SNS • SORCE News Source

Solar Radiation and Climate Experiment Monthly Newsletter **July – Sept. 2017**

2018 Sun-Climate Symposium –

Our focus topic for this 3.5-day meeting is ***"The State of the TSI and SSI Climate Records at the Junction of the SORCE and TSIS Missions."*** This meeting is sponsored by the Sun-Climate Research Center – a joint venture between NASA GSFC and LASP at the University of Colorado.

Call for Abstracts ☼ Due Jan. 5

The abstract form, and submittal instructions are available on the website. We encourage your participation and hope that you will send in an abstract and share this announcement with your colleagues. Invited speakers will be posted to the website as they accept. Please mark your calendar now to join us for a great meeting in a beautiful location!

Science Overview

Observations of the Sun and Earth from space have revolutionized our view and understanding of how solar variability and other natural and anthropogenic forcings impact Earth's atmosphere and climate. Since 1978 – more than three solar cycles – the total and spectral solar irradiance (TSI and SSI) and global terrestrial atmosphere and surface have been observed continuously, providing data of unprecedented quality for Sun-climate studies. The 2018 Symposium will convene experts from across the solar-terrestrial community and from various disciplines that include Sun-climate connections, atmospheric physics and chemistry, heliophysics, and metrology to discuss solar and climate observations and models during this crucial period near the end of the Solar Radiation and Climate Experiment and the start of the Total and Spectral Solar Irradiance Sensor (TSIS) Mission.

Lake Arrowhead, California
March 19-23, 2018

http://lasp.colorado.edu/home/sorce/news-events/meetings/2018-scs/

Join us! Submit your abstract today!

The evening sunset on beautiful Lake Arrowhead.

Sessions and Descriptions

The agenda for this interactive meeting consists of invited and contributed oral and poster presentations. Six sessions will focus on different science topics.

1. ***The creation, significance, and applications of accurate Climate Data Records***

This session will discuss the requirements for making climate data records (CDRs), what qualifies as a CDR, the scientific understanding gained from the CDRs, and the challenges that exist for future climate measurement systems and models. The session is open to climate data records of all kinds and the broad range of science questions that is or can be addressed with CDRs.

2. ***The state of the TSI and SSI Climate Records near the end of the SORCE Mission***

This session will address the total solar irradiance (TSI) and solar spectral irradiance (SSI) measurement records since the start of the space era. Emphasis is given to how measurements of the last decade have been reconciled with and contributed to composite records with associated time-dependent uncertainties.

3. ***What was learned about solar variability and impacts on the terrestrial environment during SC 24?***

This session will address the following questions.

- With SC24 being one of the weakest solar cycles during the past 90 years, can we reliably discern the terrestrial signatures of the current solar inactivity—at the surface, in the stratosphere and in space weather?
- It has been established that the upper atmosphere density has had a long-term decrease from cooling above 300 km by greenhouse gases and due to the

reduced solar activity in SC24. Are there similar indications in the lower atmosphere for warming due to greenhouse gases and other changes due to reduced solar activity?
- What does understanding of the present (in the context of the past) infer for the future variability of Earth's environment?

4. What are the expectations for the next solar minimum and SC 25?

This session will address the following questions.
- Are spectral and total solar irradiance levels lower now than during past minima, and how much might they change during solar cycle 25?
- Are we entering a new prolonged period of anomalously low activity such as the Dalton Minimum in the early 1800s?
- Can we identity anomalous behavior in the solar dynamo and surface magnetic flux transport as we enter this next cycle minimum and can these behaviors forecast SC25 activity?

5. Stellar variability and connections to the Sun

This session will address the following questions.
- How typical is the cyclic activity of our Sun relative to Sun-like stars?
- What have we learned from the Kepler Mission and ground-based synoptic programs about the ranges of total and spectral irradiance variability?
- What progress have we made in understanding what controls the amplitude and length of cyclic activity in a Sun-like star?

6. Next generation of solar and atmospheric observations

This session will discuss new missions, sensors, and implementation strategies required for a next-generation observing system to meet the current and future challenges facing climate change studies.

Confirmed Speakers (as of Sept. 7)

The confirmed invited speakers listed below are in alphabetical order (not by session) and presentation titles are tentative. Abstracts will be posted online closer to the abstract deadline.

