SCOSTEP/VarSITI

JSPS Core-to-Core Program
B: Asia-Africa Science Platform

Variability of the Sun and Its Terrestrial Impact (VarSITI): SCOSTEP's scientific program in 2014-2018

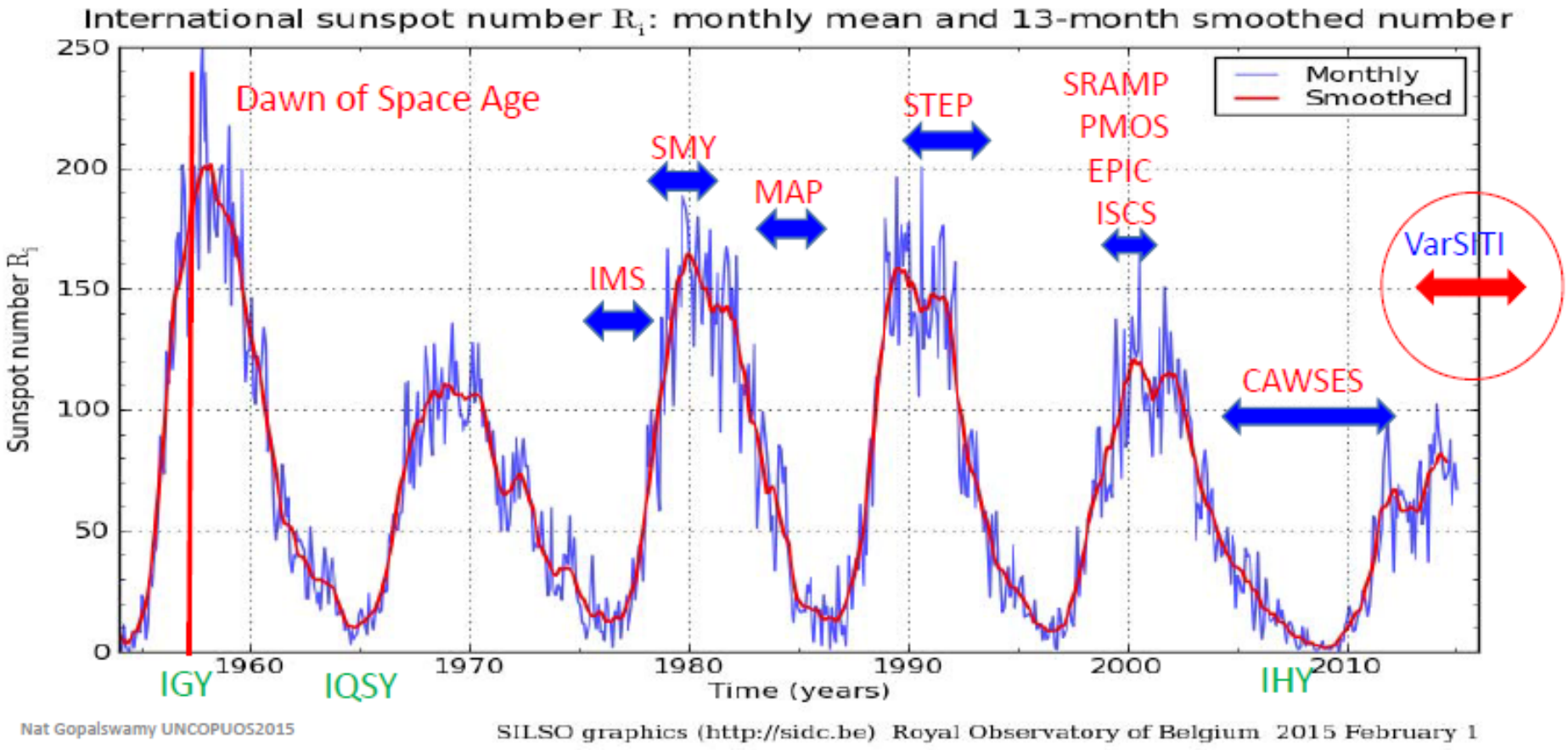
K. Shiokawa[1] and K. Georgieva[2]

1. Solar-Terrestrial Environment Laboratory, Nagoya University
2. Space Research and Technologies Institute, Bulgarian Academy of Sciences

