

A small satellite with solar panels is positioned above the word PRESTO.

PRESTO

Predictability of the variable Solar-Terrestrial Coupling

**The new SCOSTEP 5-year program
in 2020-2024**

**Kazuo Shiokawa
(SCOSTEP President)**



SCOSTEP

Scientific Committee on Solar-Terrestrial Physics

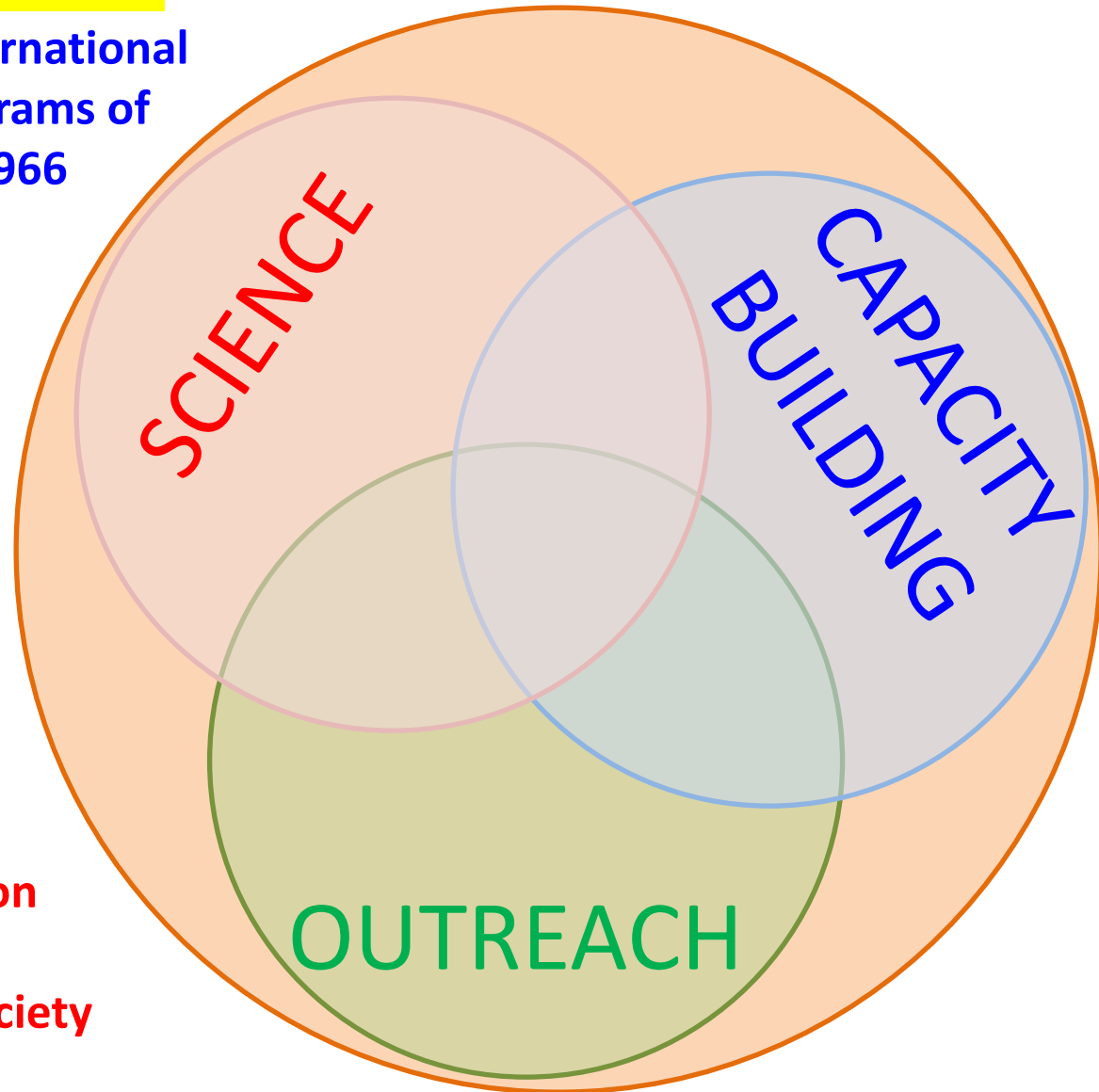


Runs long-term (4-5 years) international interdisciplinary scientific programs of solar terrestrial physics since 1966

