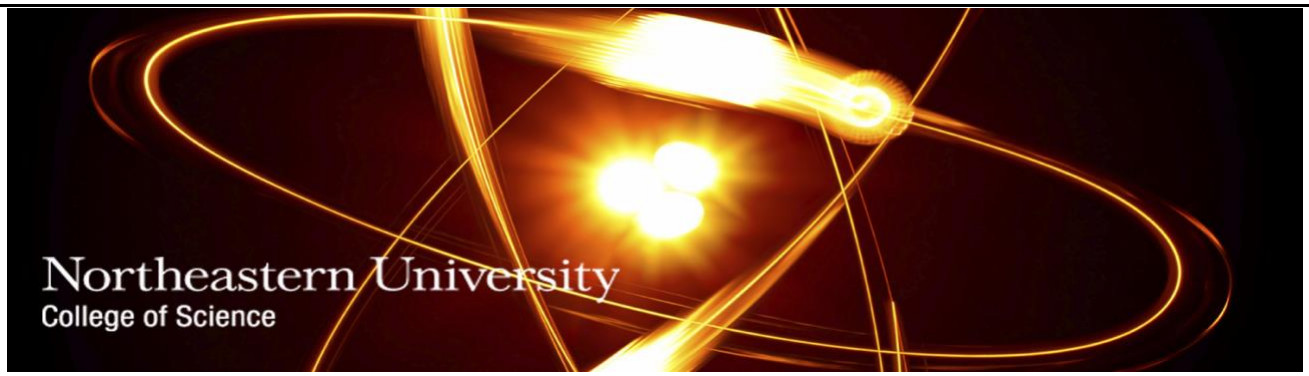


CTBP Seminar:

Limit and potential of adaptive immunity

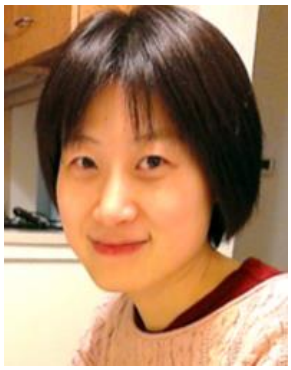
Dr. Shenshen Wang

Assistant Professor, Department of Physics and Astronomy, UCLA

Host: Herbert Levine

Thursday, September 22, 2022
3:00 p.m.

The adaptive immune system is able to learn from past experiences to better fit an unforeseen future. This is made possible by a diverse and dynamic repertoire of cells expressing unique antigen receptors and capable of rapid Darwinian evolution within an individual. However, naturally occurring immune responses exhibit limits in efficacy, speed and capacity to adapt to novel challenges. In this talk, I will discuss theoretical frameworks we developed to (1) explore functional impacts of non-equilibrium antigen recognition, and (2) identify conditions under which natural selection acting local in time can find adaptable solutions favorable in the long run, through exploiting environmental variations and functional constraints.



Biography

Shenshen Wang is an Assistant Professor in the Department of Physics and Astronomy at UCLA. Shenshen is a theorist working in the field of biological and soft condensed matter physics. She received her Bachelor's degree in Physics from Nanjing University in China and her MPhil in condensed matter theory from Hong Kong University of Science and Technology. She obtained her PhD in Physics from UCSD under the supervision of Peter Wolynes, and acquired her postdoctoral training with Arup Chakraborty and Mehran Kardar at MIT, before joining UCLA in 2016. Her group uses theory and computation to understand the organization and evolution of adaptive immune responses in the face of diverse and evolving microscopic invaders. Her recent interests also include understanding how biodiversity is maintained in migrating populations and the physics of deep generative models. She is a recent recipient of the NSF CAREER Award.