

**Department of Physics**  
**COLLEGE OF ARTS AND SCIENCES**  
**SUMMER RESEARCH OPPORTUNITIES**  
**FOR UNDERGRADUATE WOMEN**  
**APPLICATION DEADLINE: March 2, 2015**

*The Department of Physics is pleased to offer the following research project for the summer of 2015. 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: Research in Experimental Particle Physics**

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**Project Description**

The student will analyze data from the LHCb experiment at CERN or develop GPU-friendly analysis tools.

A student joining the analysis effort will learn some particle physics and to use the ROOT framework to study decays of particles containing heavy quarks. We are looking for a student who has completed at least the usual sophomore level physics courses, but will also consider very well motivated students with excellent performance in freshman physics and math courses. No prior experience with computer programming is necessary.

Alternatively, the student will develop GPU-friendly algorithms for data analysis. In this case, the student must already be fluent in C and C++. Experience with parallel algorithms and CUDA programming would be a distinct advantage, but not necessary. This research is done in conjunction with Dr. Karen Tomko's group at the Ohio Supercomputer Center. Earlier work is described in our paper, ***[Implementation of a Thread-Parallel, GPU-Friendly Function Evaluation Library](#)***, available online at

<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=6746000>

The student will work as part of a team including faculty, post-docs, graduate students, and probably other undergraduates. Two previous WISE students have continued working with us past the end of the summer program and extended their work to complete Capstone Projects. One was the principal analyst of a published paper

***[\(Measurement of the mass of the  \$D^0\$  meson,](#)***

***<http://prd.aps.org/abstract/PRD/v88/i7/e071104>***

Another started working with us last summer and continues to work with us now. We anticipate similar opportunities will be available whoever works with us this summer.