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Imaging the In-Plane Anisotropy and Lattice Defects of ReS2 Using Scanning Tunneling Microscopy

Wednesday 5 June 2019 13:45 (15 minutes)

Among the layered transition metal dichalcogenides, the compounds that exhibit in-plane anisotropy are of particular interest as they offer an additional tuning knob for their novel properties. In this talk we focus on studying the nanoscale lattice structure of semiconducting ReS₂ by using an ultrahigh vacuum, room temperature scanning tunneling microscope. We demonstrate that rhenium atoms form diamond-shaped clusters, organized in disjointed chains. We employ scanning tunneling spectroscopy to measure the bandgap and positions of the valence and conduction bands. We further characterize the structure and properties of lattice defects in the anisotropic planes of ReS₂ by exploring their influence on the local electrostatic environment.

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