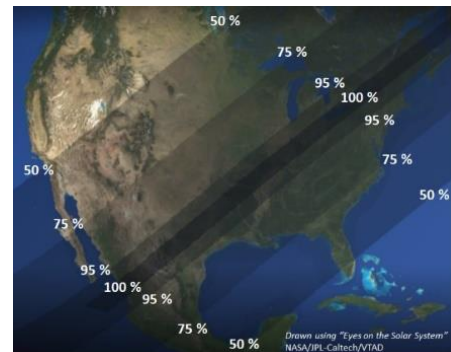


TOP STORY: TOTAL SOLAR ECLIPSE VISITING THE CLEVELAND AREA ON APRIL 8, 2023



On April 8, 2024, a total solar eclipse will cross the North American continent, passing Mexico, the United States, and Canada. The eclipse will be unique, as over 31 million people live inside the path of totality and over half of the US population lives within 250 miles of it. Because this will be a total eclipse, at peak the Sun will be completely blocked (aside from the corona) and the sky will darken as if it were late dusk or early dawn. Major cities within the path of totality include: San Antonio, Austin, Dallas, Little Rock, Indianapolis, Buffalo, Niagara Falls, Montreal, and our own Cleveland.



**Getting involved:**

Leading to and during the eclipse the Cleveland State University Physics Department will be involved in various eclipse-related activities as follows:

- Eclipse Seminar Series (held in the Science Research Building SR 151):

Date	Seminar
Tuesday, February 6, 2024, 11:30 am	<b>Ygal Kaufman</b> , Ideastream Public Radio “ <i>The Eclipse and Film</i> ”
Thursday, February 29, 2024, 11:30 am	<b>Adam Sonstegard</b> , CSU, English “ <i>How a Graphic Novelist Almost Eclipsed Mark Twain</i> ”
Tuesday, March 19, 2024, 11:30 am	<b>Andrew Resnick</b> , CSU, Physics “ <i>Eclipse Photography</i> ”
Tuesday, April 2, 2024, 11:30 am	<b>Timothy Dolch</b> , Hillsdale College, Physics “ <i>DLITE Eclipse Studies at the Geauga County Observatory Park</i> ”
Tuesday, April 9, 11:30 am	<b>Joseph Glaser</b> , West Virginia University “ <i>NANOGrav - Discovery of the Background Gravitational Wave Signal</i> ”

- April 8 - On Campus Observation site. Upcoming details to be posted at (PUT SPS link):

<https://artsandsciences.csuohio.edu/physics/total-solar-eclipse>

Important times for Cleveland area:

- Partial eclipse begins at the partial eclipse begins at 1:59 pm EDT.
  - The total eclipse begins at 3:13 pm EDT and lasts for 3 minutes and 50 seconds with the peak at 3:15 pm.
  - The partial eclipse ends at 4:28 pm EDT.
  - **The 2024 Great American Solar Eclipse has its path of totality right through the heart of SPS Zone 7 on April 8!** To celebrate this occurrence, the [Physics Department](#) and [SPS chapter](#) at [Cleveland State University](#) have graciously offered to hold an event on its campus and has invited members from across SPS Zone 7 to join them. We hope to see you there!
    - <https://sites.google.com/view/spszone7/events/2024-solar-eclipse-event>
    - Register for CSU Parking Here! <http://tinyurl.com/5h3xpkfx>
- Booth at the Total Eclipse Fest 2024, April 6 - 8, a partnership of the Great Lakes Science Center and the NASA Glenn Center:  
<https://greatscience.com/explore/events-programs/total-eclipse-fest-2024>
  - Society of Physics Students (SPS) outreach in the Cleveland Public Libraries supported by the SPS [Marsch W. White Awards](#).



### Tips for safe viewing:

Never look directly at the Sun or its reflection without using proper eye protection. During a Solar Eclipse, this applies whenever any part of the Sun, no matter how small, is visible. Regular sunglasses no matter how dark are NOT SAFE for viewing the sun. Only use solar viewers or glasses that comply with the ISO 12312-2 international standard. These are thousands of times darker than regular sunglasses. Children should use solar viewers/glasses only with adult supervision. Also, viewing the solar eclipse through telescopes, binoculars, or camera lenses, even when wearing solar glasses, will instantly lead to eye injury, as these instruments greatly focus the solar radiation. Use these instruments only if equipped with special-purpose solar filters.