Interacts with national and international programs involving solar terrestrial physics elements

Engages in Capacity Building activities such as the annual Space Science Schools with ISWI

Disseminates new knowledge on the Sun-Earth System and how the Sun affects life and society as outreach activities



SCOSTEP

**Scientific Committee on
Solar-Terrestrial Physics**



Current Member Countries and Geographical Regions of SCOSTEP

Australia

Austria

Brazil

Bulgaria

Canada

China

Czech Republic

Finland

France

Georgia

Germany

Hungary

India

Indonesia

Israel

Japan

Kenya

Mexico

New Zealand

Nigeria

Norway

Russia

South Korea

Slovakia

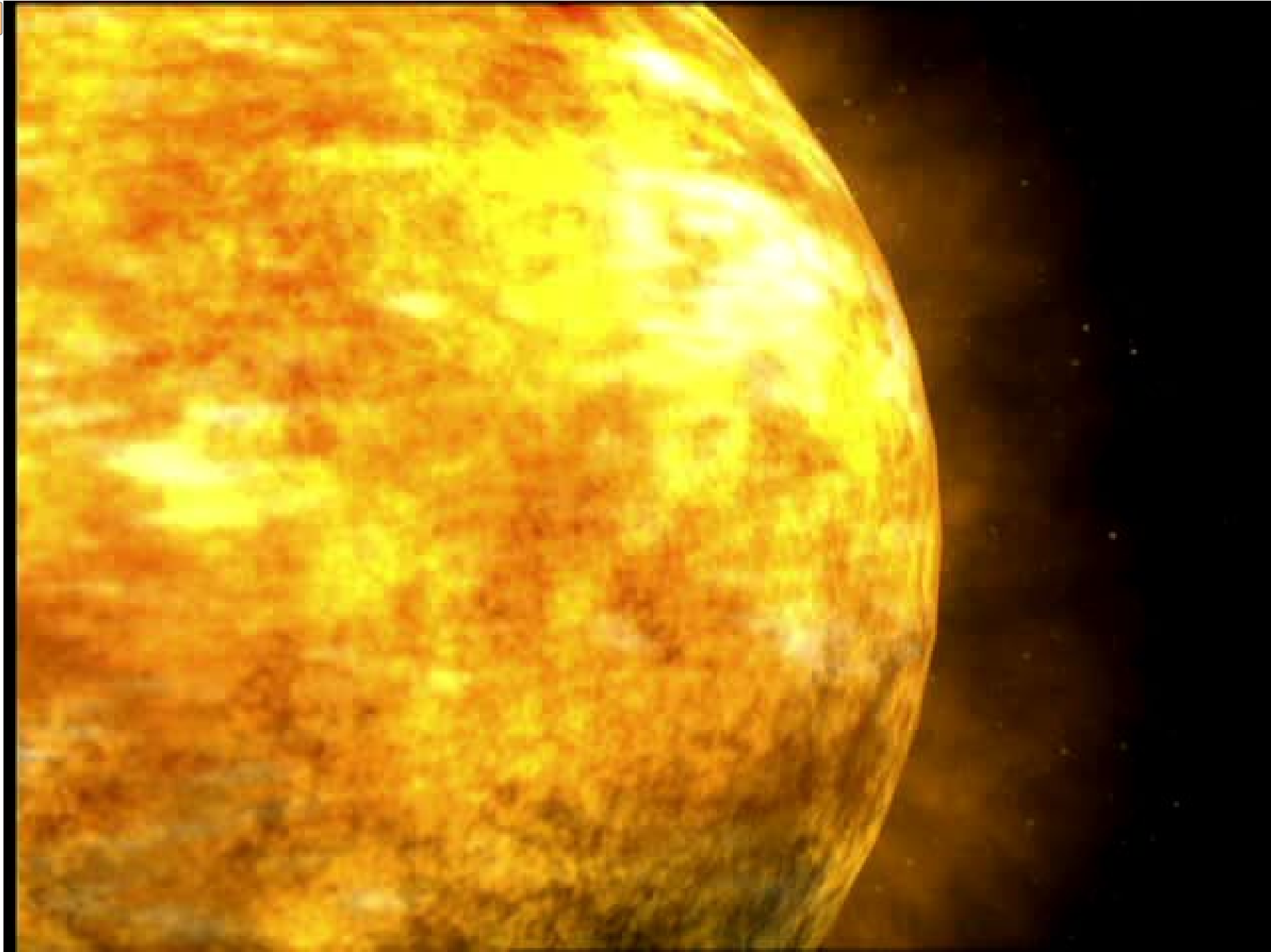
South Africa

Switzerland

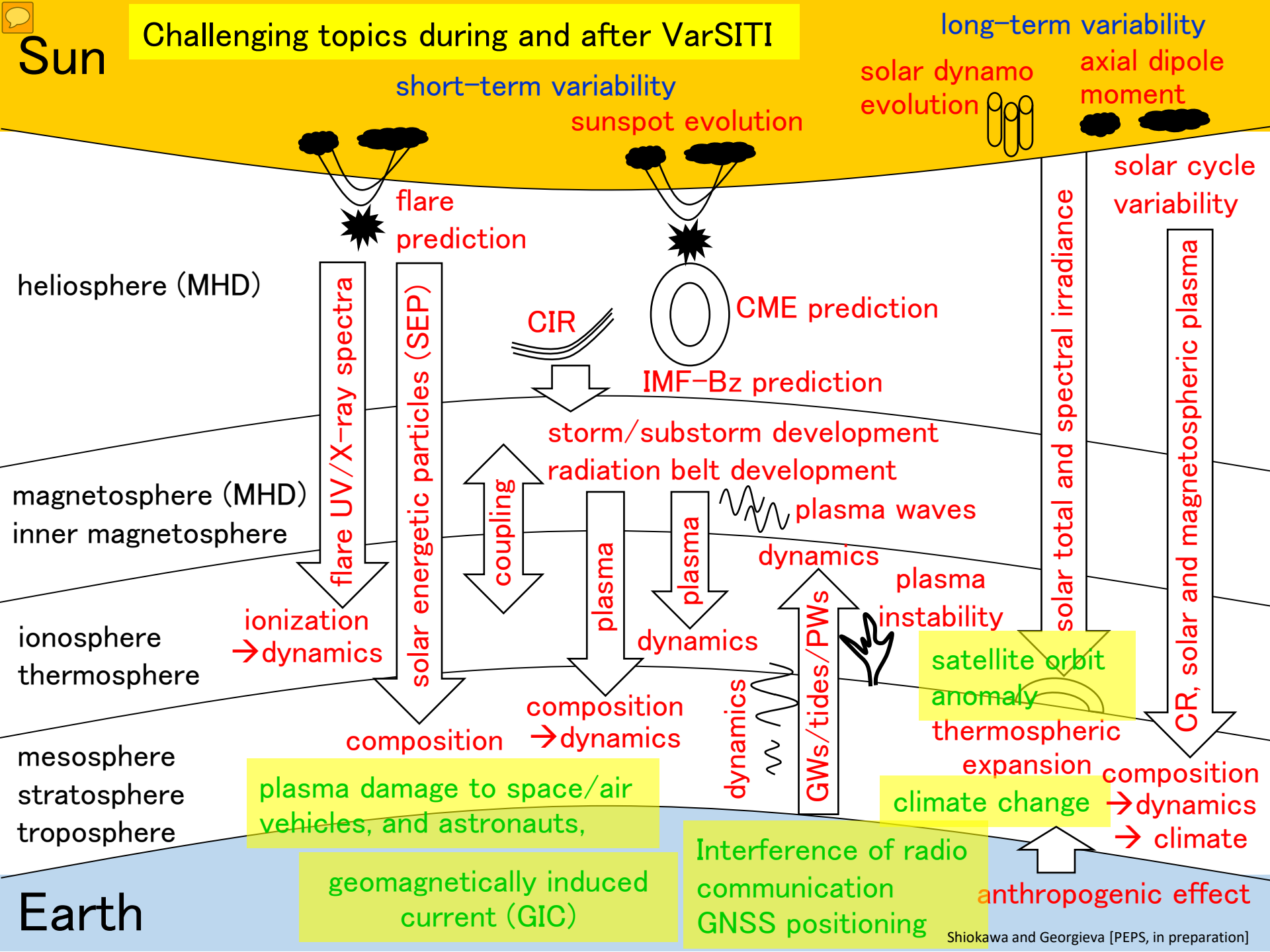
Taiwan

United Kingdom

USA



NASA schematic images





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 Next Scientific Program (NSP) committee, chaired by I. Daglis (Greece)



Figure 6: Group picture of the participants of the Forum in 2018.

