

2018 Sun-Climate Symposium

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

March 19-23, 2018 * Lake Arrowhead, California

Main Lodge – Pineview Room (Oral) and Lakeview Room (Posters)

(as of March 8, 2018)

Monday, March 19

- 5:30 – 6:30 pm **Welcoming Reception (Main Lodge)**
6:30 – 8:00 pm **Dinner – Lake Arrowhead Dining Room**

Tuesday, March 20

- 7:30 – 8:30 am **Breakfast Buffet – Lake Arrowhead Dining Room**
- 8:30 – 9:00 am **Welcome/Introduction – A TSIS & SORCE Status Overview**
Peter Pilewskie and **Tom Woods**, LASP, University of Colorado – Boulder
- Session 1. The creation, significance, and applications of accurate CDRs**
Session Chair: Odele Coddington & Peter Pilewskie, LASP, University of Colorado
- 9:00 – 9:30 am **Bruce Wielicki (Invited)**, NASA Langley Research Center, Hampton, VA
Designing the Climate Observing System of the Future
- 9:30 – 9:55 am **Alexei Pevtsov (Invited)**, National Solar Observatory, Boulder, CO
Continuity and Preservation of Long-Term Synoptic Observations of the Sun
- 9:55 – 10:10 am **Serena Criscuoli**, National Solar Observatory, Boulder, CO
Properties of Magnetic Elements Derived from HMI Data Compensated for Scattered-Light
- 10:10 – 10:40 am **Break**
- 10:40 – 11:05 am **John Bates (Invited)**, John Bates Consulting, Inc., Arden, NC
Climate Data Records – History, Status, and Future
- 11:05 – 11:20 am **Charles Ichoku**, NASA Goddard Space Flight Center, Greenbelt, MD
Potential of Satellite SSI Measurements in Ground-based Remote Sensing of Atmospheric Aerosols and Trace Gases
- 11:20 – 11:45 am **Ann Windnagel (Invited)**, National Snow and Ice Data Center in CIRES, University of Colorado, Boulder
Sea Ice Concentration CDR at the National Centers for Environmental Information
- 11:45 – 12:00 pm **David Kratz**, NASA Langley Research Center, Hampton, VA
TSI Data for the CERES CDR and the FLASHflux Environmental Data Record
- 12:00 – 1:00 pm **Lunch Buffet**

Special Guest

- 1:00 – 1:35 pm **Wenda Cao (Invited)**, Big Bear Solar Observatory, Big Bear, CA
Big Bear Solar Observatory – Cool Toys for Observing Our Warm Star

Session 2.

The state of the TSI and SSI climate records near the end of the SORCE Mission

Session Chairs: Marty Snow and Greg Kopp, LASP, University of Colorado

- 1:35 – 2:00 pm** **Werner Schmutz (Invited)**, Physikalisch-Meteorologisches Observatorium / World Radiation Center (PMOD/WRC), Davos Dorf, Switzerland
PREMOS/PICARD TSI Data Version 2 and New TSI Absolute Value from First Light of CLARA/NorSat-1
- 2:00 – 2:15 pm** **Claus Fröhlich**, Davos Wolfgang, Switzerland
Twenty-One Years of Total Solar Irradiance from VIRGO on SoHO
- 2:15 – 2:30 pm** **Greg Kopp**, LASP, University of Colorado – Boulder
The TIM Trilogy
- 2:30 – 2:55 pm** **Thierry Dudok de Wit (Invited)**, LPC2E, CNRS and University of Orléans, France
Methodology for Creating a TSI Composite
- 2:55 – 3:10 pm** **Break** **Happy 15th Birthday SORCE!** 
- 3:10 – 3:25 pm** **Erik Richard**, LASP, University of Colorado – Boulder
TSIS SIM Solar Spectral Irradiance: First Light and Early Observations
- 3:25 – 3:50 pm** **Natalie Krivova (Invited)**, Max Planck Inst. for Solar System Research, Göttingen, Germany
Update on the SATIRE Model
- 3:50 – 4:05 pm** **Romaric Gravet**, LPC2E, CNRS and University of Orléans, France
Observational Constraints on Irradiance Models in the Ultraviolet
- 4:05 – 4:20 pm** **Mija Lovric**, University of Rome, Tor Vergata, Italy
The Solar Ultraviolet Spectral Slope during the Last 270 Years
- 4:20 – 4:35 pm** **Odele Coddington**, LASP, University of Colorado – Boulder
The NOAA/NCEI Solar Irradiance Climate Data Record: Recent Advances and Comparisons with Independent Datasets
- 4:35 – 4:50 pm** **Tom Woods**, LASP, University of Colorado – Boulder
Decoupling Solar Variability and Instrument Trends using the Multiple Same-Irradiance-Level (MuSIL) Analysis Technique
- 4:50 – 5:15 pm** **Margit Haberreiter (Invited)**, PMOD/WRC, Davos Dorf, Switzerland
The New Observational Solar Spectral Irradiance Composite, Updates and Related Activities
- 5:15 – 5:30 pm** **Sergey Marchenko**, Science Systems & Applications Inc. (SSAI); NASA GSFC, MD
Improved Long-Term Spectral Irradiance Record from Aura/OMI
- 5:30 – 5:55 pm** **Luc Damé (Invited)**, Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS), France
New Solar Reference Spectrum SOLAR-ISS and Variability from SOLAR/SOLSPEC – Nine Years of Observations of Solar Cycle 24
- 6:30 – 8:00 pm** **Dinner – LACC Dining Room**

