The 25th Session of the Asia-Pacific Regional Space Agency Forum  
“Innovative Space Technology for Evolving Needs”  
6-9 November 2018, Singapore

Dear Sir/Madam,

With reference to the 25th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-25), the convening of which was communicated to you in the First Announcement distributed earlier, we are pleased to forward to you the Second Announcement. As you will note, this announcement contains further details of the scheduled meetings, including those of the four working groups, an updated schedule of events, and other important information addressing registration, accommodations, and visa requirements.

APRSAF-25 will be held from 6 to 9 November 2018, in Singapore, under the theme “Innovative Space Technology for Evolving Needs.” The main plenary will include a heads of space agencies session that will explore the innovative space technologies for solving regional issues, a special session that will share successful new innovation in space technology from Singapore, a space policy session that will introduce various country’s space policies or initiatives for promoting the space industry toward creating new players in space, and a space exploration session that will discuss the benefits of cooperation in space exploration. There will also be a dedicated session for the 25th anniversary of APRSAF.

On behalf of the co-organizers and the Executive Committee (ExCom) of APRSAF, I would like to emphasize that your participation is very important for the success of APRSAF-25. With your extensive experience and your valuable thoughts and insights, we believe that APRSAF-25 will be able to yield tangible results. We also count on your support to ensure good representation of experts and managers from your organization joining us at APRSAF-25.

To ensure that all necessary arrangements are made in time for APRSAF-25, we would be grateful if you would register your participation no later than 5 October 2018 through the following APRSAF website: https://www.pco-prime.com/sys_aprsaf25/sys/user/

Additional information concerning APRSAF-25 will be sent directly in due course to those who have registered, and this information will also be made available at our website: http://www.aprsaf.org/annual_meetings/aprsaf25/meeting_details.php

We look forward to seeing you in Singapore at APRSAF-25.

With warmest regards,

Masazumi Miyake  
Chairman  
Executive Committee (ExCom) of APRSAF
1. **About APRSAF-25**

A) **Organizers**

The 25th session of the Asia-Pacific Regional Space Agency Forum (APRSAF-25) will be co-organized by the following organizations:

- **Singapore:** Singapore Space and Technology Association (SSTA)
- **Japan:** Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- **Japan:** Japan Aerospace Exploration Agency (JAXA)

B) **Dates and Venue**

Date: 6-9 November 2018

Venue: Sheraton Towers Singapore

39 Scotts Road, Singapore, 228230, Singapore


C) **Registration**

Please visit the following registration website and complete your registration online **no later than 5 October 2018**:


**Registration Fee:**

<table>
<thead>
<tr>
<th>Online Payment by 31 October</th>
<th>Onsite Payment</th>
<th>Student</th>
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<tr>
<td>USD 60</td>
<td>USD 100</td>
<td>Free</td>
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</table>

* Cancellation policy:
  1) 70% refund for cancellation on or before 31 October 2018
  2) NO refund for cancellation on or after 1 November 2018
  3) The registration badge is transferrable

* Students are required to show their student ID at the venue.
  Failure to present a student ID at the venue will result in the payment of the onsite registration fee of USD 100.

* Participants are responsible for their own travel expenses.

* Registration fee is required only for the program held from 6 to 9 November 2018 in Sheraton Towers Singapore except Side Event.
2. **Program**

### Overall Schedule of APRSAF-25

<table>
<thead>
<tr>
<th>Dates</th>
<th>Event</th>
<th>Venue</th>
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</thead>
<tbody>
<tr>
<td>2-4 November 2018</td>
<td>Water Rocket Event</td>
<td>TBD</td>
</tr>
<tr>
<td>5 November 2018</td>
<td>SAFE Workshop</td>
<td>TBD</td>
</tr>
<tr>
<td>6 November 2018</td>
<td>Kibo-ABC Workshop</td>
<td>Sheraton Towers Singapore</td>
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<tr>
<td></td>
<td>Academic Space Policy Workshop</td>
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<tr>
<td>6-9 November 2018</td>
<td><strong>APRSAF-25</strong></td>
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<td></td>
<td>➢ 6-7 November Working Group Sessions</td>
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<td></td>
<td>➢ 8-9 November Plenary Session</td>
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<tr>
<td></td>
<td>Poster Contest</td>
<td></td>
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<tr>
<td></td>
<td>Exhibition</td>
<td></td>
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<tr>
<td>8 November 2018</td>
<td>25th Anniversary Event of APRSAF: “Space Women in Asia Pacific region”</td>
<td></td>
</tr>
</tbody>
</table>

For the tentative program, please refer to Appendix-A.

**A) Plenary Session**

The Plenary Session of APRSAF-25 will be held from 8 to 9 November 2018.

