



Cleveland State University Funding of Physics Fridays Outreach

Anna Ellis, Dr. Kiril Streletzky



ABSTRACT

The CSU Society of Physics students uses grant money to fund a Friday outreach program to the nearby Campus International Elementary school. Each outreach event consists of interactive demos, lessons, and interaction between K-8 students and SPS volunteers. The program allocates money granted by the Marsh W. White award to fund the materials necessary for each activity. The program introduces young students to physics and generates an early interest in physics education and study.

Introduction

Physics Fridays fosters an interest in physics and STEM education at an early age. Students engage with hands-on demos with the guidance of SPS volunteers who include: CSU faculty, alumni, and physics students.



Above: SPS outreach team.

Below: Campus International Students participating in a demo



Funding

The Marsh White award is administered through the Society of Physics Students every year. The Friday outreach program is funded in large part with this award. Funding provides the program with materials for interactive demos and lessons.

Activities

The planned activities for the Spring 2019 SPS outreach day are all themed around gas and fluids. Students will identify the common fluids they interact with every day, as well as fluids they do not get a chance to experiment with regularly. The Marsh White funding was used to acquire various fluids and materials that help the students interact with those fluids. Experiments are designed to encourage students to experiment at home.

Water and Its Properties

The “Water” event will include demos showcasing: Super-saturation of water, buoyancy of water and other liquids, water’s chemical composition (including an electrolysis demonstration) and water’s ability to conduct electricity and complete electric circuits. These safe and engaging lessons encourage experimentation at home with a safe and abundant resource.

Air and Other Gasses

The “Air” event will include demos showcasing: Buoyancy of air and other gases, the density of air and how it affects sound (compared to denser and less dense gases) and some chemical properties of the components of air. These lessons teach students to think more deeply about the materials and concepts that they interact with in everyday life.

Weird Fluids

The “Weird Fluids” event will showcase non-Newtonian fluids, adhesives, gallium, plaster, liquid nitrogen, and thick fluids such as honey. This batch of lessons informs students of a variety of fluids they interact with little. The materials can be expensive, messy, dangerous, or all of the above, so students will have little opportunity to explore these materials again on their own.



CSU Visitation Day

On visitation day, the students will be given insight into the daily work of physics students and faculty at CSU, allowing them to gauge interest in a subject they are otherwise not exposed to until high school. Students are provided pizza and the day is ended with a batch of ice cream made in front of the students using liquid nitrogen. This opportunity establishes a relationship with Cleveland State University at a young age, and having science interest fostered early encourages the children to pursue it further later in life.



Going Forward

The SPS chapter at CSU has held outreach programs at Campus international for years, and it has become a favorite of both the students and faculty there. SPS is building on the program’s previous successes to plan for more ambitious outreach events. The continued support of SPS volunteers and the Marsh White award allow the program to continue growing and serving the community.

Acknowledgements

Jim Pitchford, Christian Gunder, April Smith, Ilona Tsuper, Dan Terrano, Tony Dobrila, Samantha Tietjen, Ngozi Williams, Anna Ellis, Billy Calabrese