

SCOSTEP Scientific Committee on Solar-Terrestrial Physics  
太陽地球系物理学・科学委員会



・1966年のICSU(International Council of Scientific Unions)総会で臨時委員会として設立。1978年以降は常置委員会。太陽地球系物理学(STP: Solar-Terrestrial Physics)において、地球惑星科学の分野間にまたがる広い領域で、一定期間にわたる国際学術協力事業を提案・実施。また、国際研究集会を企画・開催し、さらに各種プロジェクトで得られるデータを、世界資料センター(WDC: World Data Center)を通じて広く研究者に発信する。

**SCOSTEPに対応する国内組織＝日本学術会議・地球惑星科学委員会・国際対応分科会・SCOSTEP小委員会**

**第22期委員(2012-2013):** 荻野龍樹(委員長)、中村卓司(幹事・SCOSTEP理事)  
委員: 柴田一成、津田敏隆、大村善治、荻野龍樹、草野完也、坂尾太郎、塩川和夫、篠原育、高橋幸弘、寺田直樹、長妻努、廣岡俊彦、星野真弘、山本衛

**参照: 日本学術会議・地球惑星科学委員会・国際対応分科会・STPP小委員会**

**STPに関わる国際事業で、特に、国際委員会の無いIHY/ISWIやILWS等の国際事業についての国内対応を行う組織**

# CAWSES-II

(Climate And Weather of the Sun-Earth System - II)

(太陽地球系の気候と天気-II)

[http://www.cawses.org/wiki/index.php/Main\\_Page](http://www.cawses.org/wiki/index.php/Main_Page)



SCOSTEPが実行する国際協同研究プログラム

1976-1979: IMS (International Magnetosphere Study)

国際磁気圏観測計画

1982-1985: MAP (Middle Atmosphere Program)

中層大気国際協同観測計画

1990-1997: STEP (Solar-Terrestrial Energy Program)

太陽地球系エネルギー国際協同研究計画

1998-2002: Post-STEP (S-RAMP, PSMOS, EPIC, and ISCS)

STEPの成果を継承する4プロジェクト群

2004-2008: CAWSES (Climate and Weather of the Sun-Earth System)

太陽地球系の気候と天気

2009-2013: **CAWSES-II** (Climate and Weather of the Sun-Earth System-II)

太陽地球系の気候と天気-II

CAWSES-II co-chairs: Susan Avery and Alan Rodger  
→ co-chairs: Joe Davila and Toshitaka Tsuda (July 2011-)

## TG1. What are the solar influences on climate?

co-leader: Joanna Haigh and Ilya Usoskin  
→ **Katja Matthes, Annika Seppälä**

## TG2. How will geospace respond to an altered climate?

co-leader: Dan Marsh and Jan Lastovicka

## TG3. How does short-term solar variability affect the geospace environment?

co-leader: Kazunari Shibata and Joe Borovsky

## TG4. What is the geospace response to variable inputs from the lower atmosphere?

co-leader: Jens Oberheide and Kazuo Shiokawa  
+ **S. Gurubaran**

## Capacity building

co-leader : Robert Vincent, Brigitte Schmieder,  
and Gang Lu

## Escience and informatics (Virtual Institute)

co-leader: Peter Fox and Janet Kozyra

# CAWSES–II TG4: What is the geospace response to variable inputs from the lower atmosphere?

Co-leaders: Jens Oberheide, Kazuo Shiokawa, and S. Gurubaran

## Overall Objective

TG4 will elucidate the **dynamical coupling from the low and middle atmosphere to the geospace** including the upper atmosphere, ionosphere, and magnetosphere, for various frequencies and scales, such as **gravity waves, tides, and planetary waves, and for equatorial, middle, and high latitudes.**

The essential part of TG4 is to **encourage interaction between atmospheric scientists and plasma scientists!**

## TG4 Projects

**Project 1: How do atmospheric waves connect tropospheric weather with ITM variability? (ITM=Ionosphere-Thermosphere-Mesosphere)**

