

**Department of Mechanical Engineering
COLLEGE OF ENGINEERING AND APPLIED SCIENCE**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2013

The Department of Mechanical Engineering 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: Computational Fluid Dynamics of Surface Wetting

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Project Description

Imagine being able to engineer a surface that gets wet incredibly fast, or dries incredibly fast. What has to be true for a product to change a surface to achieve such phenomena? Simulating wetting and thin-film evolution involves developing methods to capture the physics of materials in different phases with different properties, such as surface energy, surface topography, surface tension, fluid viscosity, etc. This project seeks to better understand such factors using direct numerical simulation, to ultimately guide product development for consumer goods.

The WISE student will conduct direct numerical simulations of wetting, using commercially available computational fluid dynamics software. They will develop an understanding of surface topography analysis, computational fluid dynamics of multiple-phase materials, material properties of complex fluids, and multi-scale materials modeling.

While prior research experience in these areas is not a requirement, the student is expected to possess basic engineering skills, good work ethics and the commitment to learn new concepts and methods. Opportunity for training will be provided for conducting the project research.