Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

**Spin Injection into $Co_2MnAl$ by Optical Absorption in GaAs**[1] S. ISBER, American University of Beriut, Y.J. PARK, KIST, J.S. MOODERA, MIT, D. HEIMAN, Northeastern University — Ferromagnet-semiconductor heterostructure devices have been made with half-metallic ferromagnets, which have larger spin polarizations than transition metal based ferromagnets. Spin-polarized electrons generated in the semiconductor by circularly polarized light are injected across a Schottky barrier into the ferromagnet and detected as photocurrent. In this technique, the optically pumped semiconductor is the source of spin polarized electrons, and the ferromagnet is the detector of spin polarized electrons. The heterostructures consist of MBE-grown $Co_2MnAl$ Heusler ferromagnets which are lattice matched to $n^+GaAs$, forming a Schottky barrier. A magnetic field is applied parallel to the light and perpendicular to the ferromagnetic layer, allowing the magnetization to be switched from parallel to antiparallel to the light direction, thus switching the direction of the detected spin polarization. Spin-dependent photocurrent was measured as a function of applied voltage bias across the Schottky barrier. The injection of spin-polarized electrons was determined after subtracting the magnetic circular dichroism (MCD) effect.

[1]Research supported by the NSF Grant DMR-0305360. We thank the Arab Fund for Economic and Social Development for supporting S.I.

Don Heiman
Northeastern University

Date submitted: 28 Nov 2007 Electronic form version 1.4