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High resolution neutral atom microscope GEORGIOS STRATIS, IGAL BUCAY, RODRIGO CASTILLO-GARZA, MARK RAIZEN, University of Texas-Austin — We are developing a high resolution neutral atom microscope based on the technique of metastable impact electron emission (MIEES). When an incoming metastable noble gas atom approaches the surface of our sample, the noble gas atom falls to the ground state and an electron is emitted. The emitted electrons carry information regarding the density of states of the surface without any information from the underlying layers. Furthermore, using a chromatic aberration corrected magnetic hexapole lens we expect to image our atomic beam to a spot with a diameter less than 10nm. Our primary goal is to investigate how local phenomena can give rise to macroscopic effects in materials that cannot be probed using a scanning tunneling microscope.

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