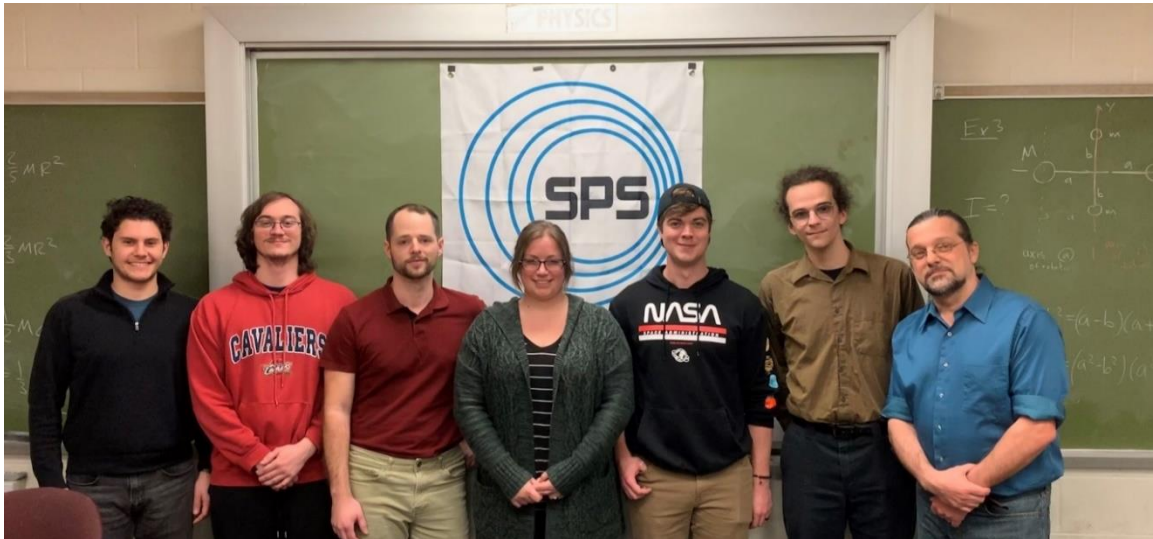
Phones should not be used to take photos of the Sun without placing a filter on their camera. The imaging sensor and lensing system can be easily thermally damaged by solar radiation.

### Resources/activities in the area and beyond:

- NASA Total Eclipse Overview: <https://science.nasa.gov/eclipses/future-eclipses/eclipse-2024/>
- Great Lakes Science Center: <https://greatscience.com/explore/events-programs/total-eclipse-fest-2024>
- Cleveland Astronomical Society: [https://www.clevelandastronomical.ai/eclipse\\_2024.html](https://www.clevelandastronomical.ai/eclipse_2024.html)
- Cleveland Museum of Natural History: <https://www.cmnh.org/visit/solar-eclipse-2024>
- Eclipse informational site: <https://www.greatamericaneclipse.com/>
- Eclipse events around Cleveland: <https://www.thisiscleveland.com/2024-solar-eclipse>

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CLEVELAND STATE UNIVERSITY'S CHAPTER OF THE SPS NAMED THE OUTSTANDING CHAPTER!



On December 15, 2023, Dr. Streletzky received notice that CSU's Society of Physics Students (SPS) chapter was granted the designation of an Outstanding SPS Chapter for the 2022-2023. Only 15% of SPS chapters nation-wide receive this honor! This was the 14<sup>th</sup> consecutive Outstanding SPS Chapter designation for CSU's SPS chapter.

2023 was a busy year for our SPS chapter which involved many regular events (see calendar at <https://artsandsciences.csuohio.edu/physics/sps-schedule-events>) such as LN2 Ice Cream parties, Spring Physics Jeopardy, Fall Physics Olympics, mini presentations by CSU faculty who do research with undergraduates, and participation of SPS in the Physics Day. In addition, our chapter had several special events and trips. In particular, with CSU hosting the combined American Physical Society's Easter Great Lakes Section, Society of Physics Students Zone 7 Meeting, and the Ohio Section of the American Association of Physics Teachers conferences, CSU's SPS chapter were instrumental in making the combined event possible, organizing many events of the conference, playing host to a wide variety of visitors, including more than 52 undergraduates from 11 SPS chapters from the SPS Zone 7, all while leading events and presenting their own research (check here for the Zone meeting report: <https://www.spsnational.org/meetings/meeting-notes/sps-zone-7-meeting-1>)!

In addition, SPS organized the 2023 Sigma Pi Sigma Induction event (Mar 31) which inducted seven new CSU members. At the event, Dr. Jearl Walker received the Honorary Sigma Pi Sigma membership, a special honor given only to those who exemplify the four pillars of the Sigma Pi Sigma (Honor, Encouragement, Service, and Fellowship), and contribute to the advancement of physics at a national level. (<https://artsandsciences.csuohio.edu/news/2023-%CF%83%CF%80%CF%83-induction-ceremony-and-special-bestowing-honorary-%CF%83%CF%80%CF%83-membership-jearl-walker>).

CSU's chapter works hard to bring the joy of physics to students of all ages. In May of 2023, CSU SPS along with SPS Alumnus James Pitchford went to Bath Elementary School to put on demonstrations showing that Physics exists in our everyday world, if you take the time to recognize it! The students from Bath Elementary later sent letters thanking the chapter for the fantastic event (<https://artsandsciences.csuohio.edu/news/physics-students-bring-fun>).

Several SPS members and CSU faculty (and CSU alumni!) went to the 2023 APS March Meeting (<https://artsandsciences.csuohio.edu/news/sizable-representation-csu-physics-2023-aps-march>).

meeting). There CSU students connected with students from around the country and presented their own research. SPS Chapter President Patrick Herron won the Best Presentation Award in the undergraduate research poster session.

