DEPARTMENT OF PHYSICS  
COLLEGE OF ARTS & SCIENCES  

SUMMER RESEARCH OPPORTUNITIES FOR UNDERGRADUATE WOMEN  

APPLICATION DEADLINE: 03/01/2019

PROJECT TITLE: First Look at Data from Belle II

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Project Description

The Belle II particle physics experiment, located at the KEK accelerator laboratory in Japan, will explore matter-antimatter asymmetries and other fundamental properties of matter in electron-positron annihilation events over the next decade. The detector collected first data in 2018 and will have a second run in the first part of 2019.

This project involves studies of the data to improve the calibrations and data analysis software for the new detector. The student will reconstruct unstable particles through the measurements made on their stable decay products, determine their numbers through statistical fitting, and optimize signal/background through studies of the array of data values associated with detected particles. The student will learn how to use the experiment's software library as well as Cernlib (public domain software developed for the high energy physics community), which involve Python and/or C++, to make data selections, fit distributions, and optimizations.