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First results for custom-built low-temperature (4.2 K) scanning tunneling microscope/molecular beam epitaxy and pulsed laser epitaxy system designed for spin-polarized measurements ANDREW FOLEY, KHAN ALAM, WENZHI LIN, KANGKANG WANG, ABHIJIT CHINCHORE, JOSEPH CORBETT, ALAN SAVAGE, TIANJIAO CHEN, MENG SHI, JEONGIHM PAK, ARTHUR SMITH, Ohio University, Nanoscale and Quantum Phenomena Institute — A custom low-temperature (4.2 K) scanning tunneling microscope system has been developed which is combined directly with a custom molecular beam epitaxy facility (and also including pulsed laser epitaxy) for the purpose of studying surface nanomagnetism of complex spintronic materials down to the atomic scale. For purposes of carrying out spin-polarized STM measurements, the microscope is built into a split-coil, 4.5 Tesla superconducting magnet system where the magnetic field can be applied normal to the sample surface; since, as a result, the microscope does not include eddy current damping, vibration isolation is achieved using a unique combination of two stages of pneumatic isolators along with an acoustical noise shield, in addition to the use of a highly stable as well as modular 'Pan'-style STM design with a high Q factor.[1] First 4.2 K results reveal, with clear atomic resolution, various reconstructions on wurtzite GaN c-plane surfaces grown by MBE, including the c(6x12) on N-polar GaN(000$\underline{1}$). Details of the system design and functionality will be presented. [1] Kangkang Wang, Wenzhi Lin, Abhijit V. Chinchore, Yinghao Liu, and Arthur R. Smith, Review of Scientific Instruments **82**, 053703 (2011).

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