

Abstract Submitted  
for the OSF12 Meeting of  
The American Physical Society

**Quantized conductance in educational labs: a consequence of nano-scale confinement** TONY SILVIDI, ROBERT TOLLEY, HERBERT JAEGER, KHALID EID, Miami University — We developed a robust and inexpensive setup to demonstrate the quantization of conductance in a macroscopic gold wire with a nano-constriction. Our setup uses a manually operated bending beam and a micrometer to break and reconnect the gold wire and get the quantized behavior. Alternatively, we use a piezo-crystal to precisely control the motion by manually changing an applied DC voltage across the piezo-crystal. We also will review our work on using an Arduino to control the piez-crystal via a computer in order to run the demonstration in a classroom or as an experiment either in a course in nanoscience and technology or in contemporary physics. This is a direct demonstration of the emergence of quantum mechanical behavior due to the wave nature of matter and due to the confinement at the nano- or atomic scale.

Khalid Eid  
Miami University

Date submitted: 10 Sep 2012

Electronic form version 1.4