SCOSTEP and its PRESTO program for predictability of the variable solar-terrestrial coupling

Kazuo Shiokawa
(SCOSTEP President)
A thematic organization of the International Science Council (ISC) and a permanent observer at UNCOPUOS.

Runs long-term (4-5 years) international interdisciplinary scientific programs of solar terrestrial physics since 1966

Interacts with national and international programs involving solar terrestrial physics elements

Engages in Capacity Building activities such as the Space Science Schools with UNOOSA/ISWI.

Disseminates new knowledge on the Sun-Earth System and how the Sun affects life and society as outreach activities.
### Current Member Countries and Geographical Regions of SCOSTEP

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International interdisciplinary programs in solar-terrestrial physics operated by SCOSTEP

1976-1979: **IMS** (International Magnetosphere Study)
1979-1981: **SMY** (Solar Maximum Year)
1982-1985: **MAP** (Middle Atmosphere Program)
1990-1997: **STEP** (Solar-Terrestrial Energy Program)
1998-2002: **Post-STEP** (S-RAMP, PSMOS, EPIC, and ISCS)
2004-2008: **CAWSES** (Climate and Weather of the Sun-Earth System)
2009-2013: **CAWSES-II** (Climate and Weather of the Sun-Earth System-II)
2014-2018: **VarSITI** (Variability of the Sun and Its Terrestrial Impact)
2020-2024: **PRESTO** (Predictability of the variable Solar-Terrestrial Coupling)
SCOSTEP’s international program in 2020-2024

**PRESTO: Predictability of the variable Solar-Terrestrial Coupling**

PRESTO identifies predictability of the variable solar-terrestrial coupling performance metrics through modeling, measurements, and data analysis and to strengthen the communication between scientists and users.

**Pillar 1: Sun, interplanetary space and geospace**

**Pillar 2: Space weather and the Earth’s atmosphere**

**Pillar 3: Solar activity and its influence on the climate of the Earth System**

For subscription on the SCOSTEP-all mailing list, send e-mail to “scosteprequest@bc.edu”.
SCOSTEP’s international program in 2020-2024

**PRESTO**: Predictability of the variable Solar-Terrestrial Coupling

**PRESTO chair and co-chairs**

- **Chair**: Ramon E. Lopez, USA
- **Co-chair**: Eugene Rozanov, Switzerland
- **Co-chair**: Jie Zhang, USA
- **Co-chair**: Loren C. Chang, (Taiwan)
- **Co-chair**: Duggirala Pallamraju, (India)
- **Co-chair**: Nick M. Pedatella, (USA)

**Pillar 1: Sun, interplanetary space and geospace**

- Allison Jaynes, (USA)
- Emilia Kilpua, (Finland)
- Spiros Patsourakos, (Greece)

**Pillar 2: Space weather and the Earth’s atmosphere**

- Odele Coddington, (USA)
- Jie Jiang, (China)
- Stergios Misios, (Greece)

**Pillar 3: Solar activity and its influence on the climate of the Earth System**
SCOSTEP/PRESTO

Predictability of the Solar-Terrestrial Coupling

PRESTO is a science program that seeks to improve the predictability of energy flow in the integrated Sun-Earth system on times scales from a few hours to centuries through promoting international collaborative efforts. PRESTO is sponsored by SCOSTEP, the Scientific Committee on Solar Terrestrial Physics.

For subscription on the SCOSTEP—all mailing list: drop e-mail to “scosteprequest@bc.edu”.
15th Quadrennial Solar-Terrestrial Physics Symposium

21 – 25 February 2022
Alibag, India (Fully Virtual)
Hosted by Indian Institute of Geomagnetism (IIG)

S1 - Overarching Topics in the Sun-Earth Connection
S2 - PRESTO Pillar 1: Sun, Planetary Space, and Geospace
S3 - PRESTO Pillar 2: Space Weather and Earth’s Atmosphere
S4 - PRESTO Pillar 3: Solar Activity and its Influence On Climate
S5 - Space Weather Prediction and Implementation
S6 - Modelling, Database and Data Analysis Tools for Solar-Terrestrial Physics
S7 - New ground- and space-based initiatives for Solar-Terrestrial Physics
S8 - Special Session on “Geomagnetism-The Connecting Link between Sun and Earth”

Abstract deadline: September 15, 2021

https://stp15.in
SCOSTEP/PRESTO Funding Opportunities

- SCOSTEP/PRESTO provides financial support for organizing international campaigns and meetings every year.