Wednesday, March 21

7:30 – 8:30 am **Breakfast Buffet**

Session 3.

Next generation of solar and atmospheric observations

Session Chair: Erik Richard & Tom Sparr, LASP, University of Colorado

- 8:30 – 8:55 am** **Elizabeth Weatherhead (Invited)**, NOAA and CIRES, University of Colorado – Boulder
Optimizing Climate Observations for Targeted Results
- 8:55 – 9:20 am** **Jeremy Werdell (Invited)**, NASA Goddard Space Flight Center, Greenbelt, MD
The Plankton, Aerosol, Cloud, ocean Ecosystem (PACE) Mission: Status, science, advances

- 9:20 – 9:45 am** **Dave Diner (Invited)**, Jet Propulsion Laboratory, California Inst. of Technology, Pasadena
Multi-Angle Imager for Aerosols (MAIA): Observations, measurements, and science
- 9:45 – 9:55 am** **Break**
- 9:55 – 10:20 am** **Dave Harber (Invited)**, LASP, University of Colorado – Boulder
The Compact SIM (CSIM) and Compact TIM (CTIM) Instruments
- 10:20 – 10:35 am** **Bill Swartz**, Johns Hopkins University/Applied Physics Lab, Laurel, MD
The RAVAN CubeSat Mission: On-orbit results
- 10:35 – 10:50 am** **Wolfgang Finsterle**, PMOD/WRC, Davos Dorf, Switzerland
Absolute Radiometers on Upcoming TSI and Future EO Missions
- 10:50 – 11:05 am** **Charles Kankelborg**, Montana State University, Bozeman
A FURST Look at the VUV Sun as a Star
- 11:05 – 11:20 am** **Candace Carlisle**, NASA GSFC
Total and Spectral solar Irradiance Sensor (TSIS) NASA Project Status
- 11:20 – 11:30 am** **David Considine**, NASA Headquarters
A NASA Earth Science Division Perspective on Solar Irradiance

11:30 am – 1:00 pm **Lunch Buffet**

Big Bear Solar Observatory

- 12:15 pm** **Bus #1** departs LACC (arrives BBSO **1:15 pm**)
- 1:00 pm** **Bus #2** departs LACC (arrives BBSO **2:00 pm**)
- 2:45 pm** **Bus #1** departs BBSO (arrives LACC **3:45 pm**)
- 3:30 pm** **Bus #2** departs BBSO (arrives LACC **4:30 pm**)

4:30 – 6:30 pm **Poster Session I**

6:30 – 8:00 pm **Dinner – LACC Dining Room**

8:00 – 9:00 pm **Special Evening Presentation**

Gary Rottman, LASP, University of Colorado – Boulder
How the Sun abandoned the Incas during the Maunder Minimum



Thursday, March 22

7:30 – 8:30 am **Breakfast Buffet**

Session 4. **Impacts of solar variability on the terrestrial environment during SC24**

