Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Superlattice nanowires via double-sided heteroepitaxy on compliant ultra-thin Si ribbons[1] CLARK S. RITZ, University of Wisconsin, Madison, FRANK S. FLACK, MICHELLE M. ROBERTS, DOUGLAS M. DETERT, YU ZHANG, University of Utah, DONALD E. SAVAGE, PAUL G. EVANS, FENG LIU, University of Utah, MAX G. LAGALLY — We fabricate and characterize a novel type of Si/SiGe superlattice nanowire. Such structures, traditionally created by VLS growth, have been of great interest for thermoelectric applications for some time. We have developed a technique for creating a superlattice-like system using strained SiGe epitaxial islands. We pattern free-standing Si nanowire ribbons made from ultrathin silicon-on-insulator (SOI) substrates and use them as a substrate for the Stranski-Krastanov growth of coherent 3D islands. Interaction between islands growing on the top and bottom surfaces causes them to order laterally. The periodic strain induced in the substrate by the ordered islands affects the electronic band structure in a periodic way. The discussion will cover the fabrication and electrical properties of these strain superlattice structures.

[1]Supported by DOE and AFOSR.

Clark S. Ritz
University of Wisconsin, Madison

Date submitted: 22 Nov 2006 Electronic form version 1.4