Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Superconductivity in Centimeter Length Indium-Gallium Nanowires[1] WEIWEI ZHAO, JESSE BISCHOF, MEENAKSHI SINGH, THOMAS FITZGIBBONS, XIN LIU, CHAOXING LIU, The Pennsylvania State University, LIN WANG, HPSync, Carnegie Institution of Washington, ZHONGHOU CAI, SI CHEN, Advanced Photon Source, Argonne National Laboratory, JOHN HAYES, PIER SAZIO, Optoelectronics Research Centre, University of Southampton, United Kingdom, JOHN BADDING, MOSES CHAN, The Pennsylvania State University — In-doped Ga nanowires 150 nm in diameter and 6mm in length have been formed in silica nanocapillaries. X-ray fluorescence and diffraction measurements performed at the Advanced Photon Source have been used to characterize their chemical composition and crystal structure. Investigation of the low temperature transport properties of these wires reveals a two stage superconducting transition. Magnetoresistance measurements are suggestive of vortex trapping in the wire. The X-ray fluorescence measurements suggest phase separation in the capillaries into Ga nanodroplets and In-Ga eutectic wires. A model to explain the vortex trapping consistent with this observation is being developed.

[1]This work is supported by the Penn State Materials Research Science and Engineering Center, funded by the National Science Foundation (DMR 0820404). TF and LW are supported by the Energy Frontier Research Center (DE-0001057), DOE.

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Date submitted: 09 Nov 2012 Electronic form version 1.4