



SIGMA PI SIGMA

The physics honor society

Sigma Pi Sigma Chapter Project Award Final Report

Project Title	Physics for the People: Community Lecture Series
Name of School	Colorado School of Mines
Sigma Pi Sigma Chapter Number	349
Total Amount Awarded	\$494
Project Leader	Emily Atkinson

Summary of Award Activity

The Colorado School of Mines Sigma Pi Sigma chapter hosted a lecture series on advanced physics topics aimed at non-academics. Most university lectures are given at a very advanced level, so the goal of these lectures is to get non-physicists more excited about physics. Our first lecture was on quantum entanglement and our second was on multi-messenger astronomy. Attendance at each was 50-80 people; a mix of Mines students, high school students, and members of the Golden community. All attendees we talked to enjoyed both talks, and we will be continuing these next year.

Statement of Activity

Overview of Award Activity

As mentioned in the proposal, the key goal of our project was to start a lecture series aimed at the general public that would make science more approachable as well as increase awareness of the Mines physics department. To do so, we organized two lectures at the local high school auditorium; “Is Quantum Mechanics Hard or Is It Just Me?” and “The Dawn of Multi-Messenger Astronomy: New Ways to Observe the Universe”. Both of these lectures were fairly well attended (an average of 60 people for each lecture) by both high schoolers and students at Mines. Both of the lectures had extensive question and answer sessions during and after the talks showing that the audience was interested and could follow the presenters. In addition to the questions during the scheduled time, Dr. Lusk (the presenter for the quantum mechanics lecture) got some emails from current high schoolers showing interest in the topic and the Mines physics department.

We were unable to gather enough emails of attendees to survey participants on their experiences, but we did try to talk to as many people as possible after the event and got very positive responses.

The lectures were mainly organized by the current Sigma Pi Sigma officers but some current members came and helped film or usher during the lecture, as well as helping advertise the event. We were fortunate that the venue was very easy to book and significantly cheaper than we expected allowing us to organize two lectures. However we ran into some unforeseen technical difficulties during the setup portion before each lecture specifically with the audio equipment. For future lectures, we have taken notes on how to work the audio system so that next year’s officers will have an easier time of it.

Certain aspects of the event were more challenging than expected, such as getting non-officer members involved, but other things ended up a lot easier, like getting community members to attend. Our first speaker made a comment after his talk that he had been expecting 20 or so attendees, not the 80 that had shown up. It was also a lot easier getting people to ask questions than we anticipated, both lectures had robust question and answer sessions and people coming up to talk to the speakers even after the question and answer portion had ended.

Impact Assessment: How the Project/Activity/Event Met the Purpose of the Award

The lecture series reached a large audience of Mines students, Golden community members, and Jefferson County high school students. This has led to a greatly increased awareness of Mines chapter of Sigma Pi Sigma.

In recent history, Sigma Pi Sigma has had little recognition at Mines. In fact, very few students or faculty, even in the physics department, knew that Sigma Pi Sigma was different from the Society of Physics Students. This lecture series has made Sigma Pi Sigma well known in the physics department as well as the whole university. Posters advertising the lectures were placed in the physics building and throughout campus and explicitly showed the lectures were hosted by Sigma Pi Sigma. There were also electronic advertisements sent to the entire student body, all highlighting Sigma Pi Sigma’s involvement in the event. This has caused a noticeable increase in recognition from Mines students about the organization. More people are aware of what Sigma Pi Sigma is and we have even had some students ask how they can join Sigma Pi Sigma.

Beyond Mines, the lecture series has caused a tremendous increase in the public's awareness of physics at Mines and of Sigma Pi Sigma. Advertisements were placed in local restaurants and shops around Golden, again with the Sigma Pi Sigma name. We also sent advertisements to over 90 high school science teachers in the Jefferson County School district. This led to a large presence of high school students at the lecture series being exposed to physics and hearing about Sigma Pi Sigma. There was even one teacher that requested to bring her class to tour Mines and talk with the Sigma Pi Sigma officers about their time at Mines. We met with the students and thus further increased recognition of physics, Mines, and Sigma Pi Sigma. Additionally all pamphlets handed out at the lecture displayed the Sigma Pi Sigma logo.

