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 (on leave 2012-2013)
Igor Klebanov, Acting Director
Adam Burrows, Acting Associate Director
Curtis Callan
Roberto Car
Garnet Chan
David Huse
Jeroen Tromp
Herman Verlinde

Center Postdoctoral Fellows
Daniel Harlow 2012-2015
Yoav Kallus 2011-2014
Samuel Lee 2012-2015
Mariangela Lisanti 2010-2013
Joseph Maciejko 2011-2014
Elisabetta Matsumoto 2011-2014
Timothy Merlis 2011-2014
Rahul Nandkishore 2012-2015
Marco Schiro’ 2010-2013
Alexander Tchekhovskoy 2010-2013
Mosahito Yamazaki 2010-2013

To find out more about Center Postdoctoral Fellowships and Programs see:  
http://pcts.princeton.edu/pcts

Through the Looking Glass:  
A Glimpse into the Geometry 
and Topology of Materials

3-5 December 2012
Jadwin Hall, Room 407

Program Organizers
Elisabetta Matsumoto, PCTS, Princeton University
Christian Santangelo, University of Massachusetts, Amherst
### Through the Looking Glass: A Glimpse into the Geometry and Topology of Materials

**Monday, 3 December 2012**

9:30 am  **Welcoming Remarks**

*10:00 – 11:00*  
“Some thoughts, conjectures and questions on bi- and multicontinuous cellular patterns.”  
*Stephen Hyde, Australian National University*

11:00 – 12:00  
“Topological moves in heterogeneous liquids: geometry and dynamics.”  
*Christophe Oguey, Universite de Cergy-Pontoise, France*

**12:00 – 1:30**  
Lunch and poster session at PCTS

1:30 – 2:30  
“The topology of vascular architecture.”  
*Eleni Katifori, Max Planck Institute*

2:30 – 3:00  
Coffee break

3:00 – 4:00  
“Coupling between topological defects and curvature in hexagonal and smectic textures.”  
*Daniel Vega, Universidad Nacional Del Sur, Argentina*

4:00 – 5:00  
“Mechanisms of Self-Assembly of Bio-optical Nanostructures.”  
*Richard Prum, Yale University*

5:00 – 7:00  
Reception and Poster Session

**Tuesday, 4 December 2012**

9:30 – 10:30  
“Surface solids: struts versus sheets.”  
*Gerd Schroder-Turk, Institute for Theoretical Physics, University of Erlangen-Nuremberg*

10:30 – 11:00  
Coffee break

11:00 – 12:00  
“Edges, ribbons and creases as geometric and material chimeras”  
*L Mahadevan, Harvard University*

**12:00 – 1:30**  
Lunch

1:30 – 2:30  
“Building with Butterflies: Folding Concentric Pleated Polygons”  
*Bryan Chen, Leiden University*

2:30 – 3:30  
“Origami folded isometric embeddings”  
*Marcelo Dias, Brown University*

**Wednesday, 5 December, 2012**

9:00 – 10:00  
“On the oriented nature of chirality.”  
*Efi Efrati, University of Chicago*

10:00 – 11:00  
“Metric variations becoming a surface.”  
*Jemal Guven, Universidad Nacional Autónoma de México*

**11:00 – 11:30**  
Coffee break

11:30 – 12:30  
“Space-filling problems in simple animal tissues.”  
*Ana Hočevar, The Rockefeller University*

12:30 – 2:00  
Lunch

2:00 – 6:00  
**Workshop on Topology: Identifying Order in Complex Systems**

2:00 – 3:00  
“The Topology of DNA.”  
*Dorothy Buck, Imperial, UK*

3:00 – 3:30  
Coffee break

3:30 – 4:30  
“Discrete Morse complexes and skeletons from digital images.”  
*Vanessa Robins, Australian National University*

4:30 – 5:00  
Break

5:00 – 6:00  
“Driving forces in corneocyte expansion: a geometric perspective.”  
*Myfanwy Evans, Institute for Theoretical Physics, University of Erlangen-Nuremberg*

6:30  
Please join us for dinner at a local restaurant.

*Talks appropriate for general audiences*