



# SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

## Future Faces of Physics Award Report

Project Proposal Title	Light on Science
Name of School	University of Oregon, Dept. of Physics
SPS Chapter Number	Z17-5379
Project Lead (name and email address)	Fehmi Yasin, fyasin@uoregon.edu Stanley Micklavzina SPS Chapter Advisor
Total Amount Received from SPS	\$300
Total Amount Expended from SPS	\$300

### Summary of Award Activity

A University of Oregon physics graduate student developed an outreach program in which graduate and undergraduate students visited third, fourth and fifth graders at River Road/El Camino Del Rio Elementary School four times throughout the school year, performing physics and chemistry demonstrations with explanations in both English and Spanish. The elementary school students also took a field trip to the University of Oregon, where they went on a research laboratory tour, as well as taking part in larger physics and chemistry demos.

# Statement of Activity

## Overview of Award Activity

We utilized existing resources available to us at the University to develop an outreach program. These resources included the UO chapter of the Optical Society of America (OSA), Mad Duck Science Outreach and the Physics Demo Show Room. In this program, we visited a local school that the Oregon Department of Education has labeled in their report card as a Priority School (“high poverty school that is ranked in the bottom 5% of Title I-A schools) based on Oregon’s rating formula. These schools generally have overall very low achievement and limited growth over time. Additional supports and interventions to make improvements are needed. Secondly, the school has a Hispanic neighborhood within its jurisdiction. As such, they have constructed their school to be a “dual immersion” program.

We visited the school on four separate occasions, and set up five physics and chemistry demo stations. The students were split into groups of eight or less and changed stations every seven minutes in order to experience all of them. The station leaders (graduate and undergraduate students) would perform and explain the demos. Some station leaders explained in both English and Spanish, allowing for a more inclusive experience. At the end of the hour-long session, they filled out summative assessments in the form of one question per station on a worksheet. We also hosted the students on a field trip to the University of Oregon, where they went on a tour of the project leader’s research laboratory and engaged in even more, bigger physics and chemistry demos that a university setting allows.

The light kits purchased by the grant were used in interactive stations focused on light addition and subtraction, viewing different light sources through diffraction glasses, and observing the spectrum from different colors of light illuminating fluorescent and phosphorescent materials. The students reacted well to seeing the colors and were excited looking at other lights in the room and trying different orientations of the glasses. They really liked the last station, drawing on the phosphorous board with a UV LED.

This project really allowed students from a minority group to experience science in a way that none of them ever imagined possible. There were approximated 40 students at each event, all of whom seemed genuinely excited every time we returned the next time with new demos.

The Dept. of Physics has various active outreach programs, Physics demonstration shows and interactive tables have been the main outreach efforts run by SPS advisor Stanley Micklavzina. There has always been a desire for developing more interactive activities for school visitations and Fehmi Yasin's desire to work and bring science to an elementary school after school program for Hispanic students was an exciting opportunity. The SPS president, Teiler Kwan, was also excited about the opportunity for SPS and we applied for the Future Faces Award. The interaction between graduate and undergraduate students was an expansion for our local SPS and the involved undergraduate students from SPS were three women and one man. The Faces project boosted the development and use of interactive stations in our outreach efforts. Acknowledgement from SPS national to our department, the University President's office, and the listing in the SPS newsletter also provided recognition for Future Faces of Physics Award, page 2

the department's outreach program. This recognition will help provide support to our efforts and projects in the future and is greatly appreciated.

One experience the project leader had that really encapsulates the spirit and purpose of the outreach was during an optics demo. While explaining the demo to the third round of students, he asked whether they understood, but one student didn't respond, and her friend turned and said that she didn't speak English. Luckily, the graduate student knew Spanish and began to translate and explain in both languages. At this notion, the child's eyes lit up in recognition and began to really engage in the demo.

### Impact Assessment: How the Project/Activity/Event Promoted Physics across Cultures

The goals of the project were to engage with a group of minority students during a very young stage in their academic careers to not only explain a wide array of scientific facts and ideas, but show them that Latinos have a place in science, too. After all five events, we are confident that we accomplished these goals, and perhaps even taught them a few meaningful things about physics and chemistry along the way.

As an assessment of whether the students were engaging in the demos, we had them fill out a worksheet in which they answered a conceptual question concerning each of the demo stations. These questions were higher order thinking in that they had to analyze the concept and use it to create a reasonable response with their peers (they were encouraged to answer them together). For example, after a station regarding the polarization of light and polarizers, the students were asked to create an experiment in which they tested the polarization of the light from the sun. Truthfully, only about half of the students responded with a sense of understanding or at least inquisitiveness. Therefore we believe we can improve by trying to hold their attention better and also by asking providing the questions in both English and Spanish, which was an oversight on our part.

### Key Metrics and Reflection

The Future Faces of Physics Award is designed to promote projects that cross cultures. What cultures did your project attempt to bring together?	Latino Minority culture and University Science culture
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "10 high school volunteers").	Approximately 55, including University student volunteers. 45 grade school students and 10 graduate and undergraduate volunteers. 1 Dept. of Physics faculty.
How many students from your SPS chapter were involved in the activity, and in what capacity?	Four SPS students were directly involved in the outreach through planning the demos and leading demo stations at the events.
Was the amount of money you received from SPS sufficient to carry out the activities outlined in your	It was sufficient, The funds purchased 10 Optics kits used in the outreach to assist

proposal? Could you have used additional funding? If yes, how much would you have liked? How would the additional funding have augmented your activity?	with our celebration of the International year of light. The 10 kits cost \$390. The University of Oregon Dept. of Physics provided the additional \$90.
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	We will absolutely continue with River Road Elementary, and perhaps expand to one other school, as there are some others that have shown interest.
What new relationships did you build through this project?	We built a relationship with River Road Elementary, their after school program coordinator and the students that came to every event craving more.
If you were to do your project again, what would you do differently?	I would interact more with SPS undergrads to encourage more of them to join the events and help develop and lead demo stations.

Press Coverage (if applicable)

N/A

## Expenditures

### Expenditure Table

Item	Cost
10 Light Blox Kits purchased from LASER Classroom.	\$390

Total of Expenses	\$390

## Activity Photos



*Physics graduate students performing optics demos at the University of Oregon during the field trip event.*



*Graduate students Jordan Chess and Julian Smith with presenting the physics of Ooblong at River Road Elementary.*



*SPS member Eryn Cangi presenting an jello optics demo at River Road Elementary.*



*Students interacting with presenters Eli Parrish and Tyler Harvey (from left to right) during a physics of sound demo.*



*Outreach Leader Fehmi Yasin explaining a optical cloaking device at River Road Elementary*



If you have any questions, please contact the SPS National Office Staff  
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