Finally, our chapter applied for and received 2024 Marsh White award for the SPS outreach project “Outreach Totality: Eclipse based Outreach-Teaching Experience”. In this project, members of the CSU’s SPS chapter taught high school students from the Hathaway Brown school how to perform Solar Eclipse demonstrations for younger Hathaway Brown students and general public. In the later stages of the project, SPS outreach team will assist Hathaway Brown students in conducting Eclipse Outreach event at 5 locations of the Cleveland Public Library.

Looking towards the future, the spring of 2024 is promising to be very exciting. First, April 8<sup>th</sup> brings to Cleveland the Total Solar Eclipse, which will be celebrated on CSU campus via many planned SPS events and SPS eclipse outreach at the Cleveland Public Library branches. Second, several SPS students confirmed attendance at the 2024 APS March Meeting in Minneapolis. Third, the 2024 Sigma Pi Sigma Induction ceremony is scheduled for May 3 (to be held at CSU’ Mather Mansion). Mark your calendars!

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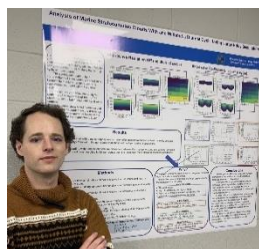
### PHYSICS GIVING DAY SCHOLARSHIP AWARDED TO JAMES TATON AND JEREMIAH GREEN

Last year the Physics Department has used for the first time the CSU February Giving Day as a platform to raise money to financially support meritorious students majoring in Physics to achieve their academic aspirations. It is hard to express in words our many thanks for all the support received from alumni, friends, faculty, and staff of the department. **Physics ended up as the leading academic department** in terms of the number of donors and is all only because of your support. **THANK YOU!** Here are also some personal thanks from the first recipients of the Physics Giving Day Scholarship:



*“From an early point in my college career I have been supporting myself financially, both in school and my personal life. This has led me to spend many hours outside of class drawn away from my studies by other work. The Giving Day Scholarship has been a very beneficial factor in giving me more time and energy to focus on my education and passion: physics. I am extremely grateful to have been a recipient of this award and I know its continuation will be of great benefit to future recipients.”*

James Taton, 2024 Physics Giving Day Scholarship Recipient



*“I made the difficult decision to leave my career in IT because I felt an insatiable intellectual curiosity I couldn’t ignore. While pursuing my studies is incredibly fulfilling, the financial burden of transitioning careers has been challenging. I have always wanted to contribute to the body of knowledge in Physics. Receiving this scholarship empowers me to further my education and potentially contribute meaningful research in this field. Words cannot express how grateful I am for your support. Knowing that individuals believe in my potential and are invested in my academic journey fuels my determination and motivates me to excel. I am committed to utilizing this opportunity to its fullest. Thank you once again for your incredible generosity.”*

Jeremiah Greene, 2024 Physics Giving Day Scholarship Recipient

**TO DONATE TO THIS INITIATIVE THIS YEAR, THE NEW DRIVE OPENS ON FEBRUARY 28 AT 12 PM AT:**

<https://www.csugivingday.com/giving-day/80778/department/80814>

**THANK YOU IN ADVANCE ON BEHALF OF OUR STUDENTS**



## A STORY FROM THE PAST: THE BEGINNING OF THE FLYING CIRCUS OF PHYSICS!

The Flying Circus of Physics by Jearl Walker, a collection of real-world physics phenomena with explanations for a general audience, has fascinated students and science educator for almost 50 years. Recently Dr. Jearl Walker shared some of his memories on the fortuitous circumstances that made the publication of this collection possible:

“After a long search, this morning I found the (attached) postcard from 1971 from Phil Morrison where he instructed me about my early Flying Circus of Physics material. He said, “Publish!”

Morrison was at the time a well-known MIT professor and the book reviewer at Scientific American. During WWII, he was part of the Manhattan Project and was in the backseat with the plutonium as it was driven out to the test site. He is portrayed (but not named) in the movie Oppenheimer.

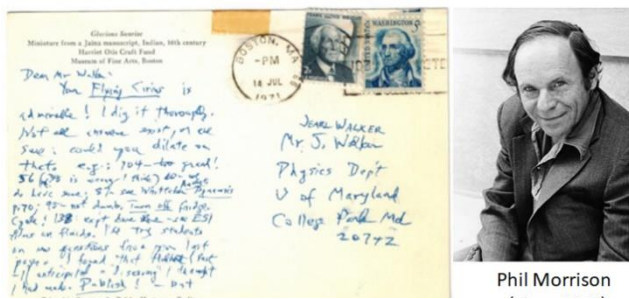
In 1971 when I was a graduate student at the University of Maryland, the Physics Department typed up my multiple Flying Circus of Physics handouts as a technical report. Someone urged me to send a copy to Morrison. I never expected to hear back from him but when his encouraging postcard arrived, I found the courage to send the technical report to two book publishers, John Wiley & Sons and Academic Press. Both sent me book contracts.

Because I had no experience with publishing, I decided to phone someone who was well experienced: Robert Resnick, whose book I had been using to teach my Maryland classes, the same Halliday-Resnick book I used as a first-year student at MIT. Although I was only a graduate student that was not even at his university, he kindly took my call. He advised me to sign with Wiley, because it was a family-owned business that had treated him and David Halliday extremely well. I signed the contract.

