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TEM-STM for Novel Nanotechnological Experimentation JOEL VAUGHN, MARTIN-E. KORDESCH, SAW-WAI HLA, Physics & Astronomy Dept., Ohio University, Athens, OH 45701 — We present the design and construction of a miniature scanning tunneling microscope (STM) to be used inside a transmission electron microscope (TEM). In our system, the entire STM head is fitted inside the TEM sample holder, which allows for both TEM imaging/diffraction and STM-tip indentation experiments. The positioning of STM-tip over the desired sample locations can be guided through the real time TEM images. In addition to the nano indentation experiments, the STM program also allows the state-of-the-art control of atom/molecule manipulation procedures [1]. This hybrid TEM-STM system can be used for nanoscale manipulation, electrical characterization and mechanical strength examination of various nanomaterials including nanowires, nanotubes and quantum dots. [1]. S.-W. Hla, K.-F. Braun, V. Iancu, A. Deshpande, Nano Lett. 4 (2004) 1997-2001. This work is financially supported by the NSF-NIRT grant no. DMR-0304314 and the US-DOE grant no. DE-FG02-02ER46012.

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