

Princeton Center for Theoretical Science

The Princeton Center for Theoretical Science is dedicated to exploring the frontiers of theory in the natural sciences. Its purpose is to promote interaction among theorists and seed new directions in research, especially in areas cutting across traditional disciplinary boundaries.

The Center is home to a corps of Center Postdoctoral Fellows, chosen from nominations made by senior theoretical scientists around the world. A group of senior Faculty Fellows, chosen from science and engineering departments across the campus, are responsible for guiding the Center. Center activities include focused topical programs chosen from proposals by Princeton faculty across the natural sciences. The Center is located on the fourth floor of Jadwin Hall, in the heart of the campus “science neighborhood”. The Center hopes to become the focus for innovation and cross-fertilization in theoretical natural science at Princeton.

Faculty Fellows

Paul Steinhardt, Director
Igor Klebanov, Associate Director
Adam Burrows
Curtis Callan
Garnet Chan
Pablo Debenedetti
David Huse
Jeroen Tromp

Center Postdoctoral Fellows

Ian Abel 2013-2016
Daniel Harlow 2012-2015
Yoav Kallus 2011-2014
Samuel Lee 2012-2015
Yi Li 2013-2016
David Limmer 2013-2016
Joseph Maciejko 2011-2014
Elisabetta Matsumoto 2011-2014
Rahul Nandkishore 2012-2015
Titus Neupert 2013-2016

To find out more about Center Postdoctoral Fellowships and Programs see:

<http://pcts.princeton.edu/pcts>



Living with a Star: Past Accomplishments and Future Promise

18-20 September 2013
Jadwin Hall, Room 407

Workshop Organizers:

Spiro Antiochos
Amitava Bhattacharjee, *Chair*
Farzad Kamalabadi
Janet Luhmann
Anthony Mannucci
Nathan Schwadron

Local Organizer:

Charlene Borsack

Living with a Star: Past Accomplishments and Future Promise

Wednesday, 18 September 2013

- 8:00 Continental Breakfast at PCTS, Jadwin Hall, Fourth Floor
- 8:30 Welcome
Amitava Bhattacharjee/David Spergel, Princeton University

LWS Targeted Research & Technology (TR&T) and the Decadal Survey

Chair: Thomas Bogdan

- 8:45 "Science at NASA".
John Grunsfeld, NASA
- 9:30 "The 2013-2022 Solar and Space Physics Decadal Survey: The Chair's One-year Perspective"
Daniel Baker, University of Colorado
- 10:00 "Space Weather at NSF: Where we are now and where we are going."
Richard Behnke, National Science Foundation
- 10:30 Break
- 10:45 "NASA Living With a Star: Critical Elements in Support of Operational Space Weather Needs of the Nation"
William Murtagh, National Oceanic and Atmospheric Administration
- 11:15 "Living with a Star: Science That Matters to People"
Madhulika Guhathakurta, NASA
- 11:45 Panel Discussion
- 12:30 Lunch at PCTS, Jadwin Hall, Fourth Floor

Solar System Exploration: Now and The Future

Chair, Michael Thompson, High Altitude Observatory

- 1:30 "Space Weather Matters: Not Just for Earth"
Janet Luhmann, Space Sciences Laboratory, University of California, Berkeley
- 2:00 "Addressing Living With a Star objectives with nano-spacecraft"
Neil Murphy, JPL, NASA

Wednesday, 18 September 2013 (continued)

- 2:30 "Space Weather and Space Climatology: A Vision for Future Capabilities"
Mary Hudson, Dartmouth College
- 3:00 Panel Discussion
- 3:30 Break

Sun Climate

Chair: Robert Leamon, NASA

- 3:45 "Looking for the solar variability fingerprint in global and regional climate"
Caspar Ammann, High Altitude Observatory National Center for Atmospheric Research Boulder, Colorado
- 4:15 "Solar Variability and the Upper Atmosphere"
Stan Solomon, High Altitude Observatory National Center for Atmospheric Research Boulder, Colorado
- 4:45 Panel Discussion
- 5:15 Walk over to Princeton University Art Museum
- 5:30-6:30 Reception, Princeton University Art Museum
Princeton University Campus
- 6:45 pm Workshop Dinner, Prospect House
Princeton University Campus

Thursday, 19 September 2013

- 8:00 Continental Breakfast at PCTS, Jadwin Hall, Fourth Floor
- Strategic Capabilities and Focus Science Topics: Past and Future**
Chair: Farzad Kamalabadi, University of Illinois

- 9:00 "Results from and Strategies for the Focused Science Team Program"
Spiro Antiochos, NASA
- 9:30 "Addressing the goals of LWS TR&T with the high performance Space Weather Modeling Framework."
Tamas Gombosi, University of Michigan

Thursday, 19 September 2013 (continued)

10:00 "LWS Science: Towards Forecasting Space Weather in the Upper Atmosphere"
Anthony Mannucci, JPL, NASA

10:30 "The Earth-Moon-Mars Radiation Environment and the Genesis of SEPs"
Nathan Schwadron, UNH

11:00 **Break**

11:15 "Aspects of the DRIVE Initiative and LWS TR&T"
Amitava Bhattacharjee, Princeton University

11:45 Panel Discussion

12:15 **Lunch at PCTS, Jadwin Hall, Fourth Floor**

LWS TR&T Role in Teaching and Mentoring

Chair: Amitava Bhattacharjee, Princeton University

1:15 "The LWS Summer School"
Karel Schrijver, Lockheed-Martin

1:45 "Experiencing the unusual solar minimum as a Jack Eddy fellow"
Liang Zhao, Jack Eddy Fellow, University of Michigan

2:15 "Insider's Perspectives of the Jack Eddy LWS Fellowship"
Andres Munoz-Jaramillo, Jack Eddy Fellow, Harvard University

2:45 Panel Discussion

3:00 **Break**

The Missions and Space Weather

Chair: Ramona Kessel, NASA

3:15 "A Once Per Century Opportunity to Study Key Particle Transport Processes and Calibrate the Long-Term and Worst-Case Impacts of Galactic Cosmic Rays"
Richard Mewaldt, Caltech

3:45 "The Current Status of EUV Irradiance Specification, Forecasting, and Modeling"
Harry Warren, Naval Research Laboratory

Thursday, 19 September 2013 (continued)

4:15-4:30 **Transition to Physics Department Colloquium Room A-10 Jadwin Hall (A-Level)**

4.30 **Physics Department Colloquium: Room A-10 Jadwin Hall**
"Sending a spacecraft to the Sun"
Justin Kasper, University of Michigan, Smithsonian Astrophysical Observatory

Friday, 20 September 2013

8:00 **Continental Breakfast at PCTS, Jadwin Hall, Fourth Floor**

The Missions and Space Weather

Chair: Ramona Kessel, NASA

8:30 "Energetic Particles in the Heliosphere: NASA/LWS Achievements and Opportunities"
Harlan Spence, UNH

9:00 "What we learned about coronal mass ejections during the SOHO and STEREO era."
Natchimuthuk Gopalswamy, NASA

9:30 "Missions, Programs contributing to Space Weather"
Lawrence Zanetti, Johns Hopkins University Applied Physics Laboratory

10:00 "The CCMC: Assembling the LWS Space Weather Puzzle"
Judith Karpen, NASA

10:30 **Break**

10:45 "The technical needs and science goals for the next generation of Space Weather Instrumentation."
Jonathan Cirtain, NASA

Chair: Madhulika Guhathakurta, NASA

11:15 **Panel Discussion on the Future of LWS TR&T**

12:15 **Lunch at PCTS, Jadwin Hall, Fourth Floor**

Adjourn