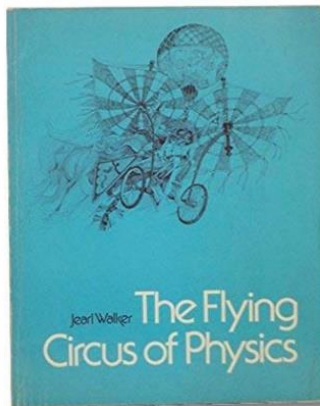
When the FCP book was published in 1975, Morrison wrote a very positive review about it in Scientific American and suggested to the magazine that I take over the monthly articles of The Amateur Scientist.

For the next 12 years, Halliday and Resnick read my articles from the Scientific American and, when they wanted to retire from the book in 1989, they offered the textbook to me. And, as you know, I still work on the book in its various print and online versions, domestic and global.

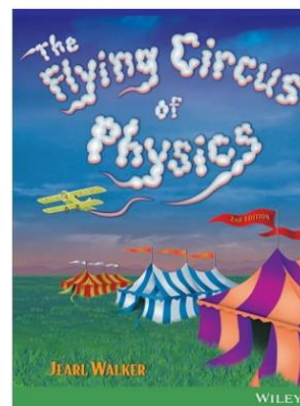
Thus, a long and expanded chain of events began 52 years ago with a postcard.”



Phil Morrison



1<sup>st</sup> edition (published 1975)



2<sup>nd</sup> edition (published 2007)

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## CSU HOSTS SPS ZONE 7 MEETING (OCTOBER 20-21, 2023)



On October 20 and 21, the local chapter of the Society of Physics Students (SPS) hosted the Fall 23 SPS Zone 7 Meeting. It was held in conjunction with the Fall 2023 Meeting of the Eastern Great Lakes Section (EGLS) of the American Physical Society (APS). Over 52 students from 11 different SPS chapters of Zone 7 participated in this meeting. The students came from the following schools: Case Western Reserve University, Cleveland State University, College of Wooster, Kent State University, Lawrence Technological University, Marietta College, Ohio University, Ohio State University, University of Mount Union,

Wayne State University, and Youngstown State University.



The SPS Zone meeting began with a Kick-Off event hosted by Associate Zone 7 Councilor Jacob Callebs, Zone 7 Councilor Ronald Kumon, and SPS President and CSU Chapter Advisor Kiril Streletzky. At the event, 45 students learned about SPS national programs and Zone 7 initiatives; participated in informal discussions of goals and issues of their SPS chapters; and listened to Patrick Herron's, (CSU SPS chapter president) presentation about SPS activities and outreach efforts by the CSU SPS chapter. Every student in attendance gave introductions and everybody began sharing what was special about their chapters. In the end, everybody came away with new ideas on how to improve their chapters and bring SPS Zone

7 to even greater heights. It was a great way to start off what was an excellent and informative conference. The afternoon continued with EGLS APS plenary talk on synthetic DNA nanostructures for nanoparticle organization by Prof. Divita Mather from CWRU. It was immediately followed by a half-hour presentation on SPS programs and structure geared more towards faculty and non-SPS students given by Callebs, Kumon, and Streletzky at the main venue of the EGLS APS meeting. This broader audience SPS introduction was followed by EGLS APS poster session, which was a great opportunity to learn about a variety of interesting research projects being conducted by undergraduate students. The topics covered a wide range, from nuclear fusion to spacetime geographies to quantum key encryption to a presentation involving DNA Origami to a physics outreach presentation. Overall, the poster session was a valuable and enjoyable experience. After the EGLS APS poster



session, SPS Zone 7 sponsored 40 students to attend the evening banquet which was then followed by the after-dinner speaker Dr. Graham Dixon on the challenges and opportunities of contemporary science communication.

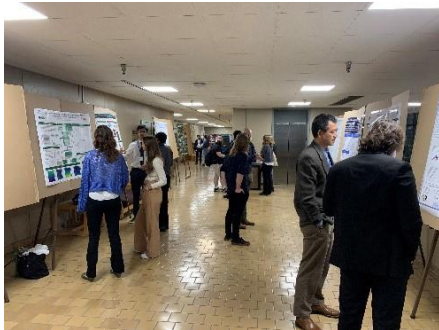
We ended the day on Friday with SPS Game Night at the CSU Physics Department seminar room that focused on card tricks and physics-themed "hangman" word games and getting to know each other a bit. Students from Ohio University, OSU, Wayne State, and CSU participated in this activity.



On Saturday, we started the day with a presentation by Dr. Streletzky on “How to REU”, i.e., how to get paid summer research internships either through NSF-sponsored REU programs or through SPS internships. The presentation was followed by one of the CSU chapter's most beloved events. Physics Jeopardy! In it, 3 teams of 3 brave young physicists/ astronomers each fought out for a grand jeopardy prize - SPS mugs. Jeopardy categories included upper-level quantum mechanics questions, astronomy, and optics questions as well as questions about SPS and APS history. It was great to see all the different strengths that each university brought to the table. The Physics Jeopardy event was a wonderful way to get to know other members and schools from across Zone 7 in a fun and competitive environment.



