

PADERBORN PHOTONICS LECTURE

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LECTURE HALL A1

10:00

All-dielectric resonant nanophotonics and meta-optics

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Abstract:

Metamaterials - artificial electromagnetic media that are structured on the subwavelength scale - were initially suggested for the realisation of negative-index media, and later they became a paradigm for engineering electromagnetic space and controlling propagation of waves. However, applications of metamaterials in optics are limited due to inherent losses in metals employed for the realisation of artificial optical magnetism. Recently, we observe the emergence of a new field of all-dielectric resonant meta-optics aiming at the manipulation of strong optically-induced electric and magnetic Mie-type resonances in dielectric and semiconductor nanostructures with relatively high refractive index. Unique advantages of dielectric resonant nanostructures over their metallic counterparts are low dissipative losses and the enhancement of both electric and magnetic fields that provide competitive alternatives for plasmonic structures including optical nanoantennas, efficient biosensors, passive and active metasurfaces, and functional metadevices.

This talk will summarize the most recent advances in all-dielectric Mie-resonant meta-optics including active nanophotonics as well as the recently emerged fields of topological photonics and nonlinear metasurfaces.



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