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

Marsh W. White Award Proposal

Project Proposal Title	Projecting the Demo Show: Getting MSUM's Demo Show Audio Technology to Improve Accessibility at the Show and in the Livestream
Name of School	Minnesota State University Moorhead
SPS Chapter Number	4499
Total Amount Requested	$403.96

Abstract

At Minnesota State University Moorhead, the local SPS chapter puts on a yearly live demo show. This demo show is aimed at getting young audiences interested in physics. Past themes include sound and light. The show is livestreamed to increase the audience in the rural region that our university serves.

Proposal Statement

Overview of Proposed Project/Activity/Event

Each year, the MSUM chapter of SPS puts on a live demo show for the local community. The demo show is held at the largest science lecture hall on campus, and features 10-15 demos each year. The show is fully scripted by students, with two MCs guiding the show and explaining the science in further detail while each member performs 1-2 demos. Other members serve behind the scenes running the audio visual tech and helping set up demos. Additionally, a live stream of the show is shared on the department Facebook page.

The demo show typically has around 80 in-person attendees. Over the lifetime of the stream, it gains around 300 views. The demo show targets elementary to middle school aged children and their families. The show promotes a local interest in physics and science and showcases opportunities at MUSM.

This tradition started almost 15 years ago to engage the public with physics, and to help SPS students develop their science communication skills. Each year, the chapter iterates and improves on the demo show in order to create a better experience that reaches more people. For the last five years, our improvements have included better advertising, developing the livestream, and creating new demos to explain physics concepts in a more accessible way.

This year, the chapter wants to create more accessible experiences for the community, and create a higher quality livestream that can be edited into smaller segments to increase community engagement online. The goal is to reach a larger audience through community engagement not only during the live demo show and online. Additionally, the video will allow students to be trained on these demos for various outreach events. This will allow more people from outside the Fargo Moorhead community to be reached, including people from underrepresented rural communities in physics.

How Proposed Activity Promotes Interest in Physics

The demo show held each spring welcomes the public to see the show in person and watch it online. The public is able to see and engage with physics in a way that they cannot in a traditional classroom setting. In the Fargo Moorhead community, it is often the first time elementary students are explicitly exposed to physics. Also, for many members of the audience this may be their only experience with physics. Past feedback from parents about the show highlights children having an increased interest in science and physics.

The demo show also helps SPS students. By giving students a means to engage with the public, they often become more passionate about physics. Additionally, students improve their science communication skills. These skills are transferable to other outreach events, including SPS events, and events at the MSUM Planetarium. Multiple students have shown interest in both formal and informal physics education after participating in the demo show.

By posting videos online of the show, people will be engaged in physics from their own homes. We plan to use our higher quality livestream recording in order to upload the entire show in full, and additionally begin to upload shorter segment videos of the demo show. These shorter segments will be uploaded to short form platforms such as Youtube Shorts, TikTok, and Reels. By uploading online content, the number of people reached will have a dramatic increase over time. The clips will have the ability to reach rural or otherwise underrepresented communities in physics that do not have a physics program nearby to provide these live experiences.

Plan for Carrying Out Proposed Project/Activity/Event

The president of SPS will be in charge of overseeing progress. Progress will be additionally monitored by the club faculty advisor. There will be five groups of students working on the demo show.

- A group of around 3 students will write the script. This group will combine scripts from past years with new work to create an original script with accurate science information. Additionally, they will decide the best order for demo content that will help to explain physics concepts to the audience.
- Another group of around 4 students will set up and operate the technology. These students will meet multiple times to discuss, plan, and practice how to set up the available technology to create the best show possible.
- 2 students will work on marketing the show. They will market in the community and on social media. They will hang flyers around our community, pass out flyers around our campus, add the event to community calendars and advertise it to children in local elementary schools. On social media, posts about the event will be posted to Facebook and Instagram by the MSUM Planetarium, the Department of Physics and Astronomy, and the local community Astronomy Club. This includes posting in relevant facebook groups about the event, in order to reach the parents of elementary aged children. Additionally, funds are allocated in the yearly club budget for advertising using facebook's advertisement system to the local area.
- 2 students will be the MCs of the show. These students will read the technical components of the script and introduce demos while the students presenting demos set up.
- The majority of students will present demos. This group will learn how to operate and execute the demos, while explaining what is being presented. This role will encompass all other members working on the demo show. Students in the scriptwriting and marketing categories will also present demos.

Typically about 15 members of SPS participate in the demo show. This is the majority of the SPS chapter. Additionally, alumni and the department professors will attend practice sessions of the show to give pointers on audience engagement and science accuracy.

Project/Activity/Event Timeline

November and December 2025	- Finalize theme and the teams for demo show - Decide on 10-15 specific demos for demo show - Begin script writing
January and February 2026	- Finish Script for demo show - Have members practice the demo they are showcasing during meetings - Have the tech team meet and finalize the tech plan
March 2026	- Have a tech and demo dry runs of the show separately
Early April 2026	- Have a run through of the demo show with technology and demos - Host the demo show
May to June 2026	- Analyse post event survey data - Post video clips from the demo show to various social platforms - Write event final report

Activity Evaluation Plan

In order to evaluate the demo show, we will track our attendance numbers manually. Typically, we expect around 80 members of the public to come in person, and around 300 members of the public to view the livestream

throughout its lifetime. Additionally, the audio quality will be compared to the previous year using the recorded streams.

Additionally, we plan on hosting a short post demo show survey with the following questions to parents and other adults:

1. I feel like my interest in physics has increased. (Agree to disagree scale)
2. I would attend the SPS demo show again. (yes or no)
3. What would you improve about this event? (open answer)
4. Is there a specific area of physics you would like us to explore? (open answer)

Additionally, questions may be added in order to better understand demographics. This data will then be analyzed after the event.

Budget Justification

The livestream was introduced during the COVID-19 pandemic. It began as a phone streaming audio/video from the back of the room, and is now a multiple camera and microphone system. It has been created using equipment from inside the lecture hall, and equipment owned by alumni. Last year, MSUM's SPS chapter obtained funding to begin purchasing equipment and allow the chapter to be independent from alumni via buying the needed cables and routers.

The current largest barrier is the current audio equipment. The current microphones are the ones placed within the lecture hall. These microphones are low quality and have multiple dead spots within the room. In order to improve this, we would like to have more and higher quality microphones. The SPS team would like to have higher audio quality, improving audio accessibility by creating even sound on all platforms.

Four microphones will allow for one microphone for each MC to have their own microphone. The microphones used by the in the past have been wired microphones on a stand. These microphones have a very short range, and the MCs are stuck in one location. By giving the MCs microphones, they would be able to walk around the show and present in a more dynamic and engaging way.

The demos are presented on either side of the MCs in the center of the room. Having one microphone on each side will allow demo presenters to more effectively switch without crossing the camera. This will allow students to focus more on giving excellent outreach.

With these microphones, more members of the public will be able to view, understand, and be exposed to physics.