Physics Jeopardy was followed by the SPS poster session which was well attended with about 20 undergraduates coming back to present their research again in a less formal setting to the APS EGLS poster session on Friday. While smaller than Friday's poster session, this session allowed students to discuss their research with fellow students and faculty in a more personal environment and delve deeper into their research. Normally presentations are short and fast, but here students spent much longer talking to one another about their research and asking questions to learn from the presenter and faculty in the field. This provided a great environment for networking for both future graduate students and future research collaboration.



The SPS poster session was followed by a final plenary of EGLS (co-sponsored by SPS) which was a presentation by Dr. Lisa Felter from Newry Corporation on her transition from physics research to life as a consultant. Our Zone 7 meeting



continued after the closing of the EGLS with a student pizza party, SPS group photo, and CSU physics lab tours. The lab tours were a great opportunity for interested students to learn more about the various research projects going on at CSU. The students were taken through several labs and given tours led by students and/or faculty who work in each lab (CSU SEM Lab, Dr. Bickel's STEM lab, and Dr. Streletzky's Light Scattering Lab). Since the event was towards the end of the conference, there were a limited number

of attendees, however, the present students were extremely engaged and asked thoughtful questions. Students were especially engaged when they could relate something back to their own research, whether they were working on a similar topic or had used a similar method. Overall, this event was a great way to spark discussion amongst students from different universities and to conclude the Zone 7 meeting at CSU.



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### APS EGLS FALL MEETING (OCTOBER 20-21, 2023)



On Friday, October 20, and Saturday, October 21, 2023, the Department of Physics at Cleveland State University hosted the 2023 American Physical Society (APS) Eastern Great Lakes Section (EGLS) Fall Meeting. This event, organized by Drs. Ulrich Zurcher and Sebastian Sensale Rodriguez, attracted over 150 participants, featured over 100 posters and contributed talks from undergraduate students, graduate students, and faculty, marking a level of engagement not seen since pre-COVID times.

Under the theme "Physics at the Nanoscale," the event featured invited speakers from academia (Dr. Fangwei Si from Carnegie Mellon University, Dr. Divita Mathur from Case Western Reserve University, Dr. Graham Dixon from Ohio State University, and Dr. Rose Cersonsky from University of Wisconsin - Madison) as well as industry (Dr. Lisa Felter from Newry Corp), bringing a diverse range of expertise to the Cleveland area.



We would like to acknowledge the high level of enthusiasm displayed by the undergraduate and graduate student researchers who actively participated in activities organized by both the APS EGLS and the local CSU chapter of the Society of Physics Students (SPS). In fact, the SPS chapter organized a Zone 7 SPS meeting which was run in parallel with the APS EGLS and brought 52 undergraduates from 11 different universities/colleges from Ohio and Michigan.



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## COMBINING PASSION FOR RESEARCH AND TEACHING AT HATHAWAY BROWN SCHOOL



CSU physics alumna, Janna Mino '15 has recently found a great way to combine her two great passions: the passion for hands-on STEM research and the passion for teaching through a new position as the Director of Fellowships in Science Research and Engineering Program (SREP) at Hathaway Brown School (HB). In this position, Janna is responsible for matching high school students at HB with research mentors in various research labs in Cleveland to conduct a graduate-level research project. HB students spend once a week after school and many weeks in the summer conducting research in the lab of their mentor. In class, they develop as a professional and submit their research for prestigious science competitions. Since 1998, SREP has served over 800 HB students and made a lasting impact on their lives and careers.

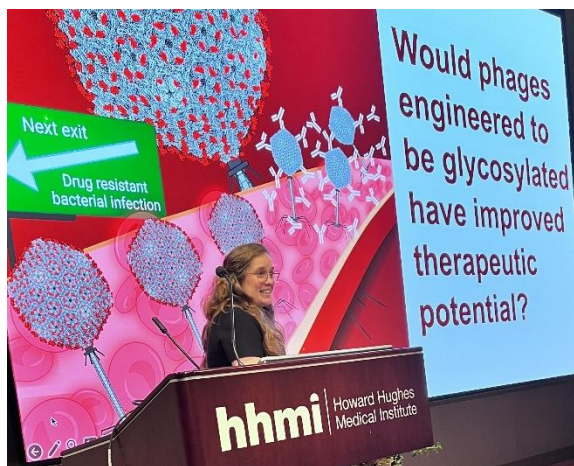
Janna developed both of her passions while at CSU where she worked in the Physics Department as an Undergraduate Teaching Assistant and Research Assistant with Dr. Kiril Strelitzky. As an undergraduate researcher, Janna was supported by the Undergraduate Summer Research Award (USRA) program in the summers of 2013 and 2014 working on light scattering studies of polymeric microgels. She also was active with the Society of Physics Students where she held the position of Physics Friday's outreach coordinator allowing CSU students to bring physics outreach to local schools. Upon graduation from CSU with a Bachelor's in Physics, Chemistry, and Biology Janna tried to find the best application for both of her passions. First, she worked in Research & Development at an LED lighting company and then transitioned into education, completing a Master of Arts in Teaching from Kent State University, teaching high school science classes at an innovative STEM School, and then serving as the STEM Education Program Specialist with The Ohio Department of Education. However, Janna's current position at Hathaway Brown gives her the best opportunity to pursue both of her passions for research and teaching.