**The general co-chairs are:**

**Mr. Kong Hwee Tan**

Executive Director, Transport Engineering, Singapore Economic Development Board (EDB)

**Ms. Mami Oyama**

Deputy Director General, Research and Development Bureau,

Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan

**B) Working Groups**

Prior to the Plenary Session, the following working group sessions will take place in parallel from 6 to 7 November 2018. The concept notes for four working groups and initiatives are detailed in Appendix-B. Participants who wish to give a presentation are requested to submit abstracts (approximately 400 words in length) upon registration.
The Working Group co-chairs are listed below:

**Space Applications Working Group (SAWG):**
- Dr. Leong Keong Kwoh: Director, Centre for Remote Imaging, Sensing and Processing (CRISP)
- Mr. Naoto Matsuura: Senior Chief Officer of Satellite Applications, JAXA

**Space Technology Working Group (STWG):**
- Prof. Kay Soon Low: Professor, National University of Singapore/ Director, Satellite Technology and Research Centre (STAR)
- Mr. Ryoichi Imai: Vice President /Director General of Research and Development Directorate, JAXA

**Space Environment Utilization Working Group (SEUWG):**
- Mr. Cheng Hai Tan: Executive Committee Member, Singapore Space and Technology Association
- Mr. Fumiaki Tanigaki: Associate Senior Researcher, Japanese Experiment Module (JEM) Utilization Center, Human Spaceflight Technology Directorate, JAXA

**Space Education Working Group (SEWG):**
- Dr. Rogel Mari Sese: Program Leader, National Space Development Program, the Philippines
- Dr. Nozomu Sakuraba: Director, Space Education Office (Space Education Center), JAXA

C) APRSAF Activities

i. **SAFE Initiative Workshop**
   - Date: 5 November 2018
   - Reference: http://www.eorc.jaxa.jp/SAFE/

ii. **Kibo-ABC Initiative Workshop**
    - Date: 6 November 2018
    - Reference: http://www.aprsaf.org/initiatives/kibo_abc/

iii. **Water Rocket Event**
    - Co-organizers: SSTA and JAXA
    - Date: 2-4 November 2018
    - Venue: TBD
    - Reference: http://www.aprsaf.org/working_groups/se/

iv. **Poster Contest**
    - Theme: “My Home in Space”
    - Co-organizers: SSTA and JAXA
    - Reference: http://www.aprsaf.org/working_groups/se/
v. APRSAF-25 Exhibition
Date: 6-9 November 2018
Venue: Ballroom Foyer, Sheraton Towers Singapore
Application: Please see Appendix-C
Further details: http://www.aprsaf.org/annual_meetings/aprsaf25/exhibition.php

3. Logistic Information

A) Visa
It is the participant’s own responsibility to check whether a visa is required to enter Singapore. Please check the following website or contact the Singapore Embassy or a consulate in your country to ascertain whether you require a visa, and to determine the requirements for obtaining a visa if required.

VISA information:
https://www1.mfa.gov.sg/Services/Visitors/Visa-Information

If you need any documents issued by the local organizer, please contact:

Ms. Jermaine Tan
Head, Global Operations, SSTA
sstaa@space.org.sg

B) Accommodations
APRSAF participants are offered discount rates at Sheraton Towers Singapore, the venue of APRSAF-25. The special rates will be posted later at the APRSAF website:

http://www.aprsaf.org/annual_meetings/aprsaf25/registration.php

Sheraton Towers Singapore
39 Scotts Road, Singapore, 228230, Singapore
Tel: +65 6737 6888 / Website: http://www.sheratonsingapore.com/

C) International and Local Transportation
Please note that participants are responsible for making arrangements and covering the costs of their international travel to and from Singapore as well as local transportation costs, including between the airport and the hotel and between the APRSAF-25 venue and any other hotel. Local transportation will not be provided by the organizers.
D) Insurance

We strongly recommend that participants arrange for their own overseas travel insurance. The organizers of APRSAF-25 are unable to take any responsibility for arrangements or costs associated with any accident, injury, or illness.

4. Contact Information
A) General Information
i. Website
Further details about the program, registration and logistics of APRSAF-25 will be made available in due course. Please check for updates on the APRSAF website at http://www.aprsaf.org/annual_meetings/aprsaf25/meeting_details.php

ii. Point of Contact
Ms. Yuki Tanaka, APRSAF-25 Secretariat
c/o Japan Aerospace Exploration Agency (JAXA)
Ochanomizu Sola City, 4–6 Kandasurugadai, Chiyoda-ku, Tokyo, 101-8008, Japan
E-mail: aprsaf25@aprsaf.org  TEL: +81-50-3362-5880

B) APRSAF Program
i. Working Groups
(1) Space Applications Working Group (SAWG)
Dr. Shin-ichi Sobue
E-mail: sobue.shinichi@jaxa.jp  TEL: +81-50-3362-5782

(2) Space Technology Working Group (STWG)
Mr. Junichi Moriuma
E-mail: moriuma.junichi@jaxa.jp  TEL: +81-50-3362-7194

(3) Space Environment Utilization Working Group (SEUWG)
Mr. Kazuo Umezawa
E-mail: SEUWG@aprsaf.org  TEL: +81-50-3362-2669

(4) Space Education Working Group (SEWG)
Ms. Mika Hosobata
E-mail: ap_sewg_edu@ml.jaxa.jp  TEL: +81-50-3362-7590
ii. APRSAF Activities

(1) SAFE Initiative Workshop
Mr. Kohei Kawamura
E-mail: Z-SAFE@ml.jaxa.jp  TEL: +81-50-3362-6386

(2) Kibo-ABC Initiative Workshop
Mr. Kazuo Umezawa
E-mail: Kibo-ABC@aprsaf.org  TEL: +81-50-3362-2669

(3) Water Rocket Event
Ms. Ayako Uchida
Email: ap_wre_edu@ml.jaxa.jp  TEL: +81-50-3362-6438

(4) Poster Contest
Ms. Ayako Uchida
E-mail: ap_poster_edu@ml.jaxa.jp  TEL: +81-50-3362-6438

(5) Exhibition
Ms. Jermaine Tan
E-mail: ssta@space.org.sg (cc: aprsaf25@aprsaf.org)  TEL: +81-50-3362-5880

5. APRSAF Side Events
During the sessions of APRSAF-25, there will also be side events. Please refer to Appendix-E or https://www.aprsaf.org/annual_meetings/aprsaf25/side_events.php, for details of each event, such as date and time, venue.