**Project leaders: Mangalathayil A. Abdu. (Brazil)  
/ Jorge Chau (Peru) /William Ward (Canada)**

**Project 2: What is the relation between atmospheric waves and ionospheric instabilities?**

**Project leaders: Jon Makela (USA) / Hisao Takahashi (Brazil)**

**Project 3: How do the different types of waves interact as they propagate through the stratosphere to the ionosphere?**

**Project leaders: Dora Pancheva (Bulgaria)  
/ Mamoru Yamamoto (Japan)**

**Project 4: How do thermospheric disturbances generated by auroral processes interact with the neutral and ionized atmosphere?**

**Project leaders: Hitoshi Fujiwara (Japan) / Mike Kosch (UK)**

**Project 5: How do thunderstorm activities interact with the atmosphere, ionosphere and magnetosphere?**

**Project leaders: Yukihiro Takahashi (Japan)  
/ Colin Price (Israel) / Earl Williams (USA)**

**TG4 Newsletter, Web page, and Mailing lists**

**encourage interaction between  
atmospheric and plasma scientists!**

**Web page: [http://www.cawses.org/wiki/index.php/Task\\_4](http://www.cawses.org/wiki/index.php/Task_4)**

**Mailing list: [cawses2tg4all@stelab.nagoya-u.ac.jp](mailto:cawses2tg4all@stelab.nagoya-u.ac.jp)**

**(Currently 214 scientists are registered in this mailing list)**

**Please sign in to be registered in the mailing list.**

**TG4 Newsletter** (editor: Michi Nishioka/Kazuo Shiokawa)

# TG4ニューズレターの発行 editor: 西岡未知・塩川和夫

## 国際ニューズレターを発行し、大気の研究者とジオスペースの研究者の交流を促進



### TG4 Newsletter Vol. 7, Jan. 2012

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Article 1

## A Brief Introduction to Meridian Project in China

**Chi Wang**  
 Professor at the Center for Space Science and Applied Research,  
 Chinese Academy of Sciences  
 Director of the State Key Laboratory of Space Weather.  
 Chief engineer of the Chinese Meridian Project.  
 E-mail: cw\_at\_spaceweather.ac.cn



Chi Wang

To develop an understanding of near-Earth space's response to solar activities and the coupling among different layers in geospace, China has initiated a ground base program to monitor China's geospace environment. Called the Meridian Space Weather Monitoring Project (or Chinese Meridian Project), the effort consists of a chain of 15 ground-based observatories located roughly along 120°E longitude and 30°N latitude. Each observatory is equipped with multiple instruments to measure key parameters such as the baseline and time-varying geomagnetic field, as well as the middle and upper atmosphere and ionosphere from about 20 to 1000 kilometers. Starting in 2012, the project will collect data for at least 11 years, providing the wide-range, continuous, and multiparameter data sets needed to guide model developments, which in turn will better describe and predict the characteristics and dynamics of the geospace environment.

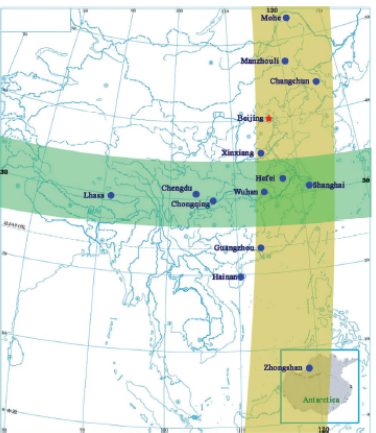


Figure 1. Distribution of observatories that form the Meridian Project (yellow band traces stations along 120°E; green band shows stations close to 30°N).

The Meridian Project is funded by China's National Development and Reform Commission as part of a series of major scientific infrastructure construction projects. With a planning and construction period spanning

Article 1

## The 13th International Symposium on Equatorial Aeronomy

Jorge L. Chau<sup>1</sup>, Archana Bhattacharyya<sup>2</sup>, Clezio M. Denardini<sup>3</sup>, David L. Hysell<sup>4</sup>, Erhan Kudeki<sup>5</sup>, Jonathan Makela<sup>5</sup>, and Kazuo Shiokawa<sup>6</sup>  
<sup>1</sup>Radio Observatorio de Jicamarca, Peru, <sup>2</sup>Indian Institute of Geomagnetism, India  
<sup>3</sup>Instituto Nacional de Pesquisas Espaciais, Brasil, <sup>4</sup>Cornell University, USA  
<sup>5</sup>University of Illinois, USA, <sup>6</sup>Nagoya University, Japan