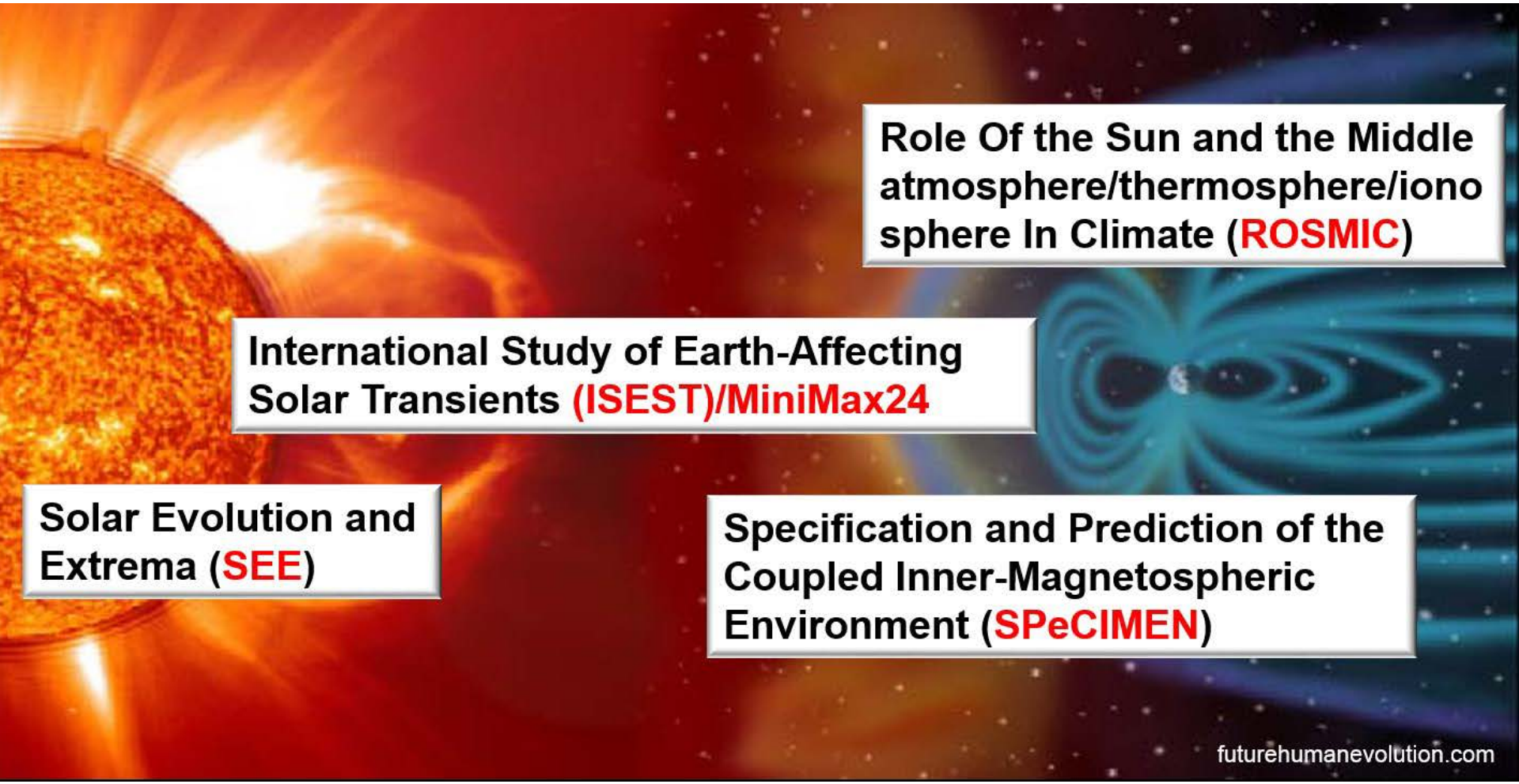
SCOSTEP
Scientific Committee on Solar-Terrestrial Physics

AOGS2015, Singapore, August 6, 2015

Solar Variability and SCOSTEP Scientific Programs



Four Elements of VarSITI



Role Of the Sun and the Middle atmosphere/ thermosphere/ionosphere In Climate (ROSMIC)

Role Of the Sun and the Middle atmosphere/thermosphere/ionosphere In Climate
ROSMIC

F.–J. Lübken,
(Leibniz-Institut für Atmosphärenphysik, Germany)

Annika Seppälä,
(Finnish Meteorological Institute, Finland)

William Ward,
(University of New Brunswick, Canada)

VarSITI (Variability of the Sun and Its Terrestrial Impact) 2014-2018

We encourage more communication between solar and heliosphere scientists and Earth's magnetosphere, ionosphere, and atmosphere scientists.

