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## Fabrication and characterisation of low-dimensional materials on surfaces

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The bottom-up construction of materials on solid surfaces has emerged as a powerful strategy for tailoring nanostructures with unique properties. Our research explores the synthesis and characterization of one dimensional (1D) and two dimensional (2D) materials on atomically well-defined surfaces, which serve as supports, templates, and catalysts for chemical reactions. We employ molecular self-assembly, on-surface reactions of atomic and molecular building blocks, semiconductor heteroepitaxy and the growth or transfer of 2D materials under ultrahigh vacuum conditions to fabricate novel materials systems. Using atom scale measurements with scanning probe microscopy, complemented by density functional theory modelling and photoemission spectroscopy, we aim to uncover the mechanisms that govern structure and properties at the nanoscale. In this talk, I will present our recent advances in fabricating and characterizing low dimensional materials, highlight opportunities enabled by ultrahigh vacuum transfer of 2D materials onto clean, ordered surfaces, and discuss how these systems open new avenues for observing quantum phenomena.

### Field of Condensed Matter

Quantum Materials

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