Jorge L. Chau

The 13th International Symposium on Equatorial Aeronomy (ISEA13) was held on March 12-16, 2012 in Paracas Peru. ISEA's meet every three to four years. They are a major gathering of scientists around the world interested in the low-latitude atmosphere and ionosphere, and their coupling to other latitudes and altitudes. Each ISEA meeting represents an opportunity

for researchers to share their most recent results and discuss possibilities for future campaigns and experiments.

The objective of the symposium is to bring together the leaders in the field of equatorial, low-, and mid-latitude aeronomy to advance our knowledge of these



Figure 1. ISEA13 group picture.

# TG4-related Campaign Observations

**Longitudinal network observation of mesosphere-  
ionosphere coupling**

**Project 2: Hisao Takahashi and Jon Makela, September –  
November 2010, August–November 2011**

**Stratospheric Warming Campaign**

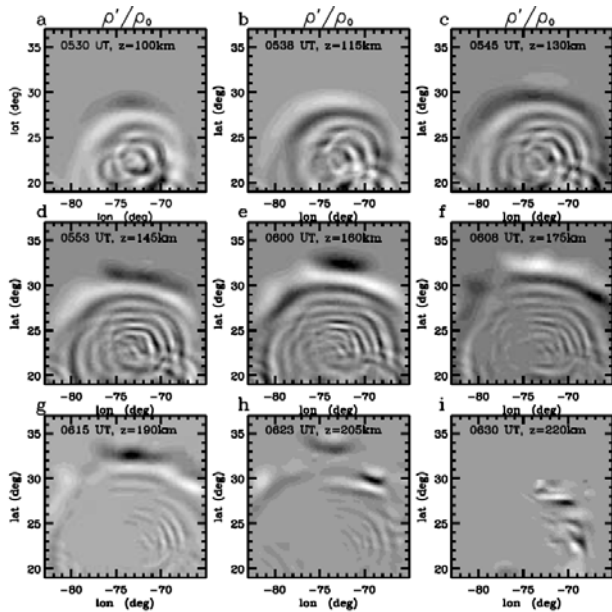
**Larisa Goncharenko, January 2010**

**Global Observing Campaigns on Tides**

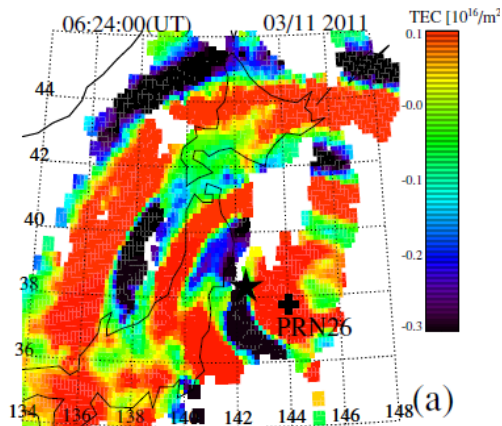
**William Ward, continuation since CAWSES era**



