Outreach: The Roots of STEM
A Conference Motivating Learning Through Outreach
Utah State University
Saturday May 16, 2008

Descriptions of Activities

9:00-9:15 Welcoming/Opening—Jan Sojka (Head, USU Physics)

9:15-9:35 LaserFest, PhysicsQuest and the Web: Outreach on a National Scale—Rebecca Thompson-Flagg

9:35-10:20 Merits of Outreach Panel Discussion

A panel of secondary teachers, educators, and outreach sponsors will lead a roundtable discussion on the issues outlined in the workshop objectives. The panel (see below) represents a wide variety of backgrounds and experiences, bring diverse perspectives to the issues to be discussed. Questions and comments will be solicited from the workshop participants.

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10:20-10:40 Really? That Was Outreach?!?—Rob Davies (USU Physics)

Important, complex and fascinating scientific issues permeate our society. As scientists and science teachers, our insights on these contemporary issues -- from microscopic black holes to vaccinations, from climate change to nuclear waste -- are constantly sought by a variety of audiences outside our classrooms. These include parents, other teachers, and school boards; friends and families, neighbors, and tablemates at the church social. Their motives range from simple curiosity, to sincere efforts to disentangle a morass of confusing and often conflicting media-based information. I propose that these interactions are among the most important outreach in which we will ever engage. They merit thought on how to best approach these diverse audiences, even when when we have no particular expertise on the issue at hand.
10:40-11:00  Food Break

11:00-11:45  Waves Is Waves…
Share, Compare & Report: Designing Outreach Follow-Up Activities
Max Longhurst, USU School of Teacher Education and Leadership
(Tiana Jones, USU Physics, Jamie Tomlinson, USU Physics)

Central to outreach is identifying the core knowledge at the focus of the activity and extending the learning into the classroom. This exercise chooses a topic from standard core curriculum, waves, and asks participants to brainstorm development of in-class curriculum that builds on experiences common at USU Physics Day at Lagoon to relate amusement park physics outreach to this seemingly distant topic.

11:45-12:05  A Conversation around Successful Outreach — Eric Packenham
(USU School of Teacher Education and Leadership,)

What are the strategies for successful physics teaching and learning? How do we create a physics class where students are applying physics and engaged their learning? How do we provide an outreach experience or similar engagement opportunity that enables students to gain effective communication skills while actively participating in real-world situations? Outreach also provide a means of bringing service learning into the mainstream of science education and producing educated citizens.

12:05-2:00  Sack Lunch
Participants are encouraged to wander around the Eccles Science Learning Center atrium with their sandwiches and drinks. Numerous, activities, displays, demonstrations, and discussion opportunities will be available.

Educator Poster Competition on Use of Outreach Activities in Classrooms
Teachers can present posters on their use of outreach inspired activities in their classroom (and have a chance to win some stellar prizes).

Shopping for Outreach Opportunities: Sponsor Displays, Posters and Handouts
There will be an opportunity for teachers to have one-on-one interactions with sponsors of many diverse outreach activities to see what best fits their specific curriculum. A complete list of outreach activities on display is provided below.

FIRST and Mindstorms Robotics Demonstrations
Groups from the two robotics outreach activities and competitions will have their robots running around the atrium for all to see. They will be able questions and provide information for those interested in becoming involved.

2:00-2:20  Encouraging Students to Excel in Science—Jessica Tams (Casual Games Association)

Encouraging students to view science as an important educational pursuit can be challenging. By helping your students to understand the real-world applications and local opportunities for employment can make the job easier.
2:20-2:40  Astronomy One On One—Shane Larsen (USU Physics)

Utah has many astronomical facilities that can serve as focal points and destinations for student experiences in science. In this talk we'll describe some of these facilities, and talk about how they can be used to enhance your students' exposure to science (and to astronomy in particular).

2:40-3:00  What can USU do for you?—
Michelle Larsen (Associate Provost, USU)
Mary Hubbard (Dean, College of Science)
Gayle Bowen (Space Dynamics Lab)
College of Education
College of Engineering,

3:00-3:30  Wrap Up Discussion
Poster Awards
Educator Door Prizes

3:45-5:00  Make-It-Take-It Activities

Marble Coasters (Tonya Triplett, USU Physics)
Make a simple marble coaster with tubing and BB’s taped to the wall. This provides a great mock roller coaster for the classroom, that students can readily customize to quantitatively demonstrate principles of conservation of energy, kinetic and potential energies, friction, angular momentum and more.

Accelerometers (JR Dennison, USU Physics; Brent Sackett, Pasco Scientific)
Compare the performance of commercial accelerometer kits from Pasco Scientific to a very simple (and inexpensive) alternative.

LED Flashers (Rebecca Thompson-Flagg, APS)
LEDs are used in everything from game systems to stop lights. Learn how they work and why they are so special. Then take a wearable one home with you!

Spectroscopes (James Coburn, USU Physics)
Make a set set of simple diffraction gratings for your class. These can be used to observe the dispersed light in a spectrum from common light sources, LEDs and lasers, and atomic spectral tubes. Compare your results to more sophisticated spectrometers.

Investigation Activities

Accelerometers and Elevators (Brent Sackett, Pasco Scientific)
Investigate acceleration on elevators and other common motion devices using the high end 3 axis accelerometers and altimeters from Pasco Scientific.

Roller Coaster Structure Systems (Brent Sackett, Pasco Scientific)
Use force sensors and photogates to measure the motion of carts on these engineering structures. Discover how precision measurements with computer data logging can extend the physics that can be explored with these structures.