

Item 11. Technical Presentation on
"International Center for Space Weather
Science and Education (ICSWSE)
of Kyushu University "



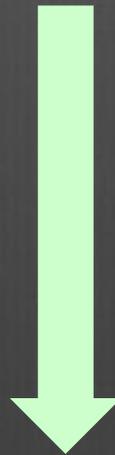
ICSWSE, Kyushu University, JAPAN

Space Environment Research Center (SERC)

April 2002 – March 2012



UNITED NATIONS
Office for Outer Space Affairs



International Center for Space Weather Science and Education (ICSWSE)

April 2012 -

Space Environment Research Center (SERC), Kyushu University, Established in 2002

Roles of SERC

Creation of interdisciplinary geospace
environment science

Basic research of space weather forecast
and space debris warning

Space Environment Research Center (SERC), Kyushu University, Established in 2002

Laboratories in the opening

**Geospace
Environment
Observation Lab.**

**Geospace
Experimental
Simulation Lab.**

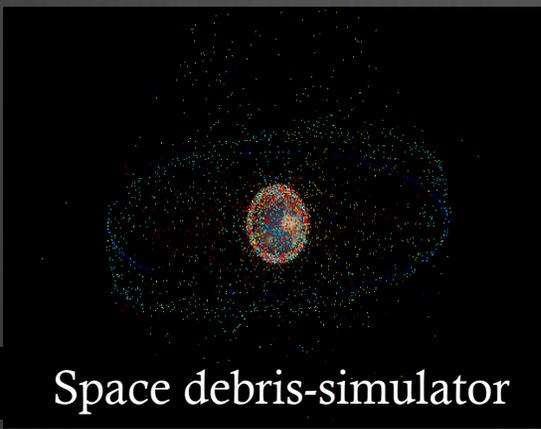
**Integrated Data
Analysis Lab.**

**Geospace Hazard
Simulation Lab.**

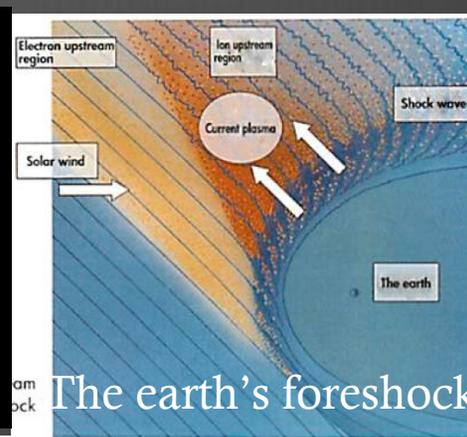
Research activities in SERC



Plasma obs. satellite



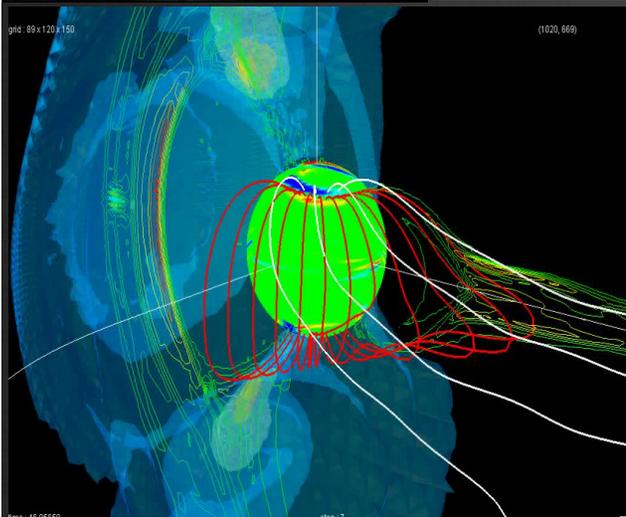
Space debris-simulator



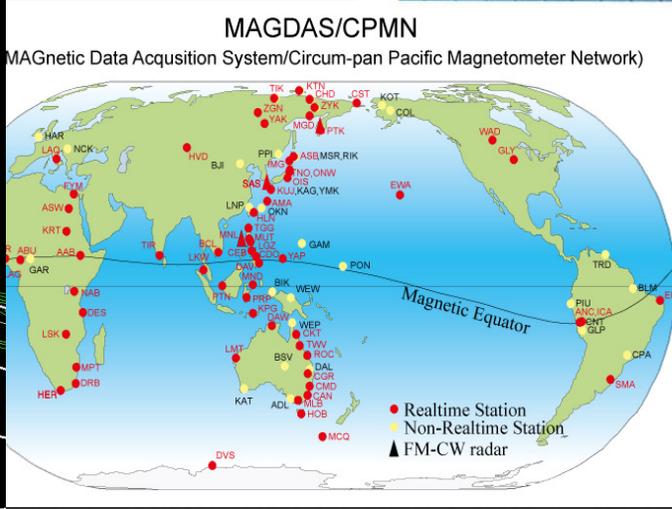
The earth's foreshock



plasma-vortex



Simulation of Auroral storm



MAGDAS/CPMN

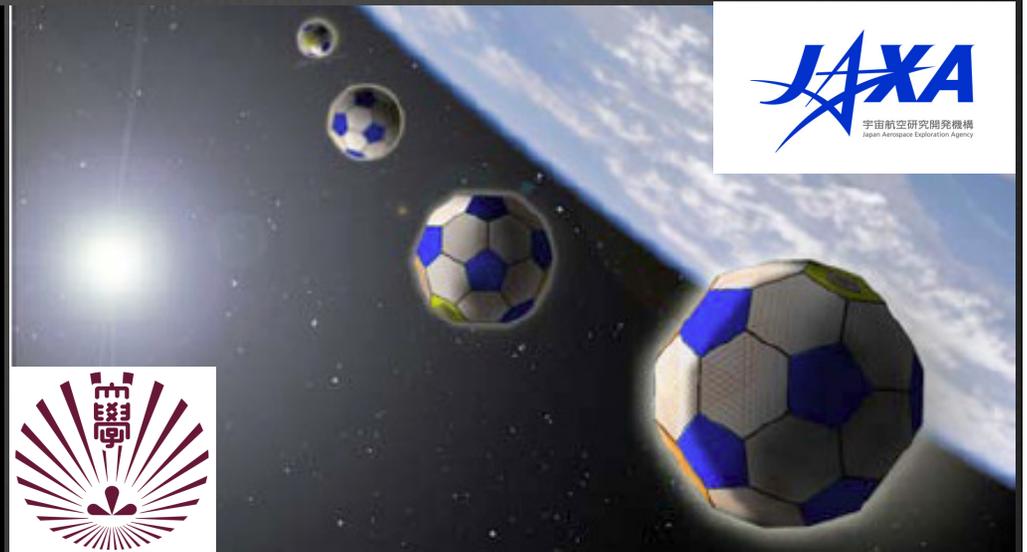
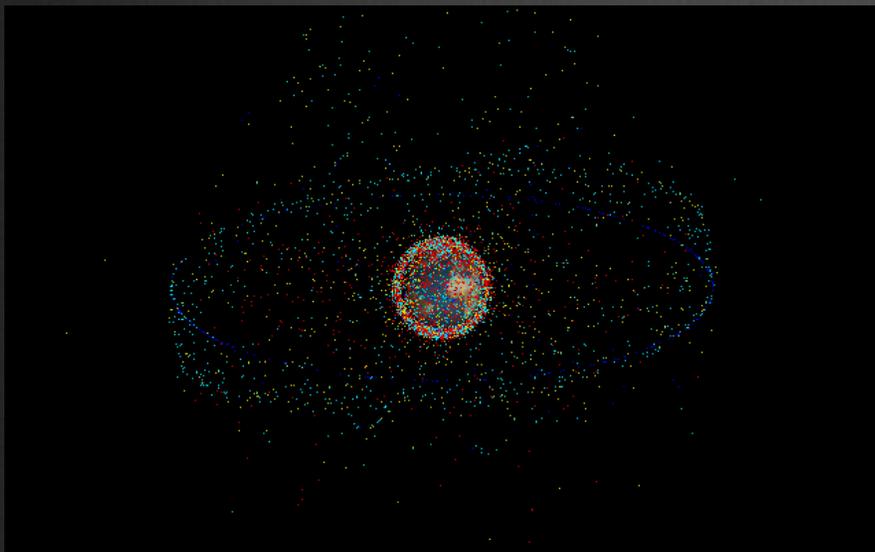