- **Campaign data analysis from the Sun to the Earth**
- **Web pages (www.varsiti.org)**
- **Mailing lists (currently more than 717 mail addresses from 66 countries are registered)**
- **Newsletters**
- **Meetings (financial support is available)**

www.varsiti.org

VarSITI

Variability of the Sun and Its Terrestrial Impact

About | Organization | Projects | Meetings | Publications | Resources | News | HOME

Good Afternoon.

Welcome to: Variability of the Sun and Its Terrestrial Impact (VarSITI)

© VarSITI 2013

Variability of the Sun and Its Terrestrial Impact

The **VarSITI** program is the next scientific program of **SCOSTEP** (2014-2018)

VarSITI was defined based on a community effort in the form of a forum organized by the **I**nternational **S**pace **S**cience **I**nstitute (**ISSI**) in *Bern* during *May 7-8, 2013*. The **VarSITI** program will strive for international collaboration in data analysis, modeling, and theory to understand how the solar variability affects Earth.

The **VarSITI** program will have ***four scientific elements*** that address solar terrestrial problems keeping the current low solar activity as the common thread:

- ✔ **SEE** (**S**olar **E**volution and **E**xtrema),
- ✔ MiniMax24/**ISEST** (**I**nternational **S**tudy of **E**arth-affecting **S**olar **T**ransients),
- ✔ **SPeCIMEN** (**Spe**cification and Prediction of the **C**oupled **I**nner-**M**agnetospheric **En**vironment), and
- ✔ **ROSMIC** (**R**ole **O**f the **S**un and the **M**iddle atmosphere/thermosphere/ionosphere **I**n **C**limate).

Inside this issue

Article 1: About the VarSITI 1
Article 2: Project SEE 2
Article 3: Project ISEST/ Minimax24 3
Article 4: Project SPeCIMEN 5
Article 5: Project ROSMIC 7
Short News 1: EGU Town Hall Meeting 8
Short News 2: STP-13 announcement 8
Upcoming Meetings 9
From the Editorial Board 9

Article 1:

About the VarSITI

Variability of the Sun and Its Terrestrial Impact

Katya Georgieva

Kazuo Shiokawa

K. Georgieva[1] and K. Shiokawa[2]

[1]Space Research and Technologies Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria

[2]Solar-Terrestrial Environment Laboratory, Nagoya University, Nagoya, Japan

The last solar minimum in 2008-2009 and the current solar maximum of sunspot cycle 24 show much lower activities compared with the previous two solar cycles 22 and 23. The scientists in the solar-terrestrial physics are watching very low solar activities and their consequences on Earth, which have never been observed since modern scientific measurements become available. The current solar dynamo theories are unable to predict the long-term solar activity variations. It is not clear whether the last deep solar maximum and the current low solar maximum may signal the end of the recent period of relatively high solar activity, and what long-term solar activity variations we can expect in the future. Moreover, it is not clear to which extend our present understanding of how the Sun influences the geospace, which is based on instrumental observations taken during only the recent period

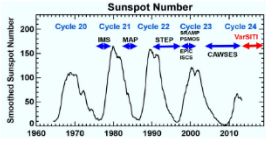


Figure 1. Variation of sunspot numbers and SCOSTEP programs. VarSITI is carried out during the lowest solar activities since the modern scientific observations become available.

Inside this issue

Article 1: Coordinated investigations of solar, planetary radio emission, solar wind and Earth's ionosphere carried out in Ukraine with the world's largest radio telescopes 1
Article 2: Installation of RENOIR at the Oukaïmeden Observatory, Morocco 3
Highlight on Young Scientists 1: Wen Li 5
Highlight on Young Scientists 2: Tigran Karapetyan 6
Highlight on Young Scientists 3: Famil Mustafa 7
Meeting Report 1: HEPPA/SOLARIS 2014 9
Meeting Report 2: SEE kick-off meeting and BBC meeting 9
Meeting Report 3: VarSITI Session at AGS 10
Meeting Report 4: VarSITI Session at JpGU 10
Meeting Report 5: Kick-off meeting of the German ROMIC project 11
Meeting Report 6: An African School on Space Science 11
Upcoming Meetings 12
Short News 1: Interest of the BBC SWS Regional Network to join VarSITI 13

Project SEE/ISEST/ROSMIC

Article 1:

