APRSAF

• Asia-Pacific Regional Space Agency Forum

Sitemap Japanese

APRSAF: Organization and Current Activities

Kohala Coast, The Big Island
Hawaii

Nov. 9, 2009

Susumu YOSHITOMI
JSF

Background

APRSAF was established in 1993 in response to the declaration adopted by the Asia-Pacific International Space Year Conference (APIC) in 1992,

- to enhance the development of each country's space program
- to exchange views toward future cooperation in space activities in the Asia-Pacific region.

4 WGs were set up on

- Earth Observation (EO),
- Communication Satellite Applications (CSA),
- Space Environment Utilization (SEU), and
- Space Education and Awareness (SEA)

APRSAF

Asia-Pacific Regional Space Agency Forum

icipants

- Australia
- People's Republic of Bangladesh
- Brunei Darussalam
- Bhutan
- Canada
- Kingdom of Cambodia
- China
- French Republic
- Federal republic of Germany
- India
- Republic of Indonesia
- Japan
- Republic of Korea
- Lao People's Democratic Public
- Malaysia
- Mongolia
- Union of Myanmar
- Nepal
- New Zealand
- Islamic Republic of Pakistan
- Republic of Philippines
- Russian Federation
- Republic of Singapore
- Democratic Socialist Republic 0f Sri Lanka
- Kingdom of Thailand
- U.S.A
- Social Republic of Viet Nam

UN/ESCAP

UN/OOSA

UNESCO

AIT

ADRC

AP-MCSTA

ASEAN Secretariat

ESA

ICIMOD

ISU

MRC

Regional / International Organizations

UN/ESCAP -United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP)

UN/OOSA -United Nations Office for Outer Space Affairs (UNOOSA)

UNESCO -United Nations Educational, Scientific and Cultural Organisation (UNESCO)

AIT -Asian Institute of Technology (AIT)

ADRC -Asian Disaster Reduction Center (ADRC)

AP-MCSTA -Asia-Pacific Multilateral Cooperation in Space Technology and Applications (AP-MCSTA)

ASEAN/SCOSA -ASEAN Subcommittee on Space Technology and Applications (ASEAN-SCOSA)

ASEAN Secretariat -ASEAN Secretariat

ESA -European Space Agency (ESA)

ICIMOD -International Centre for Integrated Mountain Development (ICIMOD)

ISU -International Space University (ISU)

MRC -Mekong River Commission (MRC)

APRSAF
Asia-Pacific Regional Space Agency Forum

Objectives

APRSAF shall provide opportunities to:

- Gather the representatives from space agencies and international organizations in the Asia-Pacific region,
- Seek measures to contribute to socio-economic development to the Asia-Pacific region and the preservation of the global environment, through space technology and its applications,
- Exchange views, opinions and information on national space programs and space resources,
- Discuss possibilities of future cooperation amongst space technology developers and space technology users to bring mutual benefits of the countries in the Asia-Pacific region, identify areas of common interest, and assign priorities thereto,
- Review the progress of the implementation of the plans and programs for further cooperation within the Asia-Pacific region,
- Consider and recognize the importance to cooperate with space agencies and organizations outside the Asia-Pacific region that support APRSAF objectives.

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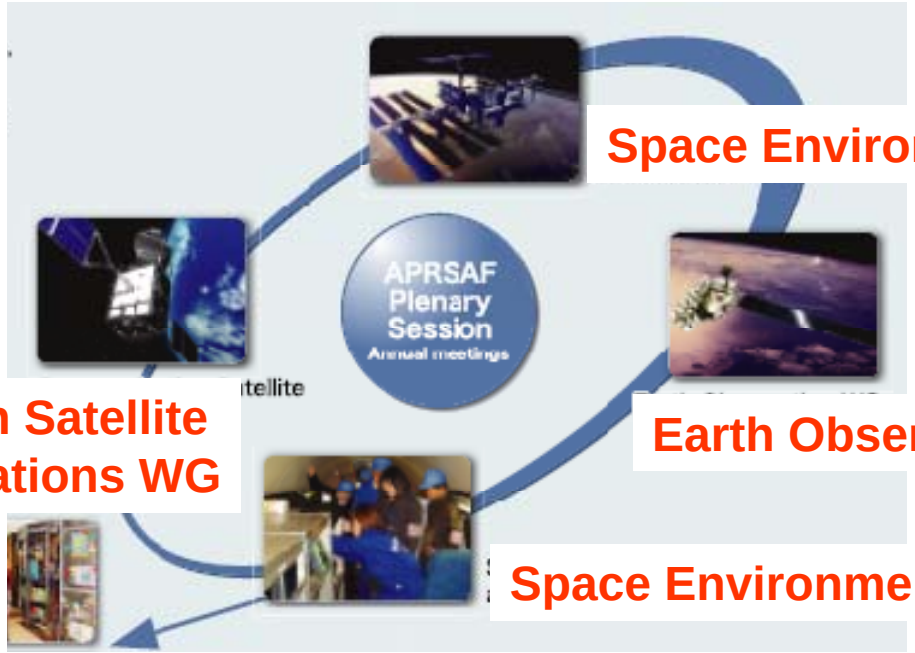
Structure



