

**Şahin K. Özdemir** (Indiana University Purdue University Indianapolis (IUPUI), USA)

Title: Non-Hermiticity as a Resource for Chiral Perfect Absorption and Sensing

Abstract: Open physical systems are in continuous exchange of energy, information, and matter with their surroundings. A unique hallmark of open systems is their discrete spectral degeneracies known as exceptional points (EPs) where both the complex eigenfrequencies and associated eigenvectors coalesce. Recent years have seen a tremendous progress in the theory and experimental implementations of EPs and associated concepts. This progress has led to a host of new intriguing results in optics with promising potential applications in controlling the propagation of light and its interaction with matter. In this talk, we will briefly discuss the outcomes of research activities in our group within the framework of non-Hermitian photonics. We will first discuss the emergence of EPs and exceptional surfaces (ESs) - a hypersurface on which every point is an EP- in a photonic system composed of ring resonators and then use it for chiral perfect absorption [1] and sensing applications. We will end the talk with a discussion of the opportunities and challenges in non-Hermitian photonics and how the concepts can branch out to other disciplines of science and technology [2,3].

References:

1. Soleymani et al. Nat. Commun **13**, 599 (2022).
2. Ergoktas et al. Science **376**, 184 (2022).
3. Zhang et al. Nature Communications **13**, 6225 (2022).