



# SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

## Marsh White Award Report Template

*Instructions: Please complete each section after reading the purple text describing what should be in that section. Then delete the purple text.*

Project Proposal Title	[STEM Day Outreach at Florida Polytech]
Name of School	[Florida Polytechnic University]
SPS Chapter Number	[2054]
Project Lead (name then email address)	[Wyatt Lyptak; Email: <a href="mailto:wliptak2946@floridapoly.edu">wliptak2946@floridapoly.edu</a> Dr. Sesha Srinivasan (Faculty Advisor); Email: <a href="mailto:ssrinivasan@floridapoly.edu">ssrinivasan@floridapoly.edu</a> ]
Total Amount Received from SPS	[\$500.00]
Total Amount Expended from SPS	[\$500.00]

## Summary of Award Activities

Florida Polytechnic University's SPS Chapter successfully organized a STEM outreach Workshop for the Middle Schoolers in Polk County of Central Florida. The organizers comprises of SPS executive board members, and SPS Faculty advisors contacted Lawton Chiles Middle Academy for recruiting 6<sup>th</sup>-8<sup>th</sup> grade students to undergo training on STEM experiments related renewable energy, optics, motion dynamics and gravity and magnetic field mapping etc. at the Physics laboratories on campus. Around 25 students participated in this workshop and obtained their lesson plans from the SPS student volunteers who acted as mentors running the labs. This STEM outreach workshop was funded by SPS National Office by supporting with Marsh White Outreach Award.

## Statement of Activity

The statement of activities during our SPS Marsh White Outreach Award period are given below.

### Overview of Award Activity

- **Brief description – What did the project look like?**  
Florida Polytech University's SPS chapter members with Polk County's Lawton Chiles Middle Academy (LCMA) together conducted one day STEM Outreach Activity for Middle schoolers at the state of the art Florida Polytech's campus. A formal interaction session was arranged by the Middle school LCMA where our Polytech's SPS board members presented the STEM Outreach activities and its details to the Students Advisory Council Members (SAC) where the SPS Faculty Advisor Dr. Sessa Srinivasan was one of the members. LCMA Principal Mr. Brian Andrews and the SAC members agreed to advertise this STEM outreach flyers to LCMA students for their participation. It was chosen that the Saint Patrick's Day, Saturday, March 17, 2018 for the STEM outreach day. Website was created for the online registration process and communications with the parents of the students two weeks before the outreach workshop.
- **Outcomes – What did the project accomplish?**  
The SPS March White and Florida Poly's STEM outreach brings awareness to middle schoolers and introduce them to cool technologies such as renewable energy, nanotechnology, gravitational waves, optics and magnetism in general. Students performed the hands-on labs on the STEM outreach day and got certification after the closure ceremony. Students enjoyed while doing experiments and understood the Physics behind each experiments. The outcome survey was conducted after the STEM outreach and got a very positive response to conduct such STEM outreach workshops in the years to come.
- **Audience – Who was the target audience and how many people were impacted?**  
The target audience were middle schoolers from 6<sup>th</sup> to 8<sup>th</sup> grade primarily from Lawton Chiles Middle Academy in Lakeland, FL. There were 23 students and grouped them according to their grade level. Apart from students, some of the student's siblings and in fact their parents participated and performed experiments with their kids. They too enjoyed a lot in practicing Physics and Engineering with a guidance from our SPS student volunteers.
- **Context of the Project – How did the project fit in with the other activities of the SPS chapter and department?**  
Our STEM outreach workshop topics and projects are (see the Figure 1 below):
  - Physics of Light and Waves (Experiments from IEEE Photonics Outreach Kits)
  - Gravitational Fields (Experiments from SPS SOCK/PASCO Scientific's Roller Coaster Kits)
  - Renewable Energy and Sustainable Technologies (Experiments from Horizon Energy Lab Kits)
  - Magnetism and Magnetic Field Mapping (PASCO Scientific's Physics Lab Kits)

The above projects are well fit with other activities of our SPS FL Poly Chapter and our Physics department. For example the magnetic field mapping and light property measurement experiments are of an important labs for our undergraduate Physics students. SPS FL Poly Chapter also conducted in the past our students lectures on Gravitation Waves and our undergraduate

students do work on the Renewable Energy research areas for the undergraduate research experience or their summer internships.

