

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.

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

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



Topological Insulators & Superconductors

New Frontiers in Low-Dimensional Systems
Program

3-5 November 2010

**PCTS – Jadwin Hall
Fourth Floor, Room 407**

Organizers

Dmitry Abanin, Andrei Bernevig
Shivaji Sondhi, Ali Yazdani

**Co-sponsored by Princeton Center for
Complex Materials**

Topological Insulators & Superconductors

Wednesday, 3 November 2010

8:50 am Welcoming Remarks

- * 9:00 – 9:50 "Topological Band Theory of Insulators & Superconductors"
Charles Kane, University of Pennsylvania
- * 10:00 – 10:50 "Topological insulators and topological superconductors"
Shoucheng Zhang, Stanford University
- 11:00 – 11:45 "Dirac Fermions in HgTe quantum wells"
Laurens Molenkamp, Wurzburg University, Germany

12:00 – 2:00 pm Lunch

- 2:00 – 2:45 "Experimental Discovery of Topological-Order in Bulk Solids and Superconductors"
Zahid Hasan, Princeton University
- 3:00 – 3:45 "Band topology in correlated solids"
Ashvin Vishwanath, Berkeley University
- 4:00 – 4:45 "Local spectroscopy of topological insulators and superconductors"
Hidenori Takagi, University of Tokyo, Japan

Thursday, 4 November 2010

- 9:00 – 9:45 "Novel transport properties of Bi-Sb and other topological insulators"
Yoichi Ando, Osaka University, Japan
- 10:00 – 10:45 "Magnetoelectric response and charge transport in topological insulators."
Joel Moore, Berkeley University
- 11:00 – 11:45 "Quantum oscillations and Hall anomaly of surface electrons in a topological insulator."
N. Phuan Ong, Princeton University

12:00 - 2:00 pm Lunch

* *Talks appropriate for General Audiences*

Thursday, 4 November 2010

- 2:00 – 2:45 "Molecular Beam Epitaxy-Scanning Tunneling Microscopy of Topological Insulators"
Qi-Kun Xue, Tsinghua University, China
- 3:00 – 3:45 "Spectroscopic Mapping of Topological Surface States"
Ali Yazdani, Princeton University
- 4:00 – 4:45 "Witten effect in a strong topological insulator"
Marcel Franz, University of British Columbia
- 5:00 – 5:30 "Topological Insulators at DARPA"
Jeffrey Rogers, DARPA/MTO

Friday, 5 November

- 9:00 - 9:45 "Classification of Topological Insulators and Superconductors"
Andreas Ludwig, University California, Santa Barbara
- 10:00 – 10:45 "Theory of magnets and superconductors on topological insulators"
Naoto Nagaosa, University of Tokyo, Japan
- 11:00 – 11:45 "STM studies of macroscopic defects in the topological insulators Bi₂Te₃ and Bi₂Se₃."
Aharon Kapitulnik, Stanford University

12:00 – 2:00 pm Lunch

- 2:00 – 2:45 "Theory of Superconductivity in a Doped Topological Insulator"
Liang Fu, Harvard University
- 3:00 – 3:45 "Topological insulators from an entanglement perspective"
Andrei Bernevig, Princeton University