Materials Science & Engineering Seminar Series

Carnegie Mellon University
Materials Science & Engineering

presents

Heusler Alloys for Spin Transport

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ABSTRACT:
It has been widely appreciated that Heusler alloys (*e.g.*, Co_2MnSi) can be half-metallic, meaning that there is a gap for one spin state at the Fermi level. It is in principal possible to use this feature to generate currents that are 100% spin-polarized. Unfortunately, exploiting this characteristic in real devices, which necessarily include interfaces between dissimilar materials, represents a far greater challenge. This seminar will focus on observations about epitaxial Heusler alloys grown on GaAs and MgO. I will discuss why we are interested in the microwave properties of these heterostructures as well as their interfacial spin-polarization. This will include a discussion of new techniques for probing spin accumulation using ferromagnetic resonance as well as some mysteries we have encountered in attempting to measure the limits on the damping of magnetic resonance in epitaxial films.

BIOGRAPHY:
Paul Crowell received his PhD in low-temperature physics from Cornell University in 1994 and was a postdoctoral associate at the CNRS, Grenoble and the University of California at Santa Barbara before joining the faculty of the University of Minnesota in 1997. He is currently a Professor of Physics and Head of the School of Physics and Astronomy. Professor Crowell's research focuses on spin dynamics in ferromagnets on sub-nanosecond time scales and spin transport in hybrid ferromagnet-semiconductor and ferromagnet/normal metal systems. He is a fellow of the American Physical Society.

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