

Spring 2025 Physics Colloquium

Friday, April 11th

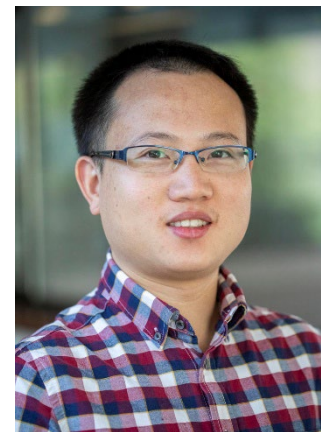
3:00 PM

PAS 201 or Zoom

(<https://arizona.zoom.us/j/86395646910>)

Sanfeng Wu

University of Princeton



Emerging Frontiers of Superconductivity in Two-Dimensional Quantum Materials

Abstract: Superconductivity—one of the most profound quantum phenomena discovered prior to the establishment of quantum mechanics—continues to drive today’s exciting developments in quantum materials, condensed matter physics, and quantum technologies. In this talk, I will discuss exciting new frontiers of superconductivity enabled by the advent of two-dimensional (2D) quantum materials. I will first highlight a series of discoveries regarding gate-induced superconductivity in a 2D topological excitonic insulator, which exhibits a unique phase diagram featuring an unconventional quantum critical point that cannot be explained by established theories. I will then discuss new opportunities enabled by a novel 2D nanochemistry approach we recently invented for nano-engineering superconductivity in moiré topological materials. The possibilities of investigating superconductivity in moiré-based fractionalized electronic systems will be envisioned.

Bio: Sanfeng Wu is an assistant professor of physics at Princeton University. He did his undergraduate work at the University of Science and Technology in Hefei, China, and received his Ph.D. from the department of physics at the University of Washington in 2016. He was the Pappalardo Fellow in Physics at the Massachusetts Institute of Technology (MIT) before receiving his appointment at Princeton. His main research areas are condensed matter physics, two-dimensional quantum matter and devices, and quantum information processes. He has received several awards and honors, including the Moore Foundation Award for the EPIQS Flexible Funding Ideas (2023), an AFOSR Young Investigator Award (2023), and a Sloan Research Fellowship (2023). He is also an associated faculty member at the Princeton Materials Institute and the Princeton Quantum Initiative.

** Refreshments served in PAS 218 at 2:30 PM – 3:00 PM **

