

PHYSIKALISCHES KOLLOQUIUM

Wintersemester 2026/27

Das Kolloquium findet (soweit nicht anders angegeben) **jeweils montags um 14:15 Uhr im Röntgen-Hörsaal** des Physikalischen Instituts, Hubland Campus Süd, Universität Würzburg **und online via Zoom** statt.

Zugangsdaten siehe <https://www.physik.uni-wuerzburg.de/aktuelles/veranstaltungen-aus-der-physik/physikalisches-kolloquium/>

26.10.2026

Prof. Dr. Jan Wiersig
Otto-von-Guericke-Universität Magdeburg, Institut für Physik

**Non-Hermitian Photonics and Sensing:
From Exceptional Points to Quantum Fisher Information**

Abstract

Optical microresonators play an important role in many areas of fundamental and applied physics. Because of coupling to their environment, they are inherently open systems and can exhibit both optical loss, for example through absorption and radiation, and optical gain provided by an active medium. In recent years, this has motivated the emergence of non-Hermitian photonics, a field that explores the nontrivial physical consequences and potential applications of such non-conservative effects.

Particularly striking phenomena arise near non-Hermitian degeneracies, known as exceptional points, where not only the resonant frequencies but also the corresponding optical modes coalesce. Near such points, the response to perturbations can be strongly enhanced, making exceptional points especially interesting for sensing applications.

In this talk, I will review recent developments in non-Hermitian photonics, with a particular focus on sensing near exceptional points. I will also discuss how the ultimate sensitivity of such systems can be characterized using the quantum Fisher information and what this reveals about the potential and limitations of non-Hermitian sensors.

Für die Dozentinnen bzw. Dozenten der Fakultät

Prof. Dr. Trauzettel, Dr. Ünzelmann, Hr. Müller