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STM studies of Weyl semimetals HIROYUKI INOUE, ANDRAS GYENIS, SEONG WOO OH, JIAN LI, ZHI JUN WANG, ANDREI BERNEVIG, Princeton University, NI NI, University of California at Los Angels, ALI YAZDANI, Princeton University — Weyl semimetal exhibits a new gapless topological phase, which is characterized by an even number of band touching points of two non-degenerate bands in the bulk, called Weyl nodes. The surfaces of these compounds are expected to harbor topologically protected surface states with disconnected Fermi surfaces, called Fermi arcs, which connect surface projections of the Weyl nodes with opposing Chern numbers. Among the theoretically predicted Weyl semimetals, there have been several experimental reports on the presence of Fermi arcs in inversion-symmetry-broken monoarsenides, such as TaAs. In this talk, we will present atomic-scale imaging and spectroscopic mapping of the electronic properties of TaAs and other Weyl semimetal candidates. Such measurements have the potential to directly visualize the Fermi arc surface states of these compounds and to probe their properties. This work is supported by ARO and NSF.

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