Coordinated investigations of solar, planetary radio emission, solar wind and Earth's ionosphere carried out in Ukraine with the world's largest radio telescopes

A. A. Konovalenko[1], N. N. Kalinichenko[1], O. A. Lytvynenko[2], V. V. Dorovskii[1], V. N. Melnik[1], A. I. Brazhenko[2], V. V. Zakharenko[1], A. A. Stanislavskii[1], and V. A. Shepelev[1]

[1]Institute of Radio Astronomy of NASU, Kharkov, Ukraine

[2]Observatory URAN-4 of Institute of Radio Astronomy NASU, Odessa, Ukraine

[3]Poltava gravimetrical observatory of institute geophysics NASU, Poltava, Ukraine

Konovalenko Alexander | Kalinichenko Nikolay | Lytvynenko Oleg | Dorovskii Vladimir | Melnik Valentin | Brazhenko Anatoly | Zakharenko Vyacheslav | Stanislavskii Alexander | Shepelev Valery

Ukraine has a substantial experimental base of radio remote sensing for research of VarSITI problems. First of all the base includes the largest in the world decameter radio telescope UTR-2 and the URAN system of radio telescopes (Figure 1).

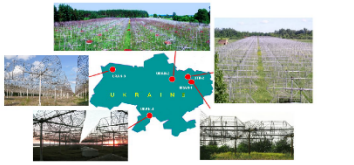


Figure 1. URAN decameter radio telescopes system on Ukraine map: Radio telescopes UTR-2 URAN-1, URAN-2, URAN-3 and URAN-4. They operate at the frequencies from 9 to 32 MHz.

Inside this issue

Article 1: The Swarm mission: Understanding the space environment in the changing Earth's magnetic field 1
Article 2: Contributions of the Nobeyama Radioheliograph to VarSITI 3
Article 3: Collaboration between ICSU World Data System and SCOSTEP/ VarSITI 5
Article 4: The creation of the database of images of old analogue magnetograms of Geophysical Observatory "Paratunka", Kamchatka, Russia, 1967-2006 7
Highlight on Young Scientists 1: Masafumi Shoji 9
Meeting Report 1: VarSITI Session at JpGU 10
Meeting Report 2: 5th IAGA/ICMA/CAWSES Workshop 10
Meeting Report 3: 14th European Solar Physics Meeting 11
Meeting Report 4: VarSITI Lunch Time Meeting at COSPAR 2014 11
Meeting Report 5: Geospace Revisited 12
Upcoming Meetings 12
Short News 1: 2015 UN/Japan Workshop on Space Weather 13

Project ROSMIC

Article 1:

The Swarm mission: Understanding the space environment in the changing Earth's magnetic field

C. Stolle[1] and R. Floberghagen[2]

[1]Helmholtz Centre Potsdam, GFZ, German Research Centre for Geosciences, Potsdam, Germany

[2]European Space Agency, ESRIN, Frascati, Italy

Claudia Stolle

Rune Floberghagen

The interaction between the upper atmosphere and the geomagnetic field is important for both of them. The location of ionospheric currents and the direction of plasma drifts, but also partly the direction of thermospheric winds depend on the shape of the geomagnetic field. Their amplitude and therefore also effective energy deposition through, e.g., Joule heating are governed by the field's strengths. In turn, currents that result from the atmospheric dynamo or from steep plasma density gradients amplify the magnetic field. Hence, simultaneous observations of the magnetic field in high precision and of plasma and thermospheric parameters have largely advanced our understanding of processes in the upper atmosphere (e.g., Olsen and Stolle, 2013; Lühr et al., 2011).

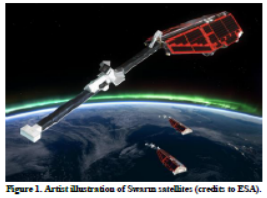


Figure 1. Artist illustration of Swarm satellites (credits to ESA).

