Our laboratory, Intelligent Space Systems Laboratory of the University of Tokyo, has been developing micro/nano/pico-satellites for more than 20 years, ever since the world’s first CubeSat, CubeSat XI-IV (which incidentally is still operational), was launched in 2003. The practical applications of microsatellites were already demonstrated by Hodoyoshi-1, 3 and 4 (Earth observation), Nano-JASMINE (space science), PROCYON (deep space exploration) and TRICOM-1R (collecting sensor data from the ground, called the “Store & Forward Mission”). A total of nine satellites have already been launched and operated successfully with five more satellites to be launched within two years.

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**Vision of micro/nano/pico-satellite Collaborations with Asia-Pacific Countries**

**Professor Shinichi Nakasuka**
Department of Aeronautics and Astronautics, University of Tokyo/
A member of the Committee on National Space Policy of the Cabinet Office of Japan
Dear APRSAF community members:

Konnichiwa from Japan!

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The year 2019 is a historic year for the space community, marking the 50th anniversary since human beings first landed on the Moon, and the 10th anniversary since the Japanese Experiment Module “Kibo” of the ISS started full operation. MEXT and JAXA are excited to host APRSAF-26 in such a commemorative year.

The theme of APRSAF-26 is “Advancing Diverse Links Toward a New Space Era.” In recent years, players in the space community are becoming ever more diverse, as new players from both the public and private sectors, as well as from space and non-space areas are actively participating in space activities. The collaboration among these players is bringing new synergy to the space community, and APRSAF is acting as one of the platforms for the promotion and advancement of such cooperation. APRSAF-26 welcomes participation from diverse players including space agencies, relevant ministries, user organizations of space technologies, development aid agencies, the private sector, research institutions, universities, international/regional organizations, and young generations.

Looking back on the history of APRSAF, the forum began as a gathering of 60 people from space agencies in 13 countries within the Asia-Pacific region in 1993. Since then, the APRSAF has been keeping consistently its unique character of an open and flexible framework for regional/international cooperation that encourages voluntary participation by anyone who is interested in the activities. Twenty-five years later, it has grown into a forum of 400 participants from more than 30 countries. As it welcomes the next quarter-century, APRSAF-26 will also provide opportunities to exchange views on its medium- to long-term vision.

One of the key topics of APRSAF-26 is the sustainability of space activities in the Asia-Pacific region, such as capacity building and space debris issues. MEXT and JAXA expect active discussions during APRSAF-26 to contribute to such global issues.

Finally, MEXT and JAXA are looking forward enthusiastically to seeing many participants at APRSAF-26 and having fruitful discussions to advance the diverse links among the Asia-Pacific region community.

Ms. Naoko Okamura
Deputy Director General
Research and Development Bureau
Ministry of Education, Culture, Sports, Science and Technology of Japan

Dr. Hiroshi Yamakawa
President
Japan Aerospace Exploration Agency

Venue: Nagoya Convention Hall
Organizers: Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), Japan Aerospace Exploration Agency (JAXA)
Registration: Please visit the following registration website and complete your registration online no later than 25 October 2019: https://www.aprsaf.org/annual_meetings/aprsaf26/registration.php

Overall Schedule of the APRSAF-26

**Plenary and Working Groups**

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**APRSAF Activities & APRSAF Related Projects**

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For most updated program of APRSAF-26, please refer to our website: https://www.aprsaf.org/annual_meetings/aprsaf26/program.php
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Ministry of Education, Culture, Sports, Science and Technology of Japan

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A PRSAF-25 was held in Singapore last year, when there were two important developments of SAWG. In the Sentinel Asia initiative, APRSAF-25 SAWG witnessed the establishment of the Ten-Year Strategic Plan of Sentinel Asia for the effective implementation of Step-3. In the SAFE initiative, the new framework SAFE Evolution was recognized at APRSAF-24 as a way forward for the enhancement of multilateral cooperation among space and international/regional agencies and the integration of related technologies. This year, the SAWG of APRSAF-26 scheduled to be held in Japan will be co-chaired by ISRO & JAXA. SAWG provides platforms for addressing common societal issues. Some of the important issues that are planned to be discussed and coordinated are:

- Accelerate to mobilize SAFE Evolution with two new SAFE projects (Agromet and rice crop monitoring to address the impact of climate change on food security) under multilateral cooperation with international funds.
- Discuss and launch a new SAFE Evolution project to create a documentary on Best Practices addressing disaster risk management and climate change monitoring showcasing potential space applications for SDGs in the Asia-Pacific region.
- Endorse the new SAFE Evolution TOR.
- Report the progress of the Ten-Year Strategic Plan and the status of Step-3.
- Report the regional satellite data sharing mechanism through multilateral collaboration for enhancing applications and shortening response time.