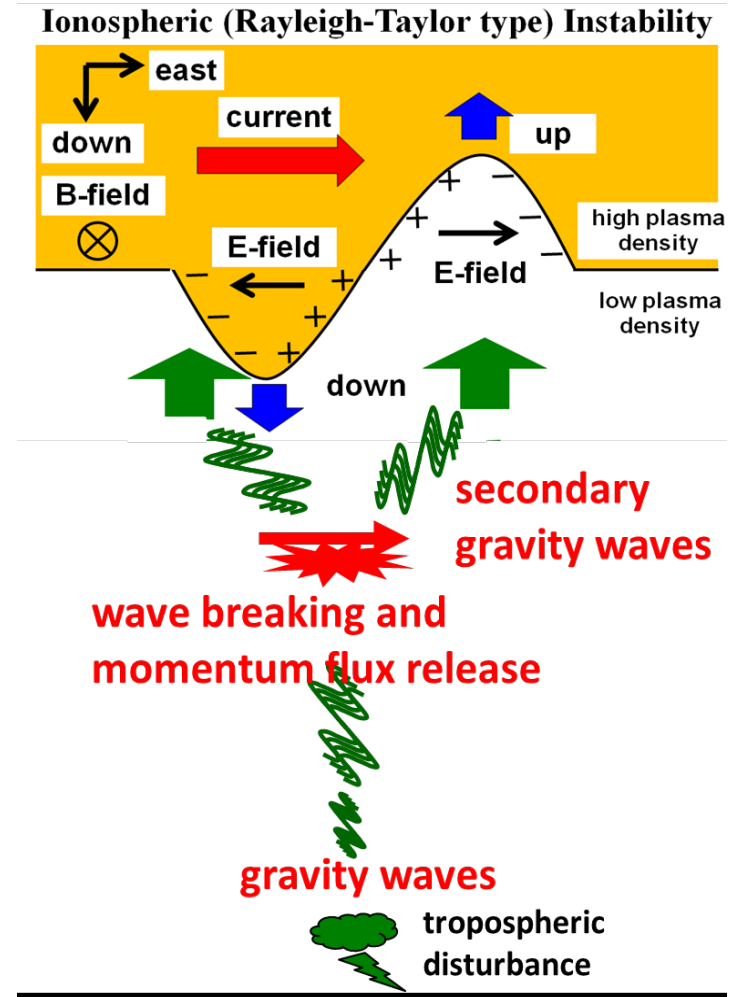
さまざまな周波数帯で大気波動が電離圏・ジオスペースに侵入していることが明らかになってきた。



Vadas and Crowley (JGR, 2010)