Distributed through the VarSITI mailing list

Inside this issue

Article 1: CASSIOPE Enhanced Polar Outflow Probe (e-POP) 1
Article 2: A roadmap for better understanding of space weather to shield society 2
Article 3: Preliminary Observations of the Magnetometer Installed at Dar Es Salaam, Tanzania 4
Highlight on Young Scientists 1: Aaron Hendry 5
Meeting Report 1: The 2nd International ANGWIN Workshop 6
Meeting Report 2: The 12th International Conference on Substorms (ICS-12) 6
Meeting Report 3: XVIII All-Russian Annual Conference 7
Meeting Report 4: 2nd TOSCA Training School 7
Meeting Report 5: International school on Space Weather, GNSS, GIS internet and data base 8
Upcoming Meetings 9
Short News 1: The EGU General Assembly 2015 10
Short News 2: NCAR Advanced Study Program Summer Colloquium: Climate, Space Climate, and Couplings Between 10
Short News 3: NASA Living with a Star (LWS) Program Announces Support for SCOSTEP/VarSITI Projects 10
Short News 4: UN/COPUOS Space Weather Report is available 11
Short News 5: Workshop on 'Global Data Activities for the Study of Solar-Terrestrial Variability' 11

Project ROSMIC

Article 1:

CASSIOPE Enhanced Polar Outflow Probe (e-POP)

A. W. Yau[1] and H. G. James[1]

[1]Department of Physics and Astronomy, University of Calgary, Calgary, Canada

Andrew Yau

Gordon James

The Enhanced Polar Outflow Probe (e-POP) is sponsored by the Canadian Space Agency (CSA), and it is a part of CASSIOPE, a multi-purpose Canadian small satellite mission. E-POP has three primary scientific objectives: in-situ observations of micro-scale characteristics of plasma outflow and related micro- and meso-scale plasma processes in the polar ionosphere, exploration of the occurrence morphology of neutral escape in the upper atmosphere, and the effects of auroral currents on plasma outflow and of plasma microstructures on radio propagation.

To achieve these objectives, the mission strategy of e-POP focusses on in-situ measurements of small-scale plasma,

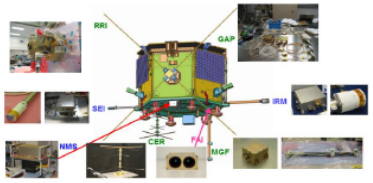


Figure 1. e-POP instrument payload layout on CASSIOPE.

Inside this issue

Article 1: Operational Space Weather Forecasting Services in National Space Science Center of China 1
Article 2: Space and Atmospheric Communication and Informatics Research Group in Thailand 4
Article 3: Metadata database and data analysis software of the upper atmospheric data developed by the Inter-university Upper atmosphere Global Observation NETwork (IUGONET) project 6
Highlight on Young Scientists 1: Bidya Binay Karaki/ Sweden 9
Highlight on Young Scientists 2: Ernest P. Macalalad/ Taiwan 10
Meeting Report 1: International School on Equatorial and Low-Latitude Ionosphere (ISELION) 12
Meeting Report 2: The 2nd Annual Conference of the Nigerian Geophysical Society (NGS) 12
Meeting Report 3: Sun-Climate Connections conference (Kiel, 16-19 March 2015) 13
Upcoming Meetings 14
Short News 1: Announcement of Opportunity The SCOSTEP Visiting Scholar (SVS) program 15

Project ISEST

Article 1:

Operational Space Weather Forecasting Services in National Space Science Center of China

S. Liu[1], B. Luo[1] and E. Aa[1]

[1]National Space Science Center, Chinese Academy of Sciences, Beijing, China

Siqing Liu

Bingxian Luo

Ercha Aa

The National Space Science Center (NSSC) was established in 1958 within the mandate to develop the first artificial satellite of China, the DFH-1.

NSSC is China's gateway to space science and is the key institute responsible for planning, developing, launching, and operating China's space science satellite

Figure 1. Increasing needs for operational space weather services in China.

Inside this issue

Article 1: Space Weather Research Activity in National Space Agency (ANGKASA), Malaysia 1
Highlight on Young Scientists 1: Shin Toriumi/ Japan 3
Highlight on Young Scientists 2: Drew Turner/ USA 5
Highlight on Young Scientists 3: Rashid I. Lasker/ Germany 6
Meeting Report 1: ROMIC (Role Of the Middle atmosphere In Climate) Seminar 8
Meeting Report 2: Energetic particle Precipitation into the Atmosphere Symposium at RIGG 8
Meeting Report 3: International Conference "Superflares and Activity of the Sun in the Cycle Formation Epoch" 9
Meeting Report 4: RIGG 2015 symposium A 15 "Long Term Trends in the Stratosphere, Mesosphere, Thermosphere and Ionosphere" 9
Meeting Report 5: Session A4 'Geospace over and related to the Arctic region' at ISAR-4 (International Symposium on Arctic Research-4) 10
Upcoming Meetings 11

