Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Direct measurement of the built-in potential in a nanoscale heterostructure ANNA ZANIEWSKI, MATTHIAS LOSTER, Department of Physics, University of California at Berkeley, Berkeley, CA 94720 U.S.A, BRYCE SADTLER[1], A. PAUL ALIVISATOS, Department of Chemistry, University of California at Berkeley, Berkeley, CA 94720 U.S.A, A. ZETTL, Department of Physics, University of California at Berkeley, Berkeley, CA 94720 U.S.A — Recently synthesized heterostructured nanorods are a promising material for applications such as photovoltaics. Understanding the electronic structure of these materials is both an interesting scientific question and vitally important for applications. We present the measurement of the built-in potential across individual Cu2S-CdS heterostructured nanorods by combining transmission electron microscopy with electrostatic force microscopy. This represents the first experimental determination of the electrostatic potential across an isolated nanostructure. We observe a variation of built-in potentials, ranging from 100 to 920 mV, with an average of 250 mV. Nanorods of a uniform composition with no heterojunction do not show built-in potential, as expected.

[1]Present address: Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA 91125 U.S.A.

Anna Zaniewski
UC Berkeley

Date submitted: 30 Dec 2010 Electronic form version 1.4