

## 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 Tchkhovskoy 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**

### Tuesday, 4 December 2012 - continued

- 3:30 – 4:00 Coffee break**
- 4:00 – 5:00 "Controllable defect lattices in smectic liquid crystals via patterned substrate topography."  
**Daniel Beller, University of Pennsylvania**
- 5:00 – 6:00 "Geometry of a crumpled object"  
**Narayanan Menon, University of Massachusetts**

### 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