

Power eigenchannels of non-Hermitian media

University of Crete and IESL-FORTH, Heraklion, Greece

Konstantinos Makris

Email: makris@physics.uoc.gr

In this talk, we discuss recent results regarding the role of singular values in the control of power amplification and the corresponding singular eigenstates in achieving focusing in multimode fibers, and waveguide lattices, that contain spatially distributed gain and/or loss. In this framework of non-Hermitian photonics, the effects of exponential sensitivity and higher order exceptional points, are also discussed.

This project was funded by the European Research Council (ERC-Consolidator) under grant agreement No. 101045135 (Beyond_Anderson), and by the Stavros Niarchos Foundation (SNF) and the Hellenic Foundation for Research and Innovation (H.F.R.I.) through the 5th Call of the "Science and Society" Action, titled "Always strive for excellence – Theodoros Papazoglou" (Project Number: 11496, "PSEUDOTOPPOS").

Short Bio: **Konstantinos Makris** is Associate Professor in the Department of Physics, of the University of Crete and Affiliated Researcher at the Institute of Electronic Structure and Laser (IESL) of Foundation for Research and Technology Hellas (FORTH). He obtained his PhD in Theoretical Photonics from the School of Optics and Photonics (CREOL-FCPE) at the University of Central Florida, USA in 2008. From 2008 until 2010 he was a postdoctoral researcher at Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland. During 2011 he was Lecturer at Institute for Theoretical Physics of Vienna University of Technology (TU-Wien), Austria. From 2012 until 2015 he was a Marie Curie fellow between Princeton University, USA and TU-Wien, Austria. His current research interests lie on non-Hermitian physics, nonlinear optics, photonics lattices and wave propagation in complex media. He has more than 100 publications in refereed journals and more than 60 invited talks-colloquia at international conferences/schools and Institutions. In 2022 he was awarded an ERC consolidator grant. He was also elected as a 2023 Fellow of OPTICA (former OSA).

