SOCIETY OF PHYSICS STUDENTS
An organization of the American Institute of Physics

Marsh White Award Final Report

Project Proposal Title	Physics Fair: A Presentation of Archival Material
Name of School	Sonoma State University
SPS Chapter Number	6474
Project Lead (name then email address)	Ben Cunningham - Super_neb@hotmail.com
Additional Project Leads (two lists: names then emails)	Cody Ray Johnson[1] Aaron Owen[2] Nicola Peyko[3] Hunter Mills[4] Kevin Zack[5] 1. johnscod@seawolf.sonoma.edu 2. aowen@newoa.net 3. peyko@seawolf.sonoma.edu 4. huntermills707@gmail.com 5. kzackelectric@gmail.com
SPS Chapter Advisor	Hongtao Shi, Ph.D.
Total Amount Received from SPS	$300.00
Total Amount Expended from SPS	$300.00

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Summary of Award Activities

The SSU chapter of SPS began the process of digitizing and archiving many spectacular materials presently sitting in storage; making them available at http://epo.sonoma.edu/SSUAstronomyArchive. The content of the website can be used by teachers to augment lesson plans as well as raise interest amongst students and the public; providing a source of continuing public outreach. In April 2014, we held a physics fair in conjunction with the Physics and Astronomy Department's Public Viewing Nights. During the fair we were able to demonstrate to the attendees the connections between physics and astronomy and how we have come to understand some of the great mysteries of the cosmos.

Statement of Activity

Overview of Award Activity

- Brief description

The project was organized into three parts. One focus was on saving stored slides and videoed talks by updating the format they are being archived with. Both the videos (VHS/8mm/MiniDV) and the slides were digitized. A related portion was to create a website where the archived materials would be stored and publicly accessible. Due to the volume of material to be archived, the website will continue to be developed as more slides are processed and archived. Third portion of the project was the production of a mini physics fair in conjunction with our department's Public Viewing Nights. A few demonstrations were setup and a presentation was run where a "comet" was created using dry ice and a mixture of material that represented what might be found in a comet. The fair was held prior to the Public Viewing Nights and ran until sun down at which time the viewing night event began.

- Outcomes

Combining $200 from this grant and the donations from the physics and Astronomy Department and SSU Education and Public Outreach the club was able to purchase a $300 slide scanner with IR dust correction feature. The scanner is capable of archival quality scans which we used to create 180MB .tif image files. We chose to prioritize scanning slides that are SSU/Student originals, which, if damaged, are irreplaceable. Many of the SSU originals depict the early history of our on campus observatory where the rest are astronomical images and spectra taken by students, using the same observatory. As of this report, much has been accomplished with the website and many of the slides and all of the video have been digitized but there are many more slides left to archive. Because we now have the equipment necessary (the scanner), this project will be able continue into next semester and hopefully until 100% of the stored media has been both saved but made available to the public.

Sonoma State Education and Public Outreach (formerly NASA: E/PO) loaned the club a 1 terabyte external hard drive and the webspace, on their server, for the website. This allowed us to confidently develop such a large scoped project. The webpage is built using wordpress and can be found at http://epo.sonoma.edu/SSUAstronomyArchive. At present, 25+ hours of talks are available through the website or on youtube.com. The number of slides and videos will grow as the newly digitized talks are edited and uploaded.

During the fair, the connection between Physics and Astronomy was demonstrated using a number of demos and activities. A few examples demos were; showing the ratio of sizes and distances of the Solar system; showing the constituent parts of comets by making a mock comet during a live presentation; creating a tactical demo by making imitation Lunar dust, Martian dirt, and the like for people to see and feel. Over 40 students attended and told us they were enjoying the demonstrations

and activities. For a couple, the fair made physics an approciable enough subject that they were going to look into declaring a major in the Physics and Astronomy department.

- Audience

The archiving process was focused on saving the images on the slides for use by future students and professors. The website is designed to not only be a internal archival location to be accessed by students and faculty but it is also aimed at reaching the much larger general public. We hope that the materials can be used by teachers, at other institutions, to augment their lesson plans and raise interest amongst their students. We see the website as providing a source of continuing public outreach for as long as we are able to keep it active and fresh.

For the physics fair, we focused on connecting with underclassmen, by helping dispel the perceived discrete nature between the concepts of physics and astronomy. The primary manner this was accomplished was through demonstrations. Additionally, the partnership with the Public Viewing Nights event allowed us to capitalize on the established audience.

- Context of the Project

The archiving and website processes were inspired due to the recent budget cuts. The tight financial situation that was far too common around the country affected SSU in a number of ways including a sudden need for space. Sadly many items in storage were being displaced and disposed of despite their potential value to future faculty and students. Not all items can be saved but slides and old VHS tapes could be digitized so that we could eventually part with the physical slides and free up valuable space while maintaining potentially valuable resources.