Space Environment Utilization WG

Communication Satellite Applications WG

Earth Observation WG

Space Environment Utilization WG

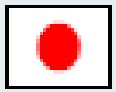
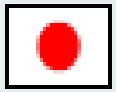
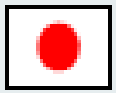
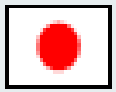
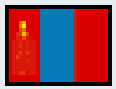
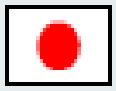
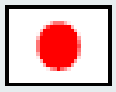
Sentinel Asia
Disaster Management Support System in the Asia-Pacific Region

STAR Program

SAFE
Space Applications For Environment

APRSAF
Asia-Pacific Regional Space Agency Forum

History (1/2)

1st	9-10 Sep. 1993 Tokyo, Japan		<co-host : Science and Technology Agency of Japan (STA), National Space Development Agency of Japan (NASDA), Institute of Space and Astronautical Science, Japan (ISAS)>
2nd	31 Oct.-2 Nov. 1994 Tokyo, Japan		(same as above)
3rd	13-15 Mar. 1996 Tokyo, Japan		(same as above)
4th	17-19 Mar. 1997 Tokyo, Japan		(same as above)
5th	21-23 Jun. 1998 Ulanbator, Mongolia		<co-host : Mongolian National Remote Sensing Center, STA, NASDA, ISAS >
6th	24-27 May. 1999 Tsukuba, Japan		Main Theme : "Application of Space Technology" <co-host : STA, NASDA, ISAS>
7th	19-22 Jun. 2000 Tokyo, Japan		Main Theme : "Easy Access to Space Benefit" <co-host : STA, NASDA, ISAS>

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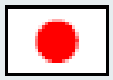
History (2/2)

8th	23-26 Jul. 2001 Kuala Lumpur,		Main Theme : "New Space Age in the Asia and Pacific Region" <co-host: Ministry of Science, Technology and the Environment, Malaysia (MOSTE), Malaysian Centre for Remote Sensing (MACRES) , MEXT, NASDA, ISAS>
9th	25-27 Mar. 2003 Daejeon, Korea		Main Theme : "Beneficial Space Application for the Region" <co-host: Ministry of Science and Technology, Korea (MOST), Korea Aerospace Research Institute (KARI) , MEXT, NASDA, ISAS>
10th	14-16 Jan. 2004 Chiang Mai, Thailand		Main Theme : "Toward Promoting Cooperation on Space Application in Our Region" <co-host: Ministry of Science and Technology, Thailand (MOST), Geo-Informatics and Space Technology Development Agency, Thailand (GISTDA), MEXT, JAXA>
11th	3-5 Nov. 2004 Canberra, Australia		Main Theme : "Toward Expansion of the Space Community" <co-host: Australian Cooperative Research Centre for Satellite Systems (CRCSS), MEXT, JAXA>
12th	11-13 Oct. 2005 Kitakyushu, Japan		Main Theme : "Maximizing Space Benefits for the Society" <co-host: MEXT, JAXA>
13th	5-7 Dec. 2006 Jakarta, Indonesia		Main Theme : "Work Together, Building a Secure and Prosperous Society" <co-host: Ministry of Research and Technology, Indonesia (RISTEK), National Institute of Aeronautics and Space, Indonesia (LAPAN), MEXT, JAXA>
14th	21-23 Nov. 2007 Bangalore, India		Main Theme : "Space for Human Empowerment" <co-host: Indian Space Research Organisation (ISRO), MEXT, JAXA>
15th	9-12 Dec. 2008 Hanoi & Ha Long Bay, Vietnam		Main Theme : Space for Sustainable Development" <co-host: Ministry of Science and Technology (MOST), Vietnam Academy of Science and Technology (VAST), MEXT, JAXA>

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APRSAF-15

9-12, Dec 2008
in Hanoi and Ha long Bay, VIETNAM
VAST, MOST, MEXT, JAXA

"Space for Sustainable Development"

