

## SFB – Colloquium

Speaker: **Prof. Dr. Saulius Vaitiekėnas**  
Niels Bohr Institute,  
Copenhagen, Denmark



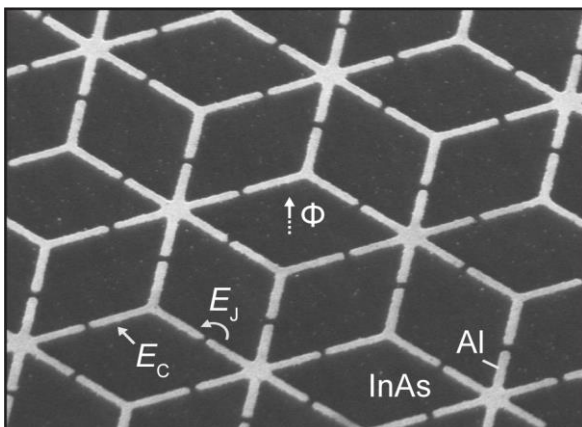
Date: Tuesday, 28 Nov. 2023, 14:15, H34

Topic: Emergent phases in hybrid Josephson junction arrays

Abstract:

Epitaxial semiconductor-superconductor hybrids offer a high-quality, tunable materials playground for novel physics. The geometric versatility of this platform allows us to fabricate hybrid Josephson junction arrays in various lattice geometries and explore low-dimensional phases along two axes: simple to complex and classical to quantum. In this talk, I will introduce such flux- and gate-voltage-tunable hybrid arrays. Focussing on the dice lattice geometry, I will discuss the experimental phase diagrams in the context of flat bands and  $4e$  superconducting states and present measurements of individual plaquettes that elucidate some of the observed features.

Host: Prof. Dr. Christoph Strunk



Hybrid Josephson junction array in dice lattice geometry. The superconducting (Al) islands with charging energy ( $E_c$ ) are interconnected via semiconducting (InAs) junctions with gateable Josephson energies ( $E_J$ ). The array can be frustrated via external magnetic flux  $\Phi$ .