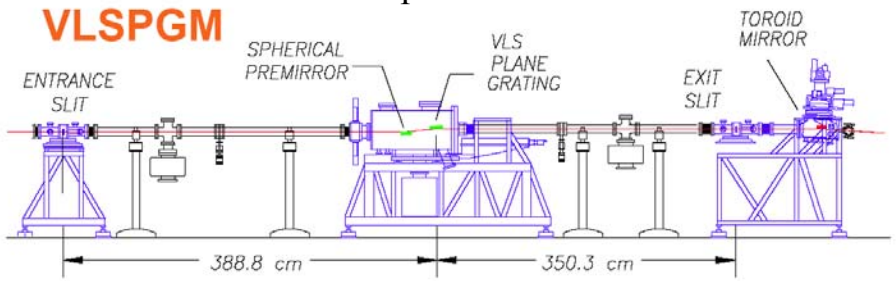
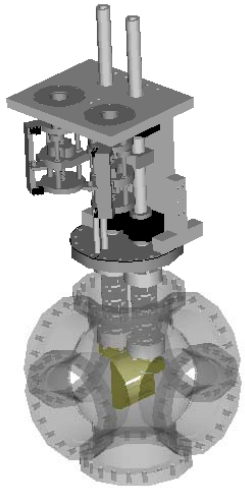
“Enhancement of a Synchrotron Beamline for Magnetics Research and Education”

Richard L. Kurtz,[1] Peter A. Dowben,[2] Gary J. Mankey,[3]
Phillip T. Sprunger,[1] and Shane Stadler[4]
1. LSU, 2. U. Nebraska, 3. U. Alabama MINT, 4. S. Illinois. U.

A beamline at LSU’s Center for Advanced Microstructures and Devices (CAMD) has been enhanced specifically for magnetics measurements. The upgrades include:

- energy range extended to cover hν=200 eV - 1.2 keV with a variable line-spaced grating - this spans the 2*p* levels of the 3*d* transition metals
- circular light selection via baffles prior to first optic
- light polarization analysis *in-situ*
- metal evaporator and magnetizing coil, photoelectron spectrometer
- partial yield measurements *vs* hν and photoemission: linear / circular dichroism (MLD, MCD)



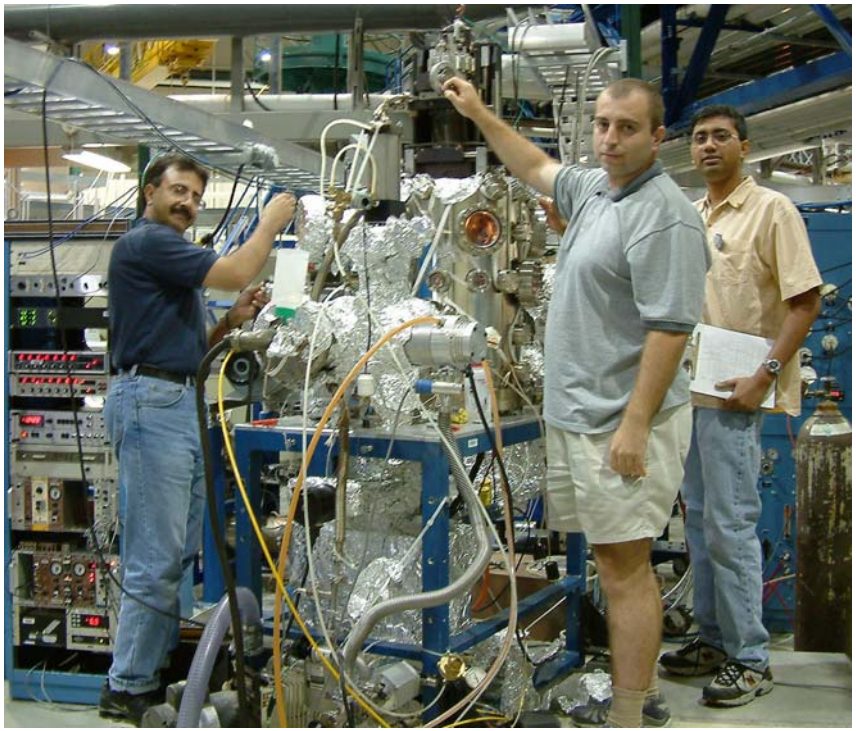


Rotatable triple-reflection polarizer to analyze the synchroton light polarization.

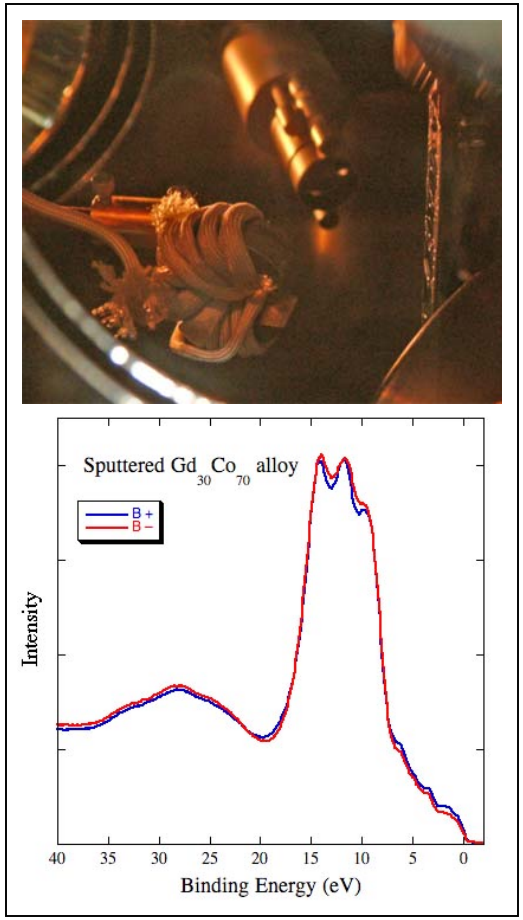
Baffle design used to select the upper/ lower portion of synchrotron beam and thereby control the light’s polarization

Education

The instrumentation funded by this grant is a primary materials characterization facility for students from multiple institutions. It is available to external users through standard CAMD access procedures.



External Users: Students from Alabama's NSF-MINT Center conducting magnetic dichroism experiments at CAMD. From left are Said Al-Ghamdi, Ilir Zoto, and Prakash Mani.



Top: uhv magnet for changing remanent magnetization with Gd_xCo_{1-x} alloys to the right; sputter gun in back **Bottom:** photoemission spectrum from $Gd_{30}Co_{70}$ versus magnetization.