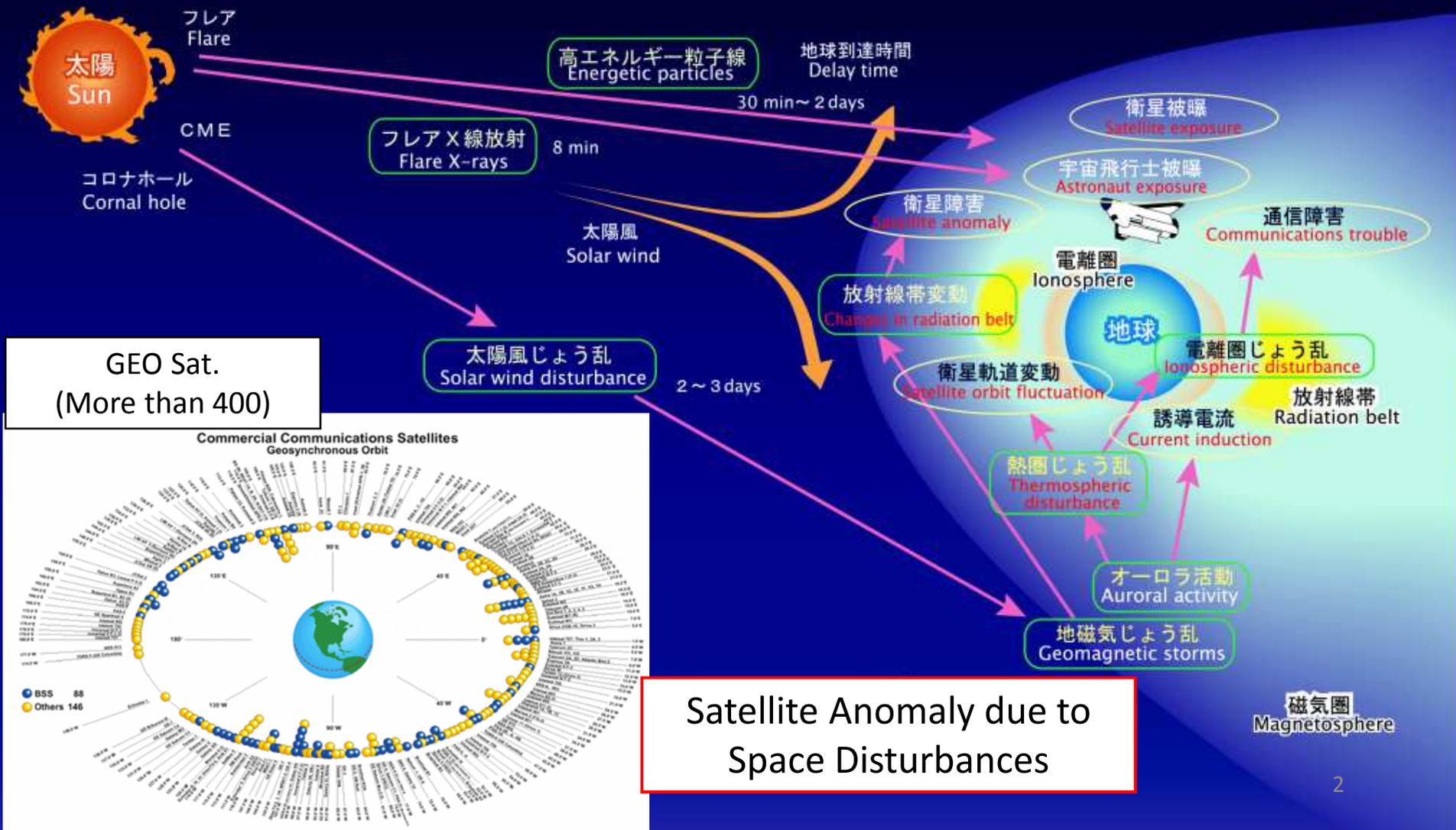


# Recent Activities of NICT Space Weather Research and Operation

Mamoru Ishii

National Institute of Information and  
Communications Technology

# Field of Space Weather

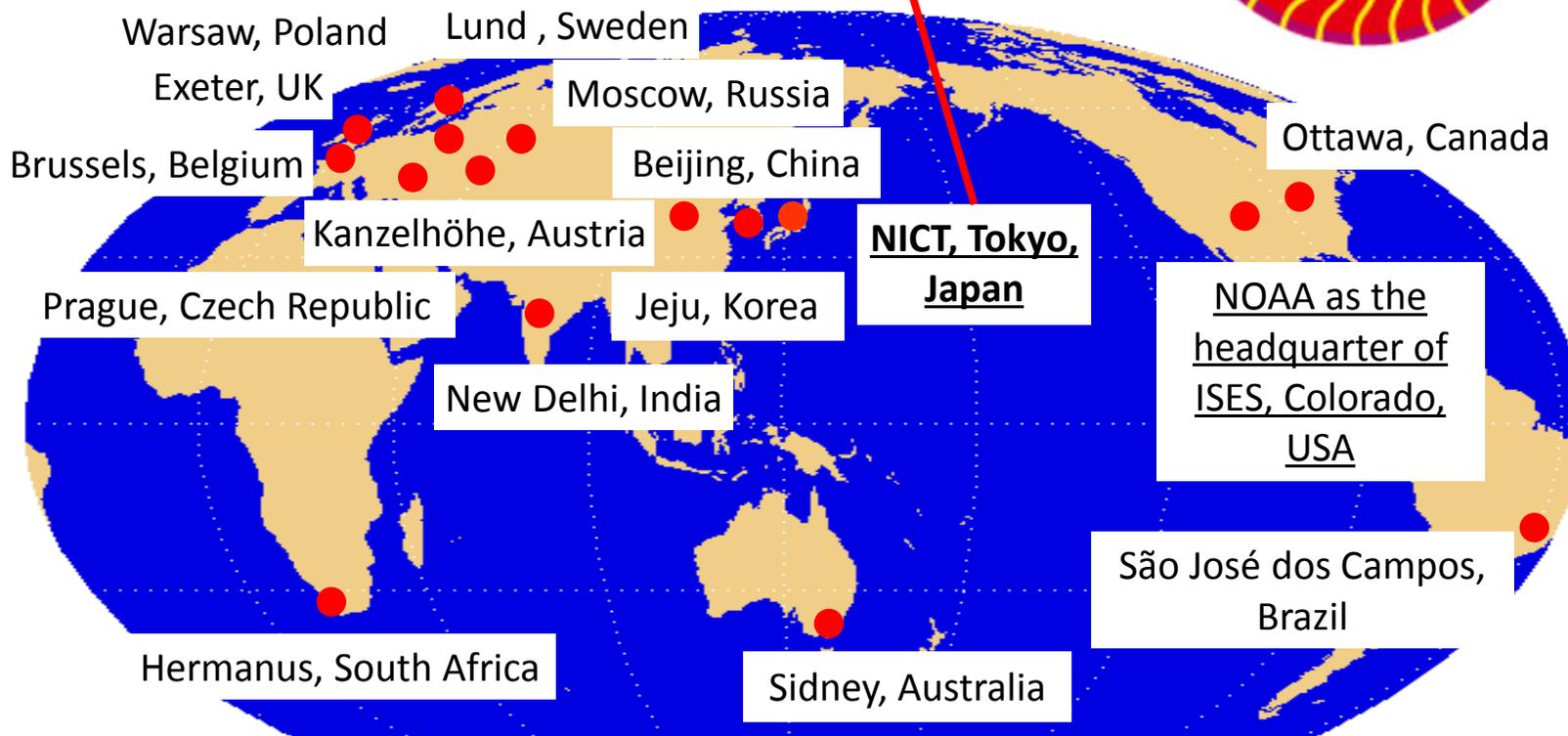


Satellite Anomaly due to Space Disturbances

# ISES: International Space Environment Service

(16 countries and ESA as a Collaborative Expert Center)

- Operational Space Weather Forecast
- Ground-based observations
- Developing original space weather forecasting code



Space weather forecast with international cooperation

# NICT Space Weather Forecast Center

Sharing of forecast information and data exchange among ISES SW forecast centers

Real-time space weather monitoring

Simulation results

Forecasting Parameters

- Flare forecast
- Magnetic field forecast
- High-energy particle forecast
- HF propagation forecast



**NICT Space Weather Forecast Center**

Web access :  
158.057/month  
(May, 2013)  
No. of e-mail  
address : 9,271

Updates on solar activity and the space environment are provided via Web, email RSS and FAX as well as press releases announcing significant events.