In addition to Sentinel Asia and SAFE Evolution, SAWG provides a strong international platform for demonstrating the potential of space application for SDGs, the Paris Agreement and the Sendai Framework in the Asia-Pacific region. The focus will be on the effective use of space technology in disasters, agriculture and water resources, as well as cross-cutting issues such as capacity building, knowledge sharing, IT and data platforms to bring the benefits of space technologies to societies. Reports on country status and achievements as well as the activities of international/regional agencies are expected to be presented.

We look forward to seeing you in Japan.

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The advancements made in space technology have become indispensable parts of our daily lives and have helped them become more prosperous and enhanced than ever before. However, the massive investments made in space technology are concentrated in the hands of a limited number of companies in some nations. These companies, such as GAFA (Google, Apple, Facebook and Amazon), are constructing space-based infrastructures, offering various services, and will likely be dominating the global economy and possibly also the space industry in the coming years. Space activities are making an economic impact on major players in America and Europe, whereas Asian companies are lagging behind those giants in international business development.

Under these circumstances, the Space Technology Working Group (STWG) feels a sense of urgency to push the enhancement and support the development of space technology and space industry activities in the Asia-Pacific region through active information exchange among experts from space agencies, academic institutions, as well as from the private sectors in this region.

The STWG of APRSAF-26, which is to be held in Japan, will be co-chaired by the Vietnam Academy of Science and Technology (VAST) and the Japan Aerospace Exploration Agency (JAXA). It will provide an opportunity to discuss current cutting-edge technologies for stimulating space industry competitiveness, introducing space industry activities in this region – such as the emergence of New Space – that are supported by private funds as well as national funds, and various activities for sustainable space utilization under upcoming mega-constellation plans. The current status regarding the preparation of the “Joint Development of Innovative Small and Cube Satellites” proposed in APRSAF-24 will be also reported.

We are looking forward to seeing you in Japan and receiving exciting and new proposals on cutting-edge technologies and innovative programs that will spark conversations among participants. Let’s share and find a solution to our challenges to realize a prosperous Asia-Pacific region by using advanced space technologies.
The Space Environment Utilization Working Group (SEUWG) is one of four working groups of the Asian-Pacific Regional Space Agency Forum (APRSAF) seeking to encourage Asia-Pacific countries to utilize the Japanese Experiment Module, or “Kibo,” onboard the International Space Station (ISS). Kibo is an existing and promising gateway to connect a unique space laboratory operating in a microgravity environment with researchers and scientists—both those who are already conducting investigations or those who have showed interest in initiating a new investigation onboard the ISS. With respect to deep space exploration toward the Moon, Mars and beyond, the SEUWG has been playing a key role as a cutting-edge capacity builder in the region for scientific and technological demonstration platforms in a low earth orbit (LEO).

Various space environment utilization projects have been successfully initiated, and many Asian satellites have been released into a LEO using the JEM Small Satellite Orbital Deployer (J-SSOD) onboard the Kibo Exposed Facility. An Indonesian CubeSat is to be deployed as the third KiboCUBE satellite selected by the United Nations Office for Outer Space Affairs (UNOOSA) and Japan Aerospace Exploration Agency (JAXA). These CubeSat programs involved engineers and researchers from across the Asia-Pacific region including Bangladesh, Bhutan, Malaysia, Mongolia, Nepal, the Philippines, Singapore, Sri Lanka, Thailand, Turkey and Vietnam. Using the Experiment Handrail Attachment Mechanism (ExHAM) on the Kibo Exposed Facility, Malaysia initiated a new dosimetry experiment, and dosimetry samples are currently undergoing testing in the Kibo laboratory for the measurement of radiation dosage. In Thailand, the Geo-informatics and Space Technology Development Agency (GISTDA) is proceeding with a Thai protein crystallization experiment onboard Kibo to develop medication against malaria.

Furthermore, with the aim of meeting the educational needs of regional societies, the SEUWG plays the role of a facilitator that focuses on the interests of young people through space-related programs such as Asian Try Zero-G and the Kibo-Robot Programming Challenge. By doing so, the SEUWG contributes to the creation of a talented workforce in the future and to the development of space applications.

We are very pleased to welcome many participants from all over the region to introduce various projects and future plans for Kibo utilization in the SEUWG sessions. Other than Kibo utilization, topics related to microgravity science are also welcome, such as parabolic flight experiments and sounding rocket experiments. Head toward a New Space Era with us! We look forward to sharing our future of space environment utilization for the Asia-Pacific region.

