Instructionally Related Activities Funds Request Spring 2017

IRA Funds Request for Field trip to Mount Wilson Observatory for Astronomy/Physics 107: The Stars and Beyond

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Instructionally Related Activities Funds Request Summary

Project Sponsor	Brian Rasnow
Activity Title	Field trip to Mount Wilson Observatory for Astronomy/Physics 107: The Stars and Beyond
Activity/Event Date	Mid semester Spring 2017
Date Funding Needed By	Mid semester Spring 2017
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)	Applied Physics/STEM
Estimated total Course Fee revenue	n/a
Amount Requested from IRA	$1350
Estimated Number of Students Participating	24
Conditions and Considerations	Field Trip
Brief Activity Description	Physics 107, “The Stars and Beyond”, is the last STEM class for many students, and thus a key gateway to encourage greater STEM enrollment. My course focuses on critical thinking and the scientific method, using cosmology as an explicit example -- how and why do we know what we know? We read the New York Times Bestseller, “The Big Bang”, provides an easier read than conventional text books, and offers rich history of the people, ideas, and technology that led to our current scientific understanding of the universe. Mount Wilson Observatory comes up frequently in this story. For example, Hubble used its 100” telescope (the world’s largest from 1917-1948) to discover the expansion of the universe, and Einstein in 1931 made a famous announcement in the Mount Wilson Library supporting the Big Bang theory and admitting his error with the Cosmological Constant. I can’t think of a better way to make the abstract, complicated, enterprise of science more real and exciting to my students than to take them on a field trip to the Mount Wilson Observatory. With minimum of 10 students we get a guided tour and sack lunch. For the ~70 miles of travel, we’ll hire a Roadrunner bus.
Learning Outcomes and Relation to IRA to Course Offerings	The field trip's goals are to give the students a direct, experiential feel for professional experimental (astronomical) research, so this has broad application to STEM courses. Mt. Wilson continues to conduct research (at night) with advanced technologies like adaptive optics, lasers, and digital imagers, but also is a museum showcasing its major contributions to our scientific understanding of the universe. It will specifically connect with Astro/Phys 107, "The Stars and Beyond". We will see the original data that's reproduced in our text books (e.g., Hubble's Law), we'll see the instruments that produced those data (the 100" telescope, spectroscopes, and numerous other apparatus on display), and we'll discuss how these humble scientists and their data profoundly changed our understanding of our origins and place in the Universe. This experience should translate towards understanding results in all of our Astro/Phys courses (105, 110), as well as numerous STEM courses that discuss experimental results. Its easier to visualize the big telescope replaced with an x-ray crystallography machine in Rosalind Franklin's lab that revealed the structure of DNA. Visiting a dome on a mountaintop makes science feel much more exciting and interesting.
Description of Assessment Process	The 1.5-2 hour bus ride home will be an opportunity for open discussion and exploration of lessons learned. A mandatory post-trip assignment will be to write a 2-5 page essay describing the most impactful aspect of the trip or prior chapters in the book. Essay rubric will focus on clarity of expression, logical and factual content, and creative choice of emphasis. Those who don't take the field trip will base their essay on the book and/or other sources of their choice. The effectiveness of the field trip will be assessed by measuring 1) the fraction of students who participated that choose to focus their essay on it, and 2) whether these essays are better -- more creative, logical, accurate, etc.
Activity Budget	iratravelbudgetformay1617.xlsx
CIA Budget	—
CIA Proposal	—

Course Syllabus	—
CIA Certification	—
Other Sources of Funding	Astro/Phys 107 has no fees. Students could be asked to contribute, but I believe that could be discriminatory. We *could* ask students to bring or buy their own lunch, but some may not have the money or forget. I don't think it would be appropriate to let some go hungry while others eat on this 7-8 hour trip -- so as a conscientious instructor, I'll end up picking up the tab for several students, which would be awkward. Thus I strongly request letting Mt. Wilson Observatory prepare the food for us -- for simplicity and fairness -- I won't have to worry about food nor money on the trip. I asked the Observatory (as a Caltech alumni -- Caltech runs the observatory) whether they can offer discounts or foundational money for a CSU class, and was told no. I solicited quotes from Roadrunner and Mt. Wilson Observatory in 2014 as part of an unsuccessful mini-grant application. I expect these costs may have risen by ~5% due to CPI.
Target Audience/Student Marketing	Once funded and reservations secured, the activity will be announced on the class website and and in class. Students will sign up committing to attend. If space remains, I'd be happy to invite students from the other Spring 2017 Astro/Phys 110, "Life in the Universe" class, which I believe has enrollment of ~100. That professor could use a lottery or merit system to fill empty seats.
Bring Benefit to Campus	Students will bring back their experience of visiting and seeing, first hand, a world class scientific institution and museum. I will allow time in the classroom after the trip for discussion and exchange. Its reasonable to expect such exchanges to continue informally in the dorms and venues that students meet.
Sustainability	All travel invokes an environmental cost, that must be offset by significant educational benefit. This proposal takes students to a relatively near (~70 miles) site of major scientific and historic importance, using the most efficient form of transportation to get there. In 2014, it was suggested that I let my students arrange their own transportation to Mt. Wilson Observatory and I refused, because that's grossly inefficient and exclusionary. As someone passionate about sustainability (and a teacher of Energy and Society and such issues), I will be sure to point out the carbon footprint of the trip.
Program Chair/Director	ivona.grzegorczyk
Dean	james.meriwether
Acknowledgement	I acknowledge that I have reviewed and accepted the Conditions and Considerations herein. Please check off boxes as appropriate.

Program Chair/Director Review

Recommendation	—
Name	—
Date/Time	—
Validation	—
Comments	—

Dean Review

Recommendation	—
Name	—
Date/Time	—
Validation	—
Comments	—

IRA Committee Decision

Decision	—
Comments	—

Current Tasks

Task	Time Assigned	Assigned To
Edit Request	9/29/2016 6:40:44 PM	Brian Rasnow
Review from ivona.grzegorczyk, Program Chair/Director	9/29/2016 6:40:44 PM	Ivona Grzegorczyk

Completed Tasks

Task	Time Assigned	Time Completed	Completed By
Fill out Request	9/29/2016 5:07:35 PM	9/29/2016 6:40:44 PM	Brian Rasnow

Actions

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