**130. Daniel Mcneel, Hope College** **Physics**

(Co-Author: Dr. Jennifer Hampton)

*A Study of the Uniformity of NiFe Electrodeposition on a Au Substrate*

The layered deposition of magnetic metals on non-magnetic metals creates materials with giant magnetoresistance. Controlled electrodeposition may produce these materials more easily and affordably than current techniques. This research used three different techniques to analyze our control over the deposition process for NiFe alloys. The three techniques were: current data during deposition, the Scanning Electron Microscope (SEM) at Hope College, and the Atomic Force Microscope (AFM) at Calvin College. The effects of varying the initial potential and the deposition time were studied. The effects of using an initial potential of 0 mV versus an open circuit initial potential were studied using current data and SEM images. Electrochemical data showed that the deposit varied more due to change in solution than due to the variation in initial potential. The effects of changing the duration of deposition were studied using SEM and AFM. SEM images were used for visual comparisons of sample uniformity. The AFM data were analyzed for height scaling properties.

**131. Eric Lunderberg, Hope College** **Physics**

(Co-Authors: P.A. DeYoung and MoNA Collabration)

*Analysis of Data from Neutron Detectors*

The goal of this experiment was to find the level structure of 13Li. This isotope is of interest as it exists beyond the neutron drip line and is highly unstable. Gaining a better understanding of it will allow for more accurate modeling of the nuclear force. 13Li was formed through one-proton knockout from a beam of 14Be at the National Superconducting Cyclotron Laboratory impinging on a 470 mg/cm2 Be target. The 13Li is expected to decay through 12Li, ending in 11Li which is analyzed using the Sweeper magnet and detector array and two neutrons which are detected by the Modular Neutron Array (MoNA). Geant4 simulations were then performed to determine the response of MoNA to neutrons.

**132. Katherine Shomsky, Calvin College** **Physics**

(Co-Author: Stan Haan)

*Double Ionization of Atoms by Lasers: Do Electrons Continue to Interact After Recollision?*

We employ 3d classical ensembles to study the effects of post-recollision electron interaction in the ionization of atoms. Experimenters have suggested that this post-recollision interaction affects the final momentum, leading to "fingerlike" structures. Simulations testing this idea showed that there was very little effect when the e-e interaction was ignored after recollision. Our investigation as to why there was so little effect showed that in many cases, the electrons have such a large separation at the time of final ionization that there is really very little interaction anyway.