

Physics & Astronomy Colloquium

Spring 2010

“Monte-Carlo Simulation of Atomic Motion and Simulated Annealing of Metal Nanowires”

Recent research into metal nanowires has become of great importance to technology. As technology becomes smaller, so does circuitry and electrical components. According to Moore's law, technology continues to become increasingly compact. Given this fact, nanowires will become an integral part of circuitry at some time in the next few decades. In order to understand metal nanowires, we used a simulated annealing program and a Monte-Carlo method to simulate atomic motion within simulated nanowires. Many of the simulations that we performed confirmed results from previous calculations, and revealed the internal structure of the nanowires. At larger diameters, the wires exhibited a hybrid structure, with Hexagonal-close-packed structures similar to nanowires existing in domains.

Brandon Ausmus

Sac State Physics Major

and

“LabVIEW Based Load Sensing and Balancing System for a Wind Turbine”

As political and social motivations have evolved, there has been an increase in the demand for renewable energy sources. In this project I will serve a supporting role in the development of an embedded load sensing and load balancing system for use in commercial wind turbine blades. The theoretical benefit being that when in use, load balanced wind turbines will realize an increase in power output and longer blade lifespan. A remote data acquisition system using National Instruments' cRio-9073 technology and modules will be designed and installed in the load balanced system in order to collect data such as blade pitch, rotor speed, generator speed, yaw error and power output. Additionally, we will be building a wind turbine test assembly for in-house testing of electronics prior to the field test.

Matt Pedri

Sac State Physics Major

Thursday, May 6, 2010
4:00-5:20 PM - MND 1015

Open and free to all students, faculty, and public