ISSI forum in Beijing, China in 2018.

SCOSTEP Next Scientific Program (NSP) committee, chaired by I. Daglis (Greece)



Figure 7: Group picture of the participants of the Forum in 2019.

ISSI forum in Bern Switzerland in 2019.

PRESTO:

Predictability of the variable **S**olar- **T**errestrial **C**oupling (2020-2024)

Detailed documentation is available at:

http://www.issibj.ac.cn/Publications/Forum_Reports/201404/W020190620592906717714.pdf

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

PRESTO chair and co-chairs



Co-chair
Katja Matthes
Germany



Chair
Ramon E. Lopez
USA

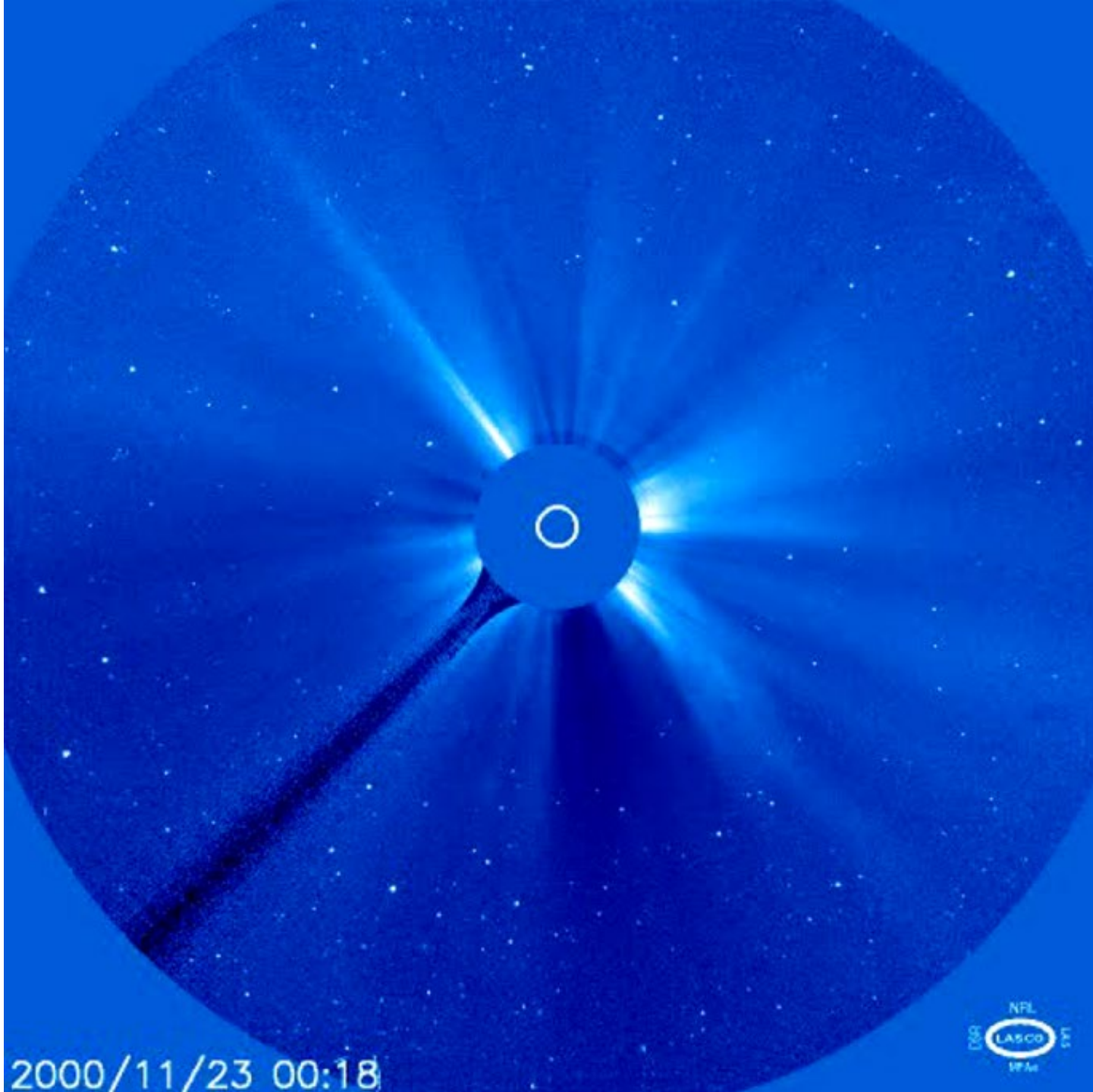


Co-chair
Jie Zhang
USA

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



Solar wind and
Coronal Mass
Ejections
(CMEs)
observed by
the SOHO
satellite



NASA
SOHO
LASCO

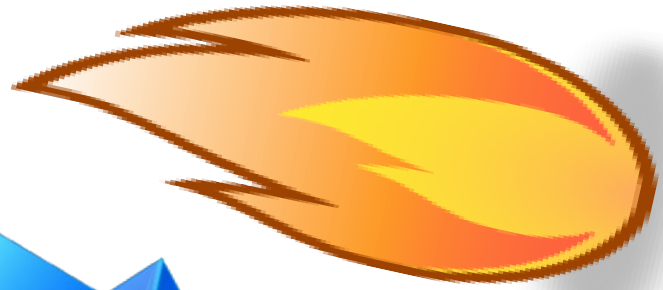
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Solar Eruption

