



SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

Future Faces of Physics Award Report

Project Proposal Title	Undulating into the Future of Public Pendulums
Name of School	University of Texas at San Antonio
SPS Chapter Number	Chapter# 7272
Project Lead (name and email address)	Shaylynn Clark (ShaylynnClark@gmail.com)
Total Amount Received from SPS	\$100.00
Total Amount Expended from SPS	\$38.92

Summary of Award Activity

Building and demonstrating pendulums in partnership with the Society for Advancement of Chicanos and Native Americans in Science chapter has expanded our reach of science to a minority within the physics community. Focusing on making a positive impact in the student demographic at the University of Texas at San Antonio with a public demonstration. Breaking down the formulas behind the physics of the project brought together several members of our SPS chapter and helped to reinstate their understanding of the concept. After the final pendulum was built, we not only gained new members, but we successfully helped to diversify our chapter.

Statement of Activity

Description:

Originally our project was partitioned into two subsets: a short term project to spread awareness of physics to the surrounding community to help increase the diversity in physics, and a long term project that would include several student organizations and partnerships to construct a Foucault pendulum to have a much greater impact in the physics community at The University of Texas at San Antonio.

Outcome:

Planning and using this project to excite new SPS members, we achieved our first goal of diversifying the chapter. As mentioned in the proposal, UTSA is a Hispanic Serving Institution (HSI). The minority is only about 20% of the physics community, based upon [UTSA student demographics](#).

Audience:

We wanted to focus on the minorities of UTSA and increase their involvement in the chapter. We worked with SACNAS, Society for Advancement of Chicanos and Native Americans in Science, to help increase minority involvement in the chapter.

Context of the Project:

In previous years our chapter has been very involved in public demonstrations with our liquid Nitrogen ice cream, and Forrest Hills Library "Space Day" events, so incorporating a public awareness project into our mission for this year was simple. As a chapter we incorporated several new members into the project and allowed for new idea input. Team building skills amongst senior members and fresh ideas of new members combined to increase the effectiveness of this project.

Highlights:

One new member in general significantly affected the project. Ivan Beeks stepped up as a leader and took on the role of project lead. His duties consisted of keeping the project on track, assigning duties, and helping to assemble the final structure. Overall he positively encouraged new members to be more active in the project as well as other SPS activities.

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

The project's goal was to focus the project toward the general student populace hoping to draw more minorities into the science community. With partnerships like SACNAS, the chapter will have resources to help aid in accommodating to that minority. After recruiting new members into the chapter, we feel that we have successfully incorporated new members to help affect the diversity within the sciences. Ivan Beeks a role model, and a successful African American physics student, helped to include many new members in this project. Working in partnership with SACNAS, our SPS chapter has built the foundation for an outreach event that we can turn over to the future members of our chapter.

We wanted to start a project that had an ongoing effect on the community. Seeing that our wave pendulum is a simple project that is cost effective, interesting to the viewer, and will attract a wide range of audiences we will be able to make more pendulums and incorporate a public workshop to continue to build our minority communities within the science. Extending the project to the academic communities surrounding UTSA, we can help to influence young minds to be excited about physics.

After this semester, we have increased our membership to 20 members. Many of the new members are also in association with SACNAS allowing for greater partnership between the two student organizations. Referring to the UTSA [enrollment statistics](#) for this past semester, out of the total 26,346 students registered, 4,488 students

were registered in the college of sciences. Overall, of the 26,346 students 63.3% of those students were a minority. Helping to improve the Hispanic/Latino diversity that stands at 46.4% and the African American diversity of 8.7%, we can help to diversity our chapter.

Ivan Beeks is a prime example of how we can help to improve diversity. Allowing a strong leadership role amongst his peers helps to encourage others to get involved.

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?	Minorities within the physics community.
How many attendees/participants were directly impacted by your project? Please describe them (for example “50 third grade students” or “10 high school volunteers”).	
How many students from your SPS chapter were involved in the activity, and in what capacity?	5 SPS members
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?	\$100.00 Seeing that we were under budget, we can use the remaining funds to build multiple pendulums as well as paint them to represent the university.
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	We plan to use this project as an outreach project at surrounding schools, and on campus during student activities to help diversify the physics department.
What new relationships did you build through this project?	We have created a new partnership with the student organization SACNAS.
If you were to do your project again, what would you do differently?	We would build a larger pendulum as well as paint it. Possibly using different materials allowing for an outside demonstration.