In addition to increasing awareness of the organization, the lecture series also helped strengthen the community of new, current and alumni members of Sigma Pi Sigma. New members were encouraged to and gladly helped with the advertising and set up of the lectures. Current members were active in the planning of the event and nearly all attended the lectures. We even had several alumni members attend the lectures and talk with the current members afterwards. This increased the sense of community within the organization and will allow for continued success as the organization progresses.

Key Metrics and Reflection

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

<p>Who was the target audience of your project?</p>	<p>The target audience was community members and students with some but not extensive knowledge of physics.</p>
<p>How many attendees/participants were directly impacted by your project? Please describe them (for example “3 alumni” or “10 physics majors”).</p>	<p>First talk: ~80 attendees (30 Mines students, 30 high school students, 20 community members) Second talk: ~65 attendees (15 Mines students, 50 high school students and community members)</p>
<p>How many students from your Sigma Pi Sigma chapter were involved in the activity, and in what capacity?</p>	<p>Six members were involved in the planning of the event, with another 5-7 students helping hang up flyers or helping hand out pamphlets on the day of the talk</p>
<p>Was the amount of money you received from Sigma Pi Sigma 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?</p>	<p>The amount of money received by Sigma Pi Sigma was enough to fund two talks. Additional funding (approximately \$200 more) would have enabled a third talk, however given this is a pilot semester, it was okay that we only had two talks. In future semesters, future officers may try to have three talks per semester.</p>
<p>Do you anticipate repeating this project/activity/event in the future, or having a follow-up project/activity/event? If yes, please describe.</p>	<p>We plan to continue having two to three community science talks per semester in future years. This grant was sufficient to prove interest in the event, both from the school and the wider Golden community, so we will strive to continue these using other sources of funding.</p>
<p>What new relationships did you build through this project?</p>	<p>We have begun building a relationship with the Golden community and with Golden High School (where we hold our talks). More immediately impactful, however, is the relationship we have built within our department. Our club was fairly under the radar for many years, and not many faculty knew about us. This lecture series has enabled us to gain notoriety within the physics department and the school because it is something that has never before been done in the department.</p>
<p>If you were to do your project again, what would you do differently?</p>	<p>We need to advertise more consistently and more comprehensively. We had the resources to do so, but did not have the time. Next semester we will need to post a lot more flyers throughout the community and contact as many local science teachers as possible to build up our network and ensure people continuously return to these talks. Drawing more attention to our Facebook and Youtube pages may also help reach people who don't see the posters, if we can get them to follow the page.</p>