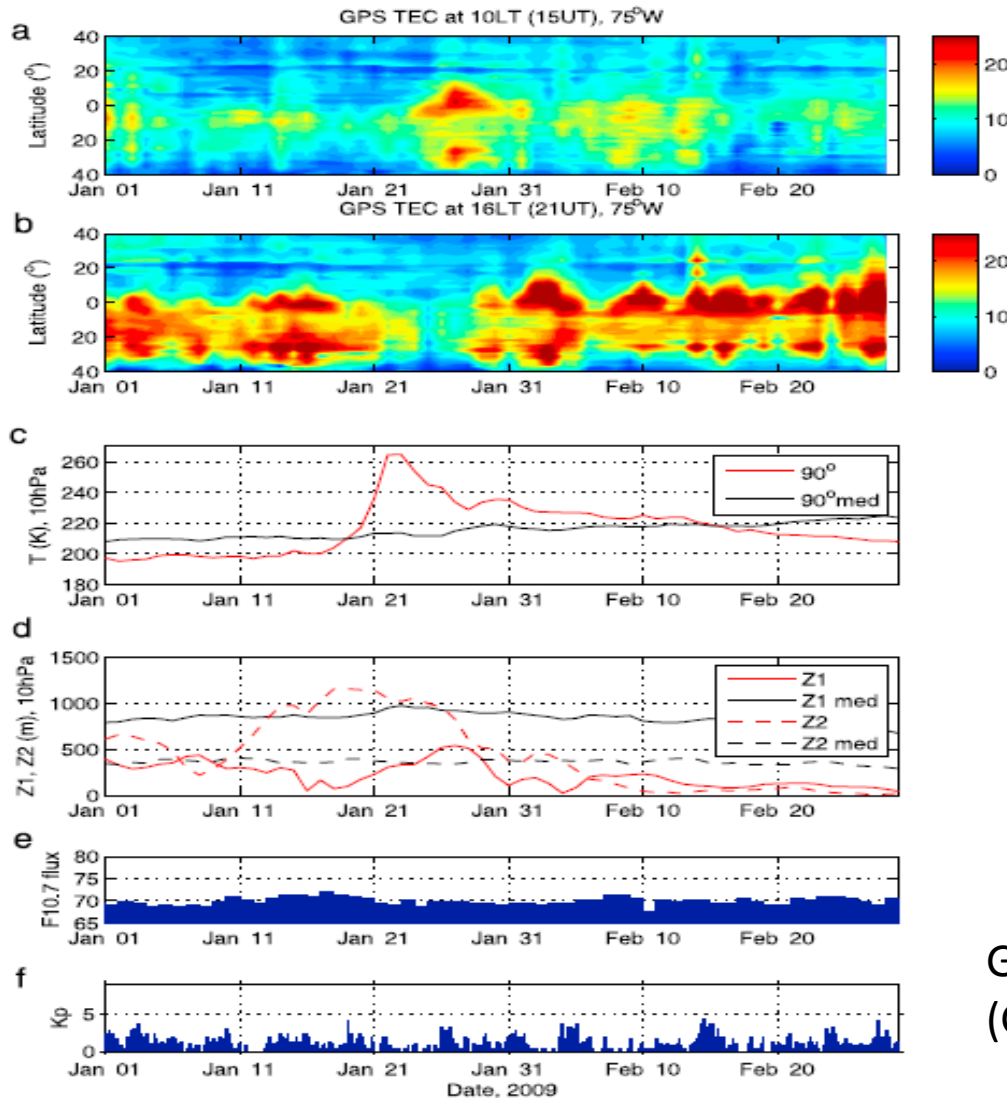


Saito et al. [EPS, 2012]



巨大津波に伴う音波や下層大気からの大気重力波が電離圏に侵入して、プラズマの変動を引き起こす。

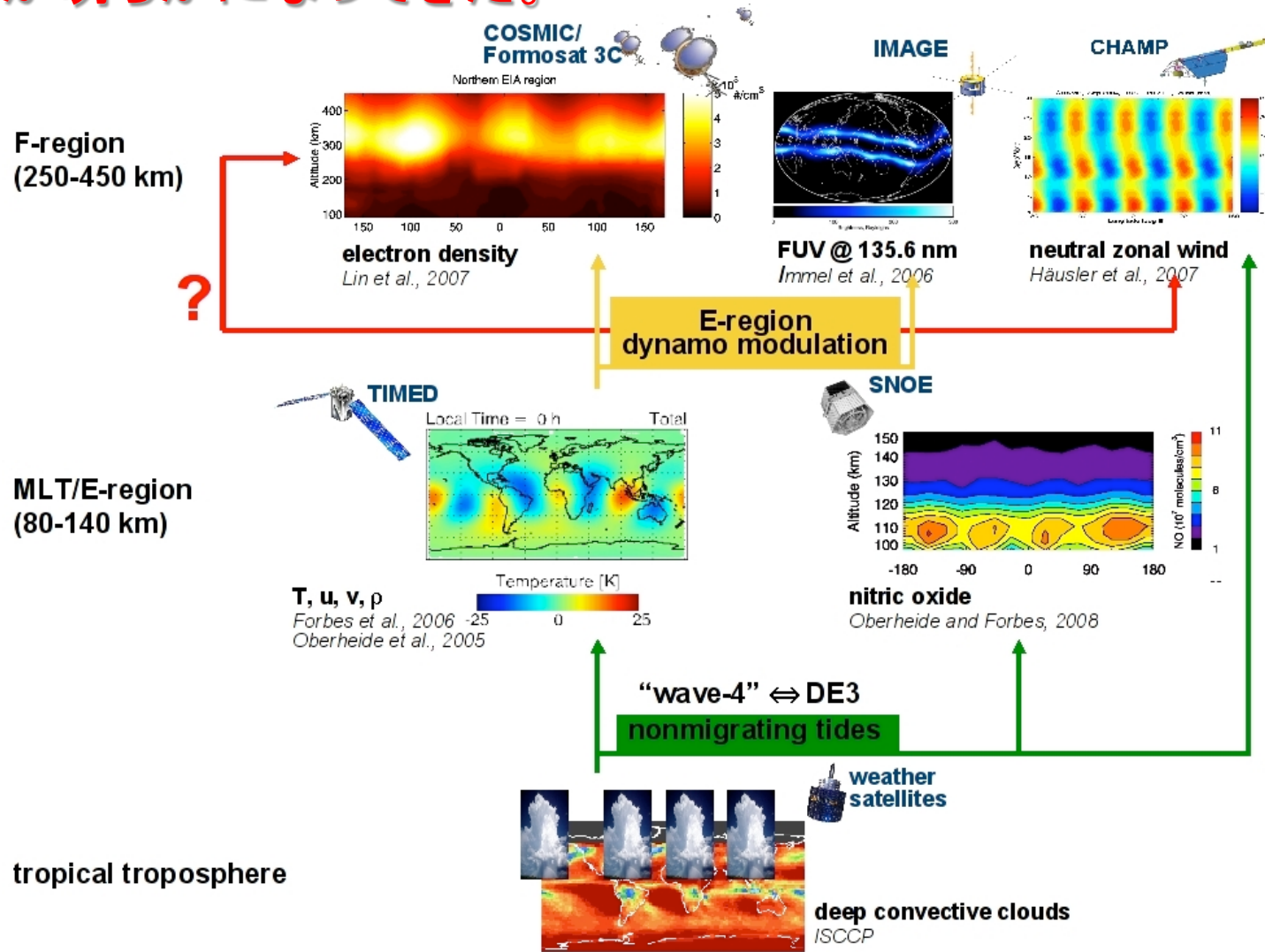
さまざまな周波数帯で大気波動が電離圏・ジオスペースに侵入していることが明らかになってきた。