Project ISEST/ROSMIC

Article 1:

Space Weather Research Activity in National Space Agency (ANGKASA), Malaysia

N. B. Pathy[1], M. F. Assilam[1] and T. A. Musa[2]

[1]National Space Agency of Malaysia (ANGKASA), Bantling, Malaysia

[2]University Technology Malaysia (UTM), Johor Bahru, Malaysia

Nyanasegari Bhoo Pathy

Mhd Fairos Assilam

Tajul Ariffin Musa

In 2005, Malaysia established the Langkawi National Observatory (LNO). The facility comes with a 50 cm Ritche-Chritenien robotic telescope that can be controlled remotely through the Internet and also a robotic 15 cm multi apo-chromatic refracting telescope. The 50 cm robotic telescope is capable of gathering data for scientists around the world who are involved in the field of photometry, spectroscopy and astrometry. Langkawi National Observatory also has a 15 cm apo-chromatic telescope. This telescope is capable of gathering data on three different wavelengths namely solar continuum, H-alpha and Calcium K lines.

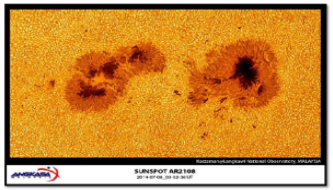


Figure 1. Sunspot AR2108 captured by Langkawi National Observatory (LNO), National Space Agency of Malaysia (ANGKASA) on 08 July 2014.

Meetings supported by VarSITI funding in 2015 (13) call for for 2016 is now on.

title	place or institute	country	date
Unsolved Problems in Magnetospheric Physics (UPMP) Workshop	Crown Spa Hotel, Scarborough	UK	6-12 September 2015
International Symposium on Equatorial Aeronomy (ISEA-14)	Bahir Dar	Ethiopia	19-23 Oct, 2015
IUGG General Assembly symposium "Energetic Particle Precipitation into the Atmosphere: Sources and Atmospheric Impacts" (A16)	Prague	Czech Republic	22 June-02 July, 2015
The Coimbra Solar Physics Meeting "Ground-based Solar Observation in the Space Instrumentation Era"	Coimbra	Portugal	5-9 October 2015
Superflares and Activity of the Sun in the Cycle Formation Epoch	Kazrin-Tel Aviv	Izrael	28 April–1 May 2014
SCOSTEP-WDS Workshop- "Global Data Activities for the Study of Solar-Terrestrial Variability"	Tokyo	Japan	28-30 September 2015
Solar Variability and its Heliospheric Effects	Athens	Greece	2-6 November 2015
Conference on Sun-Climate Connections	Kiel	Germany	16-19 March 2015
2015 African Geophysical Society Conference	Nairobi	Kenya	1 – 5 June 2015
The Role of the earth and its atmosphere on our technology (2nd annual conference of Nigerian Geophysical Society)	Covenant University, Ota	Nigeria	17-20 March, 2015
International Study of Earth-affecting Solar Transients (ISEST/MiniMax24) Workshop	National Autonomous University	Mexico	2-5 November, 2015
Session A4 'Geospace over and related to the Arctic region' at ISAR-4 (International Symposium on Arctic Research-4)	Toyama	Japan	April 27-30, 2015
IUGG General Assembly symposium "Long-term trends in the stratospher, mesosphere, thermospher, and ionosphere" (A15)	Prague	Czech Republic	22 June-02 July, 2015

VarSITI Registration Sheet for mailing list

VarSITI Registration sheet	Date:	Meeting name:		
Please sign your name and e-mail address to register into the VarSITI mailing list				
first name	**last name**	**e-mail address**	**country**	**interest of projects (choose as many as you like)**
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL
				SEE ISEST/Minimax SPeCIMEN ROSMIC ALL

Initial VarSITI Results to be Published in American Geophysical Union Journal

Editors:

Qiang Hu (USA)
Bernd Funke (Spain)
Martin Kaufmann (Germany)
Olga Khabarova (Russia)
Jean-Pierre Raulin (Brazil)
Craig J. Rodger (New Zealand)
David F. Webb (USA)

- Papers presented at SCOSTEP's 13th Quadrennial Symposium in China (October 2014)
- Related papers from the community
- Peer-reviewed
- Special issue named VarSITI

NASA Living with a Star (LWS) Program has Announced Support for SCOSTEP/VarSITI Projects