Domestic users: satellite operators, aviation offices and companies, power plant companies, HF telecommunication/broadcasters, resource survey, Universities, research institutes and amateur radio.

# NICT SWx Obs. Network

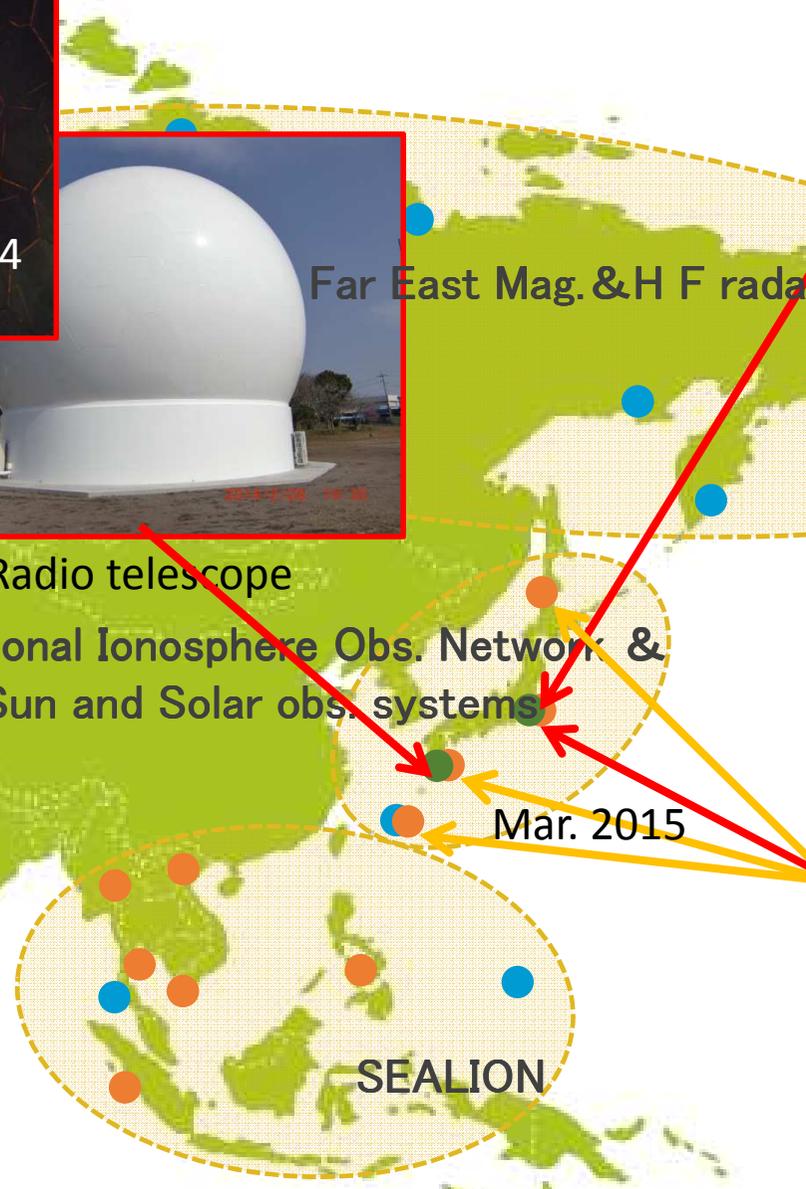


ACE receiver antenna  
● Ionosonde

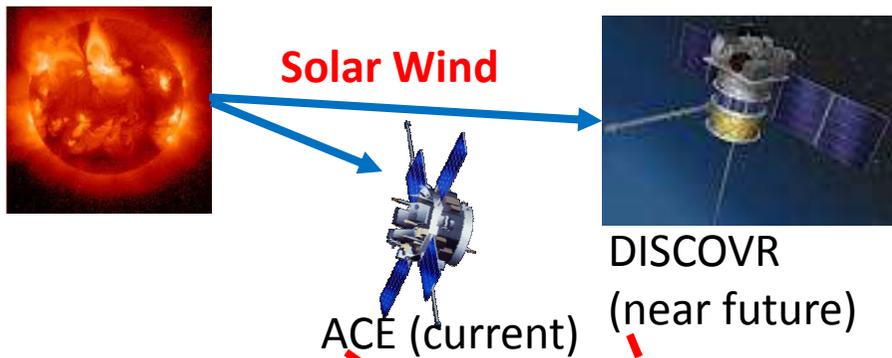
Operational Ionosphere Obs. Network & Sun and Solar obs. systems



