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High-resolution STM imaging and spectroscopy of Cu_xTiSe_2[1]
DALE KITCHEN, KENJIRO K. GOMES, ABHAY PASUPATHY, AAKASH PUSHP, PEDRAM ROUSHAN, Princeton Nanocale Microscopy Laboratory, Department of Physics, Princeton University, EMILIA MOROSAN, ROBERT J. CAVA, Department of Chemistry, Princeton University, ALI YAZDANI, Princeton Nanocale Microscopy Laboratory, Department of Physics, Princeton University
— The discovery of superconductivity in Cu-doped $TiSe_2$ has created a new opportunity to study the competition between charge density wave (CDW) formation and superconductivity in layered chalcogenides [1]. Using a cryogenic scanning tunneling microscope (STM), we have obtained atomic resolution images of *in situ* cleaved Cu_xTiSe_2 and perform spatially resolved mapping of the electronic states of this compound. The STM images measured on samples at low Cu doping, reveal the atomic lattice, the CDW organization, and show local signatures consistent with individual Cu-dopants. Imaging and spectroscopy are used to identify how the Cu-dopants alter the local electronic structure of this material and destroy the CDW organization, which eventually gives way to the rise of superconductivity. [1] E. Morosan *et al.*, *Nature Physics* **2**, 544 (2006).

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Dale Kitchen
Princeton Nanocale Microscopy Laboratory,
Department of Physics, Princeton University

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