Attachments
Appendix-A .............. Overall Program Structure (tentative)
Appendix-B .............. Concept Notes of the APRSAF Working Groups/Initiatives
Appendix-C .............. APRSAF-25 Exhibition Information
Appendix-D .............. Travel Information
Appendix-E .............. APRSAF Side Events
# APRSAF-25 Program (Tentative)

### Monday, 5 November

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:30</td>
<td>Opening Speech (1)</td>
</tr>
<tr>
<td>13:00</td>
<td>Space Applications for Environment (SAFE)</td>
</tr>
<tr>
<td>14:00</td>
<td>Lunch</td>
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<td>17:00</td>
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### Tuesday, 6 November

<table>
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<tbody>
<tr>
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</tr>
<tr>
<td>13:00</td>
<td>Lunch</td>
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### Wednesday, 7 November

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<tr>
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<tbody>
<tr>
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<td>Opening Speech (2)</td>
</tr>
<tr>
<td>13:00</td>
<td>Lunch</td>
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<td>14:00</td>
<td></td>
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### Thursday, 8 November

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8:30</td>
<td>Country Reports</td>
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<tr>
<td>13:00</td>
<td>Lunch</td>
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### Friday, 9 November

<table>
<thead>
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<tbody>
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<td>Remarks</td>
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<tr>
<td>13:00</td>
<td>Lunch</td>
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**Side Event #1**: The 5th Asia-Pacific Space Generation Workshop (Space Generation Advisory Council): 11/3-5 @TBD
**Side Event #2**: Academic Seminar (Space Policy) 11/6 @ TBD

*Time and/or title of each session is subject to change. Details will be announced in due course.*
The 25th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-25)

Space Applications Working Group (SAWG)

Concept Note

1. Scope and Objectives of SAWG Activities

The Space Applications Working Group (SAWG) was established following the 20th anniversary of the APRSAF, and its first meeting was held at APRSAF-21 in Tokyo in December 2014. Part of the motivation for forming the SAWG was to foster enhanced cooperation with local operational agencies in each country 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, especially for disaster management, integrated water and land resource management, agriculture and other Asian regional topics. Representatives and experts from existing initiatives, including Sentinel Asia and Space Applications for Environment (SAFE), outline their plans to better serve end users. At APRSAF-25 in Singapore, we would like to share information on the progress of the SAWG and its key initiatives, and to discuss further steps for sharing solutions and knowledge development through synergies between key space technologies and international and regional organizations.

1) Sentinel Asia

Sentinel Asia is an international collaboration among space agencies, disaster management agencies, and international agencies looking to apply remote sensing and Web-GIS technologies to support disaster management in the Asia-Pacific region. Sentinel Asia has been successfully operating through the voluntary contributions of Asia-Pacific members since its launch in 2006. In 2006 and 2012, a data dissemination system to support disaster management agencies—the backbone of Sentinel Asia—was established as Step 1 and Step 2. In 2013, APRSAF-19 approved Sentinel Asia to proceed to Step 3 to cover disaster cycles as a whole with the contributions of multiple space applications, while the number of its members has increased to nearly 100 organizations from 25 Asia-Pacific countries. At APRSAF-21 in Tokyo, to further contribute to disaster management for disaster-prone Asia-Pacific countries, three strategic pillars for the evolution of Sentinel Asia were endorsed: strategic management, end-user oriented activities, and cooperative promotion. A Steering Committee for the Strategic Management of Sentinel Asia was formed in 2015 and has developed the Step 3 implementation plan, a further step forward to support a comprehensive disaster management cycle in a sustainable manner under international
cooperation. This step 3 implementation plan will be reported at the Plenary and SAWG meeting.

2) SAFE (Space Applications for Environment)
SAFE is a voluntary initiative to encourage long-term environmental monitoring to better understand environmental changes. The SAFE workshop will be held on Day 0 of the SAWG (5 November, 2018) at Nanyang Technological University in cooperation with its School of Civil and Environmental Engineering (CEE). During this workshop, current SAFE prototype leads will report on the status and results of their prototype activities, as well as those of the follow-up activities for completed prototypes. A newly proposed revision of the SAFE TOR to promote APRSAF active participation under regional, multi-country and international cooperation will be presented and reviewed by the review board. Workshop reports and discussions on SAFE Evolution will be made at the SAWG meeting.

