



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Future Faces of Physics Award Proposal

Project Proposal Title	The Future Faces of Physics: the FUNdamentals
Name of School	University of the Sciences in Philadelphia
SPS Chapter Number	5619
Total Amount Requested	\$499.27

Abstract

University of the Science's chapter of SPS proposes to conduct physics outreach to a local high school and middle school in Philadelphia, with a large number of minority and low-income students. Using interactive physics demonstrations, we plan to stimulate discussion of physics which will motivate students' interest in physics.

Proposal Statement

Overview of Proposed Project/Activity/Event

Our chapter of SPS at University of the Sciences has reached out into the Philadelphia community, to visit high schools and middle schools in order to engage their young people in physics. Our program will consist of hands-on, interactive demonstrations and discussions. We have already reached out to The Mathematics, Civics, and Sciences Charter School of Philadelphia who would like us to present to an assembly of their high school and middle school students. Around ten SPS members and volunteers will visit the school in our spring semester and take approximately an hour to do our demonstrations. Our demonstrations are revolved around the fundamentals of physics, and are organized into physics topics including “The Phases of Matter”, “Electricity”, “Light and Optics”, “Waves” and “Thermodynamics”. We will have a total of six demonstration stations planned. These include stations using liquid nitrogen (superconductivity, freezing flowers, ice-cream), Bernoulli’s principle, non-Newtonian fluids (oobleck), van der graff generator-powered demonstration, optical illusions (with an infinity mirror, diffraction glasses, a mirage kit, Einstein’s mask), and a garbage can vortex. SPS members will man each station. This is the first SPS Future Faces of Physics Proposal by USciences SPS, and this grant will impact the morale and spirit of a small but growing physics major population. We expect to impact 50-75 K12 students.

How Proposed Activity Promotes Physics Across Cultures

The school we have targeted consist primarily of minorities and low income students. According to Philadelphia’s Public School publication, “The Notebook”, reports that 98% of the chosen school’s students are African American, and the other 2% are Latino. It is our goal to show minority students that learning can not only be fun but beneficial to their future. We think that if our first trip is a success, we can continue to return to the school so that the students have something to look forward to as well as to become excited about science. This community outreach will be able to empower students and motivate them to continue their studies.

Plan for Carrying Out Proposed Project/Activity/Event

- Katee O’Malley (SPS treasurer and secretary) & Oberon Wackwitz will be in charge of this project, under the supervision of the SPS advisor Dr. Roberto Ramos. Progress will be monitored by surveys after the demonstrations and discussions
- The marketing of this project will be discussed greatly with the coordinator of the project on the visiting schools side. Our SPS chapter will provide the teacher/coordinator with a flier that can be handed to the students so they can look forward to the event.
- Approximately 8-10 SPS members and volunteers will participate in this event. After a brief “training session” on-campus, USciences students set up demos and also lead discussions with K12 students. The event will be announced to the USciences community via campus emails to solicit volunteers.
- Dr. Roberto Ramos, our advisor, will be present with his expertise to ensure the safety of the project and success of the demonstrations with the ability to facilitate discussion.

Project/Activity/Event Timeline

- Tuesday February 23rd: Order all materials needed, create a demonstration outlines

- Tuesday March 1st: Practice Run of the Demonstrations: set up, demonstration, tear down
- Tuesday March 8th: Make Flyers to Hand to School and stickers as a complimentary prize
- Tuesday March 15th: Finalization of all demonstrations and discussion, “training session for volunteers”
- Tuesday March 22nd: Ensure all materials are properly package for transport
- Tuesday March 31st: Purchase Perishable materials (i.e. cream and flowers for liquid nitrogen)
- Day Before: Ensure all materials are packaged properly for transportation
- Anticipated Date for Event: April 1st, 2016 These dates are tentative and can be coordinated around the academic schedule of both the SPS members and the lesson plans of the schools

Activity Evaluation Plan

After the demonstration is complete we are asking that the students and the teacher fill out an evaluation survey to let us know if they liked the demonstration, discussion, and overall experience. This will help us to get a better understanding of how to go about the outreach for further programs. In addition we plan on sending the teacher an evaluation about two weeks after our program to see the lasting impact that our program had, this would include the teacher having a discussion with the students to see our impact throughout a longer time span. We would also like to extend an invitation to the students of the outreach to visit our school for an open house event, specifically geared toward the physics department. This day would include a tour of the labs, career talks, and the ability to shadow a current physics major in some of their classes. This will further engage the students so they have a more accurate knowledge of a future in physics. Pictures of the event will be posted on our SPS chapter website that will be advertised to the USciences community.

Budget Justification

The proposed budget will be used to purchase materials for our demonstrations. Our chapter of SPS is very new and just starting an outreach program, and for that we need a broad spectrum of tools. We already have access to the materials needed for our Bernoulli demonstration (a hairdryer and ping pong balls), and our superconductivity demonstration. Our department will be funding the cost of the liquid nitrogen, and funding from our Student Government Association should be able to cover transportation, if needed. The items listed in the budget proposal are each selected with a theme in mind. When presented to the students, this theme will be able to engage the students in physics in a hands on matter. This will have an incredible impact that has the ability for a long term effect in the students’ lives. These demonstration will be able to accomplish our goal of promoting physics to minority students so that they are able to see a future with science.