibo utilization are also welcome. Through discussion, the SEUWG aims to contribute to building cooperative projects for Kibo utilization and to provide a variety of benefits for the Asia-Pacific region.

We welcome the participation of many countries from the region and look forward to sharing and discussing the future of space environment utilization in the Asia-Pacific region.

Space Education Working Group (SEWG)


DR. A. SENTHIL KUMAR
DIRECTOR,
INDIAN INSTITUTE OF REMOTE SENSING, DEHRA DUN

DR. NOZOMU SAKURABA
DIRECTOR,
SPACE EDUCATION OFFICE (SPACE EDUCATION CENTER), JAXA

The goal of the Space Education Working Group (SEWG) is to develop a talented future workforce through space education activities. Our actions are intended to shape the futures of not just the children of the Asia-Pacific region, but of those all over the world.

Space-related learning materials go beyond aiding the acquisition of scientific knowledge and technology; these materials intrigue people and heighten their motivation to learn. Our desire is to share learning materials, learning methods, and achievements in teaching, and for the resulting knowledge and insights to be taken back to each participant's home country. This working group conducts the Water Rocket Event and the Poster Contest, and throughout the APRSAF conference period, it also serves as a platform for current educators to network and exchange information. In nurturing the talent of the next generation, it is essential to elevate teachers in terms of quality. We must support teachers—current and future—to improve the state of education by using space as a learning material, and realize their own potential to implement ever better learning activities.

In our annual meetings, the SEWG strives to deepen discussions on how to stimulate young minds and create appealing learning opportunities. The distance to our goals can best be traversed through open and flexible cooperation. We ask that working group participants volunteer information about space education activities in their countries. With a shared knowledge base about what sort of learning materials are effective, how young minds undergo a transformation, and by what means the caliber of teachers can be raised, we can assuredly be an asset to education reform everywhere. Space science and space technology exist to brighten our future. Our greatest desire is to further energize space education, and to share what we know with other working groups in the process.

NEWS ON APRSAF ACTIVITIES

APRSAF/SAFE-ESCAP MEETING AT UNESCAP

Space Applications for Environment (SAFE), one of APRSAF's initiatives, endeavors to contribute solutions to various environmental challenges in the Asia-Pacific region through the application of space technology.

To date, the initiative has implemented more than 20 prototype activities providing total support to the construction of solution systems, such as providing satellite data and the development of systems to utilize space technology, in the area of water resources, agriculture, and coastal and fisheries resources. In addition, some of these activities have been developed into joint projects with international organizations.

As an example of such joint projects, the APRSAF/SAFE-ESCAP meeting was held at the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) in Bangkok, Thailand, on May 15, 2017. It was co-organized by ESCAP and JAXA on the occasion of the 73rd session of the Commission of ESCAP. This collaboration led to a joint luncheon session on "Space Applications for Environment and Sustainable Development Goals (SDGs)." ESCAP presented space applications that have the potential to support SDGS, and talked about the New Asia-Pacific Plan of Action for Space Applications (2018-2030). As both the APRSAF and ESCAP have a common interest in maximizing the innovative contributions of space technology applications to the attainment of SDGs in the Asia-Pacific region, ESCAP's Commission session provided an excellent opportunity to showcase the benefits of space applications to policymakers and end users who are not necessarily familiar with their potential.

In the general discussion of the APRSAF/SAFE-ESCAP Meeting, Dr. Shinichi Sobue, Co-chair of the Space Applications Working Group (SAWG), APRSAF-23, showed some of SAFE initiative's possible contributions to SDGs and suggested holding a discussion on the linkage between SAFE and SDGs with international stakeholders, including ESCAP, in APRSAF-24, which will be held in India in November 2017.

SEMINAR ON "SPACE EDUCATION FOR EDUCATORS"

On May 17 and 18, 2017, a seminar titled "Space Education for Educators" was conducted at the National Science Museum (NSM) in Thailand, and was acclaimed a great success. This seminar was co-organized by the NSM, the Geo-Informatics and Space Technology Development Agency (GISTDA), and the Japan Aerospace Exploration Agency (JAXA). The purpose of the seminar was to support the development of higher education capacity in space technology for teachers and education personnel in Thailand. A total of 57 communicators from science museums as well as mathematics and science teachers in Thailand participated in the event.

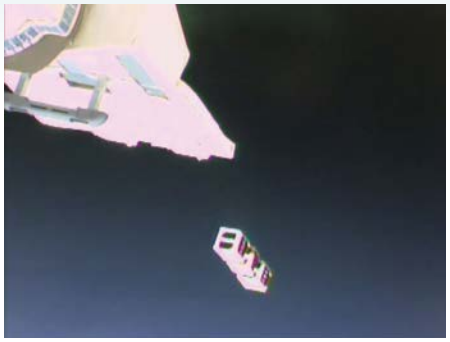
JAXA conducted lectures on space education including "New Lessons in Space Science and Technology: Letting Space Inspire the New Generation" and "Space Education Center: How We Support Educators and Mentors." JAXA lecturers consisted not only of JAXA Space Education Center staff from Japan, but also the director for the JAXA Bangkok Office.

In addition, a panel discussion called "Space Forum Education for Thailand 4.0" was conducted at the seminar. Panelists—drawn from the National Science and Technology Development Agency (NSTDA), the Royal Thai Air Force Museum (RTAFM), the ASEAN University Network (AUN) and GISTDA—introduced participants to various related activities such as the Asian Try Zero-G program, and projects of the Thai National Observatory (TNO), the AUN, and the RTAFM.