- Solicitation: NNH14ZDA001N-LWS, Heliophysics Living With a Star Science 2015
- Three-year awards to coincide with the 2014-2018 timeframe of VarSITI
- Proposals need to be relevant to VarSITI themes
- PIs to collaborate and share their models and results with each other and the international VarSITI project leaders
- More details: http://nspires.nasaprs.com/

Scientific Committee on Solar-Terrestrial Physics

In particular, Germany, India, Japan provide substantial funding for VarSITI Research

研究拠点形成事業
Core-to-Core Program

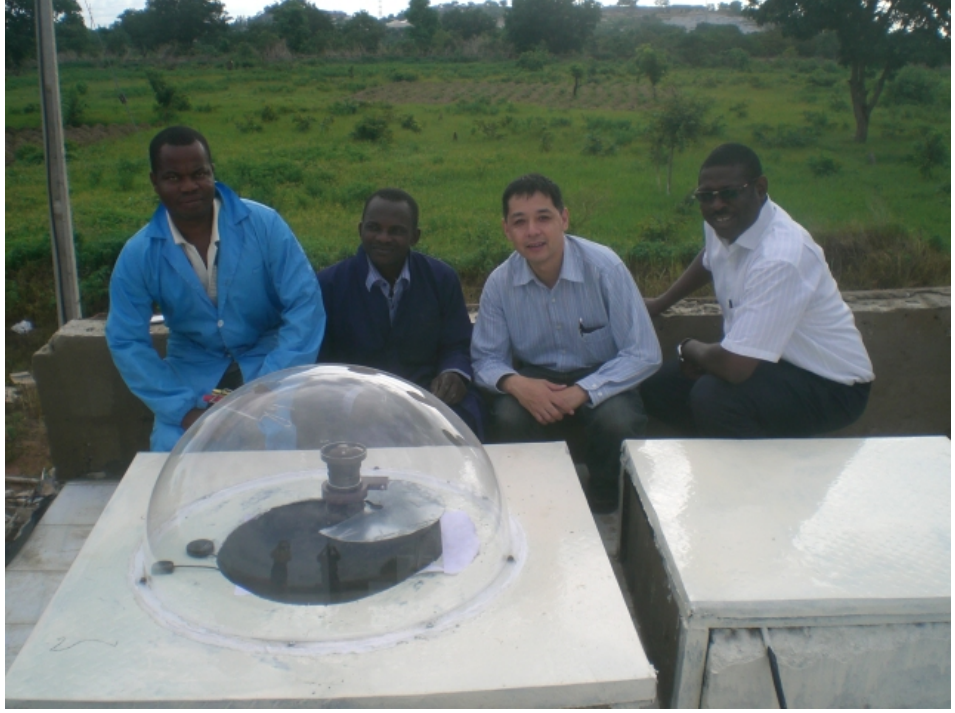
B.アジア・アフリカ学術基盤形成型
B. Asia-Africa Science Platforms

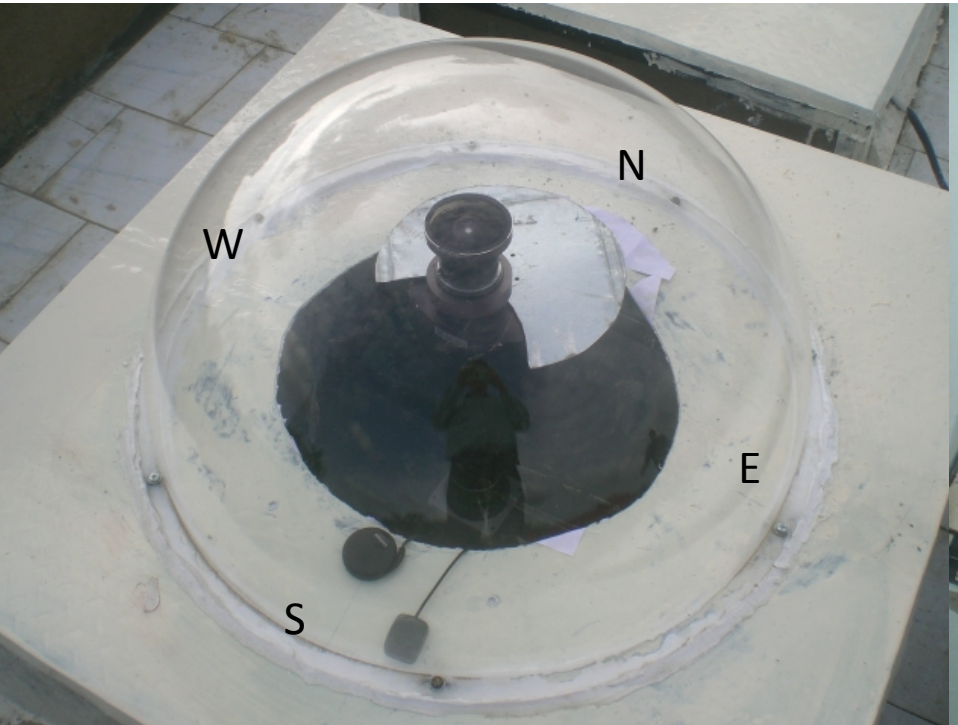
JAPAN SOCIETY FOR THE PROMOTION OF SCIENCE
日本学術振興会

