

Seminar

Topological Aspects of non-Hermitian systems

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In this talk, various topological phases in non-Hermitian (NH) systems will be explored. I will begin with the higher-order topological phase in NH systems which has recently emerged as one of the most promising and rapidly advancing fields in condensed matter physics. Many distinct phases that were absent in the Hermitian equivalents are shown in these systems. Specifically, we will examine the impact of NH perturbation on the higher-order Weyl semimetals, uncovering a new type of topological semimetal, called as non-Hermitian higher-order Weyl semimetal with surface diabolic points [1]. The second part of the talk will focus on how exceptional topology can be modulated using Floquet theory. We will demonstrate the concept of a Floquet exceptional topological insulator, which arises when conventional three-dimensional NH topological insulators are illuminated with light. Light-matter interaction facilitates the quantum phases of matter to exhibit a novel phenomenon, where, the point gaps in the bulk host surface states. These distinct surface states either fill the point gap in the complex eigenspectrum or exhibit exceptional points in the presence of a magnetic field [2].

References:

[1] S. Bid, G. K. Dash, and M. Thakurathi, Phys. Rev. B 107, 165120 (2023).

[2] G. K. Dash, S. Bid, and M. Thakurathi, arXiv:2301.13119.

Friday, Jul 28th 2023

4:00 PM (Tea / Coffee 03.45 PM)

Seminar Hall, TIFR-H