New Ionosonde system



# A New Spacecraft Data Reception system



diameter	11.3 m
polarization	RHP/LHP
frequency	S-band (2.2-23.GHz)
3dB beamwidth	0.8 deg.
antenna gain	43.8dBi at 2.25GHz
pointing accuracy	< 0.1 deg.
speed of Az and El axes	> 7.5 deg./s



11.3m Antenna



Rx. & Control System



Modeling, Data Analysis



Information Services

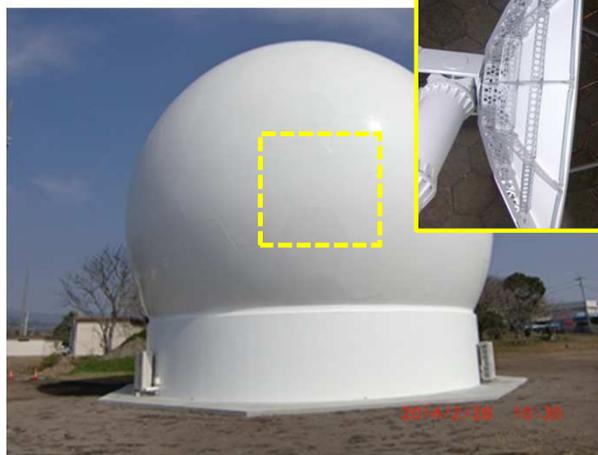
Precise forecast can be provided **one hour ahead** of the occurrence based on the ACE/DISCOVER observation at L1 point.

# A New Broadband Solar Radio Telescope

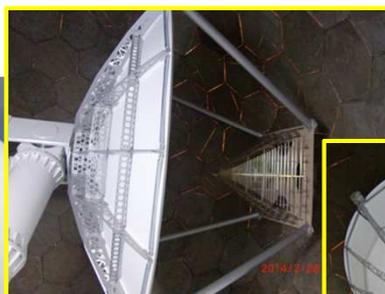
NICT new solar radio telescope (Yamagawa Radio Spectrograph)	
Freq. range	70 MHz~9.0 GHz
Freq. resolution	31.25 kHz (70 MHz~1.0 GHz) 1.0 MHz (1.0 GHz~9.0 GHz)
Time resolution	8 milliseconds

**Widest Bandwidth!**

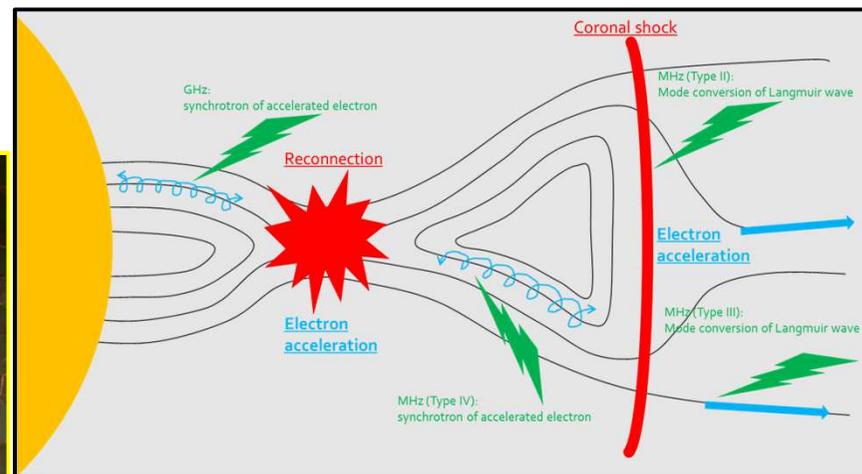
**High-time Resolution!**



20m Radome



8m Antenna



Solar eruptive events with radio bursts

**Extension of the forecast lead time** based on the earlier detection of Eruptive events on the Sun and its effect on the Earth

# Space Environment Data Acquisition Monitor (SEDA) on board Himawari-8,9



Items	Description
Number of Channels	Protons : 8 (individual 8 sensor elements) Electrons : 8 (8 stacked plates in one elements)
Energy Range	Protons : 21.6 MeV – 81.4 MeV Electrons : 0.2 MeV – 4.5 MeV
Time Resolution	10 sec.
Field of View	Protons : $\pm 39.35$ deg. Electrons : $\pm 78.3$ deg.



