

The University of Michigan Undergraduate Semester Research Program at CERN

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LHCP Conference

<http://um-cern-semester.org>

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The Students

- Undergraduate students selected from diverse colleges and universities across the U.S.
- Primarily 3rd year students in physics or engineering
- Specific support provided for participation of women and underserved communities
- Applicants judged by grades, essays, recommendations, diversity, potential
- Program advertised through APS, Society of Physics Students



The Program

- Undergraduate students spend 3 months at CERN (Sep-Dec or Jan-Apr)
- Students are registered as CERN users and embedded in experiments
- International teams provide challenging projects selected from a broad range of current research activities
- Students regularly present work to advisors, coordinators and each other
- Program provides on-site coordination, stipend and facilities near CERN
- Partnership of UM Physics Department and US Permanent Mission to International Organizations in Geneva

The Semester

Example Projects:

- sTGC FEB Hardware Integration
- ITk Strip Demonstrator with FELIX at CERN
- ALICE EMCAL Data Analysis
- Rediscovering the Higgs using CERN Open Data
- Machine Learning for Data Quality Monitoring
- di-Higgs production search in ZZbb channel
- Neural Network Regression to Approximate Matrix Element Method Likelihoods

Cultural Experiences:

- Immersion in international research groups
- Frequent travel to cultural centers in Europe
- Local French language and cultural activities
- Meetings with senior faculty and State Department officials to discuss career opportunities



Origins



Prof. Homer A Neal (1942-2018)

- Proposed NSF REU Program
- Began U.S. presence in CERN Summer Student Program
- Proposed Semester Program
- His endowment supports 3-4 students each year.

The UM CERN REU Summer Student Program

- Selects 15 students from across U.S. each year
- Students spend 9 weeks at CERN
- Join 250 other students selected worldwide
- Participate in lectures and research
- Live in equipped hostels on site
- Enjoy on-site coordination, meet regularly

Evaluation

In the words of an independent 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."

In the words of the students:

"University of Michigan's Semester Abroad program at CERN solidified my interests in physics and convinced me to pursue graduate-level research in a related field."

"My experience at CERN made me feel more confident in my ability to do research and I developed a number of invaluable skills, both soft and technical, that have been critical to my graduate studies. Additionally, I made a number of friends with graduate students, post docs, researchers, and professors from all over the world..."

Program Status

The worldwide pandemic caused by COVID-19 drew an early close to our Winter 2019 Semester Program. Current plans are to start up again in Winter (Jan-Apr) 2022. Announcements will be posted on our website at <http://um-cern-semester.org> and advertised by APS and the Society of Physics Students.