Solar wind, CIR & CME



Geomagnetic storm & substorm

High-energy particles



EM Radiation



Orbit change



Satellite anomaly



Plasma bubbles



Ionospheric disturbances



aurora



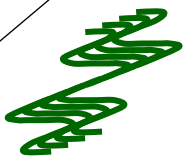
Radio communication



GNSS positioning

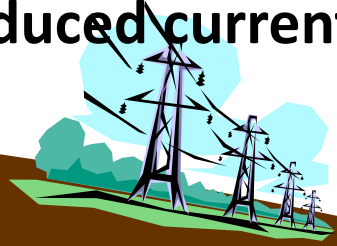


Atmospheric waves



Climate change

Geomagnetically induced current



Pillar 1. Sun, interplanetary space and geospace

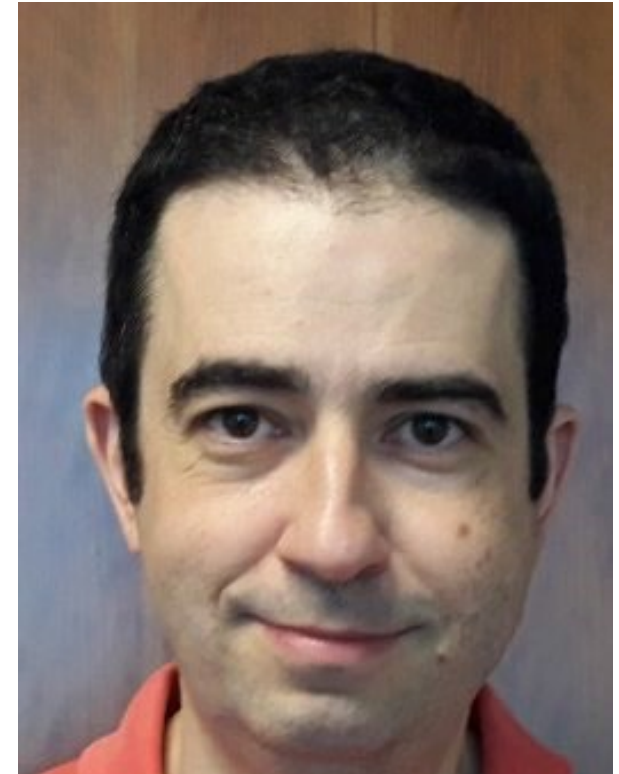
Co-leaders of Pillar 1



**Allison Jaynes
(USA)**



**Emilia Kilpua
(Finland)**



**Spiros Patsourakos
(Greece)**

Pillar 2. Space weather and the Earth's atmosphere

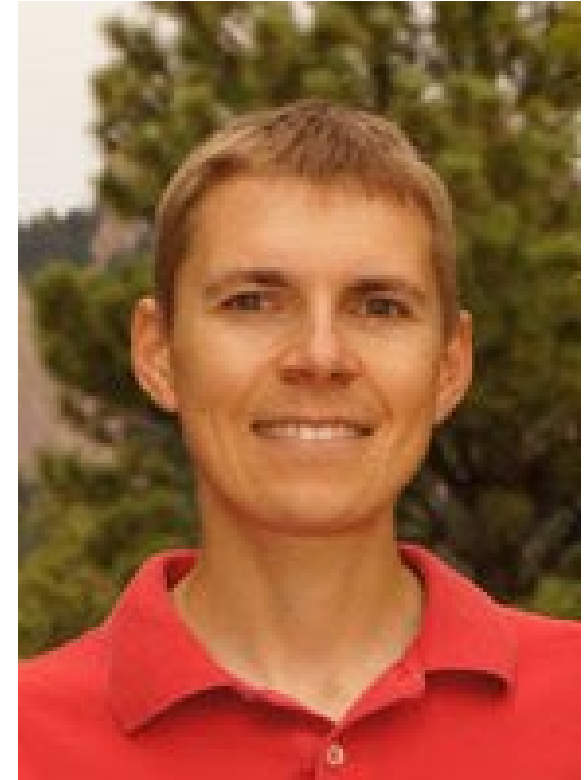
Co-leaders of Pillar 2



**Loren C. Chang
(Taiwan)**



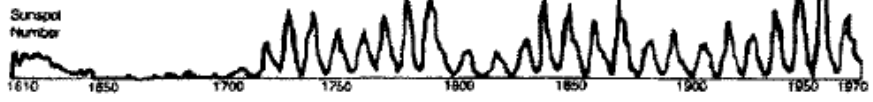
**Duggirala
Pallamraju
(India)**



**Nick M. Pedatella
(USA)**

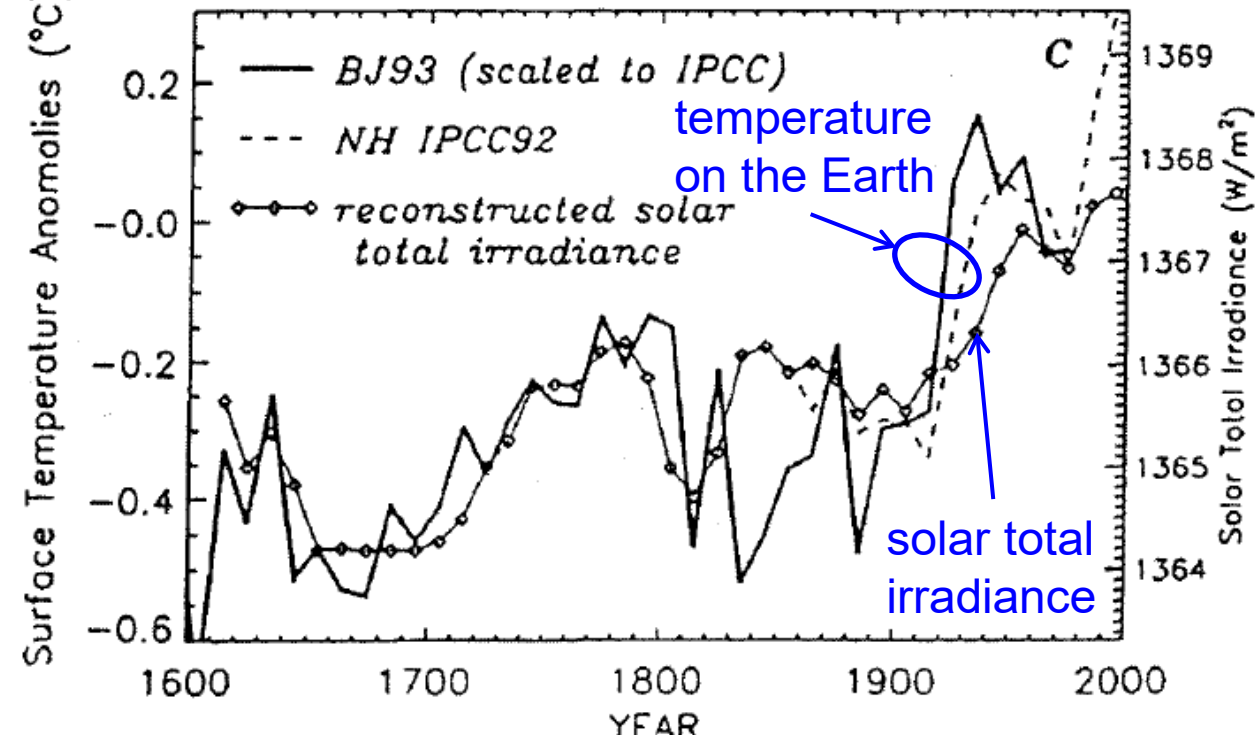
