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

Marsh W. White Award Proposal

Project Proposal Title	Physics for the Public.
Name of School	University of Southern Mississippi
SPS Chapter Number	6626
Total Amount Requested	$499.99

Abstract

The SPS chapter at the University of Southern Mississippi promotes physics through educational outreach focused mainly towards students in grades K-12. One of the events at which we perform demonstrations is Hubfest, an event organized by the city of Hattiesburg which draws attendees from all over Mississippi and surrounding states. Through the Marsh W. White award we hope to perform various demonstrations regarding sound, optics and thermodynamics to the general public.

Proposal Statement

Overview of Proposed Project/Activity/Event

- Brief description – Hubfest is a day-long street fair located in downtown Hattiesburg, Mississippi. Our outreach to the general public during Hubfest consists of various demonstrations relevant to optics and thermodynamics. We set up in a booth and start with a demo of instantaneously cooled marshmallows through liquid nitrogen. The vapor produced usually draws people inwards and after explaining the science behind it we follow up with other demonstrations regarding lasers, diffraction gratings, propagation of waves and pressure.
- Goals of the project – Through this outreach, we hope to stimulate the publics' curiosity and interest in physics along with sharing our knowledge in topics relevant to our demos. Our secondary objective is familiarizing the general public with our organization, Society of Physics Students.
- Intended audience – Hubfest draws around 30,000 attendees through the day. We get to interact with people from various age groups and walks of life, but our target audience is mostly young children and adults to whom we can instill interest in physics and the sciences in general.
- Background and motivation – Our chapter has participated in Hubfest for almost 10 years and we have felt it to be a very rewarding experience overall in terms of showing people how fun physics can be and explaining the actual science behind it, something we love to share.

How Proposed Activity Promotes Interest in Physics

The event organized by the city will be filled with vendors and people from our state and neighboring ones. This will in turn create a diverse group of attendees with whom we can directly interact and share our love for science. We will be able to communicate to them the basic necessity of science and how fun it can be. The demonstrations we perform will promote a basic understanding of applied physics and illustrate concepts found in both a classroom and the natural world.

Our target group of students that will come from surrounding areas attend schools that have few resources, or curricula designed to support an interest in physics. An opportunity like this will provide them with much needed exposure to scientific ideas and applications. Participation in this activity will further strengthen our chapter by refining our experience in outreach and helping boost our positive relationship with the community.

The experiments that we plan on performing show a variety of phenomena, which not only entertain but also educate. When audiences are allowed to interact with the experiments their curiosity is engaged, which leads to them wanting to know the science behind it. By encouraging interest in the sciences, we hope to improve the chances that young people will pursue education, and ultimately careers, in STEM fields.

Plan for Carrying Out Proposed Project/Activity/Event

- Personnel – The event committee under the chairmanship of the event coordinator will be thoroughly planning out the event while all executive members will be involved in carrying it out.
- Marketing – Our group will be engaged in advertising the event through our school while the city of Hattiesburg itself will be advertising it in different locations through different media.
- SPS member participation – Every member in the chapter will be involved in some form. We have also requested volunteers from the student organizations for the American Chemical Societry (ACS) and the Society for Industrial and Applied Mathematics (SIAM) which are active in our school. We plan on doing multiple shifts of our members with at least one executive or faculty member each shift.
- Expertise – Our chapter boasts several active members who are experienced with outreach and the demonstrations we perform. We also have a lot of new members who are currently gaining experience through our Future Faces of Physics activity and are already looking forward to the this opportunity.

Project/Activity/Event Timeline

December 3, 2018: Register for Hubfest and start formulating plans for the set of demonstrations we'll be doing and if we want to add something new to it by building new demos through the winter break.

February 9, 2019: Assign respective projects to the Demo Committee if any new demonstration is proposed. Finalize a T-shirt design and send it for printing.

March 15, 2019: Start filling up time slots for the event, recruit volunteers as necessary explaining the objectives of the activity and their role in it. Have a finalized list of demonstrations that are ready, along with write ups.

April 6, 2019*: Finish preparations, send out remainders and contact information for possible carpooling and emergencies. Load up a university vehicle with necessary demonstrations.

April 7, 2019*: Day of Hubfest

7am: Drive to the location, set up booth (usually aided by faculty advisor).
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.

* Hubfest is currently expected to take place on the 7th of April, 2019 but has not been officially announced by the city yet.

Activity Evaluation Plan

The number of people that pass by our booth can be monitored by keeping a running count on the members that come by and interact. The executive member present will be tasked with this. We will also be providing comment cards for anyone interested, which will be helpful in receiving feedback for the event.

Another statistic is the number of pamphlets we give out, containing information about SPS, our chapter and our university in general.

Budget Justification

1. Balloons - We use balloons for about three categories of demos, balloons are placed in liquid nitrogen to demonstrate what happens to a gas when it is cooled. We also use lasers to pop the balloons and a balloon to demonstrate the effects of pressure using a small bed of nails.
2. Pamphlets – We use pamphlets for sharing information regarding SPS and our University to anyone that's interested.
3. Liquid nitrogen - We have used 10-20 liters of liquid nitrogen in recent years. We use it to cool different things like flowers and marshmallows.
4. Trash Bags – For general disposal purposes and also to layer below frozen flowers to make cleaning up easier.
5. Batteries - The lasers we use to pop the balloons are powered by batteries, other equipment we use.
6. Marshmallows - The marshmallows attract a younger crowd which helps get children interested in science early on.
7. Flowers - The flowers are dipped in the liquid nitrogen and crushed.
8. Racquet Balls - We cool racquet balls in liquid nitrogen and smash them on the floor (away from the crowd in a safe distance). This shattering attracts a lot of people as they find it amusing.
9. Hand sanitizer - We distribute marshmallows to children so it is important to keep our hands clean in order to prevent spreading germs.
10. 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.
11. Wet wipes - We will use these for the same reason we use the paper towels.
12. Case of water to drink- The event is held in the middle of the day.
13. Hubfest registration - This is the cost to rent a booth from the year 2017.
14. T-shirts – This will indicate our affiliation to the public and will encourage participation of our society members.
15. Portable High-powered Laser- We will use this to pop the balloons from a distance further away that our current lasers can.