The Space Education Working Group (SEWG) functions as a guide to the Space Technology Working Group (STWG) in order to push the enhancement of multilateral cooperation among space and related international/regional agencies and the integration of related projects (Agromet and rice crop monitoring to address the impact of climate change on food security) under multilateral initiative, APRSAF-25 SAWG witnessed the establishment of two important developments of SAWG. In the Sentinel Asia SAFE Evolution was recognized at APRSAF-24 as a way forward for some nations. These companies, such as GAFA (Google, Apple, Microsoft, and Amazon) are becoming key players for stimulating space industry competitiveness, providing an opportunity to discuss current cutting-edge technologies for stimulating space industry competitiveness, and support the development of space technology and space professionals. The 21st century is an era in which a broad range of space-based possibilities are open for young people in the Asia-Pacific region. We continue to provide all possible assistance to them so that they can share and fulfill their dreams.

The SEWG organizes collaborative activities and also inspires the formation of space education policies of member countries by providing a forum for the exchange of information and opinions. Each year, the WG conducts an international Water Rocket Event that is attended by around 100 students and educators from more than 10 countries. The event provides an opportunity for students to study the principles of rocketry, compete in making and launching PET rockets; and it also fosters mutual understanding and friendship through cultural exchange. It is also an opportunity for teachers to advance the quality of their teaching. This year, the event will be held from November 22 to 24 in Sagamihara in Japan.

“See you in Space!” is the theme of this year’s Poster Contest. Children’s artwork full of imagination and dreams about space will be displayed at the plenary venue and the winners will be chosen by vote.

This year’s annual session of the SEWG will be an occasion to discuss case studies and the significance of the diverse development of space education, which provides appropriate assistance for the wide range of possibilities offered to the next generation. We will also share each country’s achievements and challenges, and discuss future courses of action for regional cooperation. In this regard, we expect this year’s session will be more active and constructive than ever by having even more diverse participants from space and educational fields. We hope that you will be joining us in Nagoya, Japan.
The 2nd Inter-Regional Space Policy Dialogue between the Asia-Pacific and Europe

During the 62nd session of the United Nations Conference on Peaceful Uses of Outer Space (COPUOS), APRSAF and the European Space Policy Institute (ESPI) jointly organized the "2nd Inter-Regional Space Policy Dialogue between the Asia-Pacific and Europe" to promote mutual understanding of diverse national space policies in both regions. The Inter-Regional Space Policy Dialogue is one of the APRSAF activities for promoting the creation of space policy community in the Asia-Pacific region.

Building on the fruitful outcomes of the 1st Dialogue in 2018, the 2nd Dialogue consisted of two events: the Space Policy Practitioners Workshop at ESPI on June 15, and the COPUOS side event at the Vienna International Centre (VIC) on June 19.

Space Policy Practitioners Workshop at ESPI (June 15)

On Saturday, June 15, 2019, ESPI hosted the Space Policy Practitioners Workshop at its premises. This event brought together space-policy practitioners from Australia, Germany, the Republic of Korea, Poland and Portugal to share their diverse experiences in the development and implementation of national space policy, and participants from many more countries from the two regions had a lively roundtable discussion.

The topics discussed included: the application of experiences from global cooperation within COPUOS to regional collaboration; the impetus for the establishment of space agencies; striking a balance between fostering the development of the space industry and the regulation thereof; the mechanisms for ministerial coordination and the involvement of a variety of stakeholders, and the expansion of inter-regional cooperation.

COPUOS Side Event (June 19)

The 2nd Inter-Regional Space Policy Dialogue continued with a COPUOS side event on "Innovation and Partnership for Enhancing Space Capabilities" that took place at the UN VIC on June 19. This event, which was opened by UNOOSA Director Simonetta Di Pippo, featured a panel discussion with insights from Austria, India, Italy, Japan and Thailand. Topics of discussion included: the success factors and challenges to support the commercialization of space; the implementation of measures to strengthen the core technical expertise of countries and foster innovation and start-ups; the institutional challenges in the “spin-in” process; as well as the role of regional cooperation in strengthening innovation and industrial competitiveness.

Toward enhancing space policy community in the Asia-Pacific region

Both the workshop and side event were well attended by many participants and received positive feedback. One participant noted that the Interregional Space Policy Dialogue is a useful mechanism to develop and enhance linkages among agencies in the two regions. The other participant were of the opinion that the dialogue had created a high-value exchange forum among government space agencies, and it would be an efficient platform for the promotion of global cooperation in the field of space policy in the future. APRSAF will continue to provide mutual learning opportunities among space policy officials with the view of contributing to the advancement of space policy and law in the region and around the globe.

A warm welcome to JICA Chubu!

