

Graz Advanced School of Science
PHYSICS COLLOQUIUM OF THE UNIVERSITY OF GRAZ AND
THE GRAZ UNIVERSITY OF TECHNOLOGY



50 μm ———

INVITATION

to the lecture of

Dr. Mario Hentschel
University of Stuttgart

Dielectric Mie voids

Manipulating light on the nanoscale has become a central challenge in metadevices, resonant surfaces, nanoscale optical sensors and many more, and it is largely based on resonant light confinement in dispersive and lossy metals and dielectrics. I will discuss a novel paradigm in dielectric nanophotonics, the resonant subwavelength confinement of light in air. Voids created in dielectric host materials support localized resonant modes with exceptional optical properties. Due to the confinement in air, the modes do not suffer from loss and dispersion of dielectric host media and even allow resonant confinement of UV light. Interestingly, these structures can be viewed as “Mie voids”, described Mie’s original theory. We experimentally realize these resonant Mie voids by focused ion beam milling into bulk silicon wafers and experimentally demonstrate resonant light confinement down to the UV spectral range at 265 nm (4.68 eV). Furthermore, we utilize the bright, intense, and naturalistic colours for nanoscale colour printing. Mie voids will thus push the operation of functional high-index metasurfaces into the blue and UV spectral range. Moreover, this extension will enable novel antenna and structure designs which benefit from the full access to the modal field inside the void as well as the nearly free choice of the high-index material for novel sensing and active manipulation strategies.

Time: Tuesday 6th June 2023

Lecture: 4:15 p.m. until 5:15 p.m. HS 05.01, ground floor

Meet the speaker: 3:45 p.m. until 4:15 p.m., Library Experimental Physics, 1st floor

Address: Universitätsplatz 5, 8010 Graz

Host: Thomas Weiss