

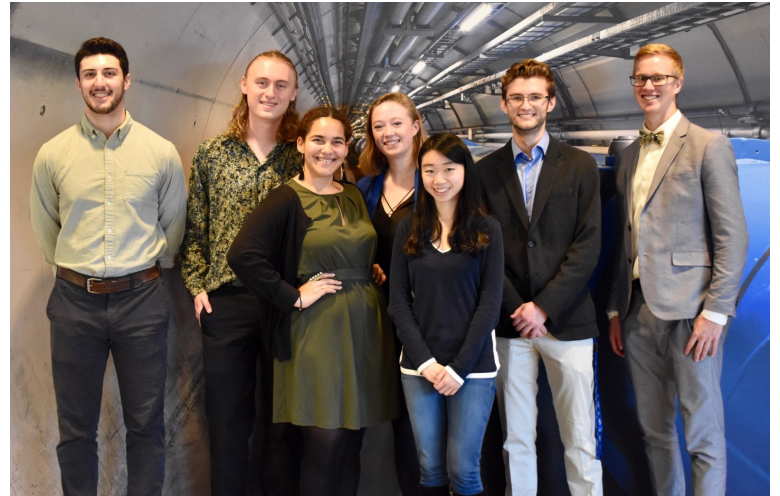


The University of Michigan

Semester Research Program at CERN

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Motivation

Why bring U.S. undergraduate students to CERN?

- Need for students with research experience
- Need for students with international experience
- CERN has a broad, world-renown scientific program

Why the University of Michigan?

- UM has administered US Summer Students at CERN since 2001 (REU program)
- UM has a large, active team of researchers on site

Why during the semester?

- Around 300 students apply for 15 summer slots at CERN
- Many have research requirements to fulfil and are only available during the semester
- 3-month semester program provides a much more in-depth research experience



The Students



Selection

- Physics, Engineering students from institutes of all size and specialty
- Announcements through Society of Physics Students, American Physical Society, direct contacts, website,...
- Judge grades, essays, recommendations, activities, diversity, potential
- Current funding:
 - 3 UM students (support from Physics Dept)
 - 3 students from under-represented groups (support from U.S. Mission, Geneva)

Institutes of Past Participants

Reed University, Michigan State University, University of Michigan, Notre Dame University, High Point University, University of North Carolina, University of Washington, Dartmouth College, Grand Valley State, University of California Berkeley, Kenyon College, University of Hawaii, Johns Hopkins University, Georgetown University, Angelo State University, St. John's University, Stony Brook University, Columbia University, Northeastern University, Penn State University, Indiana University, University of Rochester, Stanford University, University of Florida, Cornell University, University of Colorado, University of Puerto Rico, Siena College, Brigham Young University, University of California Riverside, University of Illinois, University of California Merced, St. Mary's University, College of Saint Scholastica

The Program

Fall (mid-Sep to mid-Dec) or Winter (mid-Jan to mid Apr)

Recent Projects

sTGC FEB Hardware Integration

Sabrina Corsetti (mentored by Siyuan Sun, University of Michigan)

ITk Strip Demonstrator with FELIX at CERN

Benjamin Hunt (mentored by Richard Teuscher, University of Toronto)

ALICE EMCAL Data Analysis

Cristian Ramos (mentored by Friederike Bock, CERN Fellow)

Rediscovering the Higgs using CERN Open Data

Alexander Mieth (mentored by Kati Lassila-Perini, Helsinki Institute of Physics)

Dual Readout Calorimetry Signal Analysis with Neural Networks

Murali Saravanan (mentored by Nural Akchurin, Texas Tech University)

Machine Learning for Data Quality Monitoring

Madeline Elise Hagen (mentored by Nural Akchurin, Texas Tech University)

Readout Chain Testing for ATLAS ITk Strip Detector

Dylan Hatch (mentored by Richard Teuscher, University of Toronto)

Localizing the Anti-kt algorithm

Julian Gass (mentored by Hal Evans, Indiana University)

On-Demand Workflows for Physics Analysis

Diyaselis Delgado Lopez (mentored by Kati Lassila-Perini, Helsinki Institute of Physics)

di-Higgs production search in ZZbb channel

Hang Qi (mentored by Bing Zhou, University of Michigan)

Neural Network Regression to Approximate Matrix Element Method Likelihoods

Charles Lewis (mentored by Tancredi Carli, CERN Staff).



Lessons Learned

Benefits to Students

- Outstanding research experience
 - Learn key skills, teamwork, responsibility, presentation of results
- Incomparable international experience
 - Learn value of diversity and international collaboration

Benefits to Collaborations

- Students accomplish much more in 3 months than in summer
 - Some mentors pass long-term projects from student to student

No Negative Effects on Studies

- Some students take a course or two online (we proctor exams, quizzes)
- Many students receive credit for their research
- Even if graduation delayed, value of semester on CV, applications outweighs cost

External Program Evaluation:

Its impact on students is demonstrable, positive, productive, and extensive. A semester-long experience does not have any of the negative impacts some have feared, such as interrupting normal progress toward a four-year timeline to get a degree. The knowledge and insights gained in that semester greatly increase students' understanding of what a career in physics might entail. This is a view shared by both student participants and their advisors."

