Department of Mechanical Engineering

COLLEGE OF Engineering

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 3, 2008

The Department of Mechanical Engineering is pleased to offer the following research project for the summer of 2008. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

NANOMECHANICS OF LOW-DIMENSIONAL CARBON NANOSTRUCTURES

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Project Description

The study of low-dimensional carbon nanostructures such as carbon nanotube (CNT) and graphene nanoplatelets (GNP) has led to many important findings since the discovery of CNT in 1991. Both CNT and GNP are known to possess exceptionally high stiffness, strength, resilience, as well as excellent electrical and thermal properties. The combination of these properties make them ideal candidates for a wide range of possible applications such as material reinforcement, field emission panel display, chemical sensing, drug delivery and nanoelectronics.. The main goal of this project is to understand the mechanics of CNT and GNP with the use of modeling and simulation tools. The specific aims of this WISE project include: 1) Understand the molecular structure of CNT and GNP and use computer code for generating the molecular structures of CNT and GNP with desired geometry and chirality. 2) Use molecular dynamics simulation tools to model the CNT and GNP systems. 3) Study the mechanical properties such as failure strength, stiffness and other elastic properties of the CNT and GNP. The major part of this project involves the use of a variety of engineering analysis software and programming languages. Dr. Dong Qian from the College of Engineering will be the primary mentor for this WISE project. The student will have access to the state-of-the-art computational hardware and visualization tools. The student will also be getting assistance from experienced graduate students. During early June, the student will have a chance to attend the first American Academy of Mechanics conference to be held at New Orleans (up to $1000 will be reimbursed for travel related cost).