



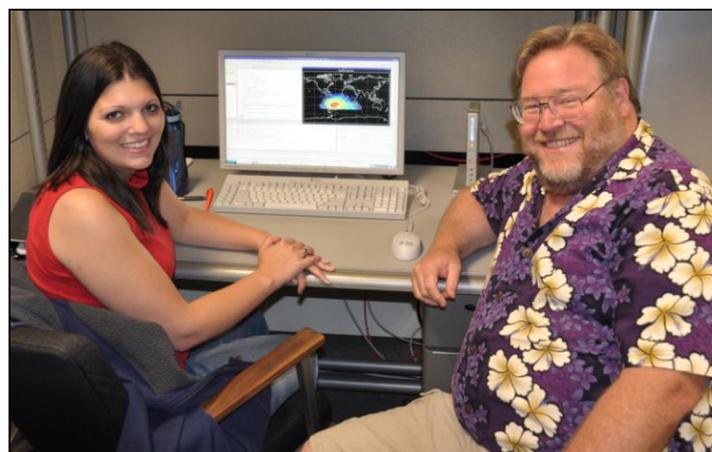
## ***SORCE Wants REU Students –***

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

Each summer, the SORCE mission funds student research projects as part of the University of Colorado's Research Experience for Undergraduates (REU) program. For eight weeks, 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.

They begin their time at LASP with a lectures series on Solar and Space Physics from experts in the field, and end with a student symposium where the REU students present their findings. Last year, three students worked on a diverse set of projects using SORCE data. This included studying the effect of the visible irradiance variability measured by the SIM instrument, tackling climate change during the recent solar minimum using meteorological datasets and irradiance observations from all of the SORCE instruments, and analyzing SOLSTICE data to measure the properties of the South Atlantic Anomaly.

This year's projects will be just as interesting! Applications for the 2012 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 details are available at <http://lasp.colorado.edu/reu> including all deadlines (application deadline is Feb. 1). For further information, feel free to contact the REU Program Organizer, Marty Snow ([snow@lasp.colorado.edu](mailto:snow@lasp.colorado.edu) or 303-735-2143).



SORCE SOLSTICE scientist Marty Snow worked with REU student Laura O'Connor from the University of Michigan during the summer of 2011.

## ***SSI Workshop Planned –***



As discussed at the 2011 SORCE Science Meeting in Sedona, Arizona, there are interesting and conflicting differences for the solar spectral irradiance (SSI) variations during the SORCE mission. The SORCE team in collaboration with NIST and GSFC is planning a series of SSI workshops

involving a small number of scientists and calibration experts to address these SSI variation differences. To keep these workshops on task, participation will be limited.

The initial workshop will primarily focus on issues related to differences in understanding degradation trends that affect the solar cycle variation in spectral irradiance. Presenters will be those involved with SSI data processing and instrument degradation tracking analysis and people at NIST and GSFC who are engaged in understanding the physical mechanisms associated with degradation in optics and detectors – a matter of prime importance to the current differences between the SSI measurements. Instrument representatives will present their measurement equations and the root causes of degradation and the methodologies employed to make the trending corrections.

To do this NIST scientists have helped develop a general description of the measurement equation that also describes how instrument degradation is estimated and how the corrections are applied. This approach will allow a more equivalent inter-instrument approach permitting instrument comparisons on a more term-by-term basis. Goals for the first workshop include:

- Discuss SSI instrument observations, capabilities, their estimated irradiance uncertainties.
- Discuss how each instrument team analyzes the spectral data, in an effort to separate out instrument effects (e.g. degradation) from intrinsic solar variations.
- Establish a better understanding of the SSI differences and refinement of their uncertainties.
- Make plans on how to identify the significant differences (new studies, calibrations, etc.) and refine uncertainties.

Additional workshops and splinter groups will be needed to complete the topics and action items discussed at

this first workshop. Future topics will include modeling SSI irradiance variability and modeling the climate / atmosphere system using SSI solar cycle variation inputs.

## Fall AGU Meeting –

By Marty Snow, LASP, Univ. of Colorado

SORCE scientists once again contributed significantly to the Fall AGU meeting. Two sessions were convened by SORCE team members at LASP. Peter Pilewskie and Greg Kopp helped organize the TSI session, while Erik Richard and Marty Snow convened a session on SSI results. Both sessions were in the Global Change (GC) section. The two oral sessions were back-to-back on Tuesday morning, and they combined poster sessions that afternoon. As is typical at AGU, most of the interaction took place during the poster session.



Posters are the heart of the AGU. Each day of the meeting, thousands of posters go up at 8 a.m. and stay until 6 p.m. They are then replaced by a new set of posters the next day. This photo was taken during the morning setup interval and shows only part of the poster hall. More than two thirds of all AGU presentations each year are posters.

Juan Fontenla, Greg Kopp, Jerry Harder, and Aimee Merkel all gave invited talks based on SORCE data at the meeting. Nearly every poster in the GC “Climate Change and the Sun” combined session used SORCE data in some way, either comparing irradiance measurements or applying SORCE observations to models.