3) Thematic sessions
The application fields of disaster, agriculture, and land and water resources, constitute the prioritized social-benefit areas of the SAWG and SAFE framework in collaboration with international/regional organizations such as UN ESCAP and international donor agencies such as ADB. In addition, commercial sector participation on advanced IT technologies, such as big data analysis and cloud computing that are playing a key role for delivering information services using space-based data, will be planned. We will focus on discussing these areas in thematic sessions in which representatives of participating countries are invited to contribute by presenting their utilization of satellite data with other data and advanced IT technologies. However, there is no intention to limit the discussions to these areas, and presentations proposing new activities for the SAWG, especially those highly important to participating countries, are also welcome. The SAWG also appreciates the sharing of experiences, the results of regional cooperation in satellite data utilization, capacity building, and so forth. In addition, we would like to invite representatives of Singapore, as the host country, to organize a special session for their priority areas, including advanced IT technologies and partnerships with commercial companies and other partners.

2. Results of SAWG Activities at APRSAF-25
General statement of SAWG adopted at APRSAF-24 is shown as follow;
- Recognising the Synergy of Earth Observation, Communication, Navigation and emerging technologies for Space Applications in support of enhanced Governance & Development
Space technology as Enabler (regional platform) for societal development through provision of information / input to find solutions addressing the Global Agenda (Sendai Framework, the Paris Agreement and the Sustainable Development Goals).

Enabling Spatial Data Infrastructure through value addition, dissemination and data sharing framework such as Open Data Cube efforts by Australia, India and Vietnam and portals such as JASMIN (JAXA), MOSDAC and BHUVAN (India), MANTAP (Indonesia), etc.

3. **Draft Agenda**
   
   1) Opening session  
   2) Review of the last SAWG meeting  
   3) Host country special session  
   4) Reports on initiatives and activities  
      - Sentinel Asia Initiative  
      - SAFE Initiative  
      - Regional / international activities for UN SDGs, Paris agreement, Sendai framework  
   5) Thematic sessions  
      - Disaster, agriculture, and forest monitoring  
      - Integrated land and water resource management  
      - Advanced IT technologies and partnership with commercial sectors  
   6) Overall discussions and determining the way forward  
   7) Conclusions and recommendations of the SAWG

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The 25th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-25)

SAFE (Space Applications For Environment)

Concept Note

1. Scope and Objectives of SAFE activities

SAFE (Space Applications For Environment) is a voluntary initiative for environmental monitoring, which was endorsed at APRSAF-15.

This session aims to report on the current activities of SAFE, and includes a discussion by the Space Applications Working Group (SAWG).

1) SAFE Workshop

The SAFE workshop will be held on Day 0 of the SAWG (5 November, 2018) at Nanyang Technological University in cooperation with its School of Civil and Environmental Engineering (CEE). During this workshop, current SAFE prototype leads will report on the status and results of their prototype activities, as well as those of the follow-up activities of completed prototypes. In addition, as an evolution of the SAFE initiative, there is a plan to revise the SAFE new Terms of Reference (TOR) in order to promote active participation and promotion of the initiative by the diversity of end users. The revision of the TOR is made for effective implementation of earth observation data to solve some of the common regional issues regarding agriculture and water resource management, and for knowledge transfer and capacity building in the Asia-Pacific region, through joint management by space agencies (including ISRO, GISDTA, and JAXA, etc.) and cooperation with international organizations and donor organizations.

2) SAFE Initiative Report in the SAWG

The SAFE secretariat will report current status and updates of SAFE activities on Day 2 of the SAWG (7 November, 2018); the updates will mainly focus on ongoing and completed SAFE prototype activities and where necessary a summary of success stories with follow-up activities. It is expected that the SAFE TOR writing team co-chair will propose the new (revised) TOR.

3) Announcement of the next SAFE Workshop

The SAFE secretariat will announce the date of the next SAFE Workshop.

2. Result of SAFE Activities in APRSAF-24

See Joint Statement adopted at APRSAF-24:

http://www.aprsaf.org/annual_meetings/aprsaf24/joint_statement.php
3. Draft Agenda

SAFE Workshop

1) Review of the outcome of the APRSAF/SAFE WS in SKP, GISTDA during 5-6 July 2018.

2) Reports on prototypes and follow-up activities
   a. Smoke Haze Monitoring in Indonesia (Indonesia) [ongoing]
   b. Promote rice-planted areas and production estimation using space based technologies (Cambodia) [follow-up]
   c. Mapping and Monitoring Oil Palm Plantations Using Optical and SAR Spaceborne Data (Indonesia) [follow-up]
   d. Efficient oil-palm management prototyping using 3D GIS (Malaysia) [follow-up]

3) Writing team report to propose the new TOR

SAFE Initiative Report in SAWG

1) Update of SAFE initiative including APRSAF/SAFE Workshop in SKP, GISTDA and SAFE Workshop on Day 0

2) Reports on prototypes

3) Results of review board meeting and revision of TOR

SAFE Initiative Report in Plenary Session

1) Summary of the APRSAF/SAFE workshop

2) Report on results of the APRSAF-25 SAFE Workshop

3) Propose to revise TOR with evolution of SAFE initiative

4) Announcement of the date of the next workshop

*****
The 25th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-25)

Space Technology Working Group (STWG)

Concept Note

1. Background and Objectives

The Space Technology Working Group (STWG) aims to promote and support space technology development in the Asia-Pacific region through active information exchange among experts from space agencies, academic institutions, as well as from the private sector in the region. During APRSAF-24 in India, the STWG shared activities and experiences on space technology development in the Asia-Pacific region. The participants exchanged the latest information on space technology research and development, capacity building, participation from industry, and space debris. Concurrently, the “Joint development of Innovative Small and Cube Satellites” among Asia-pacific regional space agencies was proposed, in order to advance STWG from merely a forum where information was exchanged to a body that conducted concrete initiatives. This joint development aims to respond to the global social issues that the region faces.