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Founded in 1876, HB is committed to a fusion of academic and experiential learning. This all-girls K-12 independent day school focuses on educational innovation and prepares students to exemplify the HB motto to learn not for school, but for life. If you to learn more, please contact Janna [jmino@hb.edu](mailto:jmino@hb.edu).

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## FROM A SUMMER USRA PROJECT ON MICROGELS TO FIGHTING ANTIBIOTIC RESISTANCE WITH BACTERIOPHAGES



Our alumna Dr. Krista Freeman ('11 BS Honors Physics, Distinguished CSU Alumna '16) has been studying biomedically relevant nanoparticles since her time at CSU. Currently as a postdoctoral research fellow at the University of Pittsburgh, Dr. Freeman is working at the intersection of structural biology, bacteriophage engineering, and immunology. She published her work at various scientific journals such as *Cell* and *Nature Communications*. Her research efforts recently led to the National Institutes of Health (NIH) MOSAIC K99 Pathway to Independence Award "Improving phage-based medicine with immunoengineering". This prestigious NIH award is designed to prepare postdoctoral researchers for becoming competitive candidates for faculty positions at universities. The

award provides several years of research funding for an awardee at a place of their future employment as a faculty. Dr. Freeman plans to conduct structural, functional, and immunological evaluations of bacteriophages and their proteins with an aim to establish an independent, interdisciplinary research group working to steer the immune response to bacteriophage therapy toward favorable clinical outcomes.

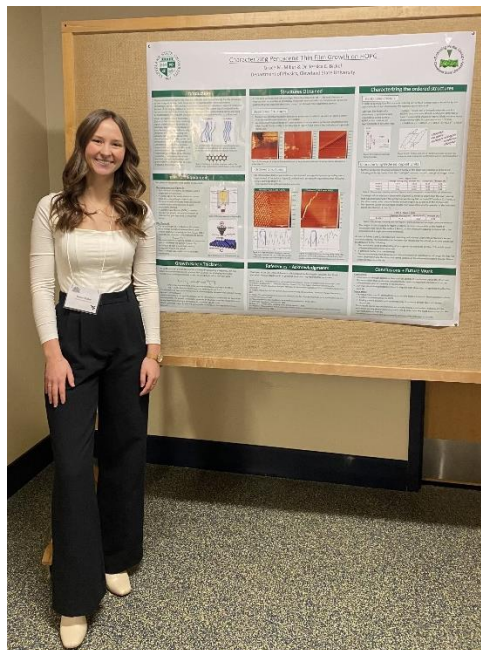
Dr. Freeman, got introduced to original research on nanoparticles as an undergraduate physics major at CSU (supported mostly by USRA program). She worked in the lab of Dr. Streletzky on helping to develop Static Light Scattering (SLS) and Depolarized Dynamic Light Scattering (DDLs) capabilities at CSU as well as on synthesis and SLS/DDLS characterization of polymeric microgels. Her undergraduate research at CSU has resulted in multiple regional and national presentations and two peer reviewed publications including one as a first author.

Dr. Freeman continues to come back to CSU to give science seminars to our undergraduates, to participate in Sigma Pi Sigma inductions, and to help our students with SPS outreach program “Physics Fridays” she helped to start back when she was at CSU.

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### STUDENTS NATIONALLY: GRACE MILLER ATTENDS APS CONFERENCE FOR UNDERGRADUATE WOMEN IN PHYSICS

On January 19-21, 2024, CSU physics honors and math honors major, Grace Miller attended APS Conference for Undergraduate Women in Physics (CUWiP) held at West Virginia University in Morgantown, WV. There she presented a poster on her research with Dr. Jessica Bickel “Characterizing Pentacene Thin Film Growth on HOPG”. Below are her reflections of the experience:



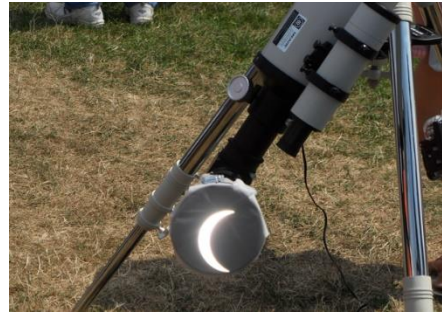
“Attending the Conference for Undergraduate Women in Physics was an extremely inspiring and uplifting experience. Having the opportunity to interact and network with dozens of women in the field was unlike anything I’ve ever been a part of. Especially coming from a smaller program with limited female representation, I was in disbelief by the amount of fellow undergraduate students in attendance. Furthermore, it was tremendously encouraging to hear from some outstanding female physicists and their journeys as scientists, as well as their experiences being women in STEM. While at the conference, I had the opportunity to present my research during the poster session and to speak to other students and faculty with similar projects to mine. The poster session also

allowed me to learn about various other areas of physics research that I would have never explored otherwise. Participating in CUWiP was more beneficial than I could have ever imagined, and I am extremely grateful that this is something I was able to experience. The Conference for Undergraduate Women in Physics was an amazing event and I hope to see more of Cleveland State’s students attending in future years.”

