

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
Andrei Bernevig
Jeremy Goodman
Duncan Haldane
Andrew Houck
Mariangela Lisanti
Thanos Panagiotopoulos
Frans Pretorius

Center Postdoctoral Fellows

Ricard Alert-Zenon 2018-2021
Nathan Benjamin 2018-2021
Andrew Chael 2019-2022
Amos Chan 2019-2022
Fani Dosopoulou 2018-2021
Biao Lian 2017-2020
Vladimir Narovlansky 2019-2022
Sabrina Pasterski 2019-2022
Abhinav Prem 2018-2021
Oren Slone 2018-2020
Yizhi You 2017-2020
Xinan Zhou 2018-2021

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

<http://pcts.princeton.edu>



Sensing Chemical Spaces

December 11-13, 2019

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

Program Organizers

Curtis Callan
Yuval Elhanati
Kamesh Krishnamurthy
Andreas Mayer

Sensing Chemical Spaces

Wednesday, December 11, 2019

- 8:30 – 8:55** **Continental Breakfast**
9:00-9:15 Welcome/Introduction
9:15-10:00 Odor mixtures – neural representation and perception
Venkatesh Murthy
10:00-10:30 Becoming what you smell: adaptive sensing in the olfactory System
Vijay Singh
- 10:30-11:00** **Coffee break**
- 11:00-11:30 A primacy coding model and the structure of olfactory space
Dima Rinberg
11:30-12:00 Hyperbolic geometry in olfaction
Tatyana Sharpee
- 12:00-1:30** **Lunch at PCTS**
1:30-2:00 Precision in a rush: decision making in early fly development
Aleksandra Walczak
2:00-2:30 Adaptation strategies for chemical sensing in E. coli and Drosophila
Thierry Emonet
- 2:30-3:00** **Coffee Break**
3:00-3:30 Mapping Odor Space
Joel Mainland
3:30-3:45 Antagonism-mediated receptor normalization in olfaction
Gautam Reddy
3:45-4:00 Optimal compressed sensing strategies for an array of nonlinear olfactory receptor neurons
Shanshan Qin
4:00-4:55 First day discussion panel
lead by Kamesh Krishnamurthy

4:55 **Poster Session and Reception at PCTS: Hors d'oeuvres and Wine/Beer**

Sensing Chemical Spaces

Thursday, December 12, 2019

- 8:30** **Continental Breakfast**
9:15-10:00 Innate and adaptive detection by T cell receptors
Paul Thomas
10:00-10:30 Negative selection for T-cells and detecting tumor antigens - How might it work?
Herbert Levine
- 10:30-11:00** **Coffee break**
11:00-11:30 Polyclonality in the T cell repertoire
Benny Chain
11:30-12:00 Mapping the immune footprint in an antigenic space
Shenshen Wang
- 12:00-1:30** **Lunch at PCTS**
1:30-2:00 Adaptive immune receptor repertoires: a structured space of chemical sensors
Will DeWitt
2:00-2:15 The structure of peptide and immune receptor space
Andreas Mayer
- 2:15-2:45** **Coffee Break**
2:45-3:15 Quantifying and decoding information in cytokine dynamics
Paul Francois
3:15-3:45 Second day discussion panel
lead by Yuval Elhanati
- 4:00-5:00** **Physics Colloquium—Room A-10 Jadwin Hall**
Diversity and memory in self-organized immune repertoires
Thierry Mora

Sensing Chemical Spaces

Friday, December 13, 2019

8:30 Continental Breakfast

9:30-10:00 Predicting how the immune system fights cancer
Marta Luksza

10:00-10:30 TCR repertoires of tumor infiltrating lymphocytes in metastatic breast cancer
Erez Greenstein

10:30-11:00 Coffee break

11:00-12:00 Summary and Discussion
Lead by Curtis Callan

12:00 noon Lunch and conclusion at PCTS

3pm – 4pm Thierry Emonet: BioE Colloquium