Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Correlating thermoelectric efficiency with nanowire diameter for electrodeposited Bismuth Telluride nanowire arrays. ERIK MENKE, UC-Irvine, REG PENNER, UC-Irvine — Physicists have predicted that the thermoelectric figure-of-merit (ZT) for a given material will increase as the material dimension is reduced from 3 to 2 to 1. However, there have been few experimental tests of these predictions because of the difficulties associated with synthesizing the nanowires and in making high quality measurements of ZT. We have devised a method for preparing arrays of very long n- and p-type Bi_2Te_3 nanowires with diameters ranging from 80 to 250 nm. These nanowires are prepared using electrochemical step edge decoration on graphite and then transferred to the surface of an electrical and thermal insulator. High quality measurements of ZT are possible on these transferred nanowire arrays, and the results of these measurements will be reported in this presentation.

Erik Menke
UC-Irvine

Date submitted: 01 Dec 2004 Electronic form version 1.4