BIRDS PROJECT, CAPACITY BUILDING FOR SMALL SATELLITE DEVELOPMENT UTILIZING THE JAPANESE EXPERIMENT MODULE "KIBO"

The Joint Global Multi-Nation Birds Satellite Project, also known as the "BIRDS Project," is a cross-border university project for the development and operation of CubeSats led by Japan's Kyushu Institute of Technology (Kyutech). Japan and Asian-African nations are participating in this two-year project to provide students with opportunities to experience the complete cycle of designing, building, testing and operating 1U-sized CubeSats, which will be deployed from the Japanese Experiment Module "Kibo" of the International Space Station (ISS). Moreover, this project aims to educate students so that they become capable of developing satellites for their own nations.

As the first round of the project, BIRDS-1 (2015-2017), five 1U CubeSats from Japan, Ghana, Mongolia, Nigeria, and Bangladesh were sent up to the ISS aboard the Dragon CRS-11 spacecraft (SpX-11) on June 4, 2017 (JST). On July 7 (JST), the CubeSats were successfully deployed into orbit from Kibo. These CubeSats are operated from seven ground stations of the five participating countries plus Taiwan and Thailand.



Credit: JAXA/NASA

Credit: JAXA/NASA

The second round of the BIRDS project, BIRDS-2 (2016-2018), is an ongoing project following the success of BIRDS-1. Students from Bhutan, Malaysia, and the Philippines are participating in BIRDS-2. A preliminary design review was held on March 28, 2017. Additionally, BIRDS-3 will start from autumn 2017. For further information about the BIRDS project, please visit the following websites:
BIRDS Project, and BIRDS-1 http://birds.ele.kyutech.ac.jp/
BIRDS-2 http://birds2.ele.kyutech.ac.jp/

APRSAF-24 IN BENGALURU

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The location of the annual meeting APRSAF-24 is Bengaluru, the capital city of Karnataka State in India, and also headquarters to the Indian Space Research Organisation (ISRO). Bengaluru, being rechristened from Bangalore, is India's fastest growing, accommodating, technophiliac, and most cosmopolitan city.

The city is located on the Deccan Plateau, over 900 meters above sea level, and enjoys a pleasant, salubrious climate throughout most of the year. There are attractive landscaped gardens such as Cubbon Park, and the city is a beautiful lush green, so Bengaluru is also called "the Garden City of India." Founded in the 16th century, Bengaluru has many structures with both artistic and historic value such as Vidana Soudha, the seat of the state legislature of Karnataka.

As well as the riches of culture and tradition, Bengaluru is also renowned as the Silicon Valley of India. A large number of aerospace, biotech, electronic, and IT companies are based here, and the city also is home to India's leading scientific research establishments, including the ISRO and CSIR-National Aerospace Laboratories (CSIR-NAL), in addition to higher education-related facilities.

For its comfortable weather, rich culture, and expanding industrial research environment, Bengaluru draws people from around the globe. We look forward to seeing you in the diverse and lively city of Bengaluru for APRSAF-24!

MESSAGE TO APRSAF COMMUNITY MEMBERS

Dr. Anond Snidvongs
Executive Director
Geo-Informatics and Space Technology Development Agency (GISTDA)

The Geo-Informatics and Space Technology Development Agency (GISTDA) has a vision of "Delivering Values From Space." To this end, we develop applications for supporting public needs and come up with innovations that improve the quality of life. We also encourage and persuade the private sector to develop and utilize GIS and geospatial technology with the 3C approach (Cluster, Connectivity, and Co-creation) in order to enhance effectiveness, efficiency and competitiveness. The GISTDA also shares our innovations with startups in the interest of strengthening the economy.

Over the past 10 years, Thailand—through the GISTDA—has been participating in various APRSAF activities. Sentinel Asia is one of the initiatives under APRSAF on which we focus because it safeguards human life and property. The GISTDA is pleased to, and never hesitates to, share thousands of satellite images with Sentinel Asia whenever a disaster happens in the Asia-Pacific region. Likewise, the GISTDA is enthusiast about engaging in Sentinel Asia STEP-3 in order to enhance the performance and effectiveness of the utilization of satellite images for a data-providing node (DPN) by introducing our in-house development tools such as OPTEMIS. OPTEMIS is a satellite-tasking tool that is able to work with multiple satellites in a harmonized and optimal condition. The requisition of satellite images will be programmed effectively without redundancy. In addition to OPTEMIS, we developed VOSSCA—a satellite-operation tool that facilitates the work of operators with its drag-and-drop features and user-friendly graphic interface; EMARALD—a flight dynamic tool that provides high-precision ephemeris and orbit prediction; and WATER—an antenna system that supplies high pointing accuracy. We are pleased to share our products and collaborate with APRSAF members in the utilization of such tools.

Last but not least, I expect APRSAF to be a platform for national space agencies, academic institutes, and other space-related agencies to mutually produce more concrete outcomes and to actively gather as a group that will be beneficial for the Asia-Pacific region. I would like to see a stage where space agencies and interested participants can debate, initiate, and negotiate particular collaborations or projects by sharing facilities, costs and personnel.

The tangible output of the above would show how space can contribute to society.

APRSAF CALENDAR

September	October	November
	APRSAF-24 Registration Close October 5	▲Nov.11-12 Water Rocket Event
		▲Nov.13 SAFE Workshop
		▲Nov.13 Kibo-ABC Workshop
		▲Nov.13 Space Policy Workshop
		▲Nov.14-17 APRSAF-24
	▲Final Announcement	▲Nov.14-17 Poster Contest
		▲Nov.14-17 Exhibition
		▲Nov.15 Evening Session: Space For Future Society
		▲Nov.16 Welcome Reception

APRSAF Secretariat

APRSAF
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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