Helicon plasma generator

Space environment monitoring: Space debris

Debris observation and simulation

Kyushu-U. JAXA dust detectors with multi-sub-satellite observation system

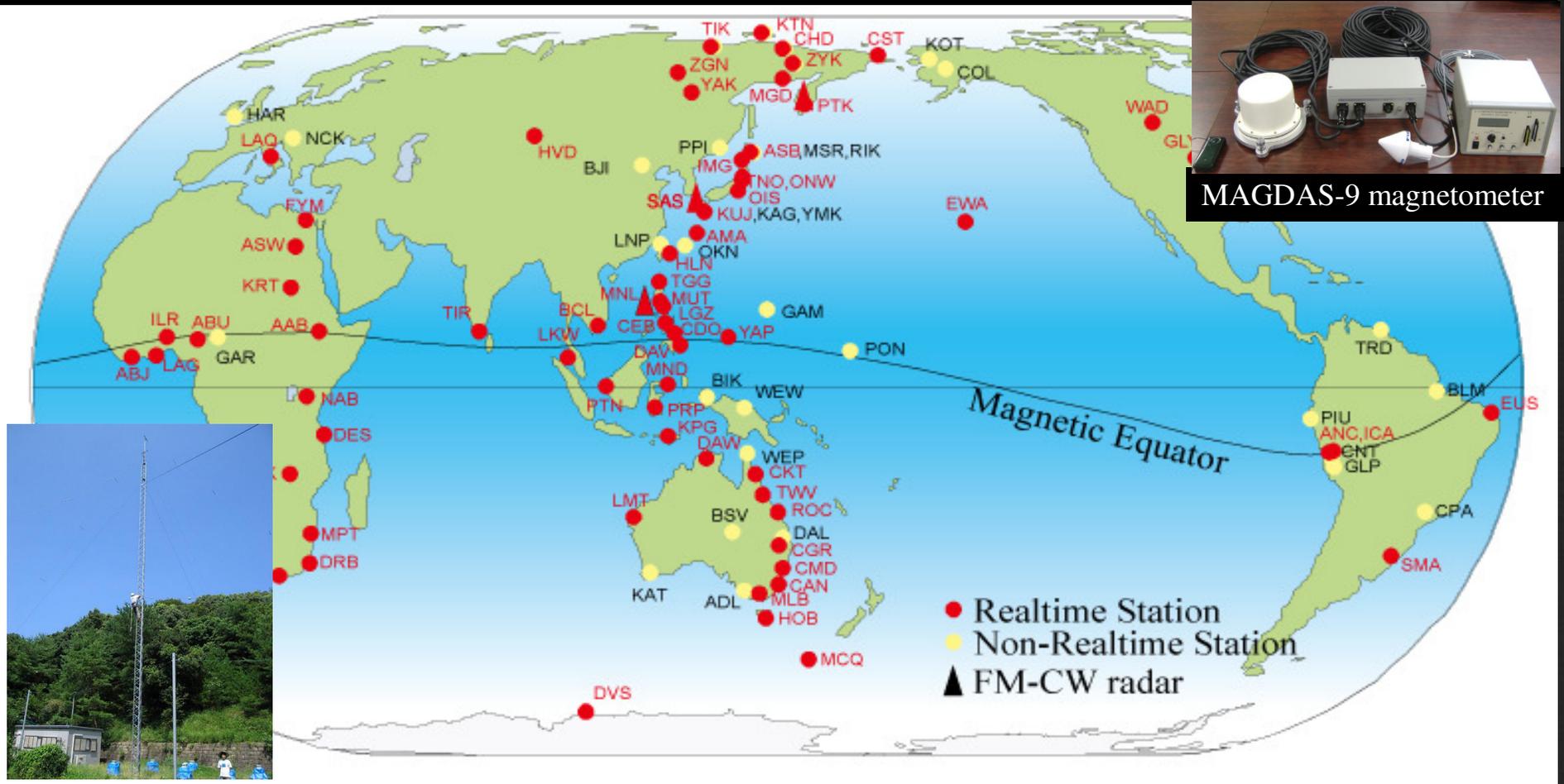


<http://ssdl.aero.kyushu-u.ac.jp/?SpaceDebris%2FOrbitalAnalysis>

Courtesy of Prof. Hanada

Space environment monitoring: Geomagnetic field disturbances

MAGDAS/CPMN started in 2003
(MAGnetic Data Acquisition System/Circum pan Pacific Magnetometer Array)



International collaborations: MAGDAS

Cooperation with MAGDAS host countries

Installation ▪ Maintenance ▪ Operation of Network



Autonomous association by MAGDAS host countries



08.2011 Africa MAGDAS Association



03.2011 Manila, Philippines, SERC sub-center

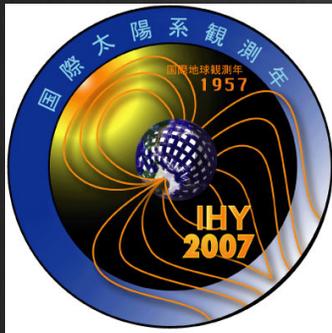
Participation to international space science projects

Contribution to the International Space Weather Science



ULTIMA (since 2006)

Chair of worldwide consortium of magnetic observational arrays



IHY (2007-2009)

Development of MAGDAS in the world



ISWI (2010-2012)

Contribution to the enlightenment of space weather science

Space weather science education

Space weather summary report

Since October 2002, daily reports on space weather have been issued by students.

Outreach activities on space weather

Over 50 public lectures on Space weather science for children and general citizen in Japan.

Foreign students from Asian/African nations

