SOCIETY OF PHYSICS STUDENTS
An organization of the American Institute of Physics

Marsh W. White Award Proposal

Project Proposal Title	Physics Interest Community Outreach
Name of School	Wofford College
SPS Chapter Number	8388
Total Amount Requested	$500.00

Abstract

The Wofford College SPS chapter is eager to reinitiate community outreach programs that were halted due to the COVID-19 pandemic. Our goal is to ignite a passion for physics through interactive physics demos, scientific labs, and fun experiments. We have reached out to several schools in the community, and the cool outreach demos and experiments will be made possible with the generous Marsh W. White Award Proposal.

Proposal Statement

Overview of Proposed Project/Activity/Event

Prior to the COVID-19 pandemic, the Wofford College Society of Physics Students organized outreach events where students from local schools were invited to the college to observe and participate in physics labs and demonstrations, as well as providing a volunteer tutoring program for high school students. We are now planning to expand these initiatives to a larger audience by visiting local schools to perform interactive physics demos, scientific labs, and fun experiments.

We currently plan to visit four local schools in the Spring semester, and hope to expand this to more schools time permitting. The following schools have expressed interest in the SPS giving presentations to their students:

- Cleveland Elementary School
- Spartanburg Day School
- McCracken Middle School
- Jesse Boyd Elementary School
- Pine Street Elementary School
- Meeting Street Academy
- Spartanburg High School

We plan to give demonstrations in the following topics:

- Fluid Dynamics
- Spectroscopy
- Projectile Motion
- Standing Waves

In particular, we plan to use the Marsh W. White award to fund the construction of new demo equipment, including a 4-foot by 2-foot bed of nails, a speaker and platform for demonstrating standing wave patterns on a drum, and spectrum tubes to demonstrate techniques in stellar astronomy.

With the Marsh W. White Award and support from our department, we hope to take our outreach to the next level focusing on broader impact. Additionally, this expanded community outreach program will help to recruit students into the SPS by bringing more attention to the work done by the organization.

How Proposed Activity Promotes Interest in Physics

Our number one goal as SPS members is to promote learning and fascination with studying and experimenting with physics, along with leaving an everlasting impact on students in the local community. We want to stress that not only can we teach physics to high school students with more complex physics ideas, but also fascinate younger students like those in middle and elementary school with visually appealing and fun interactive demos.

Each demo we want to perform requires the purchasing of demo kits and other materials needed for our projects. We want to give fun and interactive demos to younger students through the medium of

projectile motion with rockets, colorful and vibrant presentations through spectroscopy, and physics that looks like mind-blowing "magic" with standing waves on a speaker. We also want to do some more complex demos with high school students through fascinating experiments with fluid dynamics.

Plan for Carrying Out Proposed Project/Activity/Event

- Caleb Hames (SPS President) and Joanna Burgess (Treasurer) will be responsible for planning which project demos will be presented and purchasing the required demo kits and materials needed for the individual projects, overseen, and assisted by Dr. Salley and Dr. Banerjee.
- Caleb Hames (President) and Hayden Genoble (Vice President) will be responsible for ensuring that we remain on our planned timeline and following up with the schools for feedback on how our demos were received.
- Cameron Walker (Secretary) will be responsible with keeping records from the attended schools and evaluating our demos, along with setting up dates with conjunction with the contacted schools for our demos and experiments.
- Marketing – we will advertise our outreach initiative within the college to recruit new volunteers, through the Wofford Announcements section in the Wofford email, reaching out to schools directly for demo dates, social media outreach for the broader community, and coordinating this with our professors in the physics department.
- SPS member participation – We will have anywhere between 4 to 10 SPS members and volunteers assisting with our project throughout the year. This includes the current 4 cabinet members already in the SPS, along with the list of students we already have who are interested in joining the SPS, or who are already considered members.
- Expertise – Each cabinet member of the SPS has expertise in their very own demo. We all have experience in performing these labs from previous courses we have taken in physics, and many of us have experience in engineering and can contribute their own technical skills.

Overall, we hope that everyone in our SPS chapter can contribute their own ideas and vision for the events we expect to attend, along with getting more college students to join our SPS chapter so that future outreach programs can go as successfully as we hope the current year will be.

Project/Activity/Event Timeline

- January 2022: We plan to have all schools' setup to attend with specific dates in the spring. Along with all necessary demo kits purchased and materials purchased from building/materials stores like The Home Depot/Lowes. And start work on the first demo to have completed by February.
- February 2022: Have the first demo completed and attend our first school. We plan to give our first demonstration on Spectroscopy, an easier demo to give so that everyone can be involved and those who have not given demos before can easily learn. Ideally for an elementary or middle school.
- March 2022: We want to have our second demo planned out and completed to be given to another elementary or middle school. Ideally, another easy demo to give on Projectile motion, where we can bring out some rockets and shoot them off for some fun interactive learning for the students.
- April 2022: By this time, we hope to have our more complex demos planned out and completed for middle or high school students. We want to build and purchase our own speaker and show a demo on standing waves with some colorful sand.

- May 2022: Finally, by this time we should have several more members involved in the SPS; freshmen, sophomores, and juniors ready to take up the mantle of the SPS in the following years, and our final demo ready to be given to high school students on fluid dynamics.

Activity Evaluation Plan

We plan to evaluate our progress as follows:

- Following up with schools to determine how well our demos were and improving upon future demos with needed evaluation and criticism.
- Keeping track of how many students are interested in our experiments and trying our best to get and keep as many students involved as possible.
- Maintaining attendance from SPS members and how many new members attend and join the SPS as the months go by. Hopefully we can reach out on campus and get more students involved who are not necessarily already in a physics major or the department.
- Taking pictures and videos with students along with feedback for our final report at the end of our project.

Budget Justification

All the construction materials will be used to build a bed of nails for our demonstration on pressure and weight distribution, the spectrum tubes and power supply will apply to our demonstration on spectroscopy, and the Nutone speaker will be used to give our demonstration on standing waves. All other materials we may need are already owned by members or we plan to borrow them for our demos and labs. We all look forward to inspiring our local community through the lens of physics, and we are all extremely grateful given the opportunity.