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SP-STM study of layered magnetic material Fe₃GeTe₂ GIANG NGUYEN, JEWOOK PARK, SABAN HUS, QIANG ZOU, ZHENG GAI, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA, JINHWAN LEE, RENLONG LIU, CHANGGU LEE, Department of Engineering, Sungkyunkwan University, Korea, AN-PING LI, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA — 2D magnets have attracted great research interest due to their great potentials for spintronic application. With this regard, magnetic layered 2D materials have offered great opportunities for creating exfoliated 2D magnets. Here we report a recent study on magnetic 2D materials of Fe₃GeTe₂ cleaved in situ under ultra-high vacuum (UHV) using Variable-Temperature Spin-Polarized Scanning Tunneling Microscopy (VT-SP-STM). Atomic resolution images and scanning tunneling spectroscopy are acquired with both non-magnetic (W) tips and ferromagnetic (Ni) tips. Interestingly, two kinds of magnetic domain structure are observed at liquid nitrogen temperature. These domains show temperature-dependent magnetic phase transitions at ~ 180 K and ~ 250 K, respectively, which are further corroborated by SQUID magnetometry measurements. The microscopic origins of these transition will be discussed. This research was conducted at the Center for Nanophase Materials Sciences, which is sponsored at Oak Ridge National Laboratory by the Scientific User Facilities Division, Office of Basic Energy Sciences, U.S. Department of Energy.

Giang Nguyen
Oak Ridge National Laboratory

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