Six Ph D. students from 5 nations (2012)
(Egypt, Sudan, Indonesia, Philippines, 2 from Malaysia)



ISWI/MAGDAS school

15-20, August 2011, Lagos, Nigeria

1st Morning Session		2nd Morning Session		1st Afternoon Session		2nd Afternoon Session	
Day 1 Tuesday 16 Aug 2011		Arrival		Arrival			
Day 2 Wednesday 17 Aug 2011		Opening Ceremony Capacity Building (KY1) pdf	Intro to MAGDAS MAGDAS (KY2) pdf some history (KY3) pdf	Data analysis (MG1) pdf	EEJ (KY4) pdf Pc 5 Index (MG2) pdf		
Day 3 Thursday 18 Aug 2011		Principles of geomagnetism (AY1) pdf	Geomagnetic disturbances (AY2) pdf	MAGDAS data tutorial (MG3) pdf	MAGDAS Deployment in Africa (GM1) pdf		
Day 4 Friday 19 Aug 2011		Equatorial ionosphere (ABR1) pdf	Space Weather (AI1) pdf	African MAGDAS Station Status Reports click here	Lithospheric Dynamics Litho Space Weather (KY5) pdf Peru / Taiwan earthquakes (KY6) pdf Relation between solar and seismic activity (KY7) pdf	LUNCH BREAK	
Day 5 Saturday 20 Aug 2011		Analysis of satellite geomagnetic data (VD1) pdf	Estimation of EEJ using MAGDAS data (ABR2) pdf	Laboratory work on space weather I (AI2) pdf Laboratory work on space weather II (SA) pdf	Data Citation Rules (GM2) pdf		
Day 6 Sunday 21 Aug 2011		Analysis of satellite geomagnetic data (VD2) pdf	Closing Ceremony Final remarks (KY8) pdf	Excursion Trip (Downtown Lagos: shopping mall and beach --- twas great fun.)			
Day 7 Monday 22 Aug 2011		Departure		Departure			

