Abstract Submitted
for the SES09 Meeting of
The American Physical Society

Freshman Research Experience: Deposition and Characterization of thin films TRAVIS VAUGHN, TATIANA ALLEN[1], University of Tennessee at Chattanooga, PHILLIP BROUSSARD[2], Covenant College — In the summer of my freshman year, I participated in research which was a collaborative effort between the University of Tennessee-Chattanooga (advisor Dr. Tatiana Allen) and Covenant College (advisor Dr. Phillip Broussard). The goal of the research is to make thin metallic and semiconductor films to observe and study phase transitions: niobium films to study superconducting properties; molybdenum-nickel layers to study ferromagnetic transition, and manganese-based perovskite oxides to study metal-insulator transition. The films are deposited by magnetron sputtering. The transport properties of the films such as resistivity (by van-der-Pauw method), Hall Effect and magnetoresistance are studied at the University of Tennessee-Chattanooga in the temperature range between 77 and 700K. Resistivity at lower temperatures is studied at the Covenant College. During the summer I learned the theoretical aspects of the deposition and characterization procedures and was able to deposit several films. In the fall semester I will continue to work on film characterization.

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Date submitted: 17 Aug 2009 Electronic form version 1.4