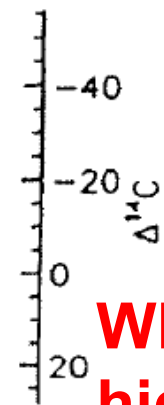
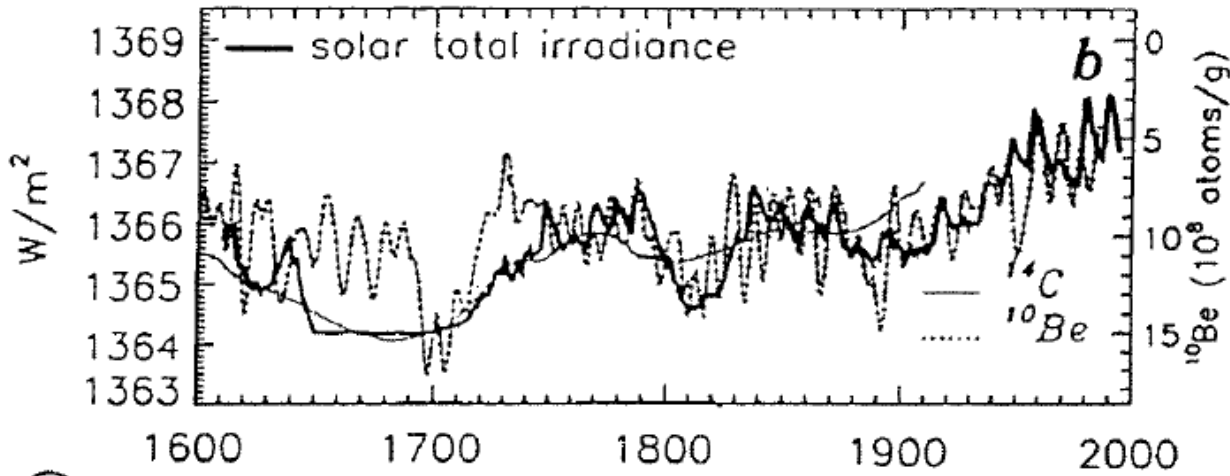
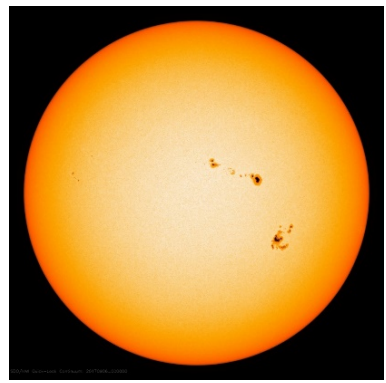


Sunspot number



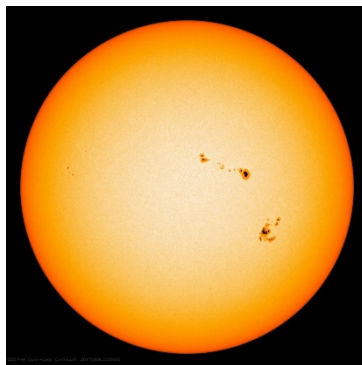
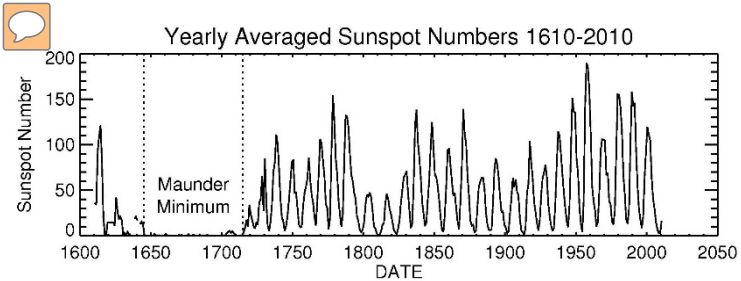
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Sun-Climate Change

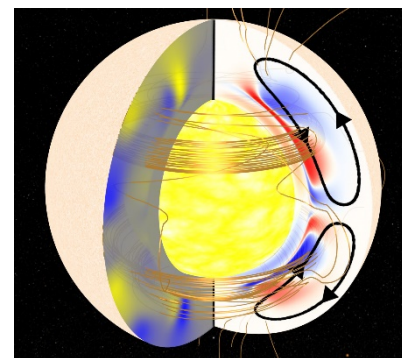


What makes this high correlation ($r=0.86$) between solar total irradiance and temperature on the Earth?