Gabriel Chiodo, Columbia University, New York, NY
Ozone/Sensitivity, based on a GCM (not observations)

Thierry Dudok de Wit, Univ. of Orléans, LPC2E, Orléans, France
Methodology for creating a TSI Composite

Lesley Gray, Oxford University, Oxford, UK
Title coming…

Margit Haberreiter, PMOD/WRC, Switzerland
Results of the SOLID Project

Jeffrey Hall, Lowell Observatory, Flagstaff, AZ
Variability of Sun-like Stars

Frank Hill, National Solar Observatory, Boulder, CO
SC Activity Related to Local and Global Helioseismology

Adam Kowalski, Univ. of Colorado and NSO
Optical/UV Emission & Variability of Exoplanet Host Stars

Natalie Krivova, Max-Planck Institute, Germany
Update on SATIRE

Scott McIntosh, HAO/NCAR, Boulder, Colorado
Deciphering the Solar Magnetic Activity Cycle

Lorenzo Polvani, Columbia University, New York, NY
Chemistry-Climate Feedbacks Associated with Ozone Layer

Gavin Schmidt, NASA Goddard Inst. for Space Studies
Title coming…

Werner Schmutz, PMOD/WRC, Switzerland
CLARA Mission Results (launched July 14, 2017)

Alexander Shapiro, Max-Planck Institute, Germany
Comparing Solar and Stellar Variability

Ken Tapping, NRC, Herzberg Inst. of Astrophysics D.R.A.O., Penticton, BC, Canada
Next Generation Solar Flux Monitor

Betsy Weatherhead, CIRES, Univ. of Col. and NOAA
Designing the Climate Observing System of the Future

Bruce Wielicki, NASA Langley Research Center
Title coming…

Eric Wolf, LASP/ATOC, Univ. of Colorado
Earth-like Exoplanet Climate and Habitability

UCLA Lake Arrowhead Conference Center

This venue is a state-of-the-art full service retreat facility on the north shore of beautiful Lake Arrowhead in southern California. Meeting attendees will enjoy the fresh air and 42 acres of beautifully forested terrain tucked in the San Bernardino Mountain foothills (5000 ft.). For more information, visit their website at: http://lakearrowheadconferencecenter.ucla.edu/.

Sunset over the San Bernardino Mountains in southern Cal.

Logistics and Registration

Please visit the 2018 Sun-Climate Symposium website for logistical information, including maps and transportation options. Registration and lodging reservations will be available in December 2017.

http://lasp.colorado.edu/home/sorce/news-events/meetings/2018-scs/

Please mark your calendar today to join us in March 2018 for this interesting symposium!

SORCE and the Solar Eclipse –

For SORCE, the August 21st eclipse was a non-event. Since SORCE produces just radiometric and spectral irradiance values of the Sun (no images), there were no special science expectations. As always, our vigilant operations team was on the alert to make sure that SORCE did successfully transit through the shadow of the moon twice during the eclipse period. All went well.

And while SORCE was quiet through the eclipse, the SORCE scientists celebrated the Sun's magnificent show!

Left: Marty Snow captured the perfect eclipse totality image.
Right: SORCE PI Tom Woods prepared for the eclipse by sharing his specially invented Solar Eclipse Cookie – layered tea biscuit (sun), white frosting (corona), sugar sprinkles (diamond ring), and a chocolate wafer (moon) to complete the total eclipse.

SORCE Satellite Status –

Years past its prime, SORCE continues to perform beyond all expectations. In early August SORCE started to experience more "brownouts" which are caused by battery degradation. A brownout happens when the voltage falls below a specific level and automatically turns off satellite systems. SORCE is prepared for these events with systems in place to respond quickly when a warning is triggered. The SORCE operations team has developed automated procedures to recover and resume science collection on the same orbit of a brownout. Daily science requirements continue to be met. GO SORCE!

Extended Mission Continues into 2018 –

In March, the SORCE team submitted a Sr. Review Proposal for another extended mission (2018-2020). SORCE successfully completed its 5-year core mission (Jan. 2003-Jan. 2008) and is currently in its tenth year of its extended mission. It has achieved its primary mission goal of measuring TSI and SSI with unprecedented accuracy and precision. The main objectives of the SORCE extended mission are very much aligned with the original SORCE mission objectives, but have new focus with the current state of NASA missions and solar activity in SC24. In addition, obtaining overlapping irradiance measurements with upcoming missions (such as TSIS) is critical, so SORCE's extension is essential.

We still await a decision from the NASA Sr. Review; meanwhile NASA has extended the SORCE contract into 2018.

Upcoming Meetings / Talks –

SORCE scientists will present papers or attend the following 2017-2018 meetings/workshops:

2017

ISSI Working Group: "Towards a Unified Solar Forcing Input to Climate Studies", Oct. 2-6, Bern, Switzerland

AGU Fall Meeting, Dec. 11-15, New Orleans, LA
https://fallmeeting.agu.org/2017/

2018

Sun-Climate Symposium, March 19-23, Lake Arrowhead, CA
http://lasp.colorado.edu/home/sorce/news-events/meetings/2018-scs/

EGU General Assembly, April 8-13, Vienna, Austria
https://www.egu2018.eu/