

# AOSWA *Link*

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By Kenji Nakayama, Space Environment Laboratory  
Applied Electromagnetic Research Institute, NICT

## **Your contributions are always welcomed!**

If you wish to submit an article, you are greatly appreciated. The articles should be approximately 500 words and contain either figures or pictures. It is also available for use as a means of spreading information, such as upcoming conference and so on. Your feedbacks are always welcomed.

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# EVENT REPORT

## 2019 Taiwan Geosciences Assembly (TGA)

I-Te Lee, Researcher, Space Weather Operational Office,  
Central Weather Bureau

Over the past few decades, people and infrastructures in Taiwan are vulnerable to typhoons, earthquakes, and other natural disasters. Many researches, applications, and systems are conducted in order to understand the cause of these natural hazards and further prevent their damages. Therefore, the joint conference so call Taiwan Geosciences Assembly (TGA) is conducted every three year in Taiwan to gather experts and scholars from various research area, involving, Atmospheric Science, Geodesy, Geography, Geology, Geophysics, Hydrology, Oceanic Science, Space Science, and science education.

This year, the “2019 Taiwan Geosciences Assembly” was held at the Taipei World Trade Center Nangang Exhibition Hall, Taipei, Taiwan, from May 14th to 17th, 2019. More than 2000 local and international participants were having

lots of lectures, posters, and in-depth discussion in 14 geoscience-related meetings and forums during this conference. In addition to scientific communication, many exhibitions are provided at the “Popular Science Area” for outreach education.

At the opening Ceremony, Prof. Jann-Yenq (Tiger) Liu, director of Center for Astronautical Physics and Engineering (CAPE), National Central University gave a keynote speech about the FORMOSAT-7 mission. The six FORMOSAT-7 satellites were launch on June 25, 2019, and will provide dense radio occultation measurements at the lower and equatorial latitudes for atmospheric and ionospheric sciences. It expect to make great improvement for weather and space weather monitoring, nowcasting, and forecasting.

Figure 1: The registration site of 2019 TGA



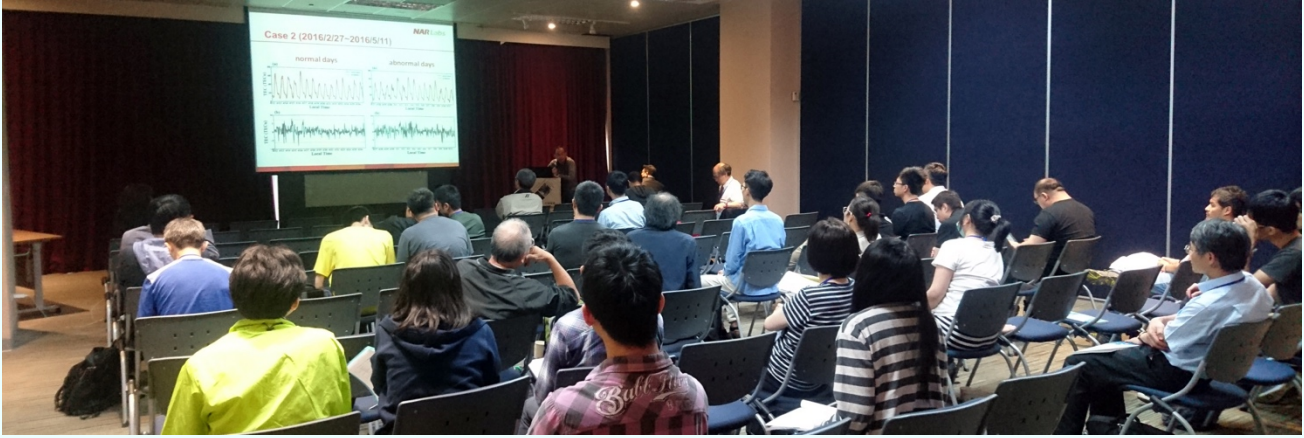


Figure 2: Audiences of the International Conference on Space weather

Three topics related to AOSWA associates are the “Satellite Missions for Space Science”, “International Conference on Space weather”, and “Sounding Rocket Application Forum”. They were hosted to report results and activities of space weather research and operation.

At the Satellite Missions for Space Science, speakers mentioned about ongoing cube satellite projects in the university to explore the space environment, and reported successful results made by Taiwan's satellite missions including ISUAL/FORMOSAT-2, GOX/FORMOSAT-3 and AIP/FORMOSAT-5. Furthermore, Dr. Katelynn Greer presented the recently successful global ionosphere observation at geosynchronous orbit by GOLD mission.

The International Conference on Space weather took two days within more than 30

presentation to cover space weather research and operation, from the Sun, interplanetary field, the Earth’s magnetosphere, ionosphere, neutral atmospheric coupling, and advanced scheme as data assimilation and machine learning.

Dr. Mamoru Ishii from National Institute of Information and Communications Technology (NICT) was invited to give two presentations in this conference.