Prof. Nguyen Khoa Son
Chairman, NRPSST, Vietnam

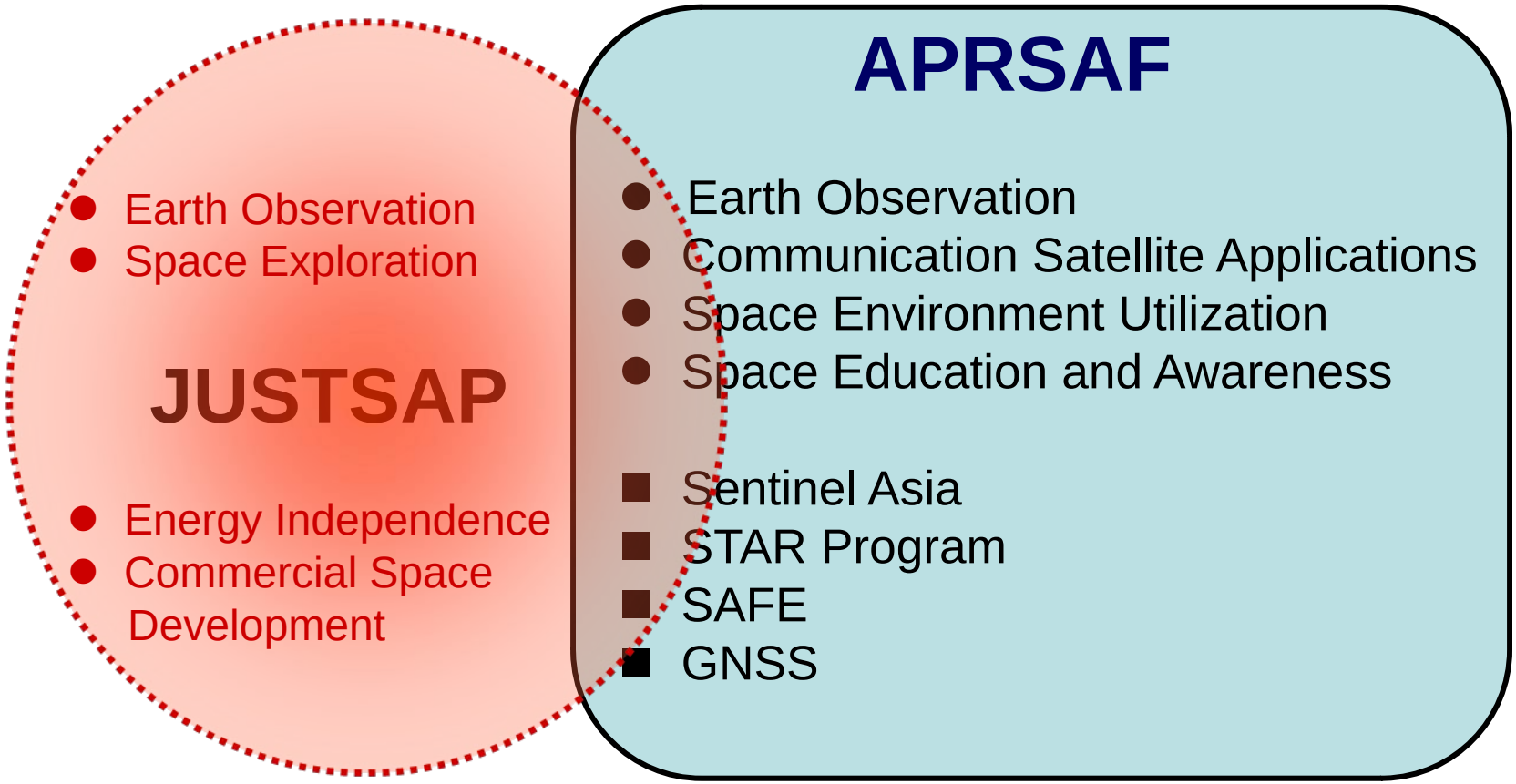
Prof. Hiroki Matsuo
Chairman, SAC, MEXT, Japan

Prof. Chau Van Minh
President, VAST, Vietnam

APRSAF
Asia-Pacific Regional Space Agency Forum

APRSAF-16, 2010

Are there any collaboration possibilities ?



Back Up Charts

Sentinel Asia

APRSAF
Asia-Pacific Regional Space Agency Forum

The Sentinel Asia (SA) initiative is collaboration between space agencies and disaster management agencies, applying remote sensing and Web-GIS technologies to assist disaster management in the Asia-Pacific region. It aims to:

- Improve safety in society by ICT and space technology
- Improve speed and accuracy of disaster preparedness and early warning
- Minimize the number of victims and social / economic losses.

SA is a voluntary and initiative led by the Asia-Pacific Regional Space Agency Forum (APRSAF) to share disaster information in near-real-time across the Asia-Pacific region, using primarily the Digital Asia (Web-GIS) platform. Its architecture is designed to operate initially as an internet-based, node-distributed information distribution backbone, eventually distributing relevant satellite and in situ spatial information on multiple hazards in the Asia-Pacific region.

