



# SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

## Marsh W. White Award Proposal

Project Proposal Title	Bringing Physics to the Community for People of All Ages
Name of School	The University of Southern Mississippi
SPS Chapter Number	6626
Total Amount Requested	\$500

### Abstract

Our chapter regularly promotes physics to the general public in addition to the outreach efforts focused on students in grades K-12. We annually show physics demonstrations at a city event called Hubfest. This event draws attendees from all over Mississippi and the SPS booth draws crowds of spectators. We provide demonstrations in Thermodynamics usually and are looking to expand into more Optics demonstrations this year.

# Proposal Statement

## Overview of Proposed Project/Activity/Event

The Overview should be a more detailed description of the proposed project/activity/event than the abstract.

This section should include:

- Brief description – The Marsh White Award has previously allowed us to attend the Hattiesburg Hubfest. In the past we have showed demonstrations involving lasers and liquid nitrogen. The vapor from the liquid nitrogen is usually seen from far away, and each demonstration sometimes attracts 20-30 people. This allows us to spark interest in many of the thousands of people at the festival. The demonstrations often include freezing marshmallows and giving them to our spectators. This is always a big hit. This year we will build upon our past demos by incorporating Optics demonstrations in the form of lasers, diffraction gratings, and polarized films.
- Goals of the project – After showing each demonstration, we explain the science behind the demo with easily understandable language in order to promote interest in the general public. People have even heard word of our booth from the other end of the festival and made it a point to see us.
- Intended audience – Hubfest brings in tens of thousands of people from not only Mississippi but also from the surrounding states. The Marsh White Award will allow us an opportunity to promote Physics to all of these members of the general public before they return to their respective areas. Historically speaking, this event has created outreach opportunities with several locations, some of which were even outside of Mississippi, and thus our intended audience is everyone attending the festival.
- Background and motivation – The motivation behind this project is that by showing people how fun and interesting science can be, we will spark an interest that may lead to them choosing a STEM major or influencing the people around them. Specifically, we are building on past years by using those demonstrations, and continually adding new demos to them.

## How Proposed Activity Promotes Interest in Physics

Our physics demonstrations have proven to be very popular. At Hubfest, we have the opportunity to reach over 30,000 people of all ages. There is no other event that provides this opportunity. The street festival design of Hubfest makes it nearly impossible for people to pass up our booth without stopping to see what we're doing. Once they are at our booth, we can show the people some of what is on the cool side of science.

## Plan for Carrying Out Proposed Project/Activity/Event

- Personnel – The entire USM chapter will be involved in helping to plan. The officers and faculty advisor will oversee the decisions made and ensure that we meet our set milestones.
- Marketing – Hubfest is a well advertised event that includes well over 250 booths from seven different states. There are certain to be substantial numbers of attendees.
- SPS member participation - We will gather approximately half of our membership, 10 to 12 people, to assist with the booth and setup process of the event. Most of our members will be involved in some aspect of the event. Members will be involved in collecting and transporting materials and will occupy the booth in teams of 3-4 for multiple shifts.
- Expertise – Most of the members of our chapter have been in the society for years and are very experienced. Most members occupy the classification of juniors, seniors, or graduate students. We have participated in this specific event for several consecutive years.

## Project/Activity/Event Timeline

January, 2016:

Register for Hubfest (Registration opens January 4), and begin mentioning Hubfest to the members during club meetings.

March, 2016:

By mid-March, we will be recruiting club volunteers for our booth. This will also be around the time when we receive our assignments from the organizers. By the end of March, we will have finalized the volunteer rosters including when each group of students will work each shift. We will distribute phone numbers in case something goes wrong.

April 1, 2016:

Load equipment into vehicles to meet the next morning for setup.

April 2, 2016:

Day of Hubfest:

7am: Set up booth

8am: Hubfest starts. Members will work in shifts of 3-4 students at a time.

5pm: Break down booth and haul equipment back to the USM campus.

## Activity Evaluation Plan

In evaluating our success we will ask that each volunteer get an estimate of how many people stopped by their booth, and give this information to the chapter president who will compile them together to see the total amount of people that stopped by. We will also have a sign-up list for students who are interested in joining our mailing list. Finally we will take pictures of our club members interacting with the people we see. These photos will be provided to the Department of Physics and Astronomy for use on the departmental website.

## Budget Justification

1. Balloons: This is crucial to both categories of demonstrations. The liquid nitrogen demonstration shows the gas decrease in volume due to temperature, and the optics demonstration will include popping balloons with the laser.
2. Laser: We plan on expanding our lasers by purchasing a new one that is approximately 50mW to 500mW in power; we will also investigate whether this laser will require additional materials.
3. Batteries: We have a small laser that is battery powered. Spare batteries are needed when we're running it off and on for 9 hours.
4. Liquid nitrogen: Based on previous years, we will need 3 10-liter containers of liquid nitrogen.
5. Marshmallows: We freeze marshmallows in liquid nitrogen and pass them out; everyone loves this part. We usually run out of marshmallows, so we put more than we normally buy in the budget.
6. Flowers: We freeze the flowers in the liquid nitrogen, and then we let the children put on insulating gloves and crush the flowers. It sounds like glass, and the kids enjoy it.
7. Racquetballs: This is a popular demonstration, it shows how the property of the material changes due to temperature.
8. Produce: Another popular demonstration involves shattering fruits and vegetables.
9. Water and Sports Drinks: It is really hot in south Mississippi in late March; therefore we provide drinks for volunteers.
10. Hand Sanitizer: There is no running water at the festival, and we are handling food because of the marshmallows.
11. Paper towels: Half-frozen and rapidly thawing marshmallows get sticky, and squished produce gets slimy.
12. Wet wipes: We need these for the same reason as #9.
13. Hubfest registration: This is what the booth rental cost in 2015, so it is reasonable to assume it will be similar in 2016.