



## 2018 Sun-Climate Symposium –

*The State of the TSI and SSI Climate Records  
at the Junction of the SORCE and TSIS Missions*

*Just a reminder...*

**Call for Abstracts ☀ Due Jan. 5**

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

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 are listed on the website and below. *Please join us for a great meeting in a beautiful location!*

### Science Overview

This 3.5-day meeting is sponsored by the Sun-Climate Research Center – a joint venture between NASA GSFC and LASP at the University of Colorado.

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**

**Join us! Submit your abstract today!**



The evening sunset on beautiful Lake Arrowhead.

### Session Descriptions and Invited Speakers

The agenda for this interactive meeting consists of invited and contributed oral and poster presentations. Six sessions will focus on different science topics. The confirmed invited speakers are listed below with tentative presentation titles. Abstracts will be posted online closer to the abstract deadline (Jan. 5, 2018). **Send your abstract in today!**

#### ***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.

#### ***Invited Speakers – Session 1:***

**John Bates**, John Bates Consulting, Arden, NC  
*Overview in CDR Acquisition, Production, and Preservation*

**Bruce Wielicki**, NASA Langley Research Center,  
Hampton, VA  
*Title coming...*

**Ann Windnagel**, NSIDC/CIRES, University of Colorado  
*Sea Ice Concentration CDR at the National Centers for Environmental Information*

## **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.

### **Invited Speakers – Session 2:**

**Thierry Dudok de Wit**, Univ. of Orléans, LPC2E, Orléans, France

*Methodology for creating a TSI Composite*

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

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

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

## **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?

### **Invited Speakers – Session 3:**

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

**Lesley Gray**, Oxford University, Oxford, UK  
*Title coming...*

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

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

## **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 identify 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?

### **Invited Speakers – Session 4:**

**Paul Charbonneau**, University of Montréal, Canada  
*Mechanisms of Solar Cycle Fluctuations*

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

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

**Dick Mewaldt**, SRL, California Inst. of Technology, Pasadena, CA  
*Spacecraft Variability of Galactic Cosmic Ray Intensities during the Space Age and the Holocene Time Period*

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

## **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?

### **Invited Speakers – Session 5:**

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

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

**Travis Metcalfe**, Space Science Institute, Boulder, CO  
*Magnetic Evolution of the Sun-like Activity Cycles*

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

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

## **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.



### Invited Speakers – Session 6:

**Arlindo da Silva**, NASA Goddard Space Flight Center  
*An Update on the Aerosol-Cloud-Ecosystem (ACE) Mission*

**David Diner**, Jet Propulsion Laboratory, Pasadena, CA  
*Multi-Angle Imager for Aerosols (MAIA): Observations, Measurements, and Science*

**Dave Harber**, LASP, University of Colorado – Boulder  
*The Compact SIM (CSIM) and Compact TIM (CTIM) Instruments*

**Betsy Weatherhead**, CIRES, University of Colorado – Boulder and NOAA

*Designing the Climate Observing System of the Future*

**Jeremy Werdell**, NASA Goddard Space Flight Center  
*PACE Mission: The Uniqueness and its Current Status*

### 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.

## *TSIS-1 Launch On Track –*

After years in the making (almost 2 decades!), the Total and Spectral Solar Irradiance Sensor (TSIS-1) launch is on track for mid December. TSIS will be launched onboard a SpaceX Falcon 9 rocket in a Dragon capsule from Kennedy Space Center. TSIS is headed to the International Space Station (ISS), where it will be mounted for optimum solar pointing activities.

TSIS is a 2-instrument package comprised of the Total Irradiance Monitor (TIM), which measures the total solar irradiance from outside of Earth's atmosphere, and the Spectral Irradiance Monitor (SIM), which measures solar spectral irradiance from 200-2400 nm. The TSIS TIM and SIM are heritage instruments to those currently flying on SORCE and both instruments are essential to understanding the energy input to the climate system. TSIS will continue the 39-year TSI record and extend the newer 14-year SORCE SSI record, insuring continuity of the solar irradiance Climate Data Records into the future.

LASP at the University of Colorado is leading the TSIS effort with PI Peter Pilewskie, PM Brian Boyle, and instrument scientists Erik Richard (SIM) and Greg Kopp (TIM). Similar to SORCE, LASP will be handling the mission operations for TSIS, and science data from the TIM and SIM instruments should be available in about 3 months.



TSIS-1 is ready to begin its 5-year mission.

### Logistics and Registration

Please visit the 2018 Sun-Climate Symposium website for logistical information, including maps and transportation options. Registration and lodging reservations are available now.

### Important Deadlines

**Abstracts: Friday, Jan. 5**

**Registration/Housing: Friday, Feb. 9**

For more information, **CLICK** 

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

## *Upcoming Meetings / Talks –*

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

### **2017**

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/>



Did you know...

SORCE will be celebrating its 15<sup>th</sup> birthday next month!