Sonoma State University is home to many amazing outreach programs including two that are run by Physics and Astronomy faculty, staff, and students. Sonoma State E/PO is headed by Dr. Cominsky, the Department Chair, and performs a number of outreach efforts using digital media such as webpages, webcomics, and the development of an online Cosmology Course. The inclusion of a webpage to this project is only possible because of the established infrastructure of the E/PO program as well as the loaned equipment, webspace, and technical help in setting up the webspace. Public Viewing Nights, run by Dr. Severson, was such a logical program to partner with for the physics fair. The goal of the viewing nights is to engage with the public (and student body) and make astronomy more accessible and understandable. These are similar set of goals of a physics fair and therefore the two events complement each other.

A goal set by the club for this past school year was to increase our outreach efforts. To achieve this goal we participated in number of tabling events throughout the year, recruited majors and non-majors alike. We hosted a STEM movie night every two weeks and doubled our club tutoring sessions to twice a week. Within this environment, the archivel/website project and the physics fair were two additional methods of outreach.

- Highlights and stories

During the process of sorting the slides for scanning, a significant number of SSU original slides were identified. These slides consisted of historical images of the SSU observatory's construction and operation by students in the first few years. It also housed images, taken by undergraduates, of solar spots and nearby galaxies and spectral data of stars from over 30 years ago. The historical importance of many of these images, for the school, is tremendous. The personal significance of these images became clearly evident when some staff were able to provide names to the nameless students in the images along with their life histories.

The fair was so well received that the professor responsible for running the monthly Public Viewing Nights asked if the club was interested in making it a recurring part of the Public Viewing Nights.

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

We wished to update the storage format of department slides / videos and other such media. All videos have been digitized. All irreplaceable SSU created slides have been scanned and are publicly available.

Happily, the physics fair was a success both in the number and the high level of interaction with the attendees. These interactions generated great interest in the subject matter with a continuous stream of questions. As previously mentioned, the professor who runs the monthly Public Viewing Nights, would like the club to incorporate a fair portion with the viewing nights at least yearly if not more frequently. Some students even asked if there will be demonstrations next year. Though plans for future physics fairs has not been finalized, any upcoming fairs would have different set of demonstrations. The plan is to have the demonstrations relate to what the public will be viewing. Our future goal is to branch out to more than just the students in the Astronomy course and have the Public Viewing Nights be more popular for the general student body and the general public.

Key Metrics and Reflection

Who was the target audience of your project?	College Freshmen, Future Students, General Public
How many attendees/participants were directly impacted by your project? Please describe them (for example "50 third grade students" or "25 families").	45 college students
How many students from your SPS chapter were involved in the activity, and in what capacity?	8 SPS chapter 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 and how would the additional funding have augmented your activity?	The project was designed around the amount of funding offered. For an additional $100 or $200, the Physics Fair could have had more elaborate demonstrations and small prizes for the participants. With an additional $1000-$2000, a professional service could have been used to digitize the slides and videos. Dramatically speeding up the process.
Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.	Each semester, the Physics and Astronomy Department offers a number of Public Viewing Nights, which the club has an open invitation to hold future physics fairs at. The Archival process will continue since the club now has a scanner and webspace.
What new relationships did you build through this project?	N/A
If you were to do your project again, what would you do differently?	Consult a web developer to create a website design plan.

Press Coverage (if applicable)

School of Science & Technology Newsletter - Volume 3, Issue 2 - March 19, 2014
http://www.sonoma.edu/scitech/newsletter/spring_2014.pdf

Expenditures

The expenditures for the project consisted of a slide film scanner at $340.30 and supplies for the physics fair at $99.94. In addition, the SSU Education and Public Outreach (EPO) group donated an external hard drive allowing us to put the savings (~$100.00) towards a higher quality scanner. The department provided an additional funding of $140.30 so we could increase the planned expenditure of $200.00 for a slide scanner to acquire a unit that will do higher resolution and scratch removal scan functions. The EPO group also donated webspace ensuring no recurring costs for the project. The budget for the physics fair was set to be ⅓ of the grant total. This money was used to purchase demonstration supplies such as dry ice, which was used in a comet making demo. The department loaned additional demonstration setups which added no additional cost to our budget.

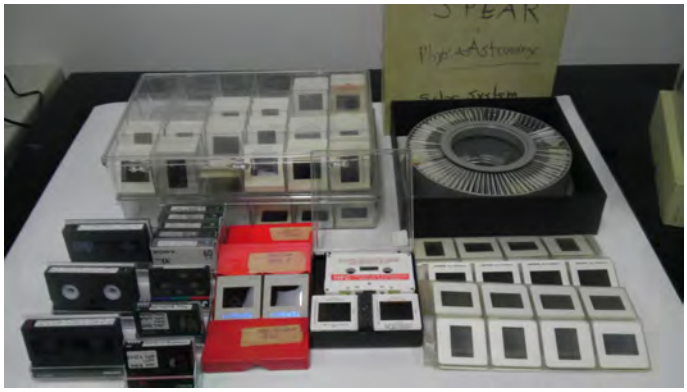
Expenditure Table

Item	Cost
Plustek OpticFilm 8200i SE Slide Film Scanner	($340.30)
1T External hard drive - Donated by Education and Public Outreach, SSU	$0.00
Webspace - Donated by Education and Public Outreach, SSU	$0.00
Physics Fair Hand On Demonstration Materials:	
Charcoal (Celestial Body Soil Demonstration)	($25.42)
Flour (Celestial Body Soil Demonstration)	($12.62)
Dry Ice (Celestial Body Soil Demonstration)	($26.98)
Clay (Celestial Body Size Ratio Demonstration)	($20.70)
Miscellaneous Demonstration Supplies	($14.22)
Subtotal	($440.24)
Additional Funding for Slide Scanner: SSU Physics & Astronomy Department	$140.30
Total of Expenses	($299.94)