The first presentation is entitled “Global Streams of Space Weather Research and Operation and the Role of Asia”, which is about the impact assessment and international activities of space weather as well as around Asia-oceanic region to start the first day session. The other one is “Recent Japanese Space Weather Research and Operation Activities”, which more focus at space weather operation at NICT on the second day.

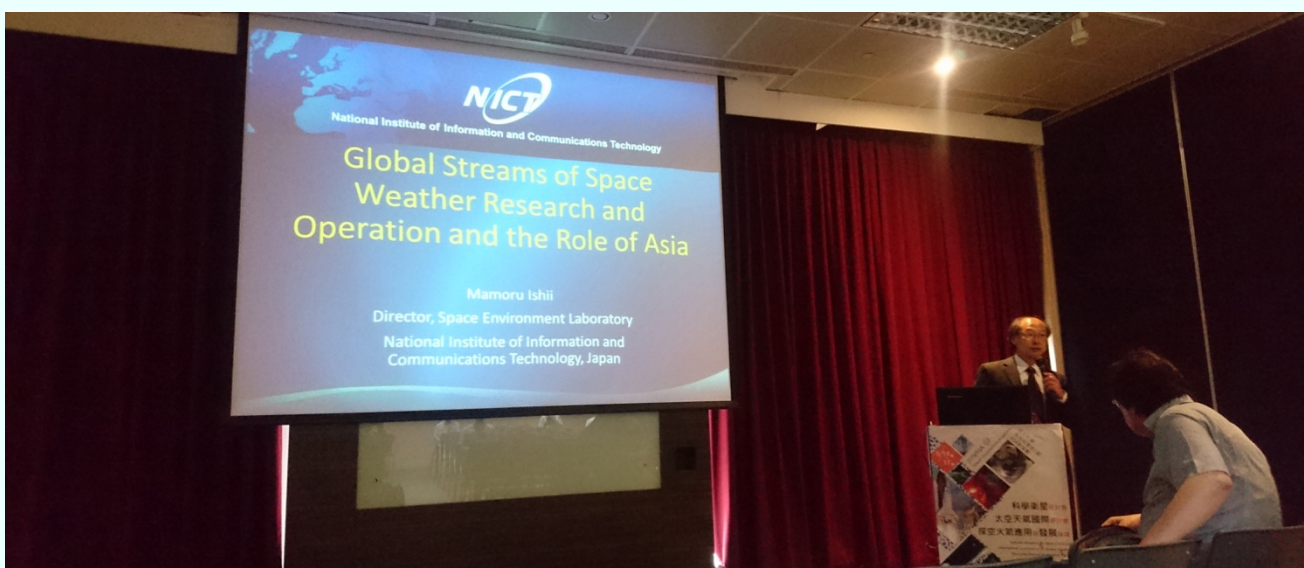


Figure 3: Dr. Ishii gave the first presentation of the International Conference on Space weather.





Figure 4: The National Space Organization (NSPO) of the National Applied Research Laboratory demonstrated FORMOSAT-7 model and provided lectures at the Popular Science Area of 2019 TGA.

Meanwhile, I also gave a presentation entitled “Space Weather Models for Operation in Taiwan” mainly about the models which are operated at the Space Weather Operational office, Central Weather Bureau to provide forecast and service for magnetopause, ionospheric scintillation and electron density. Before the end of my talk, a new developing research-to-operation (R2O) transition procedure by virtual machine technic was also introduced. We are seeking more collaboration between operational office and scientific group. However, it is difficult to transfer well developed software and/or system from research teams due to environmental conflicts. Thus, we proposed this procedure to shorter the time for transition

process and lower the conflict between two different system environments.

In summary, Taiwan’s location just right under the equatorial ionization anomaly region as the highest ionospheric electron density, which could influence radio communications and global positioning systems. A large number of great research results and satellite missions are success to investigate the ionospheric morphology and influence. It was a best opportunity to benefit space weather operation and make close partnership of space science community in Taiwan by this fulfil meetings of TGA.



Figure 5: Audiences of Sounding Rocket Application Forum





# EVENT REPORT

## The AOSWA Session and Exhibition Booth at the Asia Oceania Geosciences Society (AOGS) 16th Annual Meeting By Kenji Nakayama, National Institute of Information and Communications Technology (NICT)

From July 28<sup>th</sup> to August 2<sup>nd</sup>, 2019, the Asia Oceania Geosciences Society (AOGS) 16<sup>th</sup> Annual Meeting was held at The Suntec Singapore Convention and Exhibition Centre, Singapore. This year, AOSWA had its own session and the Exhibition Booth at the AOGS. It was intended to have opportunity for lively discussions more frequently when the AOSWA regular workshop is not held. It is also expected to promote our activity, and to encourage many researchers and scholars who attended to the biggest geosciences conference in Asia-Oceania region to join AOSWA associate.

