

Physics Colloquium

Prof. Babak Seradjeh

“Floquet-Engineered Topological Phases of Quantum Matter”

Quantum dynamics out of equilibrium is an emerging front of research on many-body systems, which is reshaping our basic understanding of possible phases of matter. I will present our recent and ongoing work on proposed realizations, detection, and applications of non-equilibrium topological phases of matter engineered and stabilized by external periodic drives. These include Floquet topological superconducting phases that support more than one type of Majorana bound states, various phases of irradiated graphene under circularly polarized lasers, higher-order topological phases that support corner and bulk bound states, and novel topological gauge pumps realized in driven trapped ions. A central theme of this work is the exquisite in-situ control offered by Floquet engineering allowing the realization and study of novel quantum phases of matter and transitions among them.

Babak Seradjeh is a physicist interested in dynamics, correlations, and topology in quantum phases of matter. After earning a PhD for work on quantum field theory of high-temperature cuprate superconductors at Simon Fraser University, he held two postdoctoral fellowships at the University of British Columbia and University of Illinois at Urbana-Champaign working on topological phases of correlated electrons, e.g. the topological exciton condensate. He joined Indiana University in 2011 and was a visiting scientist at the Max-Planck Institute for the Physics of Complex Systems in 2017-2018. His work has been supported by the NSF CAREER program, Binational Science Foundation, and the Department of Energy.

Thursday October 29th at 4:25 via Zoom

If you are outside the Lehigh Physics Department, please email Marina Long (mal516@lehigh.edu) for a link.