成層圏突然昇温に伴って、電離圏でも電子密度や風速が大きく変化していることがわかってきた。

Goncharenko et al.  
(GRL, 2010)

# さまざまな周波数帯で大気波動が電離圏・ジオスペースに侵入していることが明らかになってきた。



地形性の大気潮汐波が電離圏まで到達し、地球規模で経度方向に波数4の構造を作る。

## 今後の会合:

- CAWSES-II/ISWI国際セッション(JpGU大会幕張)  
2012年5月25日(金)
- COSPAR(インド・Misore)  
2012年7月15-21日  
C1.1,C2.2セッション等、TG4ビジネス会合(2012年7月20日)
- ISSTP Pune India  
2012年11月6-9日
- International CAWSES-II Symposium(名古屋大学)  
2013年11月18-22日  
2009-2013年のCAWSES-IIの総まとめ

#### Important Dates:

First circular: January 1, 2012

Abstract submission deadline: June 30, 2013

Financial support request deadline: June 30, 2013

Early registration deadline: August 31, 2013

#### Registration Fees:

Payment received by August 31, 2013

(after August 31, 2013)

Regular	25,000 (35,000) yen
Student	15,000 (25,000) yen
Accompanying Person	5,000 (10,000) yen

#### Science Organizing Committee:

M. Yamamoto (chair), K. Kusano (vice-chair),  
I. Usoskin, K. Matthes, A. Seppälä, T. Hirooka,  
Y. Takahashi, H. Motoyama, J. Lastovicka, D. Marsh,  
K. Shibata, J. Borovsky, Y. Omura, M. Hoshino,  
T. Shimizu, T. Sakao, T. Obara, J. Oberheide,  
K. Shiokawa, S. Ueno, K. Yumoto, P. Fox, J. Kozyra,  
T. Iyemori, I. Shinohara

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#### Local Organizing Committee:

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K. Seki, A. Ieda, Y. Miyoshi, T. Hori, M. Shimoyama,  
T. Nagatsuma, N. Terada, T. Sakanoi, M. Yamamoto,  
H. Hayashi, H. Hashiguchi, M. Tsutsumi,  
A. S. Yukimatu



Tokugawa-en, a traditional Japanese garden.  
Its colorful autumn foliage is spectacular.

Climate And Weather of the Sun-Earth System II (CAWSES-II; 2009-2013) is an international program sponsored by SCOSTEP (Scientific Committee on Solar-Terrestrial Physics) established with an aim of significantly enhancing our understanding of the space environment and its impacts on life and society.

For details about the Symposium, see the web site:  
<http://www.stelab.nagoya-u.ac.jp/cawses2013/>



**SCOSTEP**

# International CAWSES-II Symposium

Nagoya, Japan  
November 18-22, 2013



Conveners: T. Nakamura, K. Shiokawa,  
M. Yamamoto and N. Gopalswamy