

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

Ned Wingreen, Acting Director
Shinsei Ryu, Acting Associate Director
Igor Klebanov, Director
Jeremy Goodman
Duncan Haldane
Andrew Houck
Mariangela Lisanti
Thanos Panagiotopoulos
Frans Pretorius
Silviu Pufu

Center Postdoctoral Fellows

Vir Bulchandani 2020-2023	Andrew Chael 2019-2022
Amos Chan 2019-2022	Minjae Cho 2021-2024
Giorgio Cipolloni 2021-2024	Scott Collier 2020-2023
Brooke Husic 2020-2023	Alejandro Martinez-Calvo 2021-2024
Elias Most 2020-2023	Vladimir Narovlanski 2019-2022
Sabrina Pasterski 2019-2022	Carolyn Raithel 2020-2023
Frank Schindler 2020-2023	Nicole Shibley 2021-2024

To find out more about Center Postdoctoral Fellowships and Programs see: <https://pcts.princeton.edu>



New era of two-dimensional quantum matter

March 8-11, 2022

Virtual on Zoom & in person at
Jadwin Hall, Room 407, Fourth Floor

Program Organizers

Bogdan. A. Bernevig
Vir Bulchandani
Biao Lian
Frank Schindler
Sanfeng Wu
Ali Yazdani

New era of two-dimensional quantum matter

Tuesday, March 8, 2022

9:30-9:40: Opening remarks

9:40-10:10: Biao Lian, *Hartree-Fock Study of Moire Graphene, and Magic Angles near Commensuration*

10:10-10:20: Q&A

10:20-10:50: Break

10:50-11:20: Sid Parameswaran (VIRTUAL), *Kekule Spiral Order in the Normal State of Twisted Bilayer Graphene*

11:20-11:30: Q&A

11:30-12:30: Lunch break

12:30-1:00: Stevan Nadj-Perge, *Superconductivity and Strong Correlations in Magic-Angle Graphene Multilayers*

1:00-1:10: Q&A

1:10-1:40: Bohm-Jung Yang, *Geometric Properties of Gapped and Gapless Flat Bands in Two Dimensions*

1:40-1:50: Q&A

1:50-2:20: Break

2:20-2:50: Pablo Jarillo-Herrero (VIRTUAL), *Magic-Angle Graphene: a Family of Moiré Superconductors*

2:50-3:00: Q&A

3:00-3:30: Rafael Fernandes, *Electronic Nematicity and Phason Excitations in Twisted Moiré Systems*

3:30-4:00: Wrap-up discussion and networking

Wednesday, March 9, 2022

9:00-9:30: Monika Aidelsburger (VIRTUAL), *Wavepacket Dynamics in Topological Floquet Bands*

9:30-9:40: Q&A

9:40-10:10: Gwendal Feve, *Fractional Statistics in Anyon Collisions*

10:10-10:20: Q&A

10:20-10:50: Break

10:50-11:20: Oskar Vafek, *Narrow Bands in Magnetic Field and Strong-Coupling Hofstadter Spectra*

11:20-11:30: Q&A

11:30-12:30: Lunch break

12:30-1:00: Ashvin Vishwanath (VIRTUAL), *Topological Order and Superconductivity in Moiré Materials*

1:00-1:10: Q&A

1:10-1:40: Allan Macdonald, *Magnetism and Superconductivity in Strongly Correlated Graphene*

1:40-1:50: Q&A

1:50-2:20: Break

2:20-2:50: Taylor Hughes (VIRTUAL), *Electric Multipole Insulators*

2:50-3:00: Q&A

3:00-3:30: Ali Yazdani, *Correlation, Topology, and Unconventional Superconductivity in Magic Angle Graphene*

3:30-4:00: Wrap-up discussion and networking

Thursday, March 10, 2022

9:00-9:30: Zhida Song (VIRTUAL), *Magic-Angle Twisted Bilayer Graphene as a Topological Heavy Fermion Problem*

9:30-9:40: Q&A

9:40-10:10: Andrea Young, *Superconductivity and Magnetism in Crystalline Graphite Allotropes*

10:10-10:20: Q&A

10:20-10:50: Break

10:50-11:20: Eun-Ah Kim, *Theory of Fractional Correlated Insulating States in Twisted Bilayer Graphene*

11:20-11:30: Q&A

11:30-12:30: Lunch break

12:30-1:00 Liang Fu (VIRTUAL), *Inverting and Doping Mott insulators in Semiconductor Heterostructures*

1:00-1:10: Q&A

1:10-1:40: Sanfeng Wu, *Moiré Luttinger Liquids in Two Dimensions*

1:40-1:50: Q&A

1:50-2:20: Break

2:20-2:50: Ben Feldman (VIRTUAL), *Correlated Hofstadter Spectrum and Flavor Phase Diagram in Magic-Angle Graphene*

2:50-3:00: Q&A

Friday, March 11, 2022

9:00-9:30: Moty Heiblum (VIRTUAL), *Distinguishing Between Different Topological Orders of a FQHE State*

9:30-9:40: Q&A

9:40-10:10: Michael Zaletel, *The Multi-Party Entanglement Structure of 2D Topological Phases*

10:10-10:20: Q&A

10:20-11:10: Wrap-up discussion and networking