Department of Physics
COLLEGE OF ARTS AND SCIENCES

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 1, 2013

The Department of Physics is pleased to offer the following research project for the summer of 2013. 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.

PROJECT TITLE: Optical and Electronic Properties of Semiconductor Nanowire Heterostructures

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Project Description

Semiconductor nanowires are quasi one-dimensional structures which are typically 50 to 100 nm in diameter and 5 to 10 microns long. There has been much interest in designing structures both to investigate new Physics as well as to enable high efficiency optoelectronic devices. Recently, we have investigated core-multishell structures where electrons and holes are quantum confined to quantum wells which are wrapped around the central NW core. These structures exhibit strong quantum confinement. In this Summer project, the student researcher will become involved in two tasks: (1) measurement of the optical properties of the quantum confined ground and excited states, (2) numerical modeling of the quantum wavefunctions using *Mathematica* and the eigenfunction expansion method for finding solutions to the time-independent Schroedinger equation. This research is supported by two grants from the National Science Foundation.