

Marsh White Award Final Report

Pennsylvania State University SPS
May 2011

As part of Penn State SPS, one of the largest events we participate in each year is the Eberly College of Science's Exploration Day. This is a day for local families to come and learn about a variety of science topics. The annual event is sponsored by the NASA Pennsylvania Space Grant Consortium and other organizations. This past April, Exploration Day welcomed approximately 3,000 parents, children and community members. Our chapter joined with over thirty from university science departments, science clubs, and local schools to showcase and explain a variety of science to the visitors. This is the fourth year that the Penn State chapter of SPS has participated in Exploration Day and it was once again a success. As the only Physics-specific exhibitor, we certainly hope to continue the tradition for years to come.

Fourteen Penn State SPS members joined together to run our exhibit of seven physics 'mysteries'. These mysteries were 1) can you predict the motion of a double pendulum as easily as a single pendulum? 2) How and why does sand dance? 3) Why do balloons shrink and flowers break when they get cold? 4) How do figure skaters spin? 5) How can beach balls levitate? 6) Can you call something back with your mind? 7) How do you make musical notes? The kids and their parents explored these questions with the help of our SPS members through an investigatory method. As in previous years, our participation was supported almost entirely by the Marsh White Award.

The demonstrations were envisioned and created by SPS members with the gracious assistance of our Physics department. Some were created from scratch, such as the "Dancing Sand" and Double Pendulum demos while others were taken from previous ideas. Various resources were obtained using the funding provided by the Marsh White award, with other resources supplemented by the Physics department. The table below outlines our budget for the event.

Final budget

Demonstration Principle	Expense	Cost (\$)
Slowing molecules	Liquid N ₂ and flowers	80.00
Chaos in a Double Pendulum	Materials	150.00
Sound Boom Whackers	SPS provided SOCK kit	0
Dancing Sand	Provided by Physics Dept	20.00
Bernoulli Ball	"	0
Angular Momentum	"	0
Conservation of Angular Momentum	"	0
Total		250.00

In the future, we hope to not only continue our participation in Exploration Day but to use these resources, demonstrations, and experiences toward future outreach events. Both the double pendulum and "Dancing Sand" demonstrations were newly created this year. They were both successful at Exploration Day but we are working with the department staff to refine them even more for future use (possibly as lecture demonstrations!)

Select photographs from SPS Exhibit:



Chris Grigas leads a demonstration on shrinking balloons with liquid nitrogen.



A child discovers angular momentum on the “Spinny Chair”



Tyler Frisch adds even more excitement to the wonders of angular momentum by showing how a bike wheel can defy gravity.



Samhita Banavar and Emily Kremmel explain the nature of sound waves using Boomwhackers.



Blair Porterfield and Nathaniel Shaffer further explain the nature of sound using sand and a membrane over a speaker.



Adam Bell helps children discover the mystery in the Bernoulli Ball.



Some SPS member volunteers gather after Exploration Day for a group photograph.
Top row: Chris Grigas, Tyler Frisch, Phil Krosnar. Bottom Row: Lynn Ondrusek, Calvin Baldasari, Jason Bartell, Nathaniel Shaffer, Lena Bradley, Brett Scheiner, Adam Bell

Photo Credits: Lena Bradley and Alex Chinchilli

Exploration Day 2011 webpage and press:

2011

EXPLORATION DAY

A **FREE** hands-on science event for everyone!

SATURDAY, APRIL 9, 2011

10:00 a.m. - 3:00 p.m.

FREE PARKING!

40+ Science Exhibits!

Rocket launch at 12:30 p.m.*!

**please arrive at 12:15, see website for more details*

- aircrafts and vehicles
- astronomy
- biology
- bugs
- chemistry
- DNA
- ecology
- electricity
- fossils
- metals
- physics
- robotics
- telescopes and more!



Sponsored by the NASA PA Space Grant Consortium, the Penn State Astrobiology Research Center, and the Eberly College of Science. Free parking sponsored by Penn State Transportation Services.

BRYCE JORDAN CENTER

on the Concourse

explorationday.psu.edu



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<http://explorationday.psu.edu/index.html>

Note: the bottom two circular pictures show SPS members participating in the 2009 and 2010 Exploration Days!

<http://live.psu.edu/flickrset/72157626351703125>

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