



## 2015 Sun-Climate Symposium –

We are pleased to announce the 2015 Sun-Climate Symposium, which will convene November 10-13 at the Riverfront Marriott in beautiful Savannah, Georgia. Our focus topic for this 3.5-day meeting is “*Multi-Decadal Variability in Sun and Earth during the Space Era.*” Sponsors are the SORCE mission and the Sun-Climate Research Center – a joint venture between NASA GSFC and LASP at the University of Colorado.

**Call for Abstracts ☀ Due August 7**

Observations of the Sun and Earth from space have revolutionized our view and understanding about impacts of solar variability and anthropogenic forcing on Earth climate. For more than three solar cycles since 1978, the total and spectral solar irradiance (TSI and SSI) and global terrestrial atmosphere/surface have been observed continuously, enabling unprecedented quality data for Sun-climate studies. The primary objective of this symposium is to convene climate scientists, solar physicists, and experimentalists together for a better understanding how Earth climate system changes and responds to solar variability.

The agenda for this interactive meeting consists of invited and contributed oral and poster presentations. We have 8 sessions which fit under 3 theme topics. Detailed session descriptions are below and confirmed speakers (as of now) are posted on the meeting website.



Please note that the Sun-Climate Symposium is slightly longer than past SORCE Meetings since we have expanded our sponsorship and meeting theme. We will meet Tuesday morning through Friday noon, Nov. 10-13.

**Additional information, the abstract form, and submittal instructions are available on the website.** We encourage your participation and hope that you will share this announcement. Please mark your calendar to join us!

### Meeting Website:

<http://lasp.colorado.edu/home/sorce/news-events/meetings/2015-sun-climate-symposium/>

## Session Titles and Descriptions:

### 1. Decadal variability of the Sun and Sun-like stars

#### 1a) **TSI measurements and modeling**

*This session will address the total solar irradiance (TSI) measurement record since 1978, with emphasis on how measurements of the last decade have been reconciled, and have contributed to new TSI composite record with associated time-dependent uncertainties; how variability in Sun-like stars improves our understanding of the Sun's behavior over the past three decades.*

#### 1b) **SSI measurements and modeling**

*Recent challenges in the SSI observational record will be discussed over the full spectrum (UV-VIS-NIR), including recent progress on understanding spectral variability over the past solar cycle; spectral irradiance composites and comparisons with state-of-the-art irradiance modeling.*

#### 1c) **Variability of the Sun-like stars**

*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 cycle length and activity range of a Sun-like star?*

## **2. Climate change theories and observations**

### **2a) Climate changes during the space era**

*This session will discuss Earth's climate changes driven by anthropogenic and natural forcing. Observations of the Sun and Earth from space have provided a new insight in solar variability and its influence on terrestrial atmosphere for more than three solar cycles. How have these observations helped to enhance our knowledge of climate change to get an assessment of future climate?*

### **2b) Societal impacts from climate change and solar variability**

*Climate change can have potential impacts on social and economic implications as well as geophysical change. How can we transform our knowledge of climate change to improve the life of humanity? What is the current status of our understanding of sea ice loss and sea level rise and its impact on our daily lives?*

### **2c) Sun-Climate Connection: Top-down and bottom-up couplings**

*This session will discuss the possible links in Sun-Climate connection, including top-down and bottom-up couplings. What have we learned about the Sun's influence on the earth's atmosphere during the satellite era, in particular over the multi decadal time scale? How well are climate models able to capture these links?*

## **3. Challenges and opportunities for future solar and Earth observations**

### **3a) Next generation observing systems for climate records**

*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.*

### **3b) Challenges and opportunities in solar observations**

*This session will address the observational requirements for improving our ability to quantify the solar forcing of the Earth system and interpreting its response.*

## **Confirmed Speakers:**

*(as of 3/20/2015, by overall theme, and then alphabetical)*

### **1. Decadal variability of the Sun and Sun-like stars**

Gene Avrett, *Harvard-Smithsonian CfA*  
Tom Ayres, *University of Colorado – Boulder/CASA*  
William Ball, *PMOD/WRC, Switzerland*  
Jim Butler, *NASA Goddard Space Flight Center*  
Jeff Hall, *Lowell Observatory, Flagstaff, AZ*  
Hugh Hudson, *University of California – Berkeley/SSL*  
Phil Judge, *High Altitude Observatory/NCAR*  
Scott McIntosh, *High Altitude Observatory/NCAR*  
Ken Tapping, *Canadian NRC, Herzberg Inst. of Astrophys.*  
Kok Leng Yeo, *Max Planck Institute, Germany*