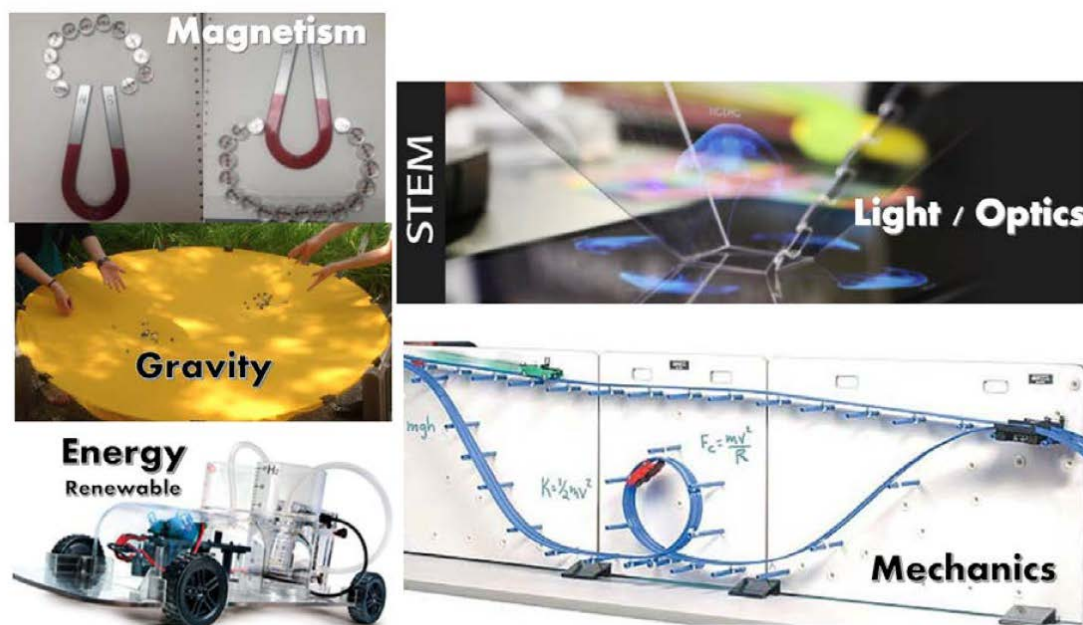


Figure 1: Types of projects for the STEM outreach Workshop

- Highlights and stories – Are there brief anecdotes that encapsulate the project? If so, please share.

In the Renewable Energy Lab Experiments, students built their Fuel Cell based Hydrogen Cars. After they built, they formed two teams and get out of the lab to the corridor of our IST building. A car racing was conducted between the student teams to see how fast and how long the car rolls with the amount of hydrogen in the fuel cells for converting to electricity to run the cars. In the light experiments, students turned off the lights of the lab and in fact performed the laser shooting with different colored lights and in fact experienced the diffraction and reflection properties of light. In the gravitational fields experiments and the roller coaster, students constructed the drive-way with different state-of-the-art configurations to test the energy and momentum transfers and overall the influence of gravitational forces.

### Impact Assessment: How the Project/Activity/Event Promoted Interest in Physics

- A list of the proposed project goals and commentary on whether those goals were met  
YES, the goals of educating younger generation of students about the modern technologies and concepts was successfully executed with the help of SPS Marsh White Outreach Award supported to our Florida Polytech's SPS chapter. At the end of the workshop, a small survey with questionnaires given to students to check their understanding and in fact about conducting any future workshops. It was overwhelmingly received a positive response from students to conduct such outreach activities in the years to come so the students can develop their professional and critical thinking skills.
- A description of the assessment plan and results from the project assessments  
A survey was conducted from the participating students about the easiness and nature of experiments. Overall, they would like to see some lesson plans with handouts would be helpful to perform and understand the concepts of Physics and Engineering. A Pre- and Post-test is planned.

## Key Metrics and Reflection

Please answer the questions below. Please indicate if a question is not applicable to your project.

Who was the target audience of your project?	<b>6<sup>th</sup> to 8<sup>th</sup> Graders</b>
How many attendees/participants were directly impacted by your project? Please describe them (for example “50 third grade students” or “25 families”).	<b>23 6<sup>th</sup> to 8<sup>th</sup> graders 2-5 siblings and parents</b>
How many students from your SPS chapter were involved in the activity, and in what capacity?	<b>4 SPS Board Members (President, Vice President, Secretary &amp; Treasurer), 10 SPS Member Volunteers</b>
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 and how would the additional funding have augmented your activity?	<b>Amount Received from SPS Marsh White Outreach Award - \$500 Florida Polytech’s Classrooms for free IEEE Light Experiments Kits – Gifted SPS-SOCK Kit – Gifted to FL Poly</b>
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	<b>YES, STEM Outreach Projects involving 3D Printing, Robotics and other Physics and Engineering Projects</b>
What new relationships did you build through this project?	<b>We have build reationships with Polk County’s school board</b>
If you were to do your project again, what would you do differently?	<b>We will ask students to build their own experiments and projects with minimal guidance from our student volunteers.</b>

## Press Coverage (if applicable)

If your project received press coverage, please include references or URLs to the coverage. When possible, attach copies of articles to this report.

