Dresden University of Technology

Faculty of Physics

PHYSICS COLLOQUIUM

Speaker:

Dr. Lars Hubatsch
Lead of Automation Facility,
Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG),
Dresden

Topic:

Transport across condensate interfaces: from physical theory to measurement

Time and place:

Tuesday, November 24, 2026, **2:50 pm** – hybrid event

The colloquium will be held in REC/C213.

Online participation possible:

Zoom-Meeting: Meeting-ID: 642 8554 1414 / passcode: w8$nSJjy

https://tu-dresden.zoom-x.de/j/64285541414?pwd=6UOwTkSBlWvNv16PgF2K1qZtoUC8cS.1

Host:

Prof. Jens-Uwe Sommer

Abstract:

Biomolecular condensates organize intracellular chemistry, but their function depends on how molecules move within them and across their boundaries. I will present a quantitative framework for transport in phase-separated systems, developed by combining theory with experiments on reconstituted condensates. Building on the physics of phase separation, we describe how molecules diffuse within and between coexisting phases, linking single-molecule trajectories to bulk transport. Using non-equilibrium thermodynamics, we show that breaking local equilibrium at thin interfaces creates an interfacial transport resistance, which can arise from a mobility minimum or an energy barrier at the interface. Recent experiments support the existence of such an interfacial transport resistance and show how it can be measured. These results also change how photobleaching experiments, one of the field's most widely used methods, should be interpreted: fluorescence recovery reflects partitioning, interfacial exchange and the surrounding environment as much as internal mobility, and is not by itself a readout of liquidity. I will close with what quantitative transport measurements can tell us about condensate function.

Bio:

Lars Hubatsch is a physicist studying molecular transport and spatial organization in living systems. He studied physics at TU Dresden and completed his PhD at University College London in 2018, working with Nathan Goehring at the Francis Crick Institute. His postdoctoral research at the MPI for the Physics of Complex Systems and MPI of Molecular Cell Biology and Genetics (MPI-CBG) combined theory and quantitative experiments to investigate diffusion and transport across biomolecular condensate interfaces. He recently took up his role as lead of the Automation Facility at the MPI-CBG in Dresden.

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