### **2. Climate change theories and observations**

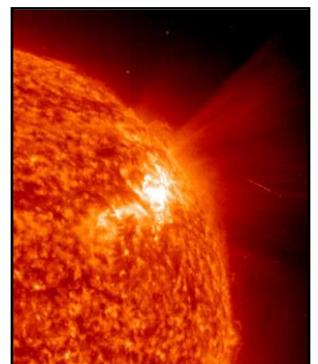
Jason Evans, *Stetson University, DeLand, FL*  
Rolando Garcia, *Earth System Laboratory/NCAR*  
Dean Hardy, *University of Georgia, Athens*  
Andrew Kren, *University of Colorado – Boulder/LASP*  
Rosana Rivera, *University of Georgia, Athens*  
Drew Shindell, *Duke University, Durham, NC*  
Anne Smith, *Earth System Laboratory/NCAR*

### **3. Challenges and opportunities for future solar and Earth observations**

David Crisp, *NASA Jet Propulsion Laboratory*  
Luc Damé, *LATMOS, France*  
Sasha Marshak, *NASA Goddard Space Flight Center*  
Hank Revercomb, *University of Wisconsin – Madison*  
Erik Richard, *University of Colorado – Boulder/LASP*  
Marty Snow, *University of Colorado – Boulder/LASP*  
Graeme Stephens, *NASA Jet Propulsion Laboratory*  
Cheryl Yuhas, *NASA Headquarters*

## **SIST Awards Announced –**

SORCE scientists and collaborators submitted several proposals in early November 2014 in response to the NASA ROSES-14 Announcement of Opportunity for the “Solar Irradiance Science Team (SIST)” solicitation. NASA received 13 proposals, and we have been unofficially notified that seven were selected for



**SORCE**

funding. Of these seven, five went to SORCE science teams! Proposal leads from LASP were Jerry Harder, Marty Snow, Erik Richard, and Greg Kopp. SORCE Co-Investigator Judith Lean from NRL also received a SIST Award.

The primary purpose of the SIST research projects is to support the development of space-based data sets of total and spectral solar irradiance (TSI and SSI). The data sets will be used as input to global models to investigate solar variations and their impacts on the Earth climate and atmospheric composition. Right up SORCE's alley!

The five SORCE-related proposal titles were:

- *Construction of a SORCE-based solar spectral irradiance (SSI) record for input into chemistry climate studies of Solar Cycle 23-24* (J. Harder)
- *Application for Solar Irradiance Variability* (M. Snow)
- *The analysis of improved laboratory measurements in the re-calibration and re-evaluation of the SORCE SIM data record* (E. Richard)
- *A TSI Community Consensus Composite Based on an Assessment of the Accuracies and Uncertainties of Space-borne TSI Measurements* (G. Kopp)
- *How does the Sun's Spectrum Vary?* (J. Lean)

## ***SORCE Extended Mission Proposal Submitted –***

The SORCE team submitted the SORCE Extended Mission Proposal for 2016-2018 in early March 2015. All NASA Earth Science Missions submit proposals for senior review every two years. SORCE successfully completed its 5-year core mission (Jan. 2003-Jan. 2008) and is currently in



the eighth year of its extended mission. It has achieved its primary mission goal of measuring total solar irradiance (TSI) and solar spectral irradiance (SSI) in the 0.1-27 nm and 115-2400 nm wavelength ranges with unprecedented accuracy and precision. The main objectives of the SORCE extended mission are aligned with our long-standing mission objectives of acquiring the highest quality solar irradiance observations, but now with an emphasis of studying the descending phase of SC 24.

After battery issues, the SORCE mission operations team has done a fabulous job getting SORCE back to taking solar measurements almost every orbit. With the new “hybrid” mode (collecting solar measurements during

orbit day and then going into safe-hold during eclipse periods to conserve battery power), they plan for SORCE to continue making good quality solar irradiance measurements throughout the extended mission timeframe. The next-generation TIM and SIM instruments are planned for a launch on a NOAA satellite in the 2017-2018 timeframe.

As a follow-up to the written proposal, the SORCE scientists will meet with the Sr. Review Panel at NASA on April 29 to respond to questions and items needing further clarification. The review panel is expected to make a decision on the next SORCE Extended Mission in early summer.

## ***Upcoming Meetings / Talks –***

*SORCE scientists will present papers or attend the following 2015 meetings/workshops:*

SOLAR/SOLSPEC Workshop, March 10-12, Brussels, Belgium

Boulder Solar Day, March 17, Boulder, CO

NOAA Space Weather Workshop, April 14-17, Boulder, CO

SOLAR/SOLSPEC Team Meeting, June 4-5, The Netherlands

IAU XXIX General Assembly, Aug. 2-6, Honolulu, HI

**Sun-Climate Symposium (SORCE/SCRC Mtg), Nov. 10-13, Savannah, GA**

***Happy Spring!***

