



## 2015 Sun-Climate Symposium –



We are pleased to announce the 2015 Sun-Climate Symposium, which is motivated by the Sun-Climate Research Center – a joint venture between NASA GSFC and CU/LASP. Our focus

topic for this 3.5-day meeting is *“Multi-Decadal Variability in Sun and Earth during the Space Era.”* Like past SORCE Meetings, the format will consist of invited and contributed oral and poster presentations in several theme sessions.

**Savannah, Georgia**  
**Nov. 10-13, 2015**

**Abstract Deadline: August 7**  
**Registration, Hotel Deadline: Oct. 9**

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. Sessions will be organized around the following themes and sub-sessions:

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

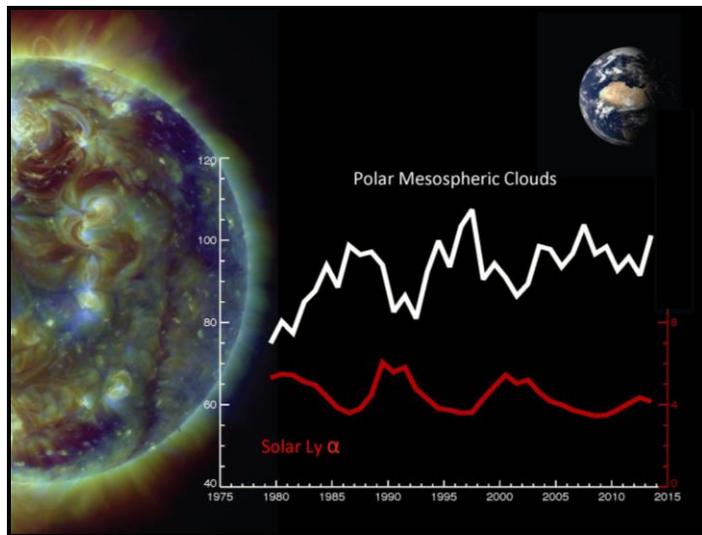
- TSI measurements and modeling
- SSI measurements and modeling
- Variability of the Sun-like stars

### 2. Climate change theories and observations

- Climate changes during the space era
- Societal impacts from climate change and solar variability
- Sun-climate connection: Top-down and bottom-up couplings

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

- Next generation observing systems for climate records
- Challenges and opportunities in solar observations



Time series of PMC ice water content in  $\text{g}/\text{km}^2$  at 74-82 N from 1979-2013, as observed by SBUV. It shows an increasing trend and the distinct 3 solar cycle anti-correlated with seasonal average solar Ly- $\alpha$  flux. (Image modified from DeLand and Thomas [2015], and the Sun image is from SDO on 1/4/2014.)

*Please mark your calendar today to join us!* We encourage your participation and hope that you will share this announcement with colleagues. The venue for the 2015 Sun-Climate Symposium is the Savannah Riverfront Marriott. The website is under development now, so for the latest information visit:

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

## Update from Mission Operations –

Within mission ops, day-to-day activities continue to go very well for SORCE. The “hybrid” operating mode continues to be very successful, allowing SORCE to take solar measurements almost every orbit and the extended mission objectives are fully met. It is



call the hybrid mode because every orbit is a combination of normal operating mode collecting science data during orbit day, and then safe-hold during eclipse periods to conserve battery power.

The LASP/OSC operations team is working on the next version of flight software for the APE (altitude and power electronics) and the OBC (on-board computer) which would allow the spacecraft to recover to science operations if/when we have another battery cell failure and cannot keep the APE in a powered-on state during eclipse as it currently does. This effort will help extend the longevity of the SORCE mission.

## ***Tom Woods Joins AGU Fellows –***

SORCE PI Tom Woods was named to the American Geophysical Union (AGU) class of 2014 Fellows. This honor is given to AGU members who have made exceptional scientific contributions and attained acknowledged eminence in the fields of Earth and space sciences.



Primary criteria for evaluation in scientific eminence are a major breakthrough or discovery, paradigm shift, or sustained impact. This is a particularly prestigious honor as no more than 0.1 percent of the total membership of AGU is recognized annually.