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## LOOKING BACK AT THE AUGUST, 2017 PARTIAL ECLIPSE AS WE PREPARE FOR THE APRIL, 2024, TOTAL ECLIPSE

In a little over two months, more precisely on April 8, 2024, observers in Northeastern Ohio will have the chance to witness a total solar eclipse with a totality that will last in the Cleveland area for almost four minutes. While total eclipses are truly rare, occurring on average only every 375 years at any given place on Earth, the excitement for this event has been building for a while in our area. In the last years the Cleveland area has been visited by two partial eclipses, one on August 21, 2017, and the other this past October 14, 2023. The later was sadly not visible due to the weather. Below are some memories on some of the events in which the CSU Physics Department has participated in on August 21, 2017.



### EDGEWATER PARK, CLEVELAND:

The Cleveland's primary observation site for the August 21, 2017 partial eclipse was the Edgewater Park where our faculty and staff joined the activities organized by the [Cleveland Astronomical Society](#).



*Alexander Borisov, Andrew Resnick, and Miroslav Bogdanovski setting up the a solar telescope for public observations*

### EMERSON ELEMENTARY, LAKEWOOD (K-5)

Department staff (Tara Peppard) and student members of the Society of Physics Students (SPS) (Justin Flaherty and Kristen Schuler-Barret) worked closely with the principal, teachers and PTO parents to bring the excitement of the partial eclipse to the K-5 students, at Emerson Elementary School in Lakewood, during their very first day back to school after the summer break. The activities used included:

1. Introduction of the orbital model (discussed motion of Earth-Sun-Moon system),
2. Guiding a Citizen Scientist program which used digital multi-meters to record the temperature and report to NASA.
3. Eclipse image projection with a telescope system.
4. Pin-hole cameras made out of easily available materials, such as cardboard boxes.



5. Viewing station and how to use solar glasses to safely view the eclipse.



Looking forward to making more great memories on April 8, 2024.

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## COLLIN DOUGLAS NAMED COLLEGE OF ARTS & SCIENCES OUTSTANDING SCHOLAR FALL 2023



Congratulations to Collin Douglas for being named College of Arts and Sciences Outstanding Scholar for the Fall 2023. Collin graduated with his BS Physics Honors and Math minor in the summer of 2023 and is currently pursuing his master's degree in physics at CSU as a part of the 4+1 MS/BS degree. In addition to Collin's perfect academic record, he has spent two years at CSU researching with Dr. Kiril Streletzky on using light scattering and small-angle X-ray scattering to study polymeric microgels and polystyrene microspheres. Collin has presented his research at

several regional and national conferences including the March Meeting of the American Physical Society in Las Vegas, NV, and the Sigma Pi Sigma Physics Congress in Washington, DC. Collin has also spent two years as a physics TA in CSU physics introductory labs and volunteered his time as secretary and treasurer of CSU's chapter of the Society of Physics Students (SPS). Collin is applying to several PhD physics programs in Ohio including CWRU, OSU, KSU, and OU, where he plans to continue his studies in either quantum materials or biological physics.

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## OUTREACH TOTALITY: ECLIPSE BASED OUTREACH-TEACHING EXPERIENCE

The upcoming 2024 total Solar Eclipse in Cleveland has provided CSU's SPS the opportunity to partner with Hathaway Brown (a local K-12 all-girls school) and Cleveland Public Library (CPL) for a unique outreach-teaching experience. CSU's SPS with the multi-year record of physics outreach in local schools (a.k.a "Physics Fridays") just got awarded its 12<sup>th</sup> Marsh W. White Award from American Institute of Physics (AIP) for the project titled "Outreach Totality: Eclipse based Outreach-Teaching Experience".

This is a collaboration of CSU's SPS with the former CSU's SPS outreach coordinator, Ms. Janna Mino, currently the Director of Fellowships in Science Research and Engineering at Hathaway Brown (HB), CSU physics lab coordinator, Tara Peppard, and the Cleveland Public Library. The goal of the project is to train a team of HB's 9-12 grade students on how to perform Eclipse outreach and facilitate combined outreach of HB students together with CSU's SPS to younger HB students and general public at several branches of the Cleveland Public Library through the spring of 2024.



In phase 1, called "First Sighting", CSU's SPS went to HB on Feb 2, 2024, and introduced Eclipse outreach activities to HB high school students and taught them how to perform outreach for themselves. The HB outreach team together with CSU's SPS then



performed Eclipse demos to the two classes of HB 1<sup>st</sup> graders (about 30 students).





Phase 2, called “Outreach Totality”, started on Feb 9, 2024, when HB outreach team together with the CSU’s SPS went to South branch of the Cleveland Public Library and performed outreach session for CPL after-school care program, library staff, and general public. Four more trips of HB outreach team together with CSU’s SPS are planned in February and March to the following locations of the Cleveland Public Library: Sterling branch on Feb 16, Collinwood branch on Feb 23, Rice branch on March 1; Rockport branch on March 22<sup>nd</sup>.