- SCOSTEP also provides financial support for capacity building activities.
1. A challenge to Physics-based Prediction of Giant Solar Flares  
   Author: Kanya Kusano (Institute for Space-Earth Environmental Research, Nagoya University, Japan)  
   Date/time: May 26 (Tue), 2020, 12:00-13:00 UT

2. Extreme solar events: A new paradigm  
   Author: Ilya Usoskin (University of Oulu, Finland)  
   Date/time: July 20 (Mon), 2020, 12:00-13:00 UT

3. Developing a Highly Predictable Geomagnetic Index to Gauge Magnetospheric Activity and Space Weather  
   Author: Joe Borovsky (Space Science Institute, USA)  
   Date: September 10, 2020, 22:00-23:00 UT

4. The Ionospheric Connection Explorer - Results from the first year on orbit  
   Author: Thomas Immel (University of California Berkeley, USA)  
   Date: November 17, 2020, 23:00-24:00 UT

5. Magnetospheric Response to Interplanetary Shocks: ULF Wave-Particle Interaction Perspective  
   Author: Q.-G. Zong (Peking University, China)  
   Date and Time: Jan 14 (Thu), 2021, 00:00-01:00 UT

6. Utilizing galactic cosmic rays as signatures of interplanetary transients  
   Author: Mateja Dumbović (University of Zagreb, Croatia)  
   Date and Time: Jan 19 (Tue), 2021, 12:00-13:00 UT

7. Physics at the edge between Earth's atmosphere and space  
   Author: Franz-Josef Lübken (Leibniz-Institute of Atmospheric Physics, Germany)  
   Date and Time: May 21 (Fri), 2021, 12:00-13:00 UT

8. The Sun making history. The mechanism behind the varying amplitude of the solar cycle  
   Author: Kristof Petrovay (ELTE Eotvos Lorand University, Department of Astronomy, Hungary)  
   Date/time: June 8 (Tue), 2021, 13:00-14:00 UT

   Author: Richard Eastes (University of Colorado Boulder, USA)  
   Date/time: September 23 (Thu), 2021, 14:00-15:00 UT
1. Speaker: David G. Sibeck, NASA Goddard Space Flight Center, USA  
   Date and Time: Jan 22 (Fri), 2021, 01:00-02:00 UT  
   Topic: "Motivation for soft X-ray imaging and plans for the STORM global imaging mission"

2. Speaker: Ulrich Taubenschuss, Institute of Atmospheric Physics AS CR, Czechia  
   Date and Time: Mar 5 (Fri), 2021, 11:00-12:00 UTC  
   Topic: "Processing of electric and magnetic signals onboard the THEMIS spacecraft and applications of polarization analysis"

3. Speaker: Jacob Bortnik, UCLA, USA  
   Date and Time: Mar 29 (Mon), 2021, 23:00-00:00 UTC  
   Topic: "Machine-learning based reconstruction of the inner magnetosphere"

4. Speaker: Alphonse C. Sterling, NASA Marshall Space Flight Center, USA  
   Date and Time: Apr 29 (Thu), 2021, 00:30-01:30 UTC  
   Topic: "An Overview of the Sun's Structure, and a Closer Look at Solar Magnetism and Activity"

5. Speaker: Esa Turunen, Sodankylä Geophysical Observatory, Finland  
   Date and Time: May 31 (Mon), 2021, 10:30-11:30 UTC  
   Topic: "The variable geospace environment and our radio wave based modern society: basic concepts of ionosphere and recent research problems at high latitudes"

6. Speaker: Keisuke Hosokawa, University of Electro-Communications, Japan  
   Date and Time: Jun 28 (Mon), 2021, 10:30-12:00 UTC  
   Topic: "Aurora as a manifestation of electromagnetic waves in space"

7. Speaker: Craig Rodger, University of Otago, New Zealand  
   Date and Time: Aug 19 (Thu), 2021, 00:30-01:30 UTC  
   Topic: "Energetic Electron Precipitation from the Radiation Belts: How plasma waves in space kill atmospheric ozone"
SCOSTEP/PRESTO Newsletter vol.21-28

Articles, Highlight of young scientists, Meeting reports, and Short news
Capacity Building schools

In 2021:

• The 44th Annual Scientific Seminar on Physics of Auroral Phenomena, 15-19 March 2021, Apatity, Russia
• The first summer school on space research, technology and application in Bulgaria, 5-11 July 2021, National Observatory Rozhen, Bulgaria
• ISWI/SCOSTEP Iberian Space Weather School, July 21-25, 2021, University of Coimbra, Portugal
• Describing and Analyzing Solar Data for a better prediction of Space Weather, TBD, 2021, Kigali, Rwanda
SCOSTEP - Science Comic Books

What is the Aurora?! 🌈

Qu’est-ce que le champ géomagnétique ?!

Co jsou kosmické paprsky?

Erderwärzung - was ist das?!

오존 끓임은 무엇인가요? 😳

Che cosa sono i raggi cosmici?!

太陽と地球気候は関係あるの?

فضای سطح کی است؟ 😳

Korean, Russian, Spanish, and Tamil are also available. https://scostep.org/
Summary

• PRESTO is the new SCOSTEP scientific program to run during 2020-2024 to understand Predictability of the variable Solar-Terrestrial Coupling

• Scientists from all over the world participate in the PRESTO program to understand predictability of space weather and solar effect on climate.

• Solar terrestrial science will reach as many developing countries as possible via SCOSTEP’s capacity building and outreach activities

PRESTO: Predictability of the variable Solar-Terrestrial Coupling
SCOSTEP: Scientific Committee on Solar-Terrestrial Physics