STWG notes the following achievements:

A) Confirm the role of STWG as sharing best practices of space technology and promoting cooperation;

B) Confirm the necessity of international cooperation in addressing space debris and other common concerns;

C) Exchange information regarding the “Joint development of Innovative Small and Cube Satellites.”

2. STWG Program Structure

Based on the achievements for STWG activities established in APRSAF-24, the proposed program structure of the STWG for this year’s session is given below. The STWG co-chairs are pleased to call for presentations (approx. 10-15 minutes per presentation) on each topic in space technology from the Asia-Pacific region as well as from other regions and industries, and we expect a lively exchange of information and views among experts, researchers, and engineers from relevant disciplines.
Space Technology Working Group Sessions

Date: 6-7 November 2018

1. Opening of the session

2. General introduction and guidance for STWG

3. Technical sessions

- Technical Session 1: Recent trends in space technology development status
  
  In this session, relevant government, institutes or space agencies in the Asia-Pacific region will present their own nations’ current trends of space technology development. In particular, this session intends to address the following topics:
  
  a) Current and future space technology development roadmap and its function;
  
  b) Advanced, cutting-edge and innovative technologies (satellite bus, devices, components, satellite application facilities and ground operation facilities) which completed development;
  
  c) Capacity building at higher education levels (relevant educational entities such as national institutes or universities in the Asia-Pacific region).

  In each presentation, the presenters who will discuss a) and b) will share their reasons why they set their roadmaps or introduce their technological barriers which they face or have faced. The presenters who will discuss c) will share their efforts of capacity building which they provide to others as a program or their lessons learnt from capacity building course which they took. Given this information, the working group can understand their best practices and solutions broadly and learn about future cooperative actions during the session.

- Technical Session 2: Space Industry participation

  In this session, industries including small and medium enterprises or relevant government institutes and space agencies in the Asia-Pacific region which support its industries will be invited. Presenters are expected to introduce advanced, cutting-edge, and innovative technologies delivered by its domestic industry or itself. Most welcome are presenters of technologies which are expected to be applied commonly or to solve common technological barriers in Asia-Pacific region. In particular, presenters from Singapore are very welcome.
Technical Session 3: Space debris countermeasures

This session will share space debris countermeasures which relevant government, institutes or space agencies in the Asia-Pacific region tackle. STWG specifically focuses on exchanging of information from technical points of view, but considering the importance of rule-making in this topic, such presentations will not be exhausted. Nations which launch satellites, and institutes or agencies from spacefaring nations are most cordially invited to this presentation.

Technical Session 4: Status report for the “Joint development of Innovative small and Cube Satellites”

During APRSAF-24, the “Joint development of Innovative Small and Cube Satellites” among Asia-pacific regional space agencies was proposed and some preparation meetings have been organized among interested entities in the region. In this session, the current status of the preparation will be reported.

*Please note that the topics of the technical sessions are subject to change.

*STWG-SEUWG Joint session as was done in APRSAF-24 will not be scheduled in APRSAF-25. Presenters who intend to discuss their capacity building program or their lessons learnt through the capacity building program which they take will be invited in Technical session 1 of STWG. Presenters who intend to state their activities related to "Kibo" utilization will be welcomed in SEUWG session.

4. Drafting observations and recommendations

5. Closing of the session
The Space Environment Utilization Working Group (SEUWG) was formed to encourage countries in the Asia-Pacific region to use the Japanese Experiment Module (JEM), also called “Kibo,” which means “hope” in Japanese. Kibo is a manned space facility that provides unique research capabilities in the International Space Station (ISS). In addition to promoting the use of Kibo, the SEUWG aims to create collaborative projects for its utilization among participating countries.

Kibo consists of the Pressurized Module, the Exposed Facility, a Logistics Module, and a Remote Manipulator System. Various scientific and engineering research activities are conducted onboard Kibo that take advantage of the unique environment of the low Earth orbit. Research is currently conducted aboard Kibo in the fields of life science, medical science, materials science, space environment monitoring, Earth observation, and demonstrations of advanced technology. The SEUWG promotes the utilization of the Kibo Module in the Asia-Pacific region in the aforementioned fields as well as for other areas and topics.

2. **Activities and Discussion Points**

Through discussion among participating nations, the SEUWG aims to contribute to building collaborative projects for Kibo utilization and to provide a variety of benefits for the Asia-Pacific region.

**Opportunities for launch and deployment of microsatellites from Kibo/J-SSOD**

The demand from Asia-Pacific nations for microsatellite deployment has been increasing. Kibo has an airlock through which experiments are transferred and exposed to the external environment of space. Almost 200 satellites have thus been deployed from Kibo, and the deployment system/J-SSOD has been attracting global attention as a new transportation system for satellites.

The KiboCUBE collaboration between JAXA and the United Nations Office for Outer Space Affairs (UNOOSA), which aims to provide educational and research institutions from developing countries with opportunities to deploy CubeSats (1U), is also in progress. JAXA and UNOOSA have agreed to extend the KiboCUBE program for three more years.