Aimee Merkel gave an invited presentation on the “Impact of solar spectral variability on middle atmospheric constituents” at the Fall 2011 AGU. Her talk featured results from two SORCE instruments (SOLSTICE and SIM) and showed the changes in the stratosphere and mesosphere predicted by the WACCM atmospheric model based on the measured variability. Her model predicts changes in ozone that agree with AURA-MLS and SABER measurements.



## SORCE Data Processing Status –

By Doug Lindholm, LASP, Univ. of Colorado

The SORCE Science Data System has been healthy since recovering from a massive disk failure earlier this year. It's been humming along with a new disk array and a leaner database design. Two new servers are due to come online early in the new year to help with the load of processing and managing the growing SORCE data as it approaches nine years on orbit.

We recently released an updated version of the **TIM** total solar irradiance (TSI) products with gain and degradation updates. You can find the version 12 data at the usual locations:

SORCE web site (<http://lasp.colorado.edu/sorce/data/>), LISIRD (<http://lasp.colorado.edu/lisird/>), or the GES DISC (<http://disc.sci.gsfc.nasa.gov/SORCE>).

We are also currently busy preparing a new version of the **SOLSTICE** data with an improved degradation correction. If all goes well, the new version 11 daily FUV and MUV products could be available by the end of the month. There are a number of other algorithm and calibration improvements that we are planning for version 12. These include improved dark, scattered light, filter transmission, and temperature corrections. We are also planning to release a 6-hourly product in addition to the daily average.

The **XPS** data have been stable but data from SDO EVE offer an opportunity to improve these XUV data products. We will be developing a product based on the EVE measurements in place of using the CHIANTI spectral model.

Release of updated **SIM** data has been on hold since the October 2010 SORCE spacecraft anomaly. Careful analysis is ongoing, as a longer time series of data become available, to characterize the observed wavelength shifts that were introduced due to an instrument instability to extreme cold. We expect to have these data reprocessed and available in the first half of the coming year.

Data access capabilities are also improving. The solar spectral irradiance (SSI) datasets from SIM, SOLSTICE, and XPS are now being delivered to the GES DISC in a new form. Previously, they were combined in daily HDF files. We are now delivering the same ASCII files that we serve on the SORCE web site. Each instrument is stored in its own mission-length data file.

We are about to roll out a significant update to the LISIRD web site (<http://lasp.colorado.edu/lisird/>). It will feature improved interactive plotting capabilities and performance, enhanced dataset documentation, and additional datasets that are relevant to solar irradiance studies.



We are also improving the interface to the LaTiS data server which can be used to directly access data from within your code and tools.

We welcome any comments on improvements to our support of data users. Please email: [doug.lindholm@lasp.colorado.edu](mailto:doug.lindholm@lasp.colorado.edu).

**3,460,327**  
**Hits to the SORCE Website**  
*(Since 4/21/03, As of 12/09/11)*

## Upcoming Meetings / Talks –

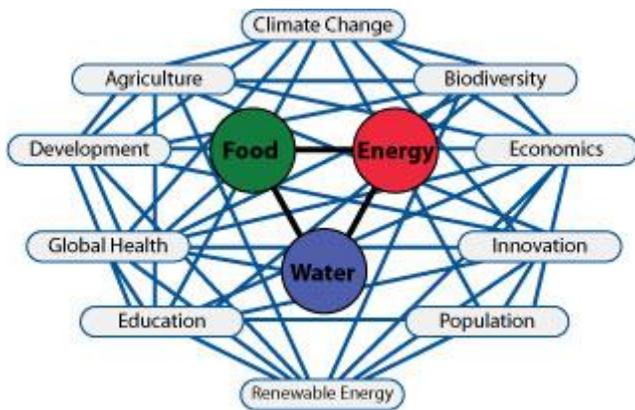
*SORCE scientists plan to present papers or attend the following 2012 meetings:*

AAAS Annual Meeting, Feb. 16-20, Vancouver, Canada  
Boulder Solar Day, March, Boulder, Colorado  
COSPAR General Assembly, July 15-22, Mysore, India  
Intl. Radiation Symposium, Aug.6-10, Berlin, Germany



## AAAS Annual Meeting –

SORCE Principal Investigator Tom Woods will be attending the upcoming American Association for the Advancement of Science (AAAS) Annual Meeting, Feb. 16-20, in Vancouver, Canada. The purpose of the 2012 gathering is to discuss climate change, energy, agriculture, health, water, biodiversity and ecosystems, population growth, and economic development – all current issues that are both global in scope and profoundly interconnected. Attendees will attempt to develop truly global models, and then global solutions.



# Happy Holidays!

Tom is co-organizing a special session called *Solar Effects on Earth's Atmosphere and Climate: Results from Space Observatories*, and he will also be giving an invited talk on "Variability of the SSI and its Energy Input to Earth's Atmosphere". His talk will focus on how the solar UV radiation could have a top-down influence on climate change through the UV radiation first being deposited into Earth's stratosphere and then slowly propagating down to the troposphere.