

## 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

Igor Klebanov, Director  
Ned Wingreen, Associate Director  
Jeremy Goodman  
Duncan Haldane  
Andrej Košmrlj  
Mariangela Lisanti  
Frans Pretorius  
Silviu Pufu  
Eliot Quataret  
Shinsei Ryu

### Center Postdoctoral Fellows

Vir Bulchandani 2020-2023	Minjae Cho 2021-2024
Giorgio Cipolloni 2021-2024	Scott Collier 2020-2023
Trevor GrandPre 2022-2024	David Hosking 2022-2025
Brooke Husic 2020-2023	Jonah Kudler-Flam 2022-2025
Yves Kwan 2022-2025	Alejandro Martinez-Calvo 2021-2024
Elias Most 2020-2023	Anirudh Prabhu 2022-2025
Carolyn Raithel 2020-2023	Rhine Samajdar 2022-2025
Frank Schindler 2020-2023	Nicole Shibley 2021-2024

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

<https://pcts.princeton.edu>



## Multi-messenger Modeling of Neutron Star Mergers

**May 8-10, 2023**

**PCTS Seminar Room**

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

### Program Organizers

**Elias Most**

**Carolyn Raithel**

## Multi-messenger Modeling of Neutron Star Mergers Monday, May 8, 2023

8:30-9:00 am	Light Breakfast at PCTS
9:00 - 9:30	Opening remarks <b>Elias Most &amp; Carolyn Raithel</b>
9:30 - 10:05	Impact of pions on binary neutron star mergers <b>Andreas Bauswein -- ZOOM</b>
10:05 - 10:20	Break
10:20 - 10:55	Revealing Phase Transition in Dense Matter with Gravitational Wave Spectroscopy of Binary Neutron Star Mergers <b>Pedro Espino</b>
10:55 - 11:30	Modelling the full spectrum of gravitational waves from BNS coalescences <b>Rosella Gamba</b>
11:30 - 1:00	Lunch
1:00 - 1:35	General relativistic Monte-Carlo transport for neutron star merger simulations <b>Francois Foucart</b>
1:35-2:10	Implementing a tabulated EOS and neutrino leakage scheme in HARM3D <b>Ariadna Murguia-Berthier</b>
2:10 - 2:30	Break
2:30 - 3:05	Progress in modeling of post-merger accretion disks <b>Rodrigo Fernandez</b>
3:05 - 3:40	Long-term evolution of remnants of binary neutron star mergers and nucleosynthetic outcomes <b>Sho Fujibayashi</b>
3:45	Discussion session
4:30	RECEPTION at PCTS

## Multi-messenger Modeling of Neutron Star Mergers Tuesday, May 9, 2023

8:30-9:00 am	Light Breakfast at PCTS
9:00-9:35	Neutrino Effects in Neutron Star Mergers <b>David Radice</b>
9:35-10:10	Neutrino Quantum Kinetics in Three Dimensions <b>Sherwood Richers</b>
10:10 - 10:30	Break
10:30-11:05	Nucleosynthesis and Kilonovae from Post-Merger Remnants <b>Sanjana Curtis</b>
11:05-11:40	Magnetized Compact Object Mergers with Neutrino Transport <b>Steven Liebling</b>
11:30 - 1:00	Lunch at PCTS & discussion session at PCTS
1:00 - 1:35	Electromagnetic signatures of short Gamma-Ray Bursts in standard and non-standard environments <b>Davide Lazzati</b>
1:35 - 2:10	Talk TBD
2:10 - 2:30	Break
2:30 - 3:05	Short GRB jets from NS-NS mergers: towards an end-to-end description <b>Andrea Pavan</b>
3:30-4:30	Spitzer Lecture: The Fastest Stellar Explosions (are really stellar explosions?) <b>Raffaella Margutti</b> <b>PEYTON HALL</b>

## Multi-messenger Modeling of Neutron Star Mergers

**Wednesday, May 10, 2023**

8:30-9:00 am Light Breakfast at PCTS

- 9:00 - 9:35 Jets from neutron-star merger remnants, massive blue kilonovae, and other electromagnetic signatures  
**Daniel Siegel – ZOOM**
- 9:35 - 10:10 Kilonova spectrum: photospheric and nebular phases  
**Kenta Hotokezaka**
- 10:10 - 10:45 Fate of Neutron Star Merger Remnants and Observational Signatures  
**Brian Metzger**
- 10:45-11:20 Multiphysics simulations of neutron-star merger remnants  
**Philipp Mösta**
- 11:20-12:15 Discussion session followed by lunch at PCTS**