

# **Society of Physics Students Future Faces of Physics Award Final Report (2013)**

Indiana Wesleyan University

*Prepared by Robert Burchell, IWU-SPS President*

Indiana Wesleyan University's Society of Physics Students partnered with the Boys and Girls Club of Grant County, Indiana to perform physics outreach for predominantly minority kids from rural Marion, Indiana. The goal was to raise awareness and appreciation for science, in general, and physics, in particular, among kids attending the after-school program of the Boys & Girls Club, and open the minds of these students to career opportunities in physics. The kids at the the Boys & Girls Club come from mostly financially-needy families of Grant County, IN, a Central Indiana county many consider as a depressed area. The outreach was held at the community center of the Boys & Girls Club. The event impacted over one hundred inner city kids and involved about a dozen IWU-SPS members and IWU student volunteers who ran the different physics demonstration stations. The different stations focused on the following themes: optical illusions, static electricity, microwave radiation, low temperature physics, energy, and hovercraft/zero friction. The stations passed around printed material describing the different career possibilities associated with the different themes.

The event began at around 4 pm with the arrival of several carloads of SPS members and volunteers and a van full of physics demos, including those acquired through SPS Future Faces Award funds and some borrowed from the IWU Physics Department. The kids, mostly grade to middle school ages, were seated on bleachers and oriented by SPS President Robert Burchell on the nature and mechanics of the event. Many were excited and curious because this was their first science outreach event. The young crowd then split up into smaller groups as they huddled around the stations that interested them. In particular, the stations included:

1. **Optics station** – consisted of optical illusions demos including an “infinity mirror”, that relied on multiple reflections that make it seem that there was an infinite

number of lights behind a shallow picture frame. There was also a Disappearing Coin demo.

2. **Microwave station** – consisted of a microwave oven used to wirelessly energize a lightbulb, create sparks on a CD and compare the effects of microwaves on liquid nitrogen, ice cubes and water. Kids were challenged to predict the effects (almost always wrong), perform the experiment, and explain the results.
3. **Hovercraft station** - demonstrated the effects of low friction. This was a favorite attraction and had the longest line of kids of all ages.
4. **Static electricity station** – Using a van de Graaf generator, kids performed experiments, including levitating aluminum pie pans, Corona discharges, and how high voltages could be safe and cause hair to rise.
5. **Alternative Energy** – Students examined closely a hydrogen car and saw how clean energy can cause a toy to move.
6. **Low Temperature Station** – Always a favorite, many kids saw, for the first time how soft, flexible petals turned into brittle, glasslike materials.

The outreach event was well-received by both kids and Boys & Girls Club administrators. In fact, they posted their appreciation of what they termed “**Physics Day**” and pictures on the Boys & Girls Club Facebook page:

<https://www.facebook.com/media/set/?set=a.10151510544330862.1073741825.139840060861&type=1> The following are excerpts taken from their Facebook page:

*“Check out our Physics Day Album! Thanks to [Indiana Wesleyan University](#) students for teaching our kids! The Club kids LOVED using liquid nitrogen to freeze roses and make ice cream, maneuver a hoverboard, and become part of an electrical circuit.”*

On the Indiana Wesleyan campus, the community outreach attracted attention and was mentioned in a feature article on the IWU Spectrum Blog which appears on the home page of the university webpage (See enclosed scan of the article). This type of educational

outreach is relatively new to the IWU community, particularly in a discipline where it does not have a major. Some excerpts from the blog:

***“SPS also received the Blake Lilly Prize for physics outreach in June 2012, and a Future Faces of Physics Award in December 2012 for their proposal to work with the Boys & Girls Club of Marion to promote physics through high-impact demonstrations and hands-on experiences to middle school and grade school minorities.”***

For their part, SPS students and volunteers, all of whom are not physics majors, were mostly amazed at how receptive young kids are when it comes to physics experiments. One student volunteer even remarked that the physics outreach experience affirmed a personal decision to teach science as a vocation.

**Expenditures**

Liquid Nitrogen, flowers, milk, balloons, cups,	\$ 50.00
Solar Energy Kit	\$ 70.00
Hydrogen Car Racer	\$125.00
Aluminum plates, Smoke Filter Experiments	\$ 30.00
Transportation	\$ 25.00
<b>Total:</b>	<b>\$300.00</b>



In one afternoon, the IWU-SPS chapter transformed the Boys & Girls Club basketball court into an educational museum of physics phenomena.



IWU SPS vice-president Josh Ostrander demonstrates what happens to the thin metal of a CD when exposed to microwaves.



Kids from Grant County fall in line for the one-man hovercraft ride demonstrating frictionless travel.



(Left) SPS Member Nick Cheeseman discusses the Van De Graff generator. (Center) SPS Member Amanda Wolfe explains how the “infinity Mirror” works. (Right) Kids enjoyed riding a one-man hovercraft with the help of SPS volunteers.



SPS member Kaley Necessary pours liquid nitrogen as she creates liquid nitrogen ice cream for Boys & Girls Club wards.



SPS members and volunteers pose with kids from the Boys & Girls Club of Grant County, Indiana. (Left to Right): Dr. Roberto Ramos, Kaley Necessary, Nick Cheesman, Brandon Cesario, Kyle Davidson, Aaron Amos, Amanda Wolfe, Robert Burchell, and Josh Ostrander.

## DOING SCIENCE

### IWU's Society of Physics Students just keeps winning awards

Posted 87 days ago by Indiana Wesleyan University (<http://www.iwuspectrum.com/author/trevor-persaud@iwes.edu/>)



Email

([mailto:?subject=Doing Science&body=http://www.iwuspectrum.com/doing-science/](mailto:?subject=Doing%20Science&body=http://www.iwuspectrum.com/doing-science/))

Somehow, IWU's Chapter of Society of Physics Students got into the habit of winning awards. Now they just can't seem to stop.

For the second straight year, the SPS has received a Marsh White Outreach Award from the American Institute of Physics.

This brings the group, which was founded a little over 12 months ago, to a total of four national awards since its inception.

It's really starting to seem like a trend.

The Marsh W. White is designed to go to chapters of the Society of Physics Students "to support projects designed to promote interest in physics among students and the general public (<http://www.spsnational.org/programs/awards/white.htm>)." This year, the SPS received the award for a physics outreach proposal entitled "Physics Outreach using Modern Medical Physics."

The proposal was written by students Robert Burchell and Josh Ostrander, with SPS advisor Dr. Roberto Ramos. It came with an award of \$300 to purchase physics demos and an opportunity to be featured on the national SPS website.

The SPS regularly holds educational events for students in the Marion/Grant County Community. This April, SPS will present "Physics in the Medical Field" on April 8, 2013, 6-7:30 pm at the Commons of the Barnes Student Center.

The event will feature hands-on demonstrations with fiber optics, ultrasound, light, microwaves, liquid nitrogen, superconductivity and electricity. Students from middle schools, high schools and universities (including IWU), and their families are invited to come. Last year, SPS did a similar outreach with more than 150 participants.

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(<http://www.iwuspectrum.com/doing-science/doing-science/>)

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