Lean (GRL, 1995)
reproduced by
Pang and Yau
(EOS, No.43, 2002)



Solar dynamo

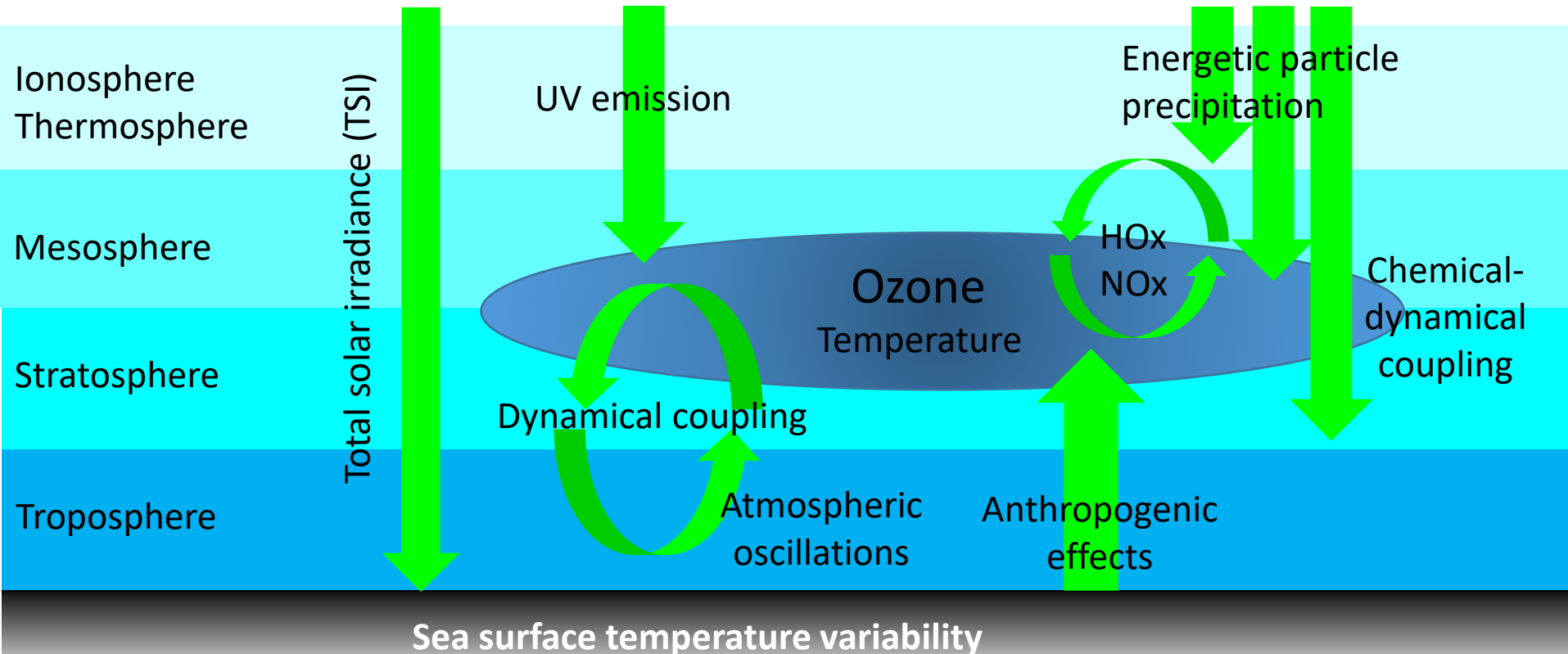


Interplanetary space

Magnetosphere

Solar energetic particles

magnetospheric particles





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

Co-leaders of Pillar 3



**Odele
Coddington
(USA)**



**Jie Jiang
(China)**



**Eugene Rozanov
(Switzerland)**



Summary

- **PRESTO** is the new **SCOSTEP** scientific program to run during **2020-2024**
- Scientists from all over the world will 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