Session Chair: Jerry Harder, LASP, University of Colorado and Dong Wu, NASA GSFC

- 8:30 – 9:00 am** **Lesley Gray (Invited)**, University of Oxford, United Kingdom
Impact of the 11-Year Solar Cycle at the Earth's Surface
- 9:00 – 9:25 am** **Gabriel Chiodo (Invited)**, Columbia University, New York, NY
Lagged Correlation between the NAO and the 11-Year Solar Cycle: Forced response or internal variability?
- 9:25 – 9:40 am** **Jae Lee**, University of Maryland, Baltimore County, Baltimore, MD
Solar Cycle Variations in Mesospheric Carbon Monoxide
- 9:40 – 9:55 am** **Dong Wu**, NASA Goddard Space Flight Center, Greenbelt, MD
Long-Term Variations in Terra/MISR Angular Radiance Differences: Solar or Aerosol Influences on Polar Cloudiness?

- 9:55 – 10:10 am** **Shuhui Wang (presented by King-Fai LI)**, JIFRESSE, Univ. of California, Los Angeles, CA
The 11-Year Solar Cycle Signal in Global NO₂ Measurements from NDACC Stations
- 10:10 – 10:35 am** **Break**
- 10:35 – 11:00 am** **Gavin Schmidt (Invited)**, NASA Goddard Institute for Space Studies (GISS), New York, NY
Improvements in Coupled Ocean-Atmosphere Model Responses to Solar Activity
- 11:00 – 11:15 am** **Liang Zhao**, IAP, Chinese Academy of Science (CAS), Beijing, China
Responses of the East Asian Monsoon to Solar Cycle
- 11:15 – 11:30 am** **King-Fai Li**, University of Washington, Seattle; and University of California, Riverside
Quasi-biennial Oscillation and Solar Cycle Influences on Arctic O₃ Simulated by the WACCM4 Model
- 11:30– 11:45 am** **Alexander Ruzmaikin**, Jet Propulsion Laboratory, California Inst. of Technology
The Solar Influence on the Earth's Climate at the Centennial Time Scale
- 11:45 – 12:00 pm** **Robert Leamon**, University of Maryland, College Park; and NASA GSFC, Greenbelt, MD
Terminators: The Death of Solar Cycles and La Niña 2020
- 12:00 – 1:00 pm** **Lunch Buffet**

Session 5. Stellar variability and connections to the Sun

Session Chair: Doug Rabin and Charles Ichoku, NASA GSFC

- 1:00 – 1:30 pm** **Jeffrey Hall (Invited)**, Lowell Observatory, Flagstaff, AZ
The Variability of Sun-like Stars
- 1:30 – 1:55 pm** **Travis Metcalfe (Invited)**, Space Science Institute, Boulder, CO
Magnetic Evolution of Sun-like Activity Cycles
- 1:55 – 2:20 pm** **Federico Spada (Invited)**, Max-Planck Institute, Goettingen, Germany
Modeling Intrinsic Luminosity Variations Induced by Internal Magnetic Field in the Sun and in Solar-like Stars
- 2:20 – 2:35 pm** **Veronika Witzke**, Max Planck Institute for Solar System Research, Göttingen, Germany
Long-Term Brightness Variability of Sun-like Stars
- 2:35 – 3:00 pm** **Alexander Shapiro (Invited)**, Max Planck Inst. for Solar System Res., Göttingen, Germany
How Typical is the Sun as a Variable Star
- 3:00 – 3:30 pm** **Break**
- 3:30 – 3:55 pm** **Adam Kowalski (Invited)**, National Solar Observatory and Univ. of Colorado, Boulder
Magnetic Activity and Flares in the Near-UV Exoplanet Host Stars
- 3:55 – 4:10 pm** **Nina-Elisabeth Nemec**, Max Planck Institute for Solar System Research and Institute for Astrophysics, Georg-August-University; Göttingen, Germany
Solar Brightness Variations as they would be Observed by Kepler Telescope
- 4:10 – 4:25 pm** **Miha Černetič**, Univ. of Ljubljana, Slovenia; and Max Planck Inst., Göttingen, Germany
Fast Spectral Synthesis for a New Generation of Solar and Stellar Brightness Variability Models
- 4:25 – 4:50 pm** **Eric Wolf (Invited)**, LASP and ATOC, University of Colorado – Boulder
Climate and Habitability of Earth-like Extrasolar Planets
- 4:50 – 6:30 pm** **Poster Session II**
- 6:30 – 8:00 pm** **Dinner – LACC Dining Room**

Friday, March 23

7:30 – 8:30 am **Breakfast Buffet**

Session 6. What are the expectations for the next solar minimum and SC 25?