A step-by-step approach for implementation of this dissemination system was adopted as follows:

Step 2 - Expansion of the dissemination backbone with new satellite communication systems, and enhancement of activities based on experiences in Step1 and new requirements (2008-2012)

Step 3 - Establishment of a comprehensive disaster management support system (2013 onwards)

SA Step1 has achieved its overall goals. The Sentinel Asia website has operated since October 2006. It has served as a good demonstrator project, to share disaster-related information obtained by several Earth observation satellites such as Advanced Land Observing Satellite (ALOS), Indian Remote Sensing Satellites (IRS), Multi-functional Transport Satellite 1R (MTSAT-1R), Terra and Aqua. It also demonstrates recent advances in web-mapping technologies and ICT systems.

SA Step 2 has recently been initiated with the following principles and objectives:

- A contribution from the space community (APRSAF) to disaster management in the Asia-Pacific region
- To promote utilization of disaster-related information obtained by space and remote sensing technology in order to mitigate and prevent damage caused by natural disasters

tually distributing relevant satellite and in situ spatial information on multiple hazards in the Asia-Pacific region.

A step-by-step approach for implementation of this dissemination system was adopted as follows:

Step1 - Implementation of the backbone Sentinel Asia data dissemination system as a pilot project, to showcase the value and impact of the technology standard internet dissemination systems (2006-2007)

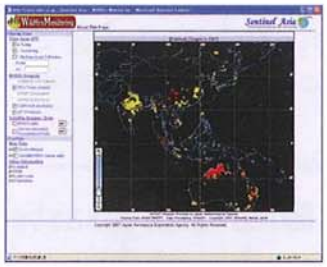
disaster management in the Asia-Pacific region

- To promote utilization of disaster-related information obtained by space and remote sensing technology in order to mitigate and prevent damage caused by natural disasters
- To strengthen and succeed Step1, considering the findings and achievements of Step 1 and users' needs
- A voluntary initiative through the new Joint Project Team

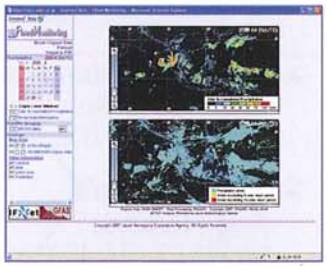
Sentinel Asia website

Top Page


Satellite Imagery with Map Data


Hotspot Information for Wildfire Monitoring


Geostationary Satellite Imagery


Precipitation Information for Flood Monitoring

Sentinel Asia provides disaster-related Information such as satellite imagenry and satellite data products through its website
Source: **http://dmss.tksc.jaxa.jp/sentinel**

SAFE

Space Applications For Environment

APRSAF

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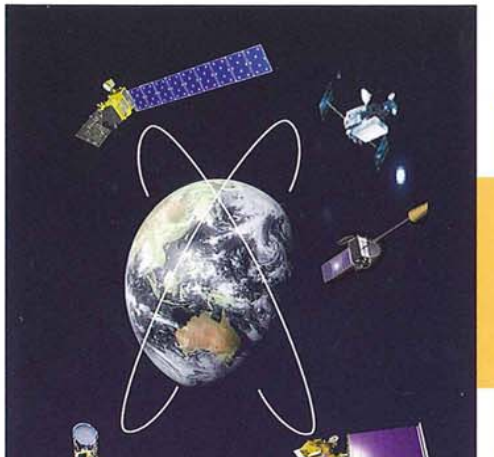
■ **Climate change** and **Human activities** accelerate hazards, such as deforestations, land slides, draughts, floods in Asian-Pacific countries.

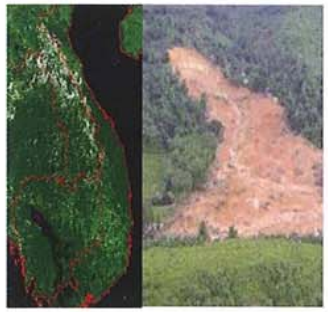
● To mitigate the hazards due to climate change and human activities, environmental monitoring has become important. Monitoring of the condition of Land, Air, Ocean, and Water Resources (LAOWR)

- Monitoring of the condition of Land, Air, Ocean, and Water Resources (LAOWR)
- To determine the threshold between normal and abnormal is important.
  And the threshold itself could change with climate change and human activities.