* J-SSOD: JEM Small Satellite Orbital Deployer
  
New exposed experiment system of Kibo/ExHAM*
Using an Exposed Facility (EF) and a robotic arm, ExHAM enables experimentation for a short period of time with a lightweight existing experiment sample, and is therefore useful for satellite design. It is currently gaining wide attention from the countries in the Asia-Pacific region, with representatives of entities in Indonesia, Malaysia, and Singapore expressing interest in its utilization. The SEUWG will organize discussions about opportunities for use of ExHAM.

* ExHAM: Experiment Handrail Attachment Mechanism

Microgravity science using Kibo’s Pressurized Module and other opportunities
Since 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. Indonesia, Malaysia, and Thailand have developed plans and proposals for space experiments using the Pressurized Module and Exposed Facility of Kibo. Active discussions have facilitated effective and fruitful exchange of opinions and information among countries. Any experimental proposal in Kibo’s Pressurized Module is welcome and open for discussion at this WG. Information on microgravity science using a small rocket, parabolic flight, and drop tower will also be shared in order to expand further experiment opportunity.

Space Environment and Kibo Utilization Workshop (SEKUW)
The SEKUW is an international workshop whose purpose is to find potential space experiments to be conducted in Kibo as part of activities of the APRSAF/SEUWG. The Third SEKUW was successfully held at the Vayupak Convention Center, Bangkok, Thailand on 9-10 February 2017. As a result, an announcement of opportunity and a feasibility study of the proposals were initiated in Thailand. The achievements and future plans of the SEKUW will be discussed at the SEUWG.

Special session; ISS commercialization and beyond - Asian Perspective
In May 2018, JAXA selected two private companies as the service providers of small satellite deployment services from Kibo on the ISS. This follows the second version of the “Kibo Utilization Strategy” that intends to promote the private sector’s independent activities in the Kibo module. Moreover, looking at the trends of ISS commercialization and post-ISS, JAXA has announced acceptance of business proposals in Japan for LEO (low-Earth orbit) activities. In this session, private companies will be invited to introduce their activities and plans that incorporate capabilities the ISS currently provides, as well as plans for developing a commercial micro-gravity space industry and outlook on market potential. They will discuss how they envision the LEO landscape of the 2020s and beyond, and identify key issues that must be considered when contemplating a transition from the ISS to other platforms.
3. Draft Agenda

1) Opening session
2) Review of the last SEUWG meeting at APRSAF-24 in Bengaluru
3) Activity reports
   ✓ Launch and deployment of microsatellites (Kibo and launch vehicles)
   ✓ Projects using the Exposed Facility of Kibo
   ✓ Microgravity science (Kibo, small rocket, parabolic flight and drop tower)
   ✓ Kibo-ABC initiative
   ✓ Space Environment and Kibo Utilization Workshop
   ✓ Other topics
4) Special session; ISS commercialization and beyond - Asian Perspective
5) Overall discussion, future work, conclusions and recommendations

* * * * *
Asian Beneficial Collaboration through Kibo utilization (Kibo-ABC)

Concept Note

1. Scope and Objectives
Kibo-ABC is a collaborative program established by the Space Environment Utilization Working Group (SEUWG) of the APRSAF that aims to promote utilization of the Japan Experiment Module (JEM)—also called “Kibo,” which means “hope” in Japanese—in the Asia-Pacific region. Kibo is a manned space facility that enhances the unique research capabilities of the International Space Station. Kibo-ABC accumulates and shares experience among participating space agencies, researchers and engineers in Asia, and promotes cooperation projects in Kibo utilization between the member countries and Japan.

These activities are conducted jointly with member countries that have consented to the Terms of Reference (TOR) of Kibo-ABC.

The Kibo-ABC Workshop will be held on 6 November 2018.
- Development of multilevel cooperative relationships among participating countries
- Discussions and considerations for creating and conducting Kibo utilization projects

2. Activities of Kibo-ABC and Discussion Points of the Workshop

■ Asian Try Zero-G:
With the goal of promoting manned space experiments aboard Kibo, Japanese astronauts have been conducting selected small experiments covering the themes proposed by youth in this region. “Asian Try Zero-G 2018” experiments were successfully performed by the Japanese astronaut Norishige Kanai onboard Kibo with the participation of seven Asian countries: Indonesia, Japan, Malaysia, Philippines, Singapore, Thailand, and Vietnam on February 13, 2018. The Experiment Results Meeting of “Asian Try Zero-G 2018” will be held in July 2018. The activities, including publicity events in participating countries, will be reported at the Workshop. A plan of the next project will be also discussed there.

■ Space Experiment for Asian Future Program, SSAF/Space Seeds for the Asian Future:
The third mission of this program, “Asian Herb in Space (AHiS),” was presented by Malaysia. Malaysian National Space Agency (ANGKASA) and JAXA have conducted feasibility studies and ground experiments from both scientific and technical perspectives with the aim of conducting plant growth experiments as part of Kibo-ABC. The preparatory activities, experiment plan, and additional mission to AHiS will be discussed among participating countries at the Workshop.