Session Chair: Tom Woods, LASP, University of Colorado – Boulder

8:30 – 9:00 am **Scott McIntosh (Invited)**, National Center for Atmospheric Res. / High Altitude Observatory, Boulder, CO

140 Years of the "Extended" SC: Predictability, Expectations for SUNSPOT Cycle 25...

9:00 – 9:25 am **Paul Charbonneau (Invited)**, Département de Physique, Université de Montréal, Canada
Mechanisms of Solar Cycle Fluctuations

9:25 – 9:40 am **Leif Svalgaard**, Stanford University, Stanford, CA
Prediction of Solar Cycle 25

9:40 – 10:05 am **Frank Hill (Invited)**, National Solar Observatory, Boulder, CO
Solar Cycle Activity Related to Local & Global Helioseismology

10:05 – 10:35 am **Break**

10:35 – 10:50 am **Jerald Harder**, LASP, University of Colorado – Boulder
Morphology and Time Evolution of Dark Facular regions in Cycle 23 and 24

10:50 – 11:15 am **Dick Mewaldt (Invited)**, California Institute of Technology, Pasadena
Galactic Cosmic Ray Intensities During the Space Age and the Holocene

11:15 – 12:00 pm **Meeting Wrap-Up / Summary**

12:00 – 1:00 pm **Lunch Buffet**

1:00 pm **Symposium Adjourned**

2018 Sun-Climate Symposium – Poster Sessions – Lakeview Room

Poster Session I: Wednesday, March 21, 4:30 – 6:30 pm

Poster Session II: Thursday, March 22, 4:50 – 6:30 pm

In alphabetical order (as of 07 March 2018):

- 1) **Logan S. Bayer**, BASIS Flagstaff Charter School and Lowell Observatory, Flagstaff, AZ
The Solar-Stellar Spectrograph: A 25-year Retrospective
- 2) **Stéphane Béland**, LASP, University of Colorado – Boulder
Update to the Whole Heliosphere Interval (WHI) Reference Spectrum
- 3) **Francesco Berrilli**, University of Rome, Tor Vergata, Italy
Impact of Solar Activity on Thermospheric Density during ESA's Gravity Mission GOCE
- 4) **Odele Coddington**, LASP, University of Colorado – Boulder
(SIST) How does the Sun's Spectrum Vary: A Summary of NASA SIST Research Activities
- 5) **Angela Cookson**, San Fernando Observatory, California State University, Northridge
The Future of Full-Disk Photometry at the San Fernando Observatory
- 6) **Angela Cookson**, San Fernando Observatory, California State University, Northridge
SFO Solar Indices, Irradiance Variation, and New TSI Composite – an Update
- 7) **Serena Criscuoli**, National Solar Observatory, Boulder, CO
Comparing Radiative Transfer Codes for Synthesis of Solar and Stellar Irradiance
- 8) **Luc Damé**, Laboratoire Atmosphères, Milieux, Observations Spatiales (LATMOS), IPSL/CNRS/UVSQ, Guyancourt, France
The SoSWEET-SOUP (Solar, Space Weather Extreme EvenTs and Stratospheric Ozone Ultimate Profiles) Dual Constellation Mission
- 9) **Matthew DeLand**, Science Systems and Applications Inc. (SSAI), NASA GSFC, Greenbelt, MD
(SIST) Creation of the V2 Composite Solar Spectral Irradiance Data Set
- 10) **Leonid Didkovsky**, Space Sciences Laboratory, Univ. of Southern California, Los Angeles
A Long-Term Dissipation of the EUV He II (30.4) Segmentation in the Full-Disk Solar Images
- 11) **Leonid Didkovsky**, Space Sciences Laboratory, Univ. of Southern California, Los Angeles
SC 24 vs SC 23: A Decreased EUV Irradiance Measured by SOHO/SEM and TIMED/SEE
- 12) **Thierry Dudok de Wit**, LPC2E, CNRS and University of Orléans, France
Identifying and Extracting Undocumented Trends from Solar Irradiance Records
- 13) **Thierry Dudok de Wit**, LPC2E, CNRS and University of Orléans, France
Long-term Variability of the Spectral Irradiance cannot be Reconstructed from its Short-term Response
- 14) **Joshua P. Elliott**, LASP, Univ. of Colorado – Boulder
High-Spectral Resolution SORCE SOLSTICE Degradation Model and Improved Irradiance Data Products
- 15) **Wolfgang Finsterle**, Physikalisch-Meteorologisches Observatorium / World Radiation Center (PMOD/WRC), Davos Dorf, Switzerland
A Concept for the Measurement of the Earth Radiation Imbalance
- 16) **Claus Fröhlich**, Davos Wolfgang, Switzerland
New Characterization of the PMO6V Radiometer of VIRGO/SoHO
- 17) **Daniele Galuzzo**, University of Rome, Tor Vergata, Italy
Climate and Radiative Properties of a Tidally-locked Planet around Proxima Centauri