EO satellites



Datasets For Environmental Monitoring

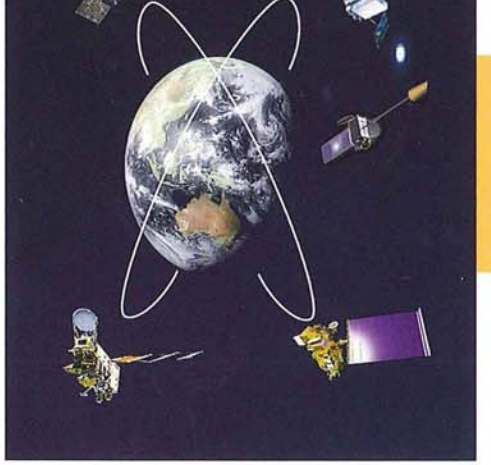


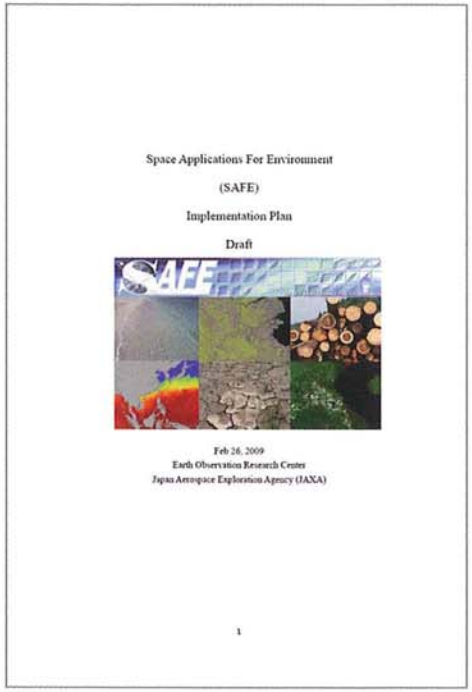
Land Use
Land Cover

Social Benefits in Asia-Pacific

Water

Weather




Space Applications For Environment

(SAFE)

Implementation Plan

Draft

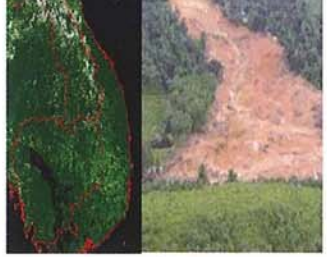
Feb 26, 2009

Earth Observation Research Center

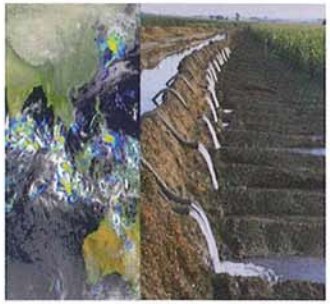
Japan Aerospace Exploration Agency (JAXA)

1

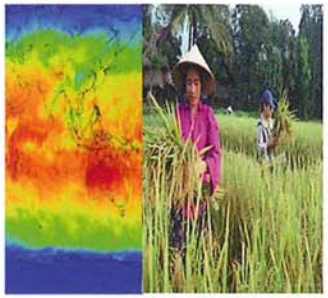
SAFE Implementation Plan (IP)



Land Use
Land Cover



Water Resources



Photosynthetically
Active Radiation

Datasets
provided by
Partner agencies
In Asia-Pacific

Water

Weather

Ecosystems

Energy

Climate

Health

Agriculture

Biodiversity

APRSAF Space Environment Utilization Working Group (SEU WG)

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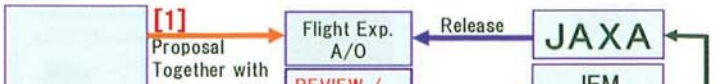
Cooperation schemes and potential joint-research subjects utilizing the space environment are discussed in the Space Environment Utilization Working Group (SEU-WG). India, Indonesia, Japan, the Republic of Korea, Malaysia, Thailand and Vietnam are presently active members of the session. Considerations have been made to realize joint on-board experiments in "Kibo" . Feasibility studies are now in progress.

The opportunity for on Board Experiment

Fig. 1. illustrates various access routes to reach "Kibo" utilization. Users in Asia-Pacific region, or any part of the world, will be able to find matching principal investigator in Japan to participate in "Kibo" utilization in collaboration with. Or one can utilize "Kibo" by bearing the cost. However, the most realistic way for researchers will be to contact the space agency of their own country.

JAXA announced the opportunity for "Kibo" utilization for Asian colleagues at the 13th meeting of APRSAF. The collaborative utilization is assumed to be bilateral, balanced, mutually beneficial, and reciprocal. JAXA will allocate the utilization resource for cooperation. The collaborating Asian counterpart is expected to contribute proportionately. Development of mission unique equipment, or small payload, will be an example of such contribution.



scheduled until 2012, and the first experiment was launched on July 24, 2009. The National Space Agency of Malaysia (ANGKASA) participates in this experiment as a collaborator of JAXA .