Longitude:  $\sim 140$  deg.

Himawari-8 Launch: 2014/10/07

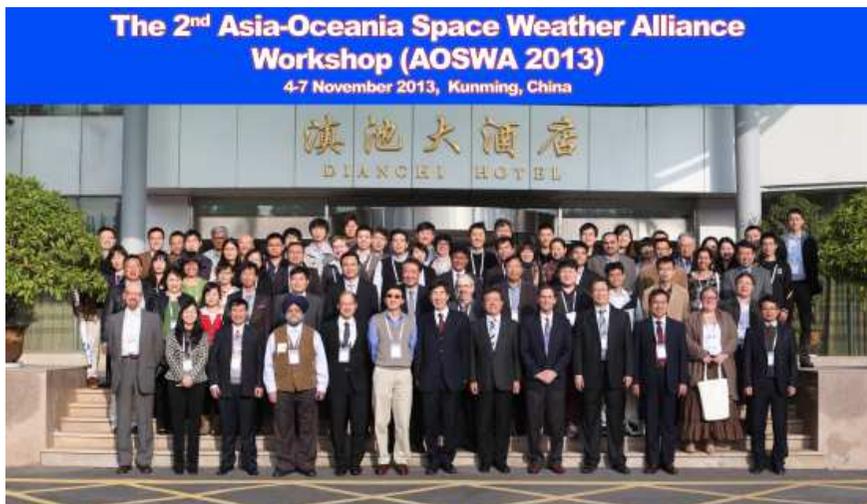
Himawari-9 Launch: 2016 (Plan)

- High-energy particle environment over Japanese sector of GEO is monitored by Himawari/SEDA.
- Near-real time SEDA data will be provided from JMA to NICT. We will provide SEDA data as part of space weather information.

# The 3<sup>rd</sup> AOSWA Workshop

The 3<sup>rd</sup> Asia-Oceania Space Weather Alliance (AOSWA) Workshop will be organized by NICT at Fukuoka, JAPAN during March 2-5, 2015.

The theme of this workshop is “International collaboration on space weather forecast”



Group Photo of the 2<sup>nd</sup> AOSWA Workshop @ Kunming, China

**AOSWA**  
Asia-Oceania Space Weather Alliance

**NICT**

## The 3<sup>rd</sup> AOSWA Workshop

*“International collaboration on space weather forecast”*

2-5 March 2015  
LUIGANS Spa & Resort  
Fukuoka, Japan

**Deadline of Registration: 31 December 2014**  
Registration Fee: 20,000 yen (Student 10,000 yen)  
This workshop will be jointly hosted by UNITED NATIONS/JAPAN Workshop  
See more detail from the workshop website  
[http://aoswa.nict.go.jp/workshop\\_3/](http://aoswa.nict.go.jp/workshop_3/)

**General Chair:**  
Fumihiko Tomita, Chief R&D Strategy Officer, Vice President  
National Institute of Information and Communications Technology, Japan

**Co-Chair:**  
Toshio Iguchi, Director General, Applied Electromagnetic Research Institute  
National Institute of Information and Communications Technology, Japan

**SPS:**  
Mamoru Ishii, National Institute of Information and Communications Technology, Japan  
Za-hra Bouya, IPS Radio & Space Services, Australia  
Siqing Liu, National Space Science Center, China  
A.K. Upadhyaya, CSIR-National Physical Laboratory, India  
Sunhak Hong, Korean Space Weather Center, Korea  
Sergey Smlimov, IKIR FEB RAS, Russia  
Pornchai Supnithi, King Mongkut's Institute of Technology Ladkrabang, Thailand  
Le Trung thanhhp, Vietnam Academy of Science and Technology, Vietnam

sponsored by:  
**NICT** National Institute of Information and Communications Technology

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