The AOSWA session, entitled as “Space Weather Research and Operation in Asia Oceania” was started in the morning on July 29<sup>th</sup> by the

convener, Dr. Mamoru Ishii from National Institute of Information and Communications Technology (NICT), Japan. The eight speakers presented their activity from various perspectives, such as;

“The Recent Activities of R2O Transition in Korean Space Weather Operation” by Seung Jun OH from SELab, Inc, Korea,

“Current Status of Ionospheric Space Weather Products in Taiwan” by I-Te LEE from Central Weather Bureau (CWB), Taiwan,

“NICT Ionospheric Observations in Japan and Southeast Asia” by Takuya Tsugawa from NICT, Japan,

“Radio Propagation Simulator to Translate Ionospheric Effect on High Frequency Waves” by Kornyanat HOZUMI from NICT, Japan,

Figure 1 & 2: The venue, Suntec Singapore Convention and Exhibition Centre, Singapore







Figure 3: Many participants at the AOGS check in site

“The Relationship Between Equatorial Plasma Bubble and Evening Counter Electrojet Current Measured in West of Southeast Asia” by Nurul Shazana ABDUL HAMID from Universiti Kebangsaan Malaysia,

“ROTI Map Generation over Thailand” by Pornchai SUPNITHI from King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand,

“Low-latitude Ionospheric Irregularities in June Solstice Observed by Equatorial Atmosphere Radar and GPS Receivers” by Prayitno ABADI from Indonesian National Institute of Aeronautics and Space (LAPAN), Indonesia, and  
 “Equatorial Ionosphere Disturbance Index Based on BDS-GEO Data” by Artem PADOKHIN from Lomonosov Moscow State University, Russia.

In spite of starting in the early morning, there were active discussions seems like the regular AOSWA workshop. Approx. 50 participants attended the session, including non-members of the AOSWA associates.

I sincerely would like to introduce that the 8<sup>th</sup> speaker, Assist. Prof. PADOKHIN joined AOSWA associate at this AOGS with his colleague.

After the AOSWA session, the Exhibition Booth was opened on the evening of July 29<sup>th</sup>. Thanks to the Exhibition hall was located at the center of the conference complex, and also used as the venue of Poster session, conference reception on the 1<sup>st</sup> evening, every coffee break and the beer hour, our booth was blessed with a lot of participants about 10 to 20 people per hour.

Figure 4: The AOSWA session, “Space Weather Research and Operation in Asia Oceania”







Figure 5: The AOSWA exhibition booth (Left), Figure 6: Dr. Ishii, NICT Japan, explaining about AOSWA on the “Innovation Theatre”(Right)

This time, five institutes from AOSWA members such as;

- CAS Key Laboratory of Solar Activity, National Astronomical Observatories, Chinese Academy of Sciences
- Korean Space Weather Center
- National Space Science Center, Chinese Academy of Sciences
- Space Weather Operational Office, Central Weather Bureau (CWB)

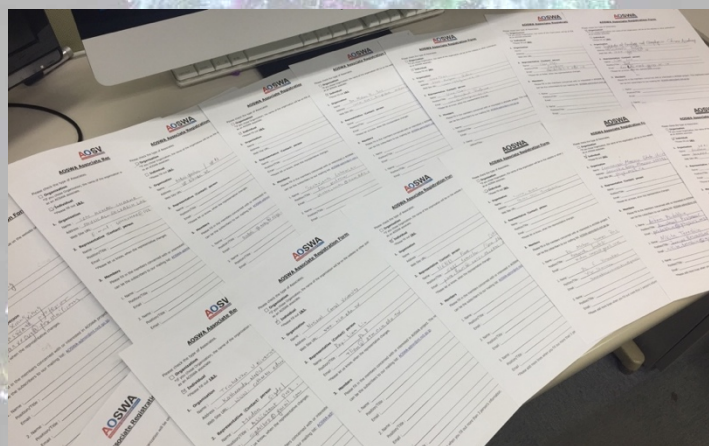
(in alphabetical order)

and NICT provided the exhibition material and screened their slides to explain their activity on behalf of AOSWA community at the booth. Furthermore, in the afternoon on August 1<sup>st</sup>, Dr. Mamoru Ishii presented AOSWA activity on the

stage of “Innovation Theatre”, which is the opportunity of the presentation about the exhibition contents.

Through the period of AOGS, we encouraged AOGS participants to join AOSWA associate by explaining our activity. At this opportunity, totally 17 persons from 10 country joined AOSWA, including newly joined countries such as Bangladesh, Mongolia, Nepal and France. AOSWA was established in 2010 and almost 10 years are about to passing. Now the associate members increase to 212 people from 20 countries and regions. We hope the activity of AOSWA will be more closely and more fruitful through the next decade.

Figure 7: The AOSWA-associate registration sheets from newly joined associates at AOGS





## *Editor's notes*

*Kenji Nakayama, Editor of AOSWA LINK*

*This summer, we had a session and exhibition at AOGS. I hope that we can have more opportunity to discuss, and exchanging the news about current activity each other. I strongly encourage you to utilize this News Letter. If you hope to circulate about your activity or introduction of your institute, please feel free to send an article to us at any time.*

*Now, we are about to starting for the next AOSWA face to face meeting in Malaysia in the next year. I will update you when the plan will be embodied.*

*Sincerely,*

**AOSWA LINK is issued by AOSWA Secretariat**

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**AOSWA**  
Asia-Oceania Space Weather Alliance