Fig. 2. JAXA PCG Cell Unit on PCRF in "Kibo"

Collaboration with Asian astronauts

ANGKASA sent the first Malaysian astronaut (Angkasawan) to the ISS in October 2007. He carried a small dosimeter,

Asian counterpart is expected to contribute proportionately. Development of mission unique equipment, or small payload, will be an example of such contribution.

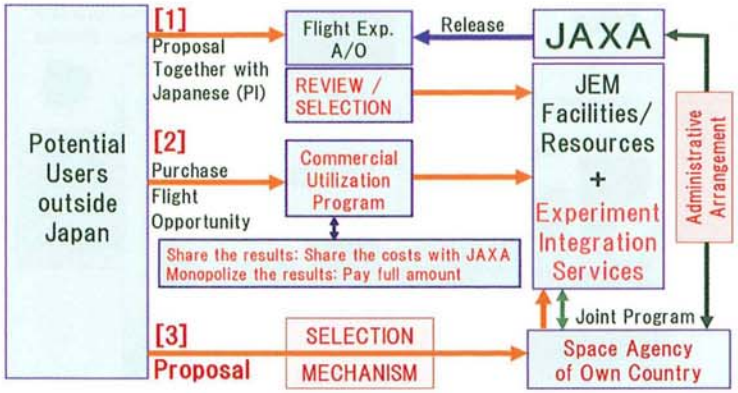


Fig.1. Access routs to "Kibo" experiment

Feasibility study

JAXA and Asian counterpart will jointly select candidate missions. The selected missions will be studied to verify, to strengthen, and to refine: (a) Justification for the experiment purpose; (b) Necessity for implementation in space; (c) Hypothesis and validation methodology; and (d) Requirement for experiment equipment on orbit. Currently, JAXA and the Korea Aerospace Research Institute (KARI) is conducting review process of potential candidates.

Protein Crystallization Project

JAXA, in cooperation with FSA (Federal Space Agency of Russia), is conducting 'High Quality Protein Crystal Growth Project" (JAXA PCG) utilizing Protein Crystallization Research Facility (PCRF, Fig. 2) in "Kibo". Six flights are

Fig. 2. JAXA PCG Cell Unit on PCRF in "Kibo"

Collaboration with Asian astronauts

ANGKASA sent the first Malaysian astronaut (Angkasawan) to the ISS in October 2007. He carried a small dosimeter, Crew PADLES, for measuring his own exposure to the space radiation. Crew PADLES is a passive dosimeter developed by JAXA. Although the core dosimeter, PADLES, has experienced number of space flights, it was the first time for the Crew PADLES. It was beneficial for JAXA also because engineering data required for further improvement of the system have been obtained.

Fig.3. Angkasawan Dr. Sheikh holds Crew PADLES
Photo courtesy of ANGKASA

In April 2008, the KARI sent the first Korean astronaut Ms.Yi So-Yeou to the ISS. She carried Crew PADLES too. In addition, JAXA cooperated with KARI and NASA to downlink the high-definition television images taken during her stay at the ISS.

STAR Program

APRSAF
Asia-Pacific Regional Space Agency Forum

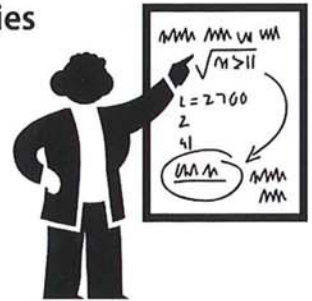
Objects of STAR (Satellite Technology for Asia-Pacific Region) program

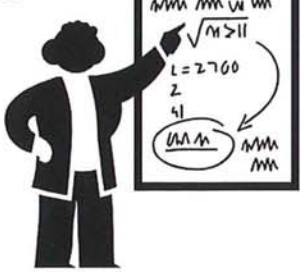
1. Opportunity of capacity building for Space Agency staffs of APRSAF community
2. Increase number of Earth Observation satellites to satisfy the needs in Asia-Pacific region in future

STAR program participants

APRSAF community ASEAN Secretariat ASEAN-SCOSA, ADRC, AIT, AP-MCSTA, APSCC, ESA, ICIMOD, ISU, MRC, UNCOPUOS,UNESCAP, UNESCO, UNHABITAT, UNOOSA

