



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 in communities. While outreach is primarily aimed toward students in K-12, downtown Hattiesburg's annual Hubfest allows SPS to present Physics demonstrations to people of all ages. The local festival attracted over 30,000 people in 2016.

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. At any given moment there are between 20 and 30 people at our booth. We perform demos illustrating concepts in light, thermodynamics, mechanics and other topics in physics. Lasers, liquid nitrogen, and a bicycle wheel are used to demonstrate and explain concepts within the aforementioned topics. Because our demonstrations are brief, our crowd is continuously changing--enabling us to present to thousands of people in one day. The society of Physics students has been participating in this event for almost ten years, so our members are confident in the material they are presenting.
- 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, placing the organization in an ideal position to promote Physics interest to audience members old and new. Our chapter's primary objective is community outreach, and Hubfest allows us extend beyond our usual school network for 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 host 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 to greater depth. This enables people of all ages to

start thinking about physics for themselves. Over the past year, our chapter has created three new demonstrations and is working on development of two more. This means that people who visited our booth last year will still be able to see something new.

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 seniors. 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 optics research, which comes in handy as many of our demos are related to optics.

Project/Activity/Event Timeline

- Late February:
 - Register for the event
- Week of March 4-10:
 - Finish and submit T-shirt design
- Week of March 18-24:
 - Receive Member T-shirts
 - Purchase needed supplies
- March 27:
 - Last SPS meeting before Hubfest
 - Ensure that all attending members are briefed and have good understanding of the demos.
 - Purchase marshmallows
- April 5th:
 - Double check all equipment
- April 6th:
 - Pack up equipment

- Purchase fresh flowers
- Complete liquid nitrogen fill
- Ensure that all students know where to arrive and at what time
- April 7th:
 - Get to the Hubfest site at 7am
 - Hubfest starts at 8am
 - Hubfest usually ends at 5pm
 - Tare 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 marshmallows 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.) Liquid Nitrogen - We use this to cool various objects: produce, marshmallow, flowers, etc.

- 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.