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Atomic scale imaging and spectroscopic investigation of Cd_3As_2 with the STM SANGJUN JEON, BRIAN ZHOU, ANDRAS GYENIS, Joseph Henry Laboratories & Department of Physics, Princeton University, QUINN GIBSON, ROBERT CAVA, Department of Chemistry, Princeton University, ALI YAZDANI, Joseph Henry Laboratories & Department of Physics, Princeton University — Cd_3As_2 is known for having high carrier mobility and inverted HgTe-type band structure and is theoretically expected to be a three-dimensional Dirac semimetal. Recently, ARPES measurements on this material show the band structure to have linear dispersions in three dimensions to form a three-dimensional Dirac conelike structure. Much remains to be understood about the nature of the electronic states in this compound. Here we probe with high spatial and energy resolution the electronic structure of Cd_3As_2 using STM measurements. Cd_3As_2 single crystals grown by Bridgman method were cleaved in UHV environment and investigated in cryogenic STM. We will report on various STM measurements to determine the atomic structure of the cleaved surfaces and use spectroscopic measurements to probe its unique bulk and surface electronic properties. Work supported by ARO-MURI.

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