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
Andrei Bernevig
Duncan Haldane
Andrew Houk
Eve Ostriker
Thanos Panagiotopoulos
Frans Pretorius
Ned Wingreen

**Center Postdoctoral Fellows**
Ricard Alert-Zenon 2018-2021
Nathan Benjamin 2018-2021
Fani Dosopoulou 2018-2021
Anna Frishman 2016-2019
Daniel Lecoanet 2016-2019
Biao Lian 2017-2020
Abhinav Prem 2018-2021
Pierre Ronceray 2016-2019
Oren Slone 2018-2020
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Xinan Zhou 2018-2021

To find out more about Center Postdoctoral Fellowships and Programs see: [http://pcts.princeton.edu/pcts](http://pcts.princeton.edu/pcts)
“Transport in Disordered Environments”

**Wednesday, January 23, 2019: Fluid flow**

8:30  Light Breakfast
9:00-9:10  Welcome/Introduction
  *Dorthe Wildenschild, Oregon State University*
9:50-10:30  Multiphase flow in porous media: wetting, disorder, and pattern formation
  *Ruben Juanes, MIT*
10:30-11:00  Coffee break
11:00-11:40  Fluid-fluid and fluid-solid reactions in multiphase flows
  *Joaquin Jimenez Martinez, ETH Zurich*
11:40-12:20  Direct simulation of fluid flow in rough fractures
  *Maša Prodanović, UT Austin*
12:20-2:00  Lunch at PCTS
2:00-2:40  Oil Recovery in Mixed Macro- and Micro-Pore Carbonates: Experiments and Modeling
  *Hubert King, ExxonMobil*
2:40-3:20  Multiscale imaging of gas transport and adsorption in shales
  *Anthony Kovscek, Stanford University*
3:20-4:00  Coffee Break
4:00-4:40  Measuring and imaging solute mixing in heterogeneous porous media
  *Ronny Pini, Imperial College London*
4:40-5:20  Porous media two ways: From self-healing gels to randomly-hopping cells
  *Sujit Datta, Princeton University*
5:30  WELCOME RECEPTION and Poster Session AT PCTS

“Transport in Disordered Environments”

**Thursday, January 24, 2019: Complex interactions**

8:30  Light Breakfast
9:00-9:40  Reactive Transport in Porous Media: Bridging Scales, Data and Physics
  *I llenia Battiato, Stanford University*
9:40-10:20  Combinatorial Analysis of Anomalous Colloid Transport in Porous Media
  *Markus Hilpert, Columbia University*
10:20-10:50  Coffee break
  *MJ Abdolhosseini Qomi, UC Irvine*
11:30-12:10  Clay, water, and salt: controls on the permeability of fine-grained sedimentary rocks
  *Ian Bourg, Princeton University*
12:10-1:40  Lunch at PCTS
1:40-2:20  Nanoparticle transport in slowly-relaxing disordered media
  *Jacinta Conrad, University of Houston*
2:20-3:00  Microbial life in unsaturated soil – hotspots and self-organization
  *Dani Or, ETH Zurich*
3:00-3:30  Coffee Break
3:30-4:10  Cytoskeletal dynamics
  *Aaron Dinner, University of Chicago*
4:10-4:50  Jamming and Clogging of Passive and Active Particles in Disordered Media
  *Cynthia Reichhardt, LANL*
4:50-5:30  Flocking through disorder
  *Denis Bartolo, ENS Lyon*
“Transport in Disordered Environments”

Friday, January 25, 2019: Biological transport
8:30  Light Breakfast

9:00-9:40  Tuning transport in biological systems with soft interactions
Meredit Betterton, University of Colorado Boulder

9:40-10:20  Push Yourself: Active Enzymes with Enhanced Diffusion
Jennifer Ross, University of Massachusetts Amherst

10:20-11:00  Coffee break

11:00-11:40  Multi-scale time-reversal asymmetry in biological active matter.
Nikta Fakhri, MIT

11:40-12:20  Phase separation in multicomponent liquid mixtures
Andrej Košmrlj, Princeton University

12:20-12:30  Concluding remarks

12:30-2:00  Lunch at PCTS