



Instructionally Related Activities Funds Request Spring 2016

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IRA Funds Request for Internships at the European Organization for Nuclear Research (CERN)

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Instructionally Related Activities Funds Request Summary

Project Sponsor	Geoff Dougherty
Activity Title	Internships at the European Organization for Nuclear Research (CERN)
Activity/Event Date	06/01/2016 - 098/09/2106
Date Funding Needed By	Feb 2016
Previously Funded?	No
Semester/Year	—
Proposal #	—
Report submitted for previously Funded Activity?	—
Report submitted for previously Funded Activity	—
Additional Report #1	—
Additional Report #2	—
Additional Report #3	—
Additional Proposers	—
Academic Program(s) / Center Name(s)	Mathematics and Applied Physics
Estimated total Course Fee revenue	40 units
Amount Requested from IRA	\$16,000
Estimated Number of Students Participating	4
Conditions and Considerations	International Travel
Brief Activity Description	Channel Islands recently joined the CSU-wide Nuclear and Particle Physics Consortium (NUPAC) (http://zimmer.csufresno.edu/~yogao/ATLAS/CSU%20ATLAS%20Consortium.html), which offers students the opportunity to work and study on the ATLAS particle detector experiments of the LHC (Large Hadron Collider) at CERN for 10 weeks during the summer.

	<p>CERN is the birth place of two Nobel Prizes and the World Wide Web. The 10 billion dollar LHC started collision in 2009. The ATLAS collaboration consists of ~3000 physicists from 38 countries, among them, ~500 US physicists from ~40 prestigious universities (Harvard, Yale, MIT, Columbia, UC-Berkeley, etc.). This offers our students outstanding opportunities to work at CERN and collaborate with top physicists, engineers and computer scientists.</p> <p>Last year, under Dr. Ivona Grzegorzczuk's application, and following a competitive process and coursework in physics, two CI students (Daniel Turner and Geordan Waldman) were selected for a 10-week internship at ATLAS computing projects and attended the famous CERN Summer Student Lecture Series. They joined other CSU students and were assigned to a research team and had an advisor at CERN. They worked on improving algorithms and the development of tools to monitor the sub-detectors, and analyze ATLAS data. This year's students would continue this collaborative work.</p> <p>LHC is one of the most exciting collaborative scientific projects in human history. This experience at CERN would prepare the students for professional success in an increasingly competitive, global, and multi-cultural society. ATLAS is committed to involving students, who will be inspired to study and appreciate science, and then go into many fields using their skills – including science, education, industry, finance, and public policy. The students' experience at CERN and LHC is clearly connected to the mission of CI, and would afford them a once-in-a-lifetime opportunity, which will also inspire other CI students.</p>
Learning Outcomes and Relation to IRA to Course Offerings	<p>The students will take two special on-line physics course (in nuclear physics and ROOT programming) developed by NUPAC (at no additional cost to them), to prepare themselves for the internship at CERN. They will do this while registered at CI for</p> <p>Phys 497-1(3 units) Directed Studies (Particle Physics for CERN), Fall 2015 Phys 497-2 (3 units) Directed Studies (Programming in ROOT), Spring 2016</p> <p>(Phys 497-1 will prepare the students to understand the theory and hardware used at CERN for fundamental particle detection Phys 497-1 will prepare the students to program in ROOT, as used in the ATLAS experiments at CERN)</p> <p>They will present and write up their results at CERN in mid-August, and on their return to CI, will present their experiences to their peers and the community through Phys 499 Senior Colloquium (1 unit).</p> <p>The internship itself will count for a further 3 units (as PHYS 492 Internship).</p> <p>(Total units/student: 3+3+1+3 =10 units)</p>
Description of Assessment Process	<p>Each of the courses to be taken by the students will be assessed by homework assignments, a mid-semester test and a final test.</p> <p>The internship (PHYS 492) will be continuously assessed by rating the students' effectiveness and contributions to the ATLAS team, and by assessing a final presentation of their research work at an ATLAS meeting. (Information on past student projects can be found at http://zimmer.csufresno.edu/~yogao/CSU-ATLAS/CSUF-ATLAS-Research.html).</p> <p>On their return to CI the students will give a joint presentation of their work at the mathematics/physics seminar (as part of Phys 499, which is assessed) open to all CI students (at least 50 would be expected), faculty and guests, as well as other venues (for example President's Circle). This way the impact of the campus and local STEM community will be quite significant. Their results will also be presented at local research conferences. In the past, CI students attending the internship published collaborative papers with CERN scientists, which is very prestigious!</p>
Activity Budget	CERNbudget2016.xlsx
CIA Budget	CERNbudget2016.xlsx
CIA Proposal	CERN2016CIAA3InternationalGroupTravelproposal.doc
Course Syllabus	CERN2016CIAcoursesyllabusdetails.docx
CIA Certification	I certify that students attending this trip are not previous or repeat attendees of a prior International UNIV 392 Trip
Other Sources of Funding	<p>The cost of 10 weeks CERN internship (travel and accommodation) is estimated to be about \$6K per student.</p> <p>We will be applying for Lottery funds (\$6000) and SRSC support (\$2000).</p> <p>We ask for as much support as possible, as Switzerland is a very expensive country and unexpected expenses can quickly add up for the students. (Also, CERN is located outside the city of Geneva, so local travel expenses are also high). The students will be expected to contribute \$4010 (\$20,010 - \$16,000 requested (see Budget)), i.e. about \$1000 each.</p>
Target Audience/Student Marketing	The intended audience is STEM undergraduates and graduates. Flyers were posted and informational sessions given in the first 2 weeks of the Fall 2015 semester.
Bring Benefit to Campus	On their return to CI the students will give a joint presentation of their work at the mathematics/physics seminar (as part of Phys 499, which is assessed) open to all CI students (at least 50 would be expected), faculty and guests, as well as other venues (for example President's Circle). This way the impact of the campus and local STEM community will be significant. Their results will also be presented at local research conferences.

Sustainability	—
Program Chair/Director	ivona.grzegorzcyk
Dean	karen.carey
Acknowledgement	I acknowledge that I have reviewed and accepted the Conditions and Considerations herein. Please check off boxes as appropriate.

Program Chair/Director Approval

Approval	I approve the IRA Funds Request described on this page
Name	Ivona Grzegorzcyk
Date/Time	10/1/2015 3:21:01 PM
Validation	myCI-signin-W0-5501

Dean Approval

Approval	I approve the IRA Funds Request described on this page
Name	Karen Carey
Date/Time	10/1/2015 3:29:39 PM
Validation	myCI-signin-HV-1365

IRA Committee Decision

Decision	—
Comments	—

Actions

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