



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Future Faces of Physics Award Report

Project Proposal Title	PhysX: High School Girls Exploring Opportunities in Physics
Name of School	Utah State University
SPS Chapter Number	7579
Project Lead (name and email address)	Vanessa Chambers Vanessa.chambers@usu.edu
Total Amount Received from SPS	\$499.26
Total Amount Expended from SPS	\$483.21

Summary of Award Activity

Utah State University hosted their second annual event, PhysX, in November 2018. PhysX is an overnight outreach event targeting girls in high school aimed to increase student interest and experience in physics prior to the submission of college applications. During PhysX students meet faculty and current students, complete hands-on workshops, and discuss difficulties inherent to minority students with tips on where to find help when needed. Local support has been overwhelmingly positive, and our team has enjoyed working with young girls interested in STEM.

Statement of Activity

Overview of Award Activity

Description:

Students were recruited for PhysX through high school teachers and advisers, social media marketing, and in-person advertising at Physics Day at Lagoon in summer 2018. Students who attended PhysX met with faculty and current students for a networking dinner that featured a panel of students (a first-year undergrad, a fourth-year undergrad, a master's student in technical writing with a B.S. in physics, and a PhD student in physics) who discussed their pathways to physics and answered student questions. Following dinner, students learned the physics behind lightening by making their own Lichtenberg figures under supervision of current students.

After spending the night at the University Inn on USU's campus, students met for a breakfast talk with Tonya Triplett, a principal lecturer at Utah State and the first woman to attend Nuclear Power School with the US NAVY. Tonya spoke about being a pioneer in her field as well as ways that young students today can make an impact in their fields and their communities. Students moved to an undergraduate physics laboratory classroom to build piezo-electric generators following a discussion of the physics behind exchanging motion for electric energy. Each student built their own generator and took it home.

Lunch was held at the TSC Marketplace, the on-campus cafeteria, so students could be exposed to what life as a USU Aggie would be like if they chose to attend Utah State. The final workshop explored thermodynamic principals critical to physics using cold ice cream and hot chocolate syrup for a fun, interactive physics lesson. PhysX concluded with a short discussion on the physics principals learned over the weekend and an invitation to join us at Utah State as physics students.

Outcomes:

Minority students in physics were exposed to physics using interactive, hands-on workshops with peer mentors to guide their activities. Attendees met current physics students and had the opportunity to ask candid questions about life as physics students and future career opportunities in physics.

Audience:

The target group for PhysX was women in grades 9 – 12 from Northern Utah. Twelve students registered and attended.

Context:

USU's SPS chapter is committed to outreach and reaches an average of 300 community members monthly through large scale events. PhysX provides a more intimate and targeted activity to encourage women, a minority group in STEM, to develop an interest in and pursue physics.

Highlights:

The most popular activity was making Lichtenberg figures on the first night. Comments include: "I've never done something like this in my school", "This is actually really cute, can I make two?", "My brother is going to think this is so cool", and "Can I try again? I want to use less vinegar mix to see if it makes a cleaner burn path."

Impact Assessment: How the Project/Activity/Event Promoted Physics across Cultures

Goal: Attendees will network with faculty and current students in physics over dinner.

- Dinner was held in the physics department conference room. 12 attendees, 2 faculty members, and 9 current physics students attended and mingled with attendees. 4 current physics students, all female, participated in a panel discussion on their pathways to physics and their future goals as well as current work/life balance.

Assessment: Student survey responses

- 8/12 students responded “strongly agree” to the question, “PhysX has increased my interest in pursuing a career in physics”
- 9/12 students responded “strongly agree” to the question, “The networking dinner helped me connect with current faculty and students in physics”

Impact Assessment: How the Project/Activity/Event Influenced your Chapter

USU SPS members who helped plan and execute PhysX gained skills in event organization, fundraising, and mentoring. SPS members expressed enthusiasm throughout PhysX and have expressed interest in continuing the activity next year.

Key Metrics and Reflection

The Future Faces of Physics Award is designed to promote projects that cross cultures. What cultures did your project attempt to bring together? (Please be as specific as possible.)	Women in STEM. Attendees were 83% white and 17% Latina.
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "10 high school volunteers").	12 female high school students
How many students from your SPS chapter were involved in the activity, and in what capacity?	2 – planning 4 – event volunteers (workshop leaders/overnight chaperones)
Was the amount of money you received from SPS sufficient to carry out the activities outlined in your proposal? Could you have used additional funding? If yes, how much would you have liked? How would the additional funding have augmented your activity?	The funding was sufficient
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	Yes. PhysX is an annual event and we anticipate repeating it in Fall 2019
What new relationships did you build through this project?	Attendees met current physics majors and were provided emails for contact. Attendees were also encouraged to join the event Facebook group to keep in contact.
If you were to do your project again, what would you do differently?	Advertise the event through Girl Scouts of America and the Utah Women's Tech Council

Press Coverage (if applicable)

Radio interview with organizer Lori Caldwell - <https://www.kvnutalk.com/11-8-2018-2/>

Expenditures

Expenditures: hotel rooms for overnight stay, catering by Costa Vida for dinner Friday, materials for piezo-electric generators, Lichtenberg figures, and ice cream thermodynamics workshops, lunch at the TSC Marketplace Saturday.

Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
Costa Vida catering	Food for networking & panel dinner on Friday evening	324.65
Workshop supplies	Consumable items for hands-on workshop sessions	40.56
Marketplace entrance	Lunch for attendees on Friday afternoon at student cafeteria	112.50
Aggie Ice Cream	Consumables for ice cream thermodynamics workshop	5.50
Total of Expenses		483.21

Activity Photos

Please include captions and credits for each photo. By including photos below, you are giving SPS and the American Institute of Physics permission to use these photos in their online and printed publications.

Note that you will be encouraged to upload high resolution copies of your best photos directly to SPS via the FluidReview site when you submit your report.

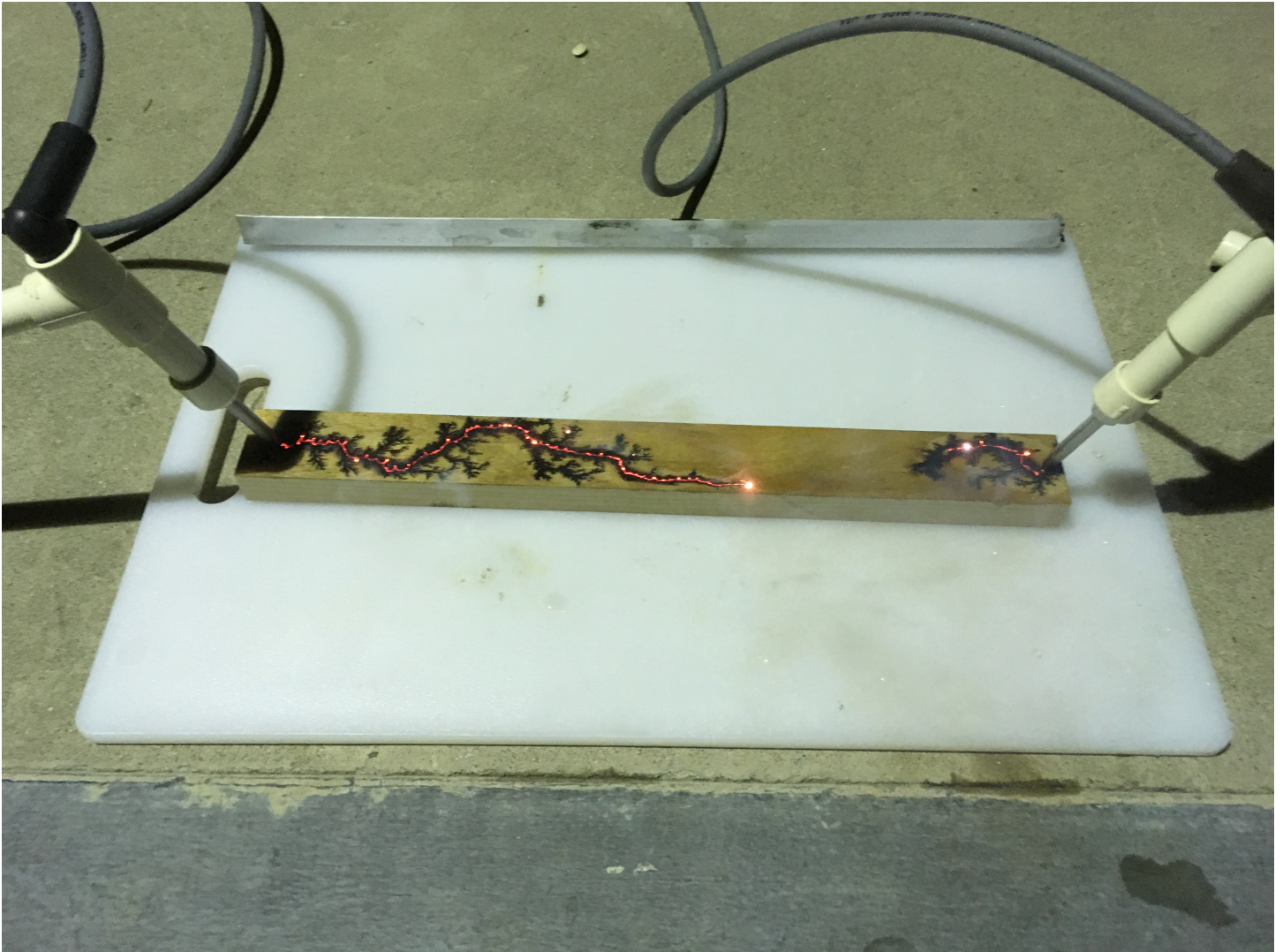


Figure 1. Lichtenberg figures (photo credit: Lori Caldwell)

