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Visualizing Weyl Fermions in $MoTe_2$ Using Scanning Tunneling Microscopy AYELET NOTIS, ERICK ANDRADE, Columbia University, SANG-WOOK CHEONG, Rutgers University, ABHAY PASUPATHY, Columbia University — $MoTe_2$, a transition metal dichalcogenide, has a metastable orthorhombic phase at temperatures below 250 K. This phase is predicted to be a type II Weyl semimetal, providing us an exciting new opportunity to explore Weyl Fermions, a type of particle long sought after but only recently realized as a quasiparticle excitation in a crystal. A topological consequence of the existence of Weyl points in a crystal is the existence of Fermi arc surface states that connect pairs of Weyl points. Here, we present scanning tunneling microscopy and spectroscopy (STM and STS) studies investigating the topography and electronic structure of this material. We resolve the crystal structure of the orthorhombic phase in STM topography, and probe the electronic structure of the Fermi arc states using quasiparticle interference imaging.

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