



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Marsh W. White Award Proposal

Project Proposal Title	Promotion of Physics in the Hattiesburg Community
Name of School	The University of Southern Mississippi
SPS Chapter Number	6266
Total Amount Requested	\$500.00

Abstract

The University of Southern Mississippi's SPS chapter promotes physics through community outreach. We participate in many outreach events with schools and events in the chapters area of operation. Hubfest is one of our largest outreach events that we participate in every year that brings a large part of the Hattiesburg community together.

Proposal Statement

Overview of Proposed Project/Activity/Event

- Brief Description – The Society of Physics Students will be working a booth in an event called Hubfest. We perform a series of demos illustrating concepts in light, thermodynamics, mechanics and other topics in physics. Lasers, liquid nitrogen, bed of nails, and other materials are used to demonstrate and explain concepts within the aforementioned topics. We have many people come to our table perpetually throughout the event, so we keep our demonstrations concise and more simple to understand.. This event has been a long standing tradition at our chapter with almost ten years of participation and the largest outreach event that we do for our community.
- Project Goals – Our demonstrations aim to attract audiences of all ages. These demonstrations capture attention and allow students and adults to observe the laws of physics firsthand. Short lectures accompanying each demo teach the audience about what they are seeing and invite them to think about physics later. This has proven effective as hundreds of people remember our liquid nitrogen marshmallows.
- Intended Audience -- Last year Hubfest had over 30,000 attendees. It is a great attraction for the city of Hattiesburg and brings in many people from nearby cities in addition to local attendees. Though our target audience is specifically children and young adults--because they are typically still undecided on what to study--we still promote the study of physics to people of all ages.
- Background and Motivation – This project aims to showcase physics concepts through visual demonstrations accompanied by short lectures, promoting the science to general communities who may not be likely to consider physics on their own time. The SPS chapter at The University of Southern Mississippi constructs new demonstrations every year, using the events as a way to not only demonstrate memorable demonstrations that they are familiar with and like, but we also introduce new demonstrations that our chapter works on to be used in other events down the line. Our chapter's primary objective is community outreach, and Hubfest allows us to extend beyond our usual school network and to present demonstrations on a much larger scale.

How Proposed Activity Promotes Interest in Physics

The Marsh W. White Award allows the SPS chapter at the University of Southern Mississippi to attend and host a booth at Hubfest. Because of the tens of thousands of attendees, our demonstrations are seen by thousands of students and adults from in and around Hattiesburg. Our demonstrations are visual explorations into concepts of thermodynamics, mechanics, and optics. Our liquid nitrogen marshmallow demonstration also allows us to directly interact with our audience and appeal to more than just their eyes. Before giving our short lectures, we ask questions of

audience members -- causing them to consider what they've seen in greater depth. This enables people of all ages to start thinking about physics for themselves. We plan to continue this cultivation in new and exciting ways for our audience as we've done in previous years.

Plan for Carrying Out Proposed Project/Activity/Event

- Personnel - Hubfest has a predetermined date. Our chapter's officers are responsible for deciding which demonstrations will take place as well as signing our chapter up for the event. The chapter will meet biweekly to decide when to purchase shirts, who will be attending the event, etc. Officers will ensure that all supplies are purchased and stocked. The Treasurer will be responsible for signing up our SPS chapter when the registration opens.
- Marketing - Hubfest is a well known festival and is marketed through the event coordinators and their public facebook page. Hubfest usually contains over 250 booths, and a large portion of these vendors also individually advertise for the festival.
- SPS member participation - 20 SPS members are projected to help throughout the day, working in five separate shifts of two hours. These shifts will include helping pack the equipment the day before Hubfest is scheduled to take place. External volunteers will be accepted only in the form of faculty from our Physics department. If fewer than 20 SPS members can attend, we can easily accommodate for such circumstances-- for our booth requires a minimum total of 7 members to successfully operate.
- Expertise - Our SPS chapter's active members are largely comprised of graduate students and upperclassmen undergraduate students. Many of our older members have been to Hubfest before and are experienced with this type of setting. Our chapter also has many members that actively participate in different kinds of research that relates to the demonstrations that we present. The Department of Physics and Astronomy provides additional support, including funding the acquisition of liquid nitrogen.

Project/Activity/Event Timeline

- Late January:
 - Register for the event
- Week of February 5-10:
 - Finish and submit T-shirt design
- Week of March 6-10:
 - Receive Member T-shirts
 - Purchase needed supplies
- March 23:
 - Last SPS meeting before Hubfest
 - Ensure that all attending members are briefed and have good understanding of the demos.
 - Purchase marshmallows
- March 24th:
 - Double check all equipment
 - Pack up equipment

- Purchase fresh flowers
- Complete liquid nitrogen fill
- Ensure that all students know where to arrive and at what time
- March 25th:
 - Get to the Hubfest site at 7am
 - Hubfest starts at 8am
 - Hubfest usually ends at 5pm
 - Take down and pack up equipment until 6pm

The specific dates of our SPS meetings are not yet finalized for next semester and may be subject to change

Activity Evaluation Plan

The number of booth attendees can be easily and efficiently ascertained by the number of materials that are popular with our booth such as marshmallows are remaining at the end of the day. Many people approach the booth and say, “I remember you guys had the marshmallows last year.” This indicates that the booth is both memorable and enjoyable enough to be approached again a year later.

We plan on recording how many groups of people approach the booth, and (separately) how many remain to witness the demonstrations. During demonstrations, we will count the number present who are actively listening and record how many people listened to each demonstration. Parents typically quiz their kids on what they learned, which shows that the parents value the information being presented by the booth.

Budget Justification

- 1.) Balloons - We put the balloons in liquid nitrogen to demonstrate what happens to a gas when it is cooled. We also use lasers to pop the balloons.
- 2.) Parabolic Mirror - We will use this device to show optics demos.
- 3.) Batteries - The lasers we use to pop the balloons are powered by batteries.
- 4.) Additional lasers – Lasers of various colors are used and a 100 mW laser is used to pop balloons

- 5.) Marshmallows - The marshmallows attract a younger crowd which helps get children interested in science early on.
- 6.) Flowers - The flowers are dipped in the liquid nitrogen and crushed.
- 7.) Produce - We cool products like bananas and apples and shatter them on the table. This often attracts viewers of all age.
- 8.) Hand sanitizer - We distribute marshmallows to children so it is important to keep our hands clean in order to prevent spreading germs.
- 9.) Paper towels - A lot of food items melt after they have been dipped in the liquid nitrogen and the paper towels will keep our demonstration area clean.
- 10.) Wet wipes - We will use these for the same reason we use the paper towels.
- 11.) Case of water to drink- The event is held in the middle of the day so it will probably be hot out.
- 12.) Hubfest registration - This is the cost to rent a booth from the year 2016.
- 13.) Racquetballs - This is also another item that we dip in the liquid nitrogen. When we throw the balls onto the ground they shatter like glass.
- 14.) T-shirts – This will indicate our affiliation to the public and will encourage participation of our society members.