■ Other topics:
  - Kibo-ABC Monthly Multilateral Web Meeting: Discussion for improvement
The 25th Session of the Asia-Pacific Regional Space Agency Forum (APRSAF-25)

Space Education Working Group (SEWG)
Concept Note

1. Background and Objective of SEWG Activities

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

In every place and culture on Earth, children love the natural world and look at life with wonder. They take pleasure in nature’s blessings, and stand in awe in the face of nature in all its power. Children may ask what lies beyond the stars they see, or how to overcome environmental crises. Over the 60-odd years that humanity has been exploring space, activities in space have increasingly become commonplace in our lives. Today, we have numerous players in aerospace, hailing from a range of countries and industries, seeking to broaden humanity’s horizons, dreaming of a more prosperous future.

The Space Education and Awareness WG was established at the 8th session of the APRSAF in 2001, changing its name to the Space Education WG in 2014. The working group has been actively pursuing a variety of programs in close collaboration with educators from the Asia-Pacific region, in service of a goal: to encourage young minds to see the world through a larger, more cosmic perspective, and channel the spirit of the curiosity, the adventure and the craftsmanship to thus make a contribution to the global community, and become a part of the solution to the ills that plague today’s society.

The SEWG has three major programs held concurrently with the annual APRSAF session. The first program is the Poster Contest that is open to children aged between 8 and 11. Its aim is to encourage the imagination through that year’s space-related theme; the theme for the next year’s Poster Contest is developed and selected at the WG’s annual meeting. Delegates to the annual APRSAF session are encouraged to vote for the best poster. The SEWG’s second program, the Water Rocket Event, is for students aged 12 to 16, and consists of a water rocket competition and cross-cultural activities. Because water rockets can be constructed from common materials such as plastic bottles, plastic sheets and plasticine, it is an ideal way to study the principles of rocketry and engineering. A great deal can be learned through the process of designing, building, and launching, then making modifications to improve performance. The program also provides students with
an opportunity to interact with different cultures and further understand their own background. And the last program, the Educator Workshop, provides a valuable opportunity for educators to gather and trade experiences, insights and achievements from their own space education activities. The aim is to enhance the quality of teaching, nurturing the kind of next-generation talent capable of true innovation. Additionally, the WG holds its Space Education Seminar for Educators once a year to promote space education within the region, organized in close collaboration with the host agency to meet the specific needs of the host country. The WG considers it important to make the seminar both participatory and practical, so that attendees can incorporate what they learn into their everyday curriculum.

2. **Results of SEWG Activities at APRSAF-24**


3. **Draft Agenda**

(1) Opening of the session  
(2) Adoption of the agenda  
(3) General exchange of views on space education  
(4) Joint educational activities for educators and young people  
   a. Water Rocket Event  
   b. Poster Contest  
   c. Space Education Seminar for Educators  
   d. Other activities  
(5) Innovative Space Education Programs  
(6) Sharing of teaching materials, with the greater aim of enriching space education  
(7) Other business

*****
APRSAF-25 Exhibition

Overview

Dates: 6-9 November 2018
Venue: Ballroom Foyer, Sheraton Towers Singapore
Exhibition Fee: USD500

* ONE table and TWO chairs will be provided.
Exhibitors may bring ONE pop-up banner stand per table. (Table dimensions: W 183 X D 51 cm)

Floor Plan (TBD)

| Ballroom 1 | ST WG (6-7NOV) |
| Ballroom 2 | SA WG (6-7NOV) |
| Ballroom 3 | SEU WG (6-7NOV) |
| Ballroom 4 | SE WG (6-7NOV) |
| Ballroom Foyer | |
◆ Please fill in the application form and send it to SSTA. SSTA will contact you upon receipt of your application.

   Contact for Exhibition:

   Email: ssta@space.org.sg (CC to aprsaf25@aprsaf.org)

   Contact Person: Ms. Jermaine Tan

◆ Please note that the exhibition tables will be allocated to exhibitors on a first-come-first-served basis, and exhibitors may need to store their belongings such as a banner stand in the ballrooms during the night-time with assistance from hotel staff.

◆ Exhibitors are requested to register for APRSAF-25. Please go to the website and complete your registration:

   https://www.pco-prime.com/sys_aprsaf25/sys/user/
Appendix C

APRSAF-25 Exhibition Application Form

Date: ______________________

Organization Name ________________________________

Address __________________________________________

Contact Person ________________________________

Telephone ________________________________________

E-mail Address ______________________________________

Date: 6-9 November 2018;
Venue: Ballroom Foyer, Sheraton Towers Singapore

We apply for: ☐ Exhibition table for APRSAF-25

Exhibition Fee: USD 500

Remarks (if any) ______________________________________

RETURN COMPLETED FORM TO:

E-mail: ssta@space.org.sg (CC to aprsaf25@aprsaf.org)

Due date: 28 September 2018
Travel Information

- **Accommodations**
  - Areas to stay
  There are many options to stay in Singapore, from budget to high-end hotels.
  The following describes some convenient areas to the APRSAF-25 venue, Sheraton Towers Singapore.

  A) Newton/ Novena
  Sheraton Towers Singapore is located at Newton.
  Novena is just one stop from Newton by North South Line. There are many malls around Novena station.
  Convenient to stay.

  B) Orchard Road
  Approximately 10-minute walk from the Sheraton Towers Singapore. This area is a major tourist attraction and great for shopping.
  Only mid-range and high-range hotels are available.

  C) Bugis, Little India and Kampong Glam
  Easily accessible and good food options. There is a great variety of hotels, from hostels to big-name luxury hotels. This area offers a mix of old charms and modernity.

