

UNIVERSITY OF MARYLAND- COLLEGE PARK
SOCIETY OF PHYSICS STUDENTS

CHAPTER# 4155

November 15, 2013

Sounds Around

Prepared by:

Kevin Cheriyan

Associate Zone Counselor, Zone 4

cheriyan@umd.edu

Donna Hammer

Director of Education, Physics Department

dhammer@umd.edu

Faculty Advisor:

Dr. Sonali Shukla

sshukla@physics.umd.edu

Abstract: The Port Discovery Children's Museum located in Baltimore, Maryland is developing a permanent exhibit called "The Percussion Garden" as part of their STEM initiative. The goal of the Garden is to exhibit collections of musical instruments and other objects of acoustical significance that enhance understanding of various physics principles. The Society of Physics Students chapter at the University of Maryland- College Park is requesting a Marsh White award to help Port Discovery refine pieces in the exhibit, create signs that explain the science, and supporting demonstrations to the exhibit.

Overview of Proposed Project

The Society of Physics Students chapter at the University of Maryland has been looking for opportunities to do outreach events with the community at large, and was pleased to hear that the Port Discovery Children's Museum at Baltimore, MD was in need of assistance with their upcoming exhibit, "The Percussion Garden". The goal of the exhibit is to present children with the opportunity to learn about physical principles in sound while they are engaged in making sounds with the instruments. The target audience for the exhibit are mostly, although not limited to, children aged 2-12 years visiting the museum with their parents or classmates and teachers. Port Discovery is visited by nearly 200,000 visitors each year, since its opening in 1998.

Most of the instruments in the Percussion Garden were assembled from recycled objects. This emphasizes the accessibility and ubiquitousness of physics. The funds that are hopefully provided by the Marsh W. White Award will aid in acquiring some of these essential objects as well as materials needed to purchase equipment to demonstrations and signage that explain the physics behind each piece in the exhibit. Our chapter also wishes to introduce a section of the exhibit where various topics in sound are introduced in rudimentary but entertaining ways.

How Proposed Activity Promotes Interest in Physics

Next to each piece, our chapter would like to post a well-crafted and explained sign that details which physics principles are being utilized. The Museum already suggested that the exhibit be divided into 8 main sections that focus on the different properties of sound, i.e. pitch, amplitude etc. Some of these sections will include instruments that simulate the sounds of weather such as rain wheels, monsoon sticks, and ocean drums. In addition to explaining how these sounds are simulated, the UMD

SPS chapter will be given opportunities to design and present our own sections and demonstrations that introduce important topics in sound like amplitude, frequency, the Doppler effect, resonance, (relative) speed of sound, importance of air as a medium for propagation of sound, damping of sound etc.

Plan for Carrying Out Proposed Project/Activity/Event

Kevin Cheriyan, UMD SPS member and Associate Zone Counselor for Zone 4 will plan the details and demonstrations of the project. Additionally, Donna Hammer, the Director of Education at UMD's Physics Department will be working closely with the chapter members to see an effective and timely completion of the project. The chapter will rely on input from the Museum officials and visitors to gain knowledge about progress on the project.

Our chapter expects to send at least 15 members on a weekly basis to the Museum to work on the exhibit. Our chapter will ask the UMD chapter of the American Meteorological Club to help on the "Rain Tree" section of the exhibit. They will be assisting with the weather and meteorological events related pieces, such as monsoon sticks, ocean drums, rain wheels and thunder box.

Justification

The UMD SPS is requesting \$300.00 to help carry out the project. These funds will be used to rent a vehicle to transport students and supplies from UMD to the Museum in Baltimore in order to plan and install demonstrations and signage. The funds are also requested to help purchase materials and supplies for the demonstration construction and demonstration purchases. Lastly, the funds will be used to help with design and printing costs for signage. We have the support of the University of

Maryland Physics Demonstration Facility to help with fabrication and the Office of Student and Education Services to help facilitate the partnership with the Museum.