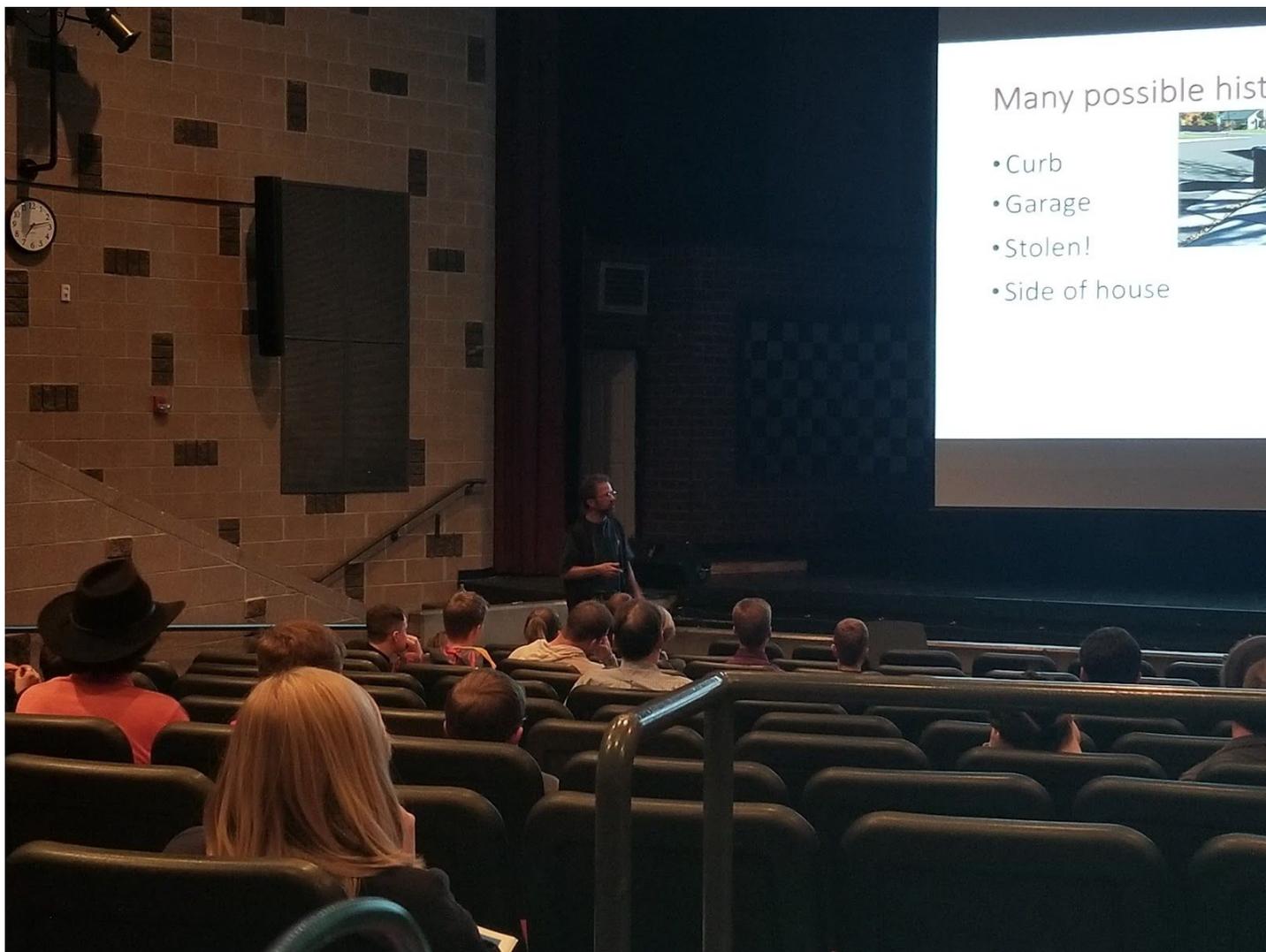
Expenditures

For each of our two lectures, we payed for the venue, speaker gifts, and advertising with Sigma Pi Sigma funding. Originally, the lowest quote we had received for a venue was \$375 per hour. However, when planning the event, we got a quote for the Golden High School auditorium at \$59 per hour which considerably cut our expenses. We rented the auditorium for 2 hours for each lecture bringing our venue expenses to a total of \$236. The speaker gifts came out to \$23.85 for the first lecture and \$27.73 for the second lecture. For each speaker we bought a book that was related to their lecture in some manner. Finally, we printed posters to hang around campus and local businesses to advertise the lectures (totaling \$50) and programs to help provide background information for attendees (\$80 for the first lecture and \$40 for the second totaling \$120). The program printing for the first lecture totaled more than our estimate of \$44. The total cost for venue, speaker gifts, and advertising for both lectures came to \$457.58. We covered all of this from Sigma Pi Sigma funding

