Stuttgarter Physikalisches Kolloquium

Fachbereich Physik, Universität Stuttgart
Max-Planck-Institut für Festkörperforschung
Max-Planck-Institut für Intelligente Systeme

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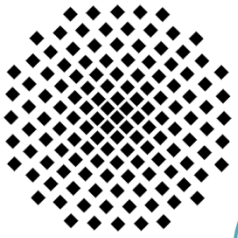

Dienstag 14. November 2023	16:15 Uhr	V57.02

Universität Stuttgart, Pfaffenwaldring 57, 70569 Stuttgart-Vaihingen

Gastgeber: Prof. Dr. Christian Holm, Universität Stuttgart, Telefon: 0711 - 685-63701

Surprising Physics of Nanopore Transport

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Abstract

Nanopore systems are ubiquitous in biology and engineering, with applications ranging from transmembrane transport to power generation and sensing. Driven by diffusion, electrophoresis, or direct mechanical pulling, the transport can be highly selective and is regulated through a variety of mechanisms, including steric exclusion, electrostatic trapping and dehydration. In this lecture, I will review our discovery of new mechanisms that can govern transport of biomolecules to and through nanoscale pores. I will describe how the physical insights uncovered through computer simulations can be applied to block nanoscale transport in the absence of physical gates, to deliver biomolecules to nanopore sensors and to design DNA systems capable of converting electric field into rotary motion. The lecture will highlight the use of microscopic simulations to design and explore nanoscale biomolecular systems.