Press Coverage (if applicable)

N/A

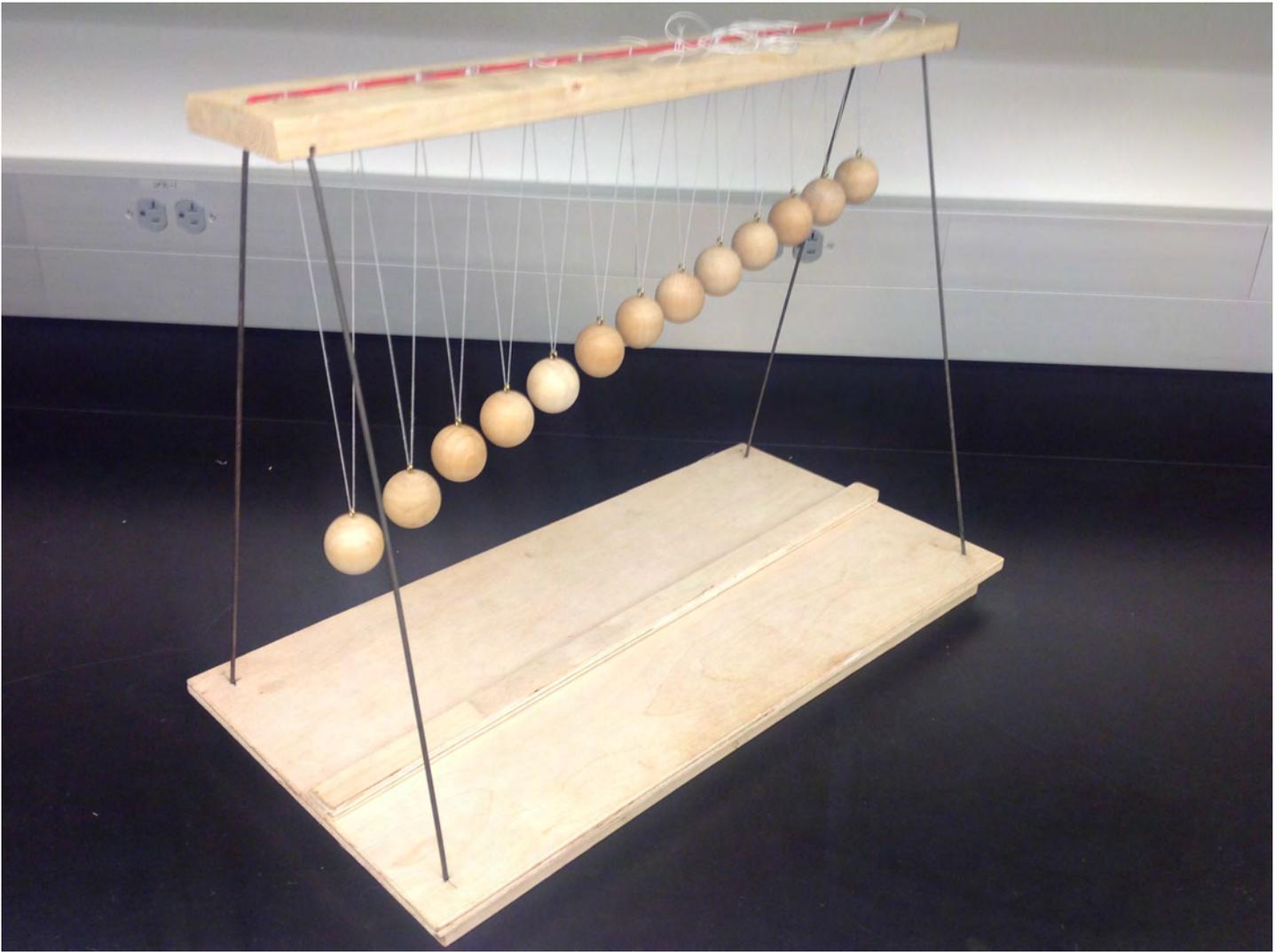
Expenditures

Overall the project was very cost effective. We budgeted about \$50 for one pendulum. We were able to build the pendulum for \$38.96. As far as the remaining funds, we can build a second pendulum to keep in the department and use the current pendulum for outreach events. Painting the pendulum to represent the UTSA physics department will also be a good use of the remaining funds.

