

Controlling Charge Density Waves, Layer by Layer

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Abstract: Two-dimensional materials now form the basis for a broad and rich field of research bristling with exciting possible applications from photonics to quantum computing and leading to discoveries of new phenomena due to the high customizability of the materials systems and interactions within them. Charge density waves form an emergent charge superlattice, whose properties and electronic states depend on interlayer interactions that can be manipulated. Here, I will describe our work in understanding and manipulating charge density waves in 2D materials.

Bio: Shawna Hollen received her bachelor's degree in physics from Occidental College and her doctorate from Brown University where she studied Cooper pair insulators near the superconductor-insulator quantum phase transition with Jim Valles. She was a postdoctoral fellow at the Center for Emergent Materials at The Ohio State University where she studied ultrahigh vacuum grown graphene and graphene devices using scanning tunneling microscopy (STM). Her lab at University of New Hampshire uses STM and transport measurements to study quantum properties of 2D materials and their phases and defects. She was promoted to Associate Professor with tenure in 2022, has served on the American Physical Society Division of Condensed Matter Physics Executive Committee as a Member-at-Large, on the Proposal Review Board for the Molecular Foundry at Lawrence Berkeley National Laboratory, and serves on the Executive Advisory Board for the MonArk Quantum Foundry.