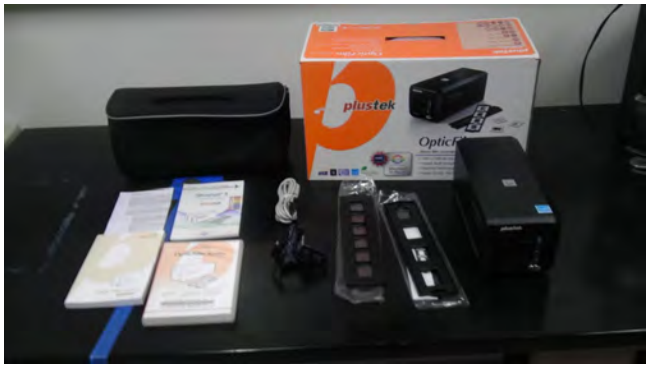
Activity Photos

All Photos by (Sonoma State University Society of Physics Students)

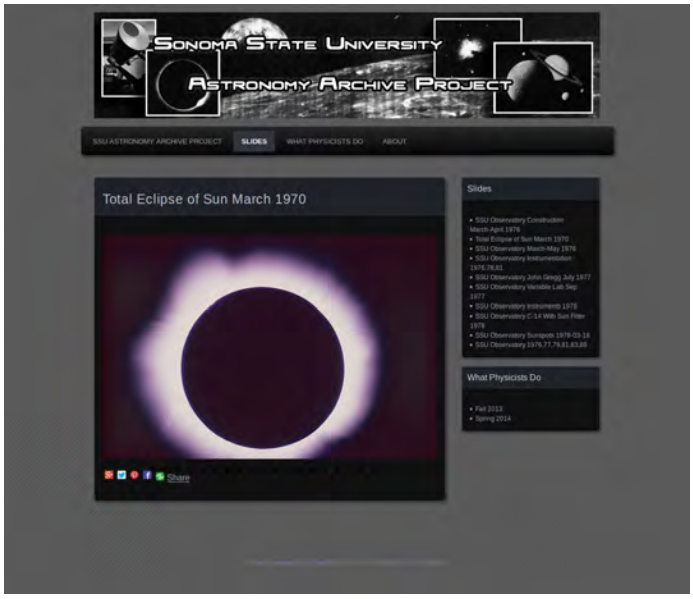
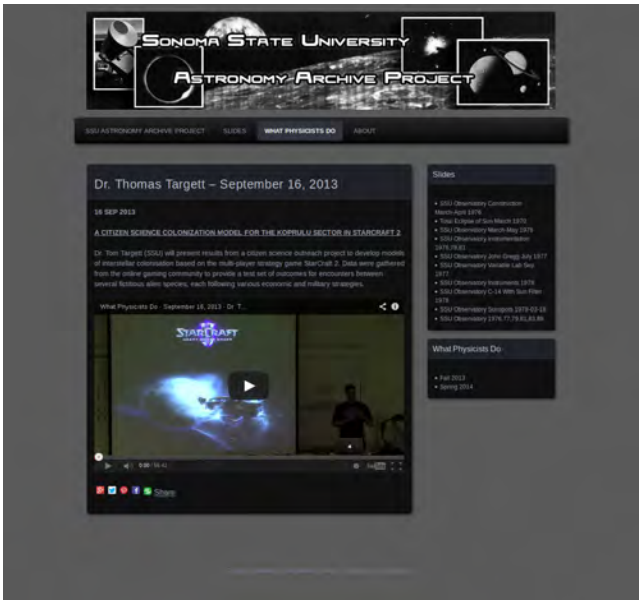
back left: Hunter Mills, Cody Johnson, Kevin Zack, Ben Cunningham
front left: Aaron Owen, Stephan Jackowski, Nicola Peyko, Hongtao Shi, Ph.D. (advisor)



A sample selection of the slides, slide shows, 8mm DV, and VHS tapes being converted to a digital format.



The Plustek OpticFilm 8200i SE Slide Film Scanner

	
A simple and clean gallery style was chosen to display the archived slides.	YouTube.com uploads of past What Physisits Do talks are embeded for easy viewing.

If you have any questions, please contact the SPS National Office Staff
Tel: (301) 209-3007; Fax: (301) 209-0839; E-mail: sps-programs@aip.org