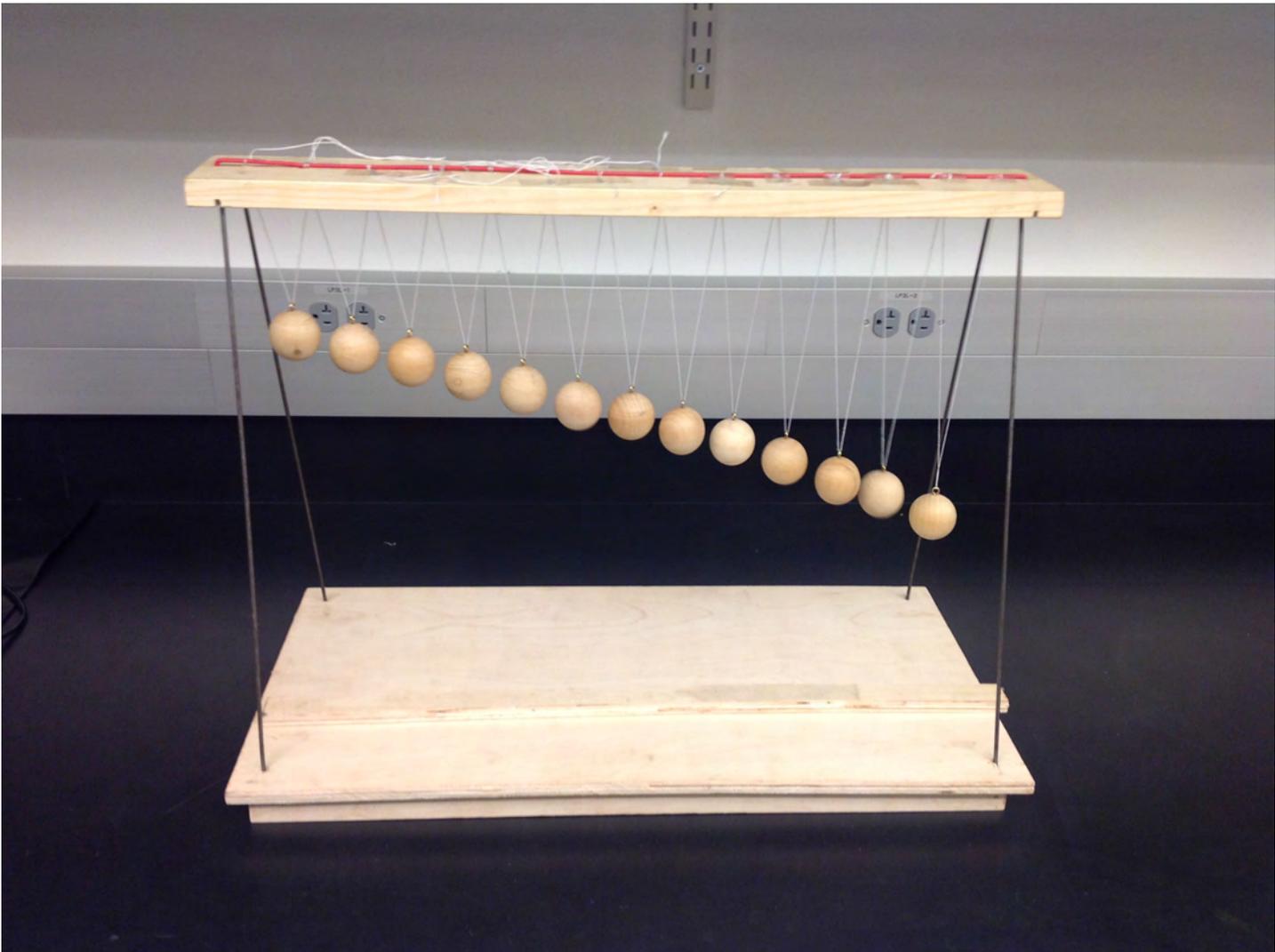
Expenditure Table

Item	Cost
Plywood 4x8 (23/23in thick)	\$27.18
Wood Dowels (qty 4 @ \$0.71 each)	\$2.83
String (one roll)	\$2.79
Wooden Bobs (pack)	\$2.27
Total of Expenses	\$38.96

Activity Photos



Completed pendulum from a side view.



Completed pendulum from a front view.

$$T = 2\pi \sqrt{\frac{L}{g}}$$

$T = \text{period}$
 $L = \text{length}$
 $g = \text{gravity (9.8 m/s}^2\text{)}$

To find length of the longest string:

$$L = \left(\frac{1}{2\pi}\right)^2 \cdot \frac{g}{T^2}$$

to find subsequent shorter lengths take the longest as $\left(\frac{n}{n}\right)$ then multiply this factor by the period (T) and solve for L_n

$$\frac{21}{21} T = 2\pi \sqrt{\frac{L_1}{g}} \quad \text{longest}$$

$$\frac{21}{22} T = 2\pi \sqrt{\frac{L_2}{g}} \quad \text{shorter}$$

$$\frac{21}{23} T = 2\pi \sqrt{\frac{L_3}{g}} \quad \text{shorter}$$

⋮

$$\left(\frac{k}{k+n}\right) T = 2\pi \sqrt{\frac{L_n}{g}}$$

Formulas used to calculate length of each pendulum bob.