STAR program activities





Lectures & Consultations

JAXA Professors & Experts,
JAXA retired
RESTEC
Satellite company experts

ISRO, GISTDA, KARI experts

Capacity building for project members

JAXA SCOAP
(Space Coopration office for Asia-Pacific Region

Contracted engineers

Interpreter & Logistics support

STAR program participants

Organization A

Organization B

Organization C

Organization D

Project office at JAXA Sagamihara campus

Satellite Technology Seminar for participants

#	Theme	Japan				India	Thailand	Korea
		JAXA	RESTEC	Company	Univ.	ISRO	GISTDA	KARI
1	Guidance for Sat Tech Seminar	○						
2	Optical Sensor 1			○				
3	Digital Circuit Design	○						
4	System Engineering methodology 1	○						
5	Satellite Test Procedures	○						
6	Rocket Interface	○						
7	Power Supply System	○						
8	Imager Sensors	○						
9	Remote Sensing Applications						○	
10	Control Electronics					○		
11	Control Dynamics (including software design)					○		
12	Optical Sensor 2			○				
13	Methodology of EO sat. mission requirement and definition		○					
14	Reliability and Quality Management			○				
15	Frequency Management	○						
16	System Engineering methodology 2				○			
17	Satellite System Architecture	○						
18	Communication System Design	○						
19	Orbit Design	○						
20	Determination of Satellite position	○						
21	Structure Design	○						
22	Thermal Design							○
23	Electric Charge Analysis and Radiation Hard Design	○						
24	Outline of Launch Preparation	○						
25	Outline of Ground Station Interface	○						
26	Examples of Micro Satellites	○						
27	Operation Practice of Small Satellites	○						
28	Assembly of Small Satellite Training Kit	○						

Practice of Embedded System Development

Lecture of Rocket Interface

Lecture of Satellite Test Procedure by JAXA expert

Practice of Attitude control dynamics using MATLAB/Simulink by ISRO expert

Practice of Satellite Orbit Calculation

Practice of FPGA programming by ISRO expert

APRSAF Communication Satellite Application Working Group (CSA WG)

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Asia-Pacific Regional Space Agency Forum

The APRSAF CSA WG is an opened working group to find way to solve the digital divide issues as well as broadband service in Asia-Pacific region. The CSA WG share the experiences to realize cooperation among participating countries in this region, regarding applications of satellite communication for tele-education, tele-medicine and disaster management, taking into account the needs to resolve the digital-divide in the Asia-Pacific region.

CSA WG at APRSAF-15

Participants

APSCC

UN-HABITAT

Meeting Summary

- The major focuses during the deliberations and

General Conclusion

- The Asia-Pacific region still has a digital divide

Meeting Summary

- The major focuses during the deliberations and the presentations were;
- on the use of Communication Satellites and associated technologies for addressing the digital divide issues,
- on the future potential collaborations related to the Global Navigation Satellite System (GNSS) applications in the region.
- Three satellite systems, VINASAT-1, WINDS and QZSS, and their applications were introduced.
- Current situation on the communications satellite market and the associated technologies were presented.
- Country reports were presented by the respective agencies from India, Korea, Indonesia, Thailand and Mongolia.
- There were detailed questions and answers session subsequent to each presentation.
- As a part of the concluding session a brain storming discussion was conducted.

General Conclusion

- The Asia-Pacific region still has a digital divide and in particular there is an imminent need for applications of Tele-education and Tele-medicine for the rural, remote and islands areas.
- Communication Satellites can play a major role in mitigating the risks and aiding disaster management support and relief requirements.
- Many countries in this region have independent national plans and programs for their respective countries in these areas of SATCOM and GNSS applications.
- There are some possibilities to use the multi GNSS in order to enhance the GNSS applications in the region.
- Collaboration is progressing steadily between countries of this region including the satellite communications experiments using the WINDS satellite.

APRSAF Secretariat
c/o Japan Aerospace Exploration Agency
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Tel : 81-50-3362-5880 Fax : 81-3-6266-6908
secretariat@aprsaf.org http://www.aprsaf.org

APRSAF Earth Observation Working Group (EO WG)