School instructors:
KY= Prof. K. Yumoto; ABR=Dr Rabiui; VD=Prof Vafi D.; AY=Dr A. Yoshikawa; GM=George Maeda; AI=Dr A. Ikeda; SA=Dr S. Abe; MG=Magdi of Sudan.



- A 264-page textbook entitled *Selected Papers of MAGDAS* was published prior to the School, containing MAGDAS-related papers that had been published in peer-reviewed journals.
- 60 participants, of whom 8 were instructors mainly from Kyushu University/remaining participants from MAGDAS African host countries and Nigerian students.

ISWI/MAGDAS school

Future schools:

2012	Indonesia
2013	Côte d'Ivoire
2014	Japan

Sponsorship:

JSPS Core to Core Program –
the Asia-Africa Science Platform Program

JSPS研究拠点形成事業(B.アジア・アフリカ学術基盤形成)
Core-to-Core Program

国際宇宙天気キャパシティ・ビルディング
(能力強化)拠点の形成



From SERC to ICSWSE...

New focus of concern in space weather

- Direct effects of solar activity
- Long-term presence of humans in space

Request from the ISWI community to SERC

- Abuja ISWI Resolution (Abuja, Nigeria 2011)

Re-organization of SERC to ICSWSE was decided:

- **Further development of space weather science**
- **Establishment of the international center consistent with the goals of the ISWI**

ICSWSE Agenda

- To provide the basic knowledge that will help humans work in space
- To create the foundations of Space Weather Study, Geospace Science and Space Terrestrial Study
- To explore the synergy of space science, space engineering, and space medicine

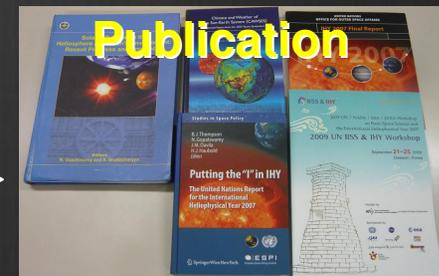
ICSWSE Activities

- Enlarge the scope of its space weather research
- Conduct more detailed investigation on the links between geospace changes, climate changes, and natural disasters
- Start new research in the biomedical aspects of geospace
- Evolve internationally as the Center for Space Weather

Science

and Education consistent with the **Abuja International Space Weather Initiative resolution (A/AC.105/1018: IV)**

Capacity building



Capacity building

1. Training on the instrumentation

1. Training on data analysis

2. Training on doing science with the data

Summary (1)

The new ICSWSE will conduct *ISWI activity* for young scientists in Japan and in the world through a wide-variety of approaches:

- Conducting overseas ISWI/MAGDAS Schools
- Implementing student exchanges
- Installing ground magnetometers (e.g.MAGDAS) in "missing areas"
- Bringing students who want to learn more about space weather science to Japanese universities.
- Growing a network of centres, focusing on space weather around the world, dedicated to the advancement of space weather research and education.

Summary (2)

ICSWSE : “iku-sei” : 育成

- Research initiatives (e.g., collaboration with foreign researchers)
- Data-collection initiatives (e.g., the MAGDAS Project)
- Education initiatives (e.g., ISWI/MAGDAS Schools)

New center will contribute to Space Weather Capacity Building with cooperation of COPUOS and other space weather related institutes in the world.