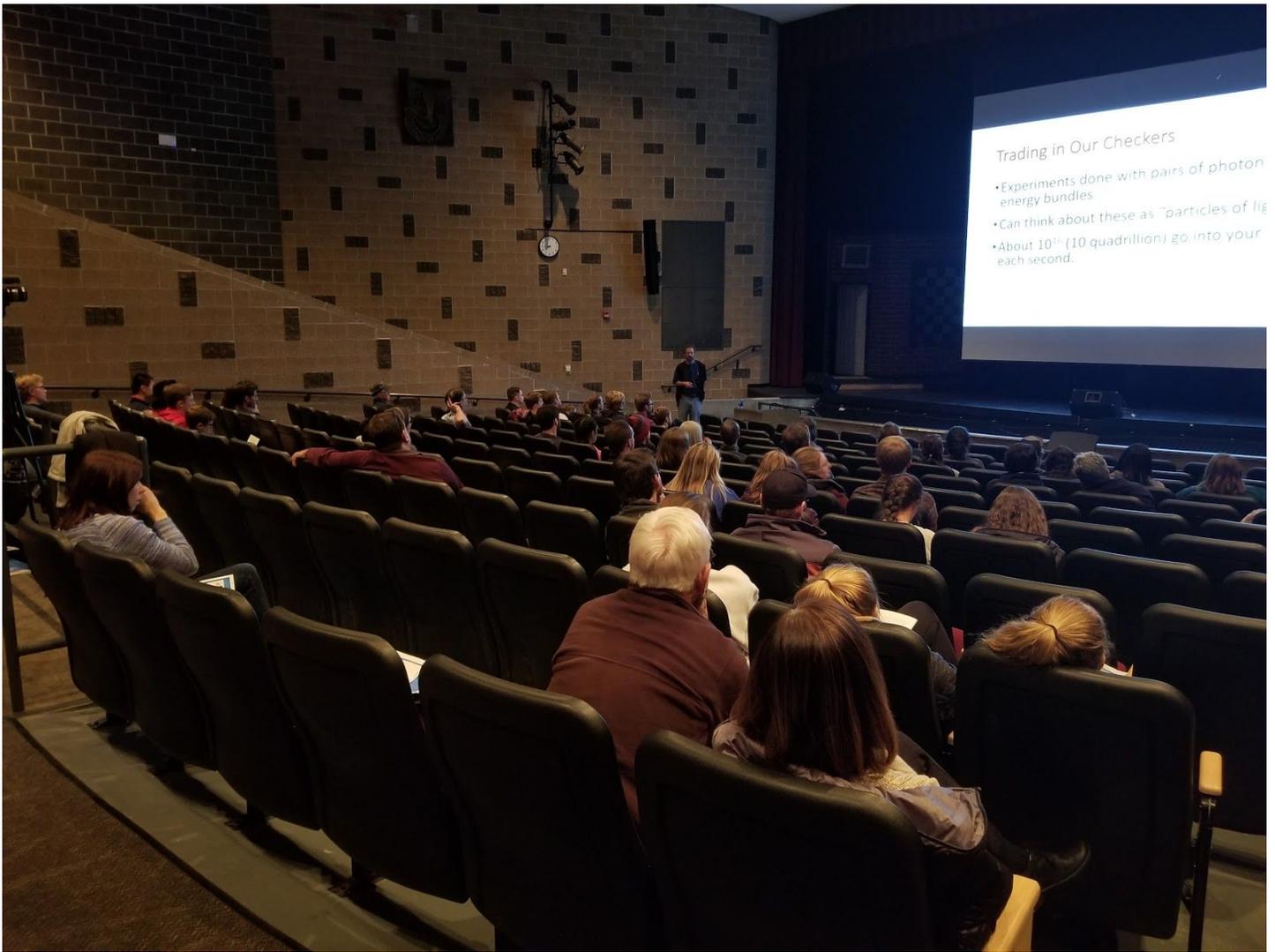
Expenditure Table

Item	Please explain how each expense relates to your project as outlined in your proposal.	Cost
Lecture Series Advertisement	We printed flyers to hang around campus and local businesses to advertise the lectures	\$50
March Lecture Facility	We rented the Golden High School auditorium to make the talk accessible to the community	\$118
March Lecture Speaker Gift	We bought a book for our speaker to thank him for donating his time	\$23.85
March Lecture Printing	We printed programs to provide background knowledge for attendees	\$80
April Lecture Facility	We rented the Golden High School auditorium to make the talk accessible to the community	\$118
April Lecture Speaker Gift	We bought a book for our speaker to thank him for donating his time	\$27.73
April Lecture Printing	We printed programs to provide background knowledge for attendees	\$40
Total of Expenses		\$457.58

Activity Photos



Dr. Mark Lusk addressing the audience on the many-worlds interpretation of quantum mechanics.



Dr. Mark Lusk explaining quantum entanglement through use of checkers to Golden community members.



View of the audience at Dr. Mark Lusk's talk on March 1st.



Dr. Fred Sarazin and a partial view of the audience he was presenting to.



Dr. Fred Sarazin and his title slide on multi-messenger astronomy.

