

Photonics

Exceptional points in periodic optical systems

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Abstract: Exceptional points (EPs) are point singularities in the parameters space of a system at which at least two of its eigenvalues and eigenvectors coalesce. Such points are often associated with non-Hermitian (optical) systems and have been the focus of intense research in the last decade due to their potential applications in optical sensing, switching, lasing, but also in signal processing and impedance matching. While EPs mostly studied in the context of parity-time symmetric systems, they can also be found in passive and Hermitian periodic systems, where they are often designated as stationary points and associated with vanishing group velocity. In this talk, I will review the fundamental concepts of stationary points formation in periodic system and discuss their applications, mainly light amplification and lasing. I will also present our recent work on EPs in PT-symmetric periodic systems.



Bio: Koby Scheuer is the Bernard L. Schwartz Chair in Nano-Scale Information technology and a full professor at the school of Electrical Engineering, Tel-Aviv University. He received the B.Sc. degree (summa cum laude) in electrical engineering and in physics, and the Ph.D. degree in electrical engineering from the Technion-Israel Institute of Technology, Haifa, Israel, in 1993 and 2001, respectively. He was a Chief Designer with Lambda crossing-an optical component startup specializing in microring resonators for two years. Then, he joined the Center for the Physics of Information and the Department of Applied Physics, the California Institute of Technology, Pasadena, as a Research Associate. In 2006 he joined the School of Electrical & Computer Engineering, Tel-Aviv University. His main fields of research involve metasurfaces, plasmonics, integrated optics and telecommunications. Prof. Scheuer is the author or co-author of more than 220 scientific paper in peer-review journal, more than 140 papers in conference proceeding, and 12 patent applications. He is a Fellow of Optica (former Optical Society of America) and a fellow of the SPIE.

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