

**DEPARTMENT OF PHYSICS
College of Arts & Sciences**

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: MARCH 3, 2003

The Physics Department is pleased to offer the following research project(s) for the summer of 2003. Interested students are urged to contact the faculty member(s) directing the project(s) that most interest 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.

Dynamics of Freezing, Glass Formation, and “Chemical” Ordering

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The aim of this project will be to uncover basic understanding of some very simple physical systems using computer simulation techniques. This work may be of interest to students in Physics, Chemistry, and Material Science. The code design needed in this project may be especially attractive to Computer Science students who are interested in simulations and topics such as “importance queuing,” and in using a Beowulf cluster for actual calculations. The student selecting this topic will be asked to help develop a computer code to simulate the dynamics of mixtures of hard spheres and then use it to study various systems. The physical laws on the microscopic level are quite simple. Without attractive interactions between the particles, the observed freezing is quite a surprise. The goal of this summer’s work will be an understanding of binary mixtures of different sized hard spheres and in particular, dynamics in such systems, which are not well understood despite the underlying simplicity.