UNIVERSITÄT LEIPZIG

Physics Colloquium

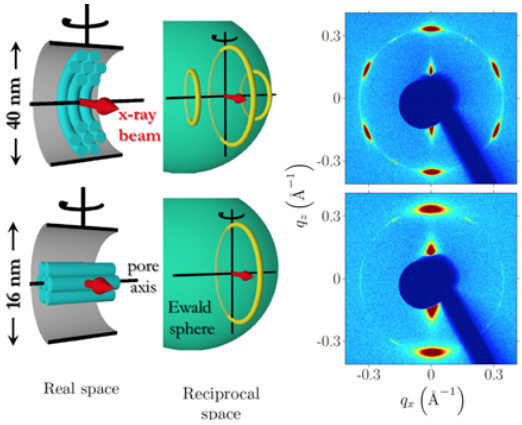
Tuesday, 6 June 2023 at 16:30

Prof. Dr. Patrick Huber

Institute for Materials and X-Ray Physics, Hamburg University of Technology *and*
Photon Science Division, Deutsches Elektronen-Synchrotron DESY

Soft Matter in Hard Confinement: What do we know about it and what is it good for?

In my group we use synchrotron-based X-ray scattering to study nanopore-confined liquids and liquid crystals. The pore sizes, shape, and orientation of the nanoporous material are precisely controlled through self-organized nanoporosity, which facilitates studies of fundamental properties of soft matter in well-defined, extreme spatial confinement. The combination of soft and nanoporous hard matter also provides versatile opportunities for the design of functional materials.



First, I will present experimental studies on sorption-induced deformation and capillarity-driven flow of liquids, mainly water, in nanoporous media. Second, I will show that nanopore-confined liquid crystals offer novel opportunities for subwavelength control of light-matter interactions. A remarkably rich self-assembly behavior, unknown in the bulk state, can be observed, such as the quantized formation of concentric discotic rings. The soft-hard hybrid materials exhibit novel metaphotonic functionalities, including stepwise temperature-dependent optical anisotropy, enhanced light rotation, and extremely fast electro-optically active excitations.

Venue: Universität Leipzig, Faculty of Physics and Earth Sciences
04103 Leipzig, Linnéstraße 5, **Change of room: small lecture hall**

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