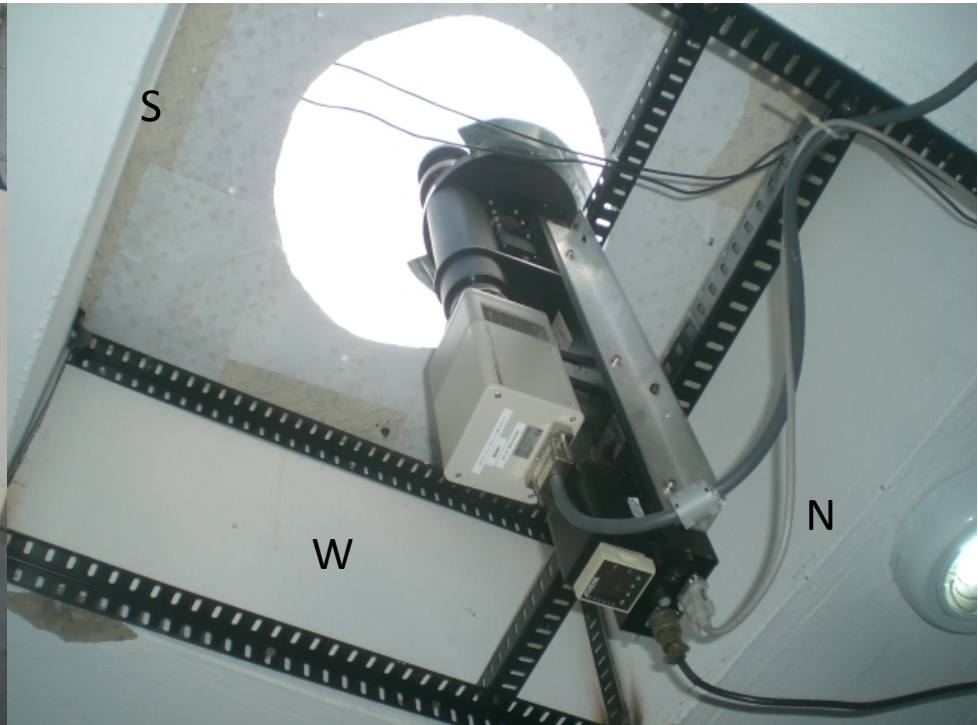
Observations of the equatorial ionosphere in south-east Asia and west Africa (2013-2015)

Coordinator: Kazuo Shiokawa

All-sky airglow imager at Abuja, Nigeria
June 9, 2015-







International CAWSES-II Symposium
November 18-22, 2013, Nagoya, Japan (LOC: STEL)
320 attendees from 33 countries

International School on Equatorial Low Latitude Ionosphere (ISELION)
March 16-20, 2015, Indonesia (LOC: LAPAN)
39 students from 7 countries

International School on Equatorial Low Latitude Ionosphere (ISELLI)
September 14-18, 2015 Nigeria (LOC: CAR/NASRDA)
65 Students from 7 Countries

The 14th International Symposium on Equatorial Aeronomy
October 19-23, 2015 Bahir Dar (LOC: Bahir Dar Univ.)
>100 attendees from 25 Countries

Nagoya University, Japan

Solar-Terrestrial Environment Laboratory (STEL)

(30 faculties)

Hydrospheric Atmospheric Research Center

(11 faculties)

Center for Chronological Research

(5 faculties)

October 1, 2015

Institute for Space-Earth Environmental Research

(ISEE) (46 faculties)

Center for International Collaborative Research

Center for Integrated Data Science

Center for Orbital and Suborbital Research