### SPS-MARSH WHITE OUTREACH: STEM WORKSHOP @ FLORIDA POLYTECH

FLORIDA POLYTECH’S SPS (STUDENTS OF PHYSICS SOCIETY) CHAPTER/PHYSICS CLUB SUCCESSFULLY ORGANIZED THE SPRING STEM OUTREACH WORKSHOP ON SATURDAY, MARCH 17, 2018 WHICH WAS FINANCIALLY SUPPORTED BY PHYSICS CLUB AND SPS-MARSH WHITE OUTREACH AWARD. POLK COUNTY’S LAWTWON CHILES MIDDLE ACADEMY STUDENTS (6<sup>TH</sup>-8<sup>TH</sup> GRADERS) PARTICIPATED AND ENGANGED IN VARIOUS PHYSICS AND ENGINEERING DESIGN AND DEMONSTRATION ACTIVITIES. SPS/PHYSICS CLUB VOLUNTEERS MENTORED BY THE FACULTY ADVISOR DR. SESA Srinivasan SHOWCASED FOUR DIFFERENT LABS ON (i) TECH-LIGHT LAB ON LIGHT EXPERIMENTS, (ii) GRAVITY AND ROLLER COASTER LAB USING SPS-SOCK KIT, (iii) MAGNETISM AND MAGNETIC FIELD EXPERIMENT LAB AND (iv) RENEWABLE ENERGY AND FUEL CELLS LAB. STUDENT PARTICIPANTS AND THE POLY PHYSICS CLUB VOLUNTEERS RECEIVED STEM OUTREACH WORKSHOP CERTIFICATES FROM THE SPS NATIONAL OFFICE, WASHINGTON DC.

## Expenditures

The major expenditures are related to purchasing of stationaries, label markers, certificate printing papers and other printing materials. Other expenses related to photocopy of flyers and STEM outreach booklets with the in-kind support from Florida Polytech's copy center. Another major expenses was planned and will be procured for the next STEM outreach activities are T-Shirts with SPS logo. Finally, we have also waived the participants parking fee at the campus however, we have purchased bulk parking by paying some minimal fee to our parking and transportation department.

### Expenditure Table

Item	Please explain how this expense relates to your project as outlined in your proposal.	Cost
Parking Fee (for 25 participants)	Participants got waivership but SPS chapter paid the parking fee	50.00
Stationaries and Printing Materials Photocopying	This expense is allowed in our proposal	100.00
Snacks and Water	Since our outreach activities started from 10AM till 3PM, we purchased some snacks and water for our participants	150.00
T-Shirts with Screen Printing of SPS FL Poly Logo	Since we did not get time to purchase, we will be planning to get this for our future STEM Outreach which was approved by SPS National Office	200.00
<b>Total of Expenses</b>		<b>500.00</b>

## 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.

Figures 2a through 2i reflects the STEM Outreach Activities at Florida Polytech which was financially supported by the SPS Marsh White Outreach Award.



Figure 2a: STEM Outreach Activity on Gravity Experiment



Figure 2b: STEM Outreach Activity on Magnetic Field Mapping Experiment



Figure 2c: STEM Outreach Activity on Light/Laser Experiment



Figure 2d: STEM Outreach students, their siblings, and parents with volunteers after performing the Renewable Energy Experiments



Figure 2e: STEM Outreach Activity at the Physics Lab, performing Roller Coaster Experiment





Figure 2f: STEM Outreach Activity at the Renewable Energy/Fuel Cell Cars Experiment



Figure 2g: STEM Outreach Workshop closure ceremony and certificate distribution



Figure 2h: STEM Outreach Workshop closure ceremony and certificate distribution



Figure 2h: STEM Outreach Workshop closure ceremony and certificate distribution



Figure 2i: STEM Outreach Workshop closure ceremony and certificate distribution



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