- 18) **Romarc Gravet**, LPC2E, CNRS and University of Orléans, France
How can the Sun Explain the Correlations between CaII and Ha Emissions of Stars?
- 19) **Songyan Gu**, National Satellite Meteorology Center, Beijing, China
Introduction to China FY-3 Satellite Plans and SSIM (Solar Spectral Irradiance Monitor)
- 20) **Jerald Harder**, LASP, University of Colorado – Boulder
(SIST) Construction of a SORCE-based SSI Record for Chemistry Climate Models
- 21) **Cristoph Jacobi** (presented by Margit Haberleiter), PMOD/WRC, Davos Dorf, Switzerland
Earth Energy Imbalance Explorer (EAGER)
- 22) **Andrew Jones**, LASP, University of Colorado – Boulder
New Solar EUV Irradiance Measurements from GOES-16
- 23) **Matthieu Kretschmar**, LPC2E, CNRS and University of Orléans, Orléans, France
An Empirical Model of the Variation of the Solar Lyman- α Spectral Irradiance
- 24) **Steffen Mauzeri**, ATOC and LASP, University of Colorado – Boulder
Revision of the Sun's Spectral Irradiance as Measured by SORCE SIM
- 25) **Mustapha Meftah**, Université Paris Saclay, CNRS, LATMOS, Guyancourt, France
SOLAR/SOLSPEC Ultraviolet SSI Variability from 5 April 2008 to 15 Feb. 2017
- 26) **Stergios Misios** (presented by Lesley Gray), University of Oxford, UK; and Aarhus University, Denmark
Observed and Modelled Influences of the 1-Year Solar Cycle on the Walker Circulation
- 27) **Jin Qi**, National Satellite Meteorological Center, Beijing, China
In-flight Performance of Solar Irradiance Monitor-II on-board FY-3C and its TSI data
- 28) **Erik Richard**, LASP, University of Colorado – Boulder
(SIST) Recalibration and Re-evaluation of the SORCE SIM Data Record
- 29) **Laura Sandoval**, LASP, University of Colorado – Boulder
The Latest SORCE-SIM Solar Spectral Irradiance Data Release and Initial Comparison with TSIS-SIM Measurements
- 30) **Martin Snow**, LASP, University of Colorado – Boulder
The Magnesium II Index: Continuing Progress on the Facular Proxy in the GOES-R Era
- 31) **Martin Snow**, LASP, University of Colorado – Boulder
(SIST) Solar Spectral Irradiance: Lyman Alpha, Magnesium II, and Sigma k Proxies (SSIAMESE)
- 32) **Martin Snow**, LASP, University of Colorado – Boulder
Tribute to Juan Fontenla
- 33) **Tom Sparn**, LASP, University of Colorado – Boulder
TSIS-2 and Beyond
- 34) **Bob Weber**, Lower Peninsula, MI
The Solar Cycle Influence: How TSI and Insolation Warm and Cool the Ocean
- 35) **Richard Willson**, ACRIM Team
Resolution of the Decadal Trend Differences between the ACRIM and PMOD Total Solar Irradiance Composite Time Series of Satellite Observations
- 36) **Jia Yue**, (presented by Jae Lee), Hampton University, Hampton, VA
Solar Cycle and Trend Global Gravity Waves Derived from 14 Years of SABER Temperature Observations (2001-2015)