Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Investigation of superconductivity in AuSn nanowires NITESH KUMAR, MINGLIANG TIAN, JINGUO WANG, JAMES KURTZ, MOSES CHAN, The Center for Nanoscale Science and Department of Physics, Pennsylvania State University, University Park, PA 16802 — We have fabricated superconducting AuSn nanowires by electrochemical deposition in porous polycarbonate membranes. The diameter of the wires is in the range of 40-100nm with length of 6μm. By carefully adjusting the deposition parameters, we can fabricate nanowires containing different phases of Au-Sn alloy. Electrical resistivity measurements were done on the array of nanowires still inside the membrane using a two-point probe technique. We observed two phases, AuSn and AuSn4, exhibiting different superconducting properties as observed in the transition temperature, critical field, etc. Currently, we are trying to conduct resistivity measurements on single AuSn nanowire in a four-point configuration, using an electrical field-assisted assembly technique to align the nanowires. This work was supported by Penn State MRSEC NSF grant DMR 0213623.

Nitesh Kumar
The Center for Nanoscale Science and Department of Physics,
Pennsylvania State University,
University Park, PA 16802

Date submitted: 30 Nov 2004 Electronic form version 1.4