  D) China Town
  If you are looking for a budget hotel, China Town is recommended. Most accommodations in China Town are boutique hotels and backpacker hostels, however. If you prefer to stay at another type of property like a chain hotel, other areas are recommended.
  A lot of food options, from hawker stalls that locals frequent to Michelin-starred fine-dining outlets, is available.

- **Hotel List**

<table>
<thead>
<tr>
<th>Hotel Name</th>
<th>Website</th>
<th>Area</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Oasia Hotel Novena Singapore</td>
<td><a href="http://www.stayfareast.com/ja-jp/hotels/oasia-hotel-novena-singapore">http://www.stayfareast.com/ja-jp/hotels/oasia-hotel-novena-singapore</a></td>
<td>A</td>
<td>Connected directly to Novena MRT Station</td>
</tr>
<tr>
<td>2 Goodwood Park Hotel</td>
<td><a href="http://www.goodwoodparkhotel.com/default-en.html">http://www.goodwoodparkhotel.com/default-en.html</a></td>
<td>A</td>
<td>10-min walk from Sheraton Towers Singapore</td>
</tr>
<tr>
<td>5 Hilton Garden Inn Serangoon</td>
<td><a href="http://hiltongardeninn3.hilton.com/en/hotels/singapore/hilton-garden-inn-singapore-serangoon-SINGIGI/index.html">http://hiltongardeninn3.hilton.com/en/hotels/singapore/hilton-garden-inn-singapore-serangoon-SINGIGI/index.html</a></td>
<td>C</td>
<td>6-min walk from Little India MRT Station</td>
</tr>
<tr>
<td>6 Fragrance Hotel Riverside</td>
<td><a href="https://www.fragrancehotel.com/hotel/fragrance-hotel-riverside">https://www.fragrancehotel.com/hotel/fragrance-hotel-riverside</a></td>
<td>D</td>
<td>5-min walk from Chinatown MRT Station or Clarke Quay</td>
</tr>
</tbody>
</table>

* Please note that room reservations are the responsibility of participants.
APRSAF-25 Secretariat cannot take any responsibility for problems associated with any room reservation.
Please refer to the MRT Map below:

Sheraton Towers Singapore is 5-min walk from Newton.
Transportation from Singapore Changi Airport to the City Center

➢ Train
The train station is walking distance from Terminal 2 or Terminal 3. From Terminal 1, you can take Sky Train to Terminal 2 or 3.

To get to the city center, transfer to a westbound train, East West Line, at Tanah Merah station. First train to Tanah Merah Station departs Changi Airport Station at 5.31am on Monday to Saturday and at 5.59am on Sunday and public holidays. Last train to Tanah Merah station that connects to the city center departs Changi Airport Station at 11.18pm.

Please refer to the URL below for the fares and routes of travel.
https://mrt.sg/fare

➢ Taxi
Taxis are available at the taxi stands on the Arrival level of each Terminal. A ride into the city takes about 30 minutes and costs between S$20 and S$40. Fares are metered and there is an additional airport surcharge for all trips originating from the airport:

S$5 Airport surcharge: 5.00 pm - midnight (Fri - Sun)
S$3 Airport surcharge: All other times
Midnight surcharge of 50% of final metered fare: midnight - 6.00 am
Peak hours surcharge of 25% of final metered fare: 6.00 am - 9.30 am (Mon - Fri) and 6.00 pm - midnight (Mon - Sun)
APRSAF-25 Side Events

The following side events will be held in conjunction with the APRSAF-25. Further information will be provided in due course.

<table>
<thead>
<tr>
<th>The 5th Asia-Pacific Space Generation Workshop (APSGW 2018)</th>
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<tbody>
<tr>
<td>Organizer</td>
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<tr>
<td>Co-organizer</td>
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<tr>
<td>Date</td>
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<tr>
<td>Venue</td>
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<tr>
<td>URL</td>
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<td>Contacts</td>
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</tbody>
</table>

**Event Description**

Now in its 5th year, the AP-SGW will be a two-and-half day regional workshop consisting of working group discussions and presentations, as well as panel discussions among keynote speakers who will be sharing their fields of expertise. The workshop will witness at least 60 competitively selected Asia Pacific space enthusiasts between the ages of 18-35 years, focusing on university students (B.Sc., M.Sc., Ph.D. students) and young professionals working in the Asia Pacific region. By the end of the workshop, a total of six working groups will complete presentations on key topics and provide recommendations that will help shape the future of the Asia Pacific space sector. These recommendations will be included in SGAC’s Annual Report together with the submission to UN COPUOS.

As part of the event, a Speed Mentoring Event will also take place, where aspiring space entrepreneurs will be given the opportunity to seek mentorship and share ideas with space professionals in the region.

Please find the tentative schedule at:
http://www.aprsaf.org/annual_meetings/aprsaf25/pdf/side_events/Appendix-E_5th_AP-SGW_Schedule.pdf
The following side events will be held in conjunction with the APRSAF-25. Further information will be provided in due course.

<table>
<thead>
<tr>
<th><strong>Academic Workshop on “Space Policy and Law Perspectives for Space Debris Management”</strong></th>
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<td><strong>Contacts</strong></td>
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<tr>
<td><strong>Event Description</strong></td>
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</table>