

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
Ravindra Bhatt
William Bialek
Curtis Callan
Roberto Car
David Spergel
Salvatore Torquato

Center Postdoctoral Fellows:

Dmitry Abanin 2008-2011
Benjamin Basso 2009-2012
Adam Brown 2009-2012
Bryan Clark 2009-2012
Thomas Klose 2007-2010
Jean-Luc Lehners 2007-2010
M. Lisa Manning 2008-2011
Matthew Reece 2008-2011
Branson Stephens 2007-2010
Aleksandra Walczak 2007-2010

Center Associate Postdoctoral Fellows:

Jeremy England, Lewis-Sigler Institute for Integrative Genomics 2009-2010
Shravan Hanasoge, Geosciences, 2009-2010

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

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



Computational Relativistic Astrophysics

22-24 October 2009

Fourth Floor, Jadwin Hall

Organizers:

Adam Burrows
Frans Pretorius
Anatoly Spitkovsky
Branson Stephens
Jim Stone

Co-sponsored by The D. E. Shaw Group

Thursday, 22 October 2009
Overview of gravitational wave astronomy.

- 9:45 am Welcome Remarks
Frans Pretorius & Paul Steinhardt
- * 10 – 11 am "Gravitational-Wave Astronomy with LIGO and Virgo"
Duncan Brown, Syracuse University
- 11 – 11:15 am Coffee Break**
- 11:15 – 12:15 pm "Advances in Binary Black-Hole Simulation"
Manuella Campanelli, Rochester Institute Technology
- 12:15 – 1:30 pm Lunch – On Your Own**
- 1:30 – 2:30 pm "Improving the accuracy of binary black hole simulations"
Dennis Pollney, Albert Einstein Institute
- 2:30 – 2:45 pm Coffee Break**
- 2:45 – 3:45 pm "Black holes, gravitational waves, and LISA"
John Baker, NASA Goddard
- 4:00 – 4:30 pm Tea, Room 218 Jadwin Hall
- * 4:30 – 5:30 pm Physics Colloquium, Room A-10 Jadwin Hall
"Black Holes and Gravitational Waves"
Saul Teukolsky, Cornell University

Friday, 23 October 2009

Binary neutron star & black hole/neutron star mergers.

- * 10 – 11 am "Simulation for neutron star-neutron star and black hole-neutron star binaries"
Masaru Shibata, Yukawa Institute for Theoretical Physics, Kyoto University
- 11 – 11:15 am Coffee Break**
- 11:15 – 12:15 pm "Modelling the Inspiral and Merger of Binary Neutron Stars"
Luciano Rezzolla, Albert Einstein Institute

12:15 – 1:30 pm Lunch – On Your Own

* **Talks appropriate for General Audience**

Friday, 23 October 2009-- Continued
Binary neutron star & black hole/neutron star mergers.

- 1:30 – 2:30 pm "GRMHD simulations of Compact Binary Mergers: Gravitational Radiation, Hypermassive Neutron Stars and Gamma-Ray Bursts"
Stu Shapiro/Yuk Tung Liu, UIUC
- 2:30 – 2:45 pm Coffee Break**
- 2:45 – 3:45 pm The Variety of Black hole-neutron star binaries: spin, compaction, and equation of state
Matt Duez, Cornell University
- 3:45 – 4:00 pm **Coffee Break**
- 4:00 – 5:00 pm "Compact binary systems as engines of light: gravity meets electromagnetic fields"
Luis Lehner, Perimeter Institute

Saturday, 24 October 2009

Accretion disks, collapsars, jets, and supernovae.

- 10 – 11 am "Accretion onto Black Holes"
Scott Noble, Rochester Institute Technology
- 11 – 11:15 am Coffee Break**
- 11:15 – 12:15 "GRB Hydrodynamics"
Andrew MacFadyen, New York University
- 12:15 – 1:30 pm Lunch – On Your Own**
- 1:30 – 2:30 pm "Observations of wisps in relativistic MHD simulations of the Crab Nebula"
Serguei Komissarov, Leeds
- 2:30 – 2:45 pm Coffee Break**
- 2:45 – 3:45 pm "Stellar Collapse, Core-Collapse Supernovae, and the Formation of Stellar-Mass Black Holes"
Christian Ott, Caltech
- 3:45 – 4:00 pm **Coffee Break**
- 4:00 – 5:00 pm Open Discussion