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Spectroscopic Imaging - Scanning Tunneling Microscopy studies of the Nematic Metamagnet $Sr_3Ru_2O_7$ M.P. ALLAN, Cornell University, University of St. Andrews, T.-M. CHUANG, Cornell University, National High Magnetic Field Lab, Y. XIE, Cornell University, A.W. ROST, University of St. Andrews, R.S. PERRY, University of Edinburgh, J.-F. MERCURE, University of Bristol, A. GIBBS, A.P. MACKENZIE, University of St. Andrews, J.C. DAVIS, LASSP, Dep. of Physics, Cornell University, Ithaca NY; CMPMS, Brookhaven National Laboratory, Upton, NY; University of St. Andrews, Fife, Scotland — The metamagnetic perovskite $Sr_3Ru_2O_7$ can be tuned towards a putative quantum critical point in an external magnetic field, and in ultrapure samples, an electronic nematic forms in a small region of the phase diagram around this putative quantum critical point. Much insight about these phenomena in $Sr_3Ru_2O_7$ come from a wealth of high-quality thermodynamic experiments but little is known about the microscopic electronic origin of criticality and nematicity. We recently re-engineered our SI-STM to achieve sub-Kelvin temperatures and magnetic fields up to 9T, and are now imaging the local density of states in different regions of the $Sr_3Ru_2O_7$ phase diagram, including within the nematic phase.

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