This year, Nagoya is pleased to welcome APRSAF-26 and related events. The SAFE (Space Applications For Environment) Workshop and one of the side events, the 6th Asia-Pacific Space Generation Generation Workshop (AP-SGW 2019) will be held at JICA Chubu Center (JICA Chubu), which is one of the domestic offices of the Japan International Cooperation Agency (JICA). JICA Chubu has been conducting operations in the Chubu Region (comprising the prefectures of Aichi, Gifu, Mie, and Shizuoka) since 1961, operating as the Nagoya International Training Center. In 2009, JICA Chubu opened Nagoya Global Plaza and moved its base to the current Sasashima area adjacent to Nagoya Station.

The Chubu region, which has a large population of foreign residents, is characterized by its multicultural coexistence mindset with the various institutions, universities, and organizations that are engaged in international cooperation. As a facility fully open to citizens, JICA Chubu collaborates closely with local communities and through its activities aims at promoting international cooperation as a culture deeply rooted in the region.

At JICA Chubu’s Nagoya Global Plaza, citizens can learn about the world under the theme of International Cooperation, and enjoy foreign food, and buy “fair trade” items from overseas. This building is immediately adjacent to the venue of APRSAF-26, Nagoya Convention Hall. The APRSAF secretariat hopes all participants to APRSAF-26 will enjoy a marvelous stay in Nagoya.
Space Applications For Environment (SAFE) Workshop Held in Hanoi, Vietnam

On June 25, 2019, the Space Applications For Environment – SAFE 2019 Workshop was held jointly in Hanoi, Vietnam, by the Vietnam National Space Center (VNSC) of the Vietnam Academy of Science and Technology (VAST) and the Japan Aerospace Exploration Agency (JAXA). Around 30 experts from Australia, Cambodia, India, Indonesia, Japan, Malaysia, Singapore, Sri Lanka, Thailand, Vietnam and the Asian Development Bank (ADB) participated in this workshop.

Dr. Lam Dao Nguyen from VNSC and Dr. Kei Oyoishi from JAXA co-chaired the workshop. Dr. Vu Anh Tuan, Vice Director General of VNSC, made welcome address and mentioned expectations regarding remote sensing data usage for environmental issues.

In the first session of the workshop, the SAFE Executive Board reported on the SAFE Evolution project concept, status and proposal. One of the discussion items was to have consensus on the new SAFE Terms of Reference (TOR) for defining the SAFE Evolution concept. The participants shared new concepts shifting from bilateral prototyping to multi-lateral projects to tackle earth environmental (climate change) issues in the Asia-Pacific region. We also confirmed the progress of the Agromet Project related to agrometeorological information and the proposal on the Rice Crop Monitoring Project.

After the report of the SAFE Executive Board, the results of SAFE prototypes were reported. With respect to smoke haze monitoring in Indonesia, the participants confirmed progress in hotspot detection and smoke haze monitoring from Himawari-8, including the development of an automatic data processing and distribution system with the support of the University of Tokyo. As for rice crop monitoring in Cambodia, we confirmed the expansion of good progress in the validation framework using ALOS-2 and INAHOR in six provinces.

The final session of the workshop was the SAFE Project and Related Activities Session. In this session, activities in the ASEAN region by many organizations such as VNSC, the Indian Space Research Organisation (ISRO), the Geo-Informatics and Space Technology Development Agency (GISTDA), the National Institute of Aeronautics and Space (LAPAN) and ADB were presented. These activities offer the possibility of being able to work in collaboration with SAFE projects.

The next SAFE workshop will be held in November 2019 in Nagoya, Japan, in association with the 26th Asia-Pacific Regional Space Agency Forum (APRSAF-26).

Four CubeSats deployed from Japanese Experiment Module on International Space Station

On June 17, 2019, four CubeSats were deployed from the Japanese Experiment Module (JEM) “Kibo” on the International Space Station (ISS). They are: NepaliSat-1, mainly developed by the Nepal Academy of Science and Technology (NAST); Raavana-1, mainly developed by the Arthur C Clarke Institute of Modern Technologies (ACCIIMT) Sri Lanka; Uguisu, developed by the Kyushu Institute of Technology (Kyutech); and SpooQy-1, co-developed by the Singapore Space and Technology Association (SSTA) and the National University of Singapore.

The first three CubeSats were developed under the third round of the BIRDS Project (officially called the Joint Global Multi Nation Birds), an international joint development and operations project of CubeSats, led by Kyutech, with participation from various Asian and African nations.

JAXA provides opportunities to deploy small satellites from the Kibo module based on a range of programs. The launch of these four CubeSats was one such example.
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