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Construction of a sub-Kelvin ultra-high vacuum scanning tunneling microscope in high magnetic field UNGDON HAM, Department of Physics and Astronomy, University of California, Irvine, CA 92697-4575, USA, XI CHEN, Department of Physics, Tsinghua University, Beijing 100084, P.R.China, CHI CHEN, FREDDY TOLEDO, Department of Chemistry, University of California, Irvine, CA 92697-2025, USA, WILSON HO, Department of Physics and Astronomy and Department of Chemistry, University of California, Irvine, CA 92697-4575, USA — A sub-Kelvin ultra-high vacuum (UHV) scanning tunneling microscope (STM) in high magnetic field has been built. The Besocke type scanner is mounted to the He3 pot of a bottom loading UHV compatible helium- 3 cryostat with a 9 Tesla superconducting magnet. The helium-4 reservoirs for the non-bakeable NbTi superconducting magnet and the UHV space are thermally separated in order to achieve UHV condition without overheating the magnet. A two-chamber UHV system creates reliable environment for tip and sample preparation, and surface imaging and characterization. Various atoms and molecules can be deposited at room or low temperatures. The STM system has the unique capability to probe matter at very low temperatures, in high magnetic fields, under ultrahigh vacuum conditions, and with spatial resolution below one nanometer.

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