



# Active and passive non-Hermitian devices

**Date:** September 21, 2022 (Wednesday)

**Time:** 5:00 p.m.

**Zoom Online Lecture:** <https://bit.ly/3KyAWfv>

**Meeting ID:** 921 1310 5357

**Password:** 2859



*Prof. Henning SCHOMERUS*

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## Abstract:

In photonic systems, gain and loss can be used to induce intriguing effects that are linked to non-Hermitian and topological physics. Prominent examples are exceptional points and the non-Hermitian skin effect, which can be used for enhanced sensing and directed amplification, as well as symmetry-protected states, which can be addressed by topological mode selection. Many of these applications make explicit use of mode nonorthogonality, which becomes especially intriguing when the system is nonreciprocal. I describe how these effects can be probed in response theory, transport, and scattering, and highlight fundamental practical limits of the observability of some effects.

## Biography:

Prof. Dr. rer nat Henning Schomerus got his Diploma/MSc in Physics in University of Stuttgart, and PhD in Physics in University of Essen, Germany in 1993 and 1998 respectively. Afterwards, he spent two years in Leiden University, The Netherlands as a postdoc and since 2000 to 2005 as a Head of Junior Research Group "Waves in Complex Media and Mesoscopic Phenomena" in MPIKPS Dresden, Germany. Since 2005, he has been Reader and Professor in Condensed Matter Theory, Department of Physics, Lancaster University, UK and Head of Theory Group. Professor Schomerus is Senior Fellow of the Higher Education Academy (2017), MInstP/FInstP (2006/2017), Member of DPG (1994), Member of EPS (1994). Professor Schomerus' research aims to uncover quantum phenomena occurring for electrons and photons in small quantum systems, in particular involving topology, disorder and interactions, and dissipation. This includes the study of topological photonic systems such as lasers, topological insulators and superconductors, and quantum many-body systems.

## Key references:

H Schomerus Phys. Rev. Lett. 104, 233601 (2010); Opt. Lett. 38, 1912-1914 (2013)  
Phys. Rev. Research 2, 013058 (2020); arXiv:2207.09014 (2022)  
Poli et al, Nat. Commun. 6, 6710 (2015); H Zhao et al Nat. Commun. 9, 981 (2018)

Anyone interested is welcome to attend!

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