This project will not only educate and prepare CSU students and general public to the upcoming Eclipse but will also provide female students from Hathaway Brown the skills to perform their own outreach so we can further spread the fun of science to schools in northeast Ohio.

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#### IN MEMORIAM: JAMES ALBERT LOCK (1948-2023)



It is with very heavy hearts that we announce to the friends and alumni of our department that Dr. James A. Lock passed away on October 28, 2023. There are no words to describe the sorrow in our hearts. A steadfast champion of rigorous undergraduate education at CSU, Dr. Lock touched the lives of countless students and faculty. He was an inspirational and caring teacher who infected students with enthusiasm for physics and a desire to work hard. His meticulous, hand-written lecture notes - which he assembled for at least 8 courses ranging from classical to quantum mechanics and light scattering - became the sought-after standard for many students and faculty. In fact, following his wishes, the department is now in the process of digitizing these transcripts, so they are available to CSU physicists of the past, present, and future. This final act of generous service reflects Dr. Lock’s spirit and his lifetime of guiding, supporting, and encouraging students, even long after they left CSU.

A beautiful obituary for Dr. Lock, written by his wife Vida, and reflections from his former students and colleagues can be found here: <https://www.buschcares.com/obituaries/James-Albert-Lock?obId=29748414>. Another touching obituary from Dr. Lock’s research colleagues (Drs. G. Gouesbet, F. Xu, P. Marston) appeared in the Journal of Quantitative Spectroscopy and Radiative Transfer and can be accessed here: <https://www.sciencedirect.com/science/article/pii/S0022407323004119>.

Dr. Lock’s contribution to the fields of Optics and Light Scattering are immense as he published 160 peer-reviewed papers, many as the sole author. He was recognized by the journal of Applied Optics as one of 50 most prolific authors of the journal. He continued to pursue his passion of research well after retiring from teaching at CSU and often came back to the department to present his newest discoveries to faculty, students, and alumni. Notably his latest publication “Generalized Airy Theory and Its Region of Quantitative Validity” came out a week after his passing, highlighting his drive to continue to do research till the end.

Although Dr. Lock will be greatly missed, his legacy of gentle excellence lives on in each of us.



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## SAVE THE DATE: 2024 SIGMA PI SIGMA INDUCTION CEREMONY

The 2024 Sigma Pi Sigma induction ceremony is scheduled to take place on Friday May 3<sup>rd</sup>, 2024. The CSU's Mather Mansion will host our 5<sup>th</sup> Sigma Pi Sigma induction ceremony since the resurrection of the CSU's Sigma Pi Sigma chapter in 2018. More details to follow, but please reserve the date and plan to attend.

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## STUDENT PRESENTATIONS/PUBLICATIONS

### *Undergraduate Research Presentations (National & Regional) since July 23:*

#### **Fall 2023 Eastern Great Lakes Section (EGLS) APS Meeting, Cleveland OH, Oct 20-21, 2023:**

1. "Approaches to Analysis of Depolarized Dynamic Light Scattering Data on Solutions of Elongated Particles", G. Nyabere, **P. Dee**, K. Streletzky, Oct 20
2. "Developing SAXS Methodology for Solution of Polystyrene Spheres", **C. Douglas, P. Herron**, K. Streletzky
3. "Study of Micromixing Systems Employing Extensional Flows", **J. Taton**, C. Kothapalli, P. Fodor, Oct 20.
4. "Performing Small Angle X-ray Scattering (SAXS) on Polystyrene Probes and Polysaccharide Microgels" **P. Herron, C. Douglas**, K. A. Streletzky, Oct 20.
5. "Characterizing Pentacene Thin Film Growth on HOPG", **G. Miller**, J. Bickel, Oct 20.
6. "Solvent Effects on the Interaction of Charged nanoparticle", **J. Ball**, S. Sensale Rodriguez, Oct 20

#### **Conference for Undergraduate Women in Physics, West Virginia University, Morgantown WV, Jan 19-21, 2024:**

7. "Characterizing Pentacene Thin Film Growth on HOPG", **G. Miller**, J. Bickel, Jan 20.

### *Undergraduate Publications since July 2023:*

1. **S. Tietjen**, "The Top 5 reasons to get involved in SPS", *The SPS Observer* **57**, 2, 16-17 (2023).
2. **P. Herron** and K. A. Streletzky, "Measuring  $dn/dc$  for Polysaccharide Microgels of Varying Cross-linking Density", *Journal of Undergraduate Research in Physics and Astronomy (JURPA)* **32**, 1, 30-34 (2023).

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## CONTACT US!

Have something you'd like to share? Send an email to [physics.dept@csuohio.edu](mailto:physics.dept@csuohio.edu) or call the number below! Thank you for supporting the Physics Department of the CSU!

Physics Department, Cleveland State University  
<https://sciences.csuohio.edu/physics/physics>  
2351 Euclid Ave, Cleveland OH us 44115  
(216) 687-2425

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