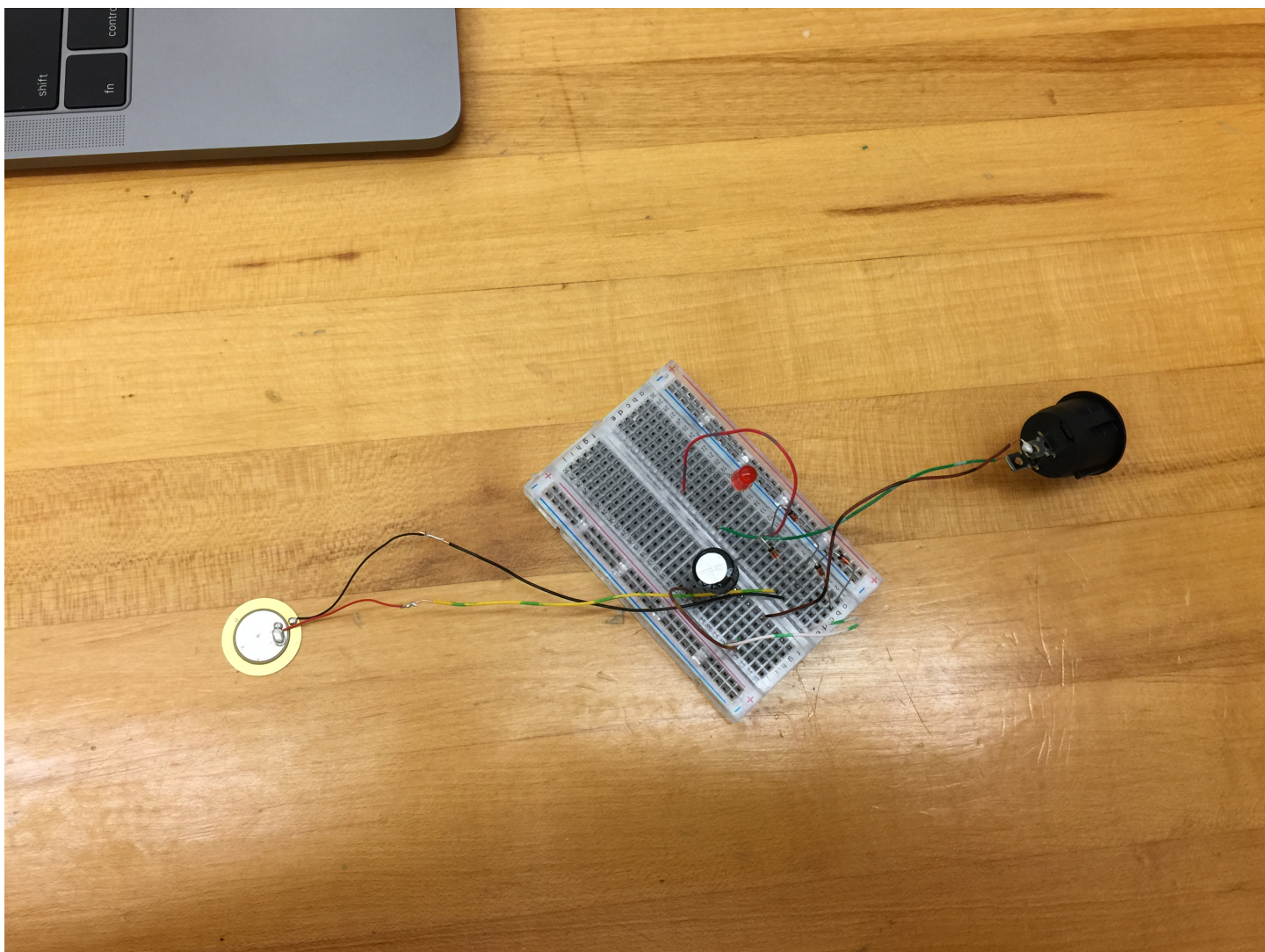


Figure 2. Piezo-electric generator. Students tap on piezo element (metal disk on left) to store energy in capacitor then flip switch (right) to light up LED (on board). (photo credit: Lori Caldwell)



Figure 3. Students building piezo-electric generators (photo credit: Lori Caldwell).



Figure 4. Students using ice cream and hot chocolate syrup to explore thermodynamic principles (photo credit: Lori Caldwell).



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Figure 5. Students calculating heat transfer from hot chocolate syrup to cold ice cream (photo credit: Lori Caldwell).



If you have any questions, please contact the SPS National Office Staff
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