Tom was recognized for his fundamental contribution and enduring commitment to advancing the measurements and understanding of solar irradiance across the spectrum. A special ceremony was held at the fall AGU Meeting in San Francisco on Wednesday, Dec. 17, 2014 to honor the 2014 class of 62 individuals. Congratulations Tom!

## ***Busy AGU Meeting for SORCE –***

SORCE scientists from LASP were very busy during the Fall AGU Meeting in San Francisco, California, December 15-19. Presentations included:

- Tom Woods – *A Different View of Solar Cycle Spectral Variations: Total Energy during Isolated Solar Outburst Periods (Invited)*
- Jerry Harder – *The Importance of Solar Spectral Irradiance to the Sun-Earth Connection: Lessons-learned from SORCE and their relevance to future missions (Invited)*
- Gary Rottman – *A Reliable and Accurate Long-term Climate Record: Solar Irradiance*

- Robert Cahalan – *SORCE Observations of Solar Cycles 23-24: What's new? What's next?*
- Guoyong Wen – *GISS GCMAM Modeled Climate Response to Total and Spectral Solar Forcing on Decadal and Centennial Time Scales*
- Anne Wilson – *A Semantically Enabled Metadata Repository for Solar Irradiance Data Products*
- Doug Lindholm – *LaTiS: Interoperability via a Universal Functional Data Model*

## ***SORCE Extended Mission Proposal in Progress –***

The SORCE team is busy working on the next SORCE Extended Mission Proposal for 2016-2018, which is due March 3, 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 Solar Cycle 24.

We hope 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 in late April 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.

## ***Dong Wu Replaces Bob Cahalan as GSFC SORCE Project Scientist –***

We are pleased to report that Dong Wu has been selected to replace Robert “Bob” Cahalan as the new GSFC SORCE Project Scientist. Dong has had a long-term interest in the Sun-climate



Dong Wu at the Jan. 2014 SORCE Meeting in Cocoa Beach, FL.

connection, so he is an excellent choice to fill this opening. Educated at the University of Michigan, Dong has a strong background in studying dynamics of the upper atmosphere and their interactions with the lower ionosphere. He is the PI of a Sun-climate study funded under the NASA Living With a Star program, and has been very active with the *SORCE* Sr. Review Proposal, as well as leading the organizing committee for the 2015 Sun-Climate Symposium in Savannah, Georgia. Doug Rabin remains the *SORCE* Deputy Project Scientist.

Bob officially retired from NASA in early January 2015. The *SORCE* team will miss Bob's leadership and science capability, but we are optimistic that he will remain active with his *SORCE* science research.

## *SORCE* Wants Summer Undergrad Research Students –

*By Marty Snow, LASP, Univ. of Colorado*

Each summer, the *SORCE* mission funds 2-3 student research projects as part of the CU/LASP's Research Experience for Undergraduates (REU) program. For eight weeks (June 7-August 1), the students come to Boulder, Colorado to work with *SORCE* scientists on a research project involving measurements from *SORCE*. The program pays for the students' travel costs and housing, plus a \$500/week stipend.



2014 REU students work on a project their first week of the program.

They begin their time at LASP with a lecture series on Solar and Space Physics from experts in the field, and end with a student symposium where the students present their findings. Last year, three students worked on a diverse set of projects using *SORCE* data. This included studying the response of the Earth's atmosphere to solar variability, developing a proxy model for solar EUV irradiance, and studying climate change on Mercury.

This year's projects will be just as interesting! Applications for the 2015 program are now being accepted, and we invite students from around the country to apply for a position to work on *SORCE* and other missions. We depend on professional scientists interested in *SORCE* science to recommend well qualified students to our program. Full program details are available at <http://lasp.colorado.edu/reu>, including all deadlines (application deadline is Feb. 3). For further information, feel free to contact the REU Program Organizer and *SORCE* science team member, Marty Snow ([snow@lasp.colorado.edu](mailto:snow@lasp.colorado.edu) or 303-735-2143).

## *SORCE's* Birthday!

*SORCE* is celebrating its 12<sup>th</sup> birthday on **Jan. 25!** Not bad for a 5-year mission! Go *SORCE*!



**Happy Birthday *SORCE*!**



## *Upcoming Meetings / Talks –*

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

AMS, Phoenix, AZ, Jan. 4-8, Phoenix, AZ

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

Boulder Solar Day, March 17, Boulder, CO

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

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