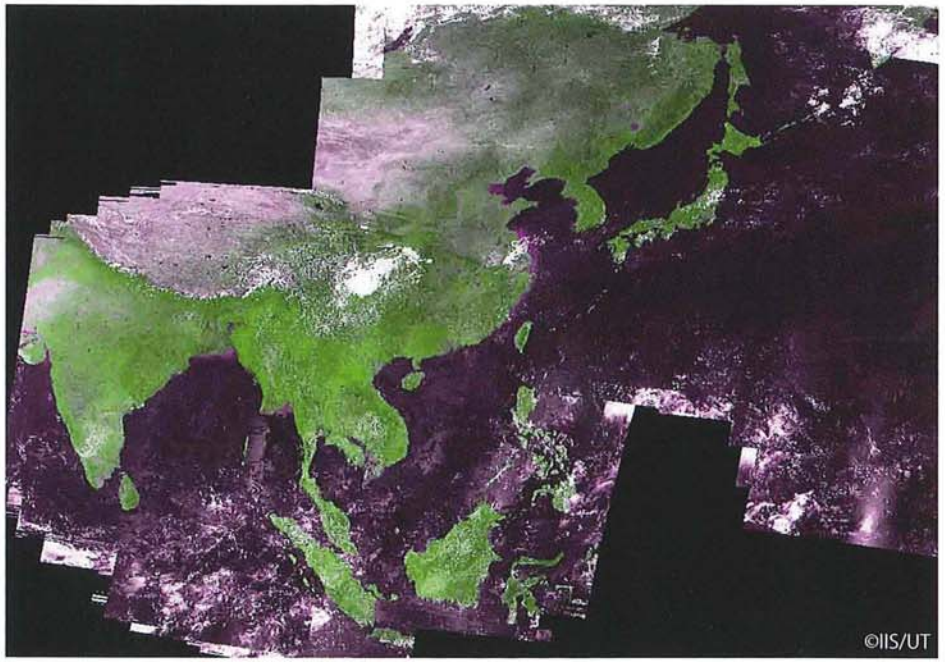
APRSAF
Asia-Pacific Regional Space Agency Forum

Objectives

Discussing comprehensive topics on Earth observation activities in the Asia-Pacific region, and providing good opportunities to study a global network of space-based systems to promote global environmental research, natural disaster mitigation and other practical data applications.

Missions

- Understand use of EO technologies to monitor Earth's environment and exchange EO activity information
- Sentinel Asia initiative
- SAFE (Space Applications For Environment) Initiatives



MODIS Asian Mosaic Data

KAGUYA HDTV Earth Rise

History

1) APRSAF-11 in 2004, the EO WG has begun. APRSAF-11 Side Event/Technical Workshop "Satellite Application for Effective Disaster Reduction" (2 November 2004)
2) APRSAF-12 Earth Observation Working Group(11-13 October 2005). Technical Workshop "Disaster Reduction through Effective Space Technology Utilization in the Asia Pacific Region" (24-26 May 2005). Recommend "Sentinel Asia" pilot projects implementation.
3) APRSAF-13 Earth Observation Working Group (6 December 2006) Special Session on "Establishment of a Joint Project Team for Disaster Reduction through Effective Space Technology Utilization in the Asia Pacific Region"(12 October 2005)
4) APRSAF-14 Earth Observation Working Group(November 21-23, 2007)
5) APRSAF-15 Earth Observation Working Group(December 9 -12, 2008). Recommend that Space Application for Environment (SAFE) as a platform for development of solution-oriented prototype systems for environmental monitoring

APRSAF Space Education and Awareness Working Group (SEA WG)

APRSAF
Asia-Pacific Regional Space Agency Forum

Background and objectives

Recognizing the need to strengthen efforts to use space materials to enhance the quality of education for young people and also to increase public awareness of the usefulness and importance of space science and technology and their applications for the society, APRSAF at its 8th session, in July 2001, established the Space Education and Awareness Working Group with the aim of: i) effectively using space materials to enhance education for young people; ii) providing education and training opportunities for young people in space science and technology; iii) contributing to enhancing mutual understanding among countries in the region through exchange opportunities for young people; and iv) increasing public awareness of the societal benefits and importance of space activities.

Membership

The Working Group is currently composed of members from the following 17 countries and 4 international entities: Australia, Bangladesh, Cambodia, India, Indonesia, Japan, Kazakhstan, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Vietnam, Asian Institute of Technology, the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS) and the United Nations Office for Outer Space Affairs (UNOOSA).

Working Group meeting during APRSAF-15

Joint Activities

Starting from 2004, the Working Group began to take concrete actions to achieve its objectives. To date, the Working Group has undertaken the following education activities.

Working Group meeting during APRSAF-15

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Water Rocket Event for young people

The Working Group has organized the Water Rocket Event each year since 2005, immediately following the APRSAF session. Attended by 20–30 students from about 10 countries, selected through national competitions, the Water Rocket Event has provided opportunities for young people between 12 and 16 years old not only to learn about basics of rocket science as well as space activities in general and to turn their knowledge into practice by making and launching their water rockets for better results, but also to learn about other countries and their cultures and to build lasting friendship beyond national borders based on common interest in space subjects. The next Event is planned to be held in Bangkok, Thailand, on 23 and 24 January 2010, immediately preceding APRSAF-16.

Ha Noi, Vietnam, December 2008

Kitakyushu, Japan, October 2005

Jakarta, Indonesia, December 2006

Bangalore, India,November 2007

ASIA-PACIFIC REGIONAL SPACE AGENCY FORUM(APRSAF) POSTER CALENDAR : WONDERS OF THE UNIVERSE