

CONDENSED MATTER SCIENCES SEMINAR

Dr Babak Seradjeh

Indiana University

Host

Dr Hitesh Chaglani

Title

Floquet Topology and Many-Body Dynamics in Quantum Matter

Friday, April 3rd, 2026

1st Floor – B101

15:00-16:00

Abstract

Periodic driving can generate interactions in quantum systems that are absent in static settings. This “Floquet engineering” has been demonstrated across different platforms, including cold atoms in optical lattices, trapped ions, photonic devices, and solid-state systems, offering precise in situ control for realizing and probing novel quantum phases of matter. In this talk, I will present our recent work in this area. First, we propose using twisted light to generate and control multiple topological phases in graphene. Second, we study the steady-state population of driven systems weakly coupled to a fermionic bath, and use these results to derive a “Josephson Floquet sum rule” for driven superconductors. Time permitting, I will also discuss our ongoing work on simulating quantum magnetism in spin-1 Hamiltonians by driving the rotational states of trapped dipolar molecules with circularly polarized microwaves.