

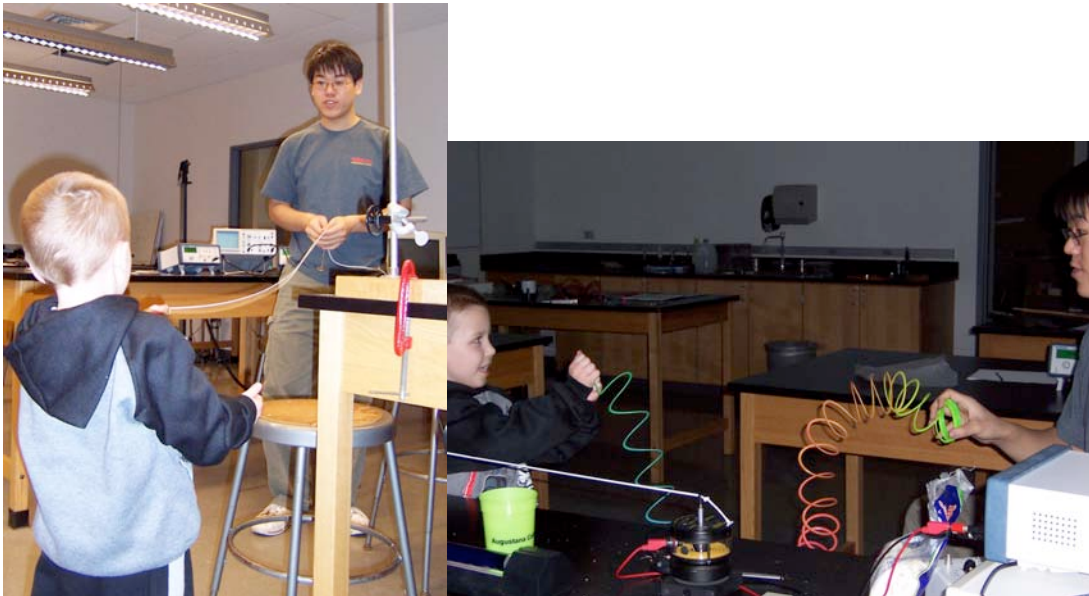
Augustana College Marsh White Outreach Award Report 2011

The Augustana College SPS Chapter held a Laserfest Open House to help celebrate the 50th anniversary of the laser. Approximately 40 people were in attendance, many of them families with young children. Our goals were to show participants the fascination of science, and to teach about the properties of light and lasers. It was a success!

There were several demonstrations at the open house:

Standing waves:

Standing waves were demonstrated in strings, slinkies, and microwaves. The standing microwaves melted marshmallows for delicious cracker sandwiches! Waveforms were also viewed on an oscilloscope, which turned out to be very fascinating to the older children in attendance.



Above: Andrew Kim and visitors create standing waves in string and slinky.

Fiber Optics:

You often see light from laser pointers traveling in a straight line. Many people are unaware that light can be made to follow a curved path for fiber optic communication. This fact was presented using a green laser pointer, a larger plastic fiber, and a stream of water from a tank.

Mirrors:

Plane-mirror reflections are very familiar, but what happens when you place two plane mirrors at right angles? What if the mirror is not flat? Can mirrors be used to make a toy pig appear to float in mid-air? The answers to these questions were explored in our hall of mirrors.



Above left: Curved mirrors reflect children fascinated by toy pig which appears to float in mid-air.

Above right: Mark Warren shows a participant what happens when they wink at their image in the corner reflector.

White is Colorful:

We explored the rainbow of colors that make up white light using prisms, soap bubbles, and diffraction gratings. Then we contrasted how light from a laser pointer did not spread into a rainbow of colors.

Laser Light Show:

We used the output of an mp3 player to drive motors to make a laser beam dance to the music.



Above: Kyle Weigand shows visitors a laser beam, which is dancing on the wall behind them (though it is drowned out by the camera flash).

Laser Maze:

Open House attendees were challenged by a maze – not one they had to traverse, but one they had to reflect a laser beam through. A fog machine helped them see where their laser beam was, while they placed mirrors to guide it around obstacles and through openings to the finish line!

Incurred expenses:

- 2 Pasco lens holders (used to hold mirrors for maze) \$40
- 5 red laser pointers: \$25
- 1 green laser pointers: \$43
- LED keychains (as giveaways): \$50
- marshmallows, crackers \$5
- bubble soap \$3
- 2 Laser safety goggles-532 nm: \$70

More photos and larger versions of these photos can be found at <http://helios.augustana.edu/physics/club/2010/slides/21.html>