



Science Institute News

Spring 2025

SI Program Updates

During the fall 2024 semester, LAMP supported 21 Learning Assistants (LAs) who collaborated with LAMP-trained professors in 11 distinct courses. LAMP also organized 7 educator learning communities (ELCs)—3 at UW and 4 statewide—educating 55 college instructors on active and inclusive teaching methods. The statewide communities are located at NWC, WWCC, LCCC, and Casper College. Additionally, LAMP co-facilitated UW's first NSF Inclusive STEM Teaching Project (ISTP) learning community, which built local community, examined course content, and explored applications of the affiliated NSF MOOC. LAMP also partnered with the UW Office of Engagement and Outreach to create the Community Engaged Faculty Institute centered on service-learning. Lastly, the application period for LAMP Fellows has closed, and award letters will be sent on April 3rd. The yearlong training program will begin with a summer institute from May 19-24 at Historic Ranch A in the Wyoming Black Hills.

This past semester, enrollment in WRSP increased from 46 to 66 scholars (of which 35 were new this year). These 35 new scholars were enrolled in the 1-credit WRSP course, where they practiced science communication and worked toward an end-of-semester poster symposium. 39 students took part in this symposium, and students, faculty, and staff from across campus attended the symposium. WRSP scholars were also active in outreach, as well, participating in events ranging from the UW STEM Carnival to outreach events throughout the state.

The Science Initiative Roadshow has been busy bringing STEM learning activities to communities across the state. On

top of a busy outreach schedule, program directors presented at the Wyoming Department of Education Innovation in Learning Conference and Rocky Mountain Community Science Conference, as well as meeting with K-12 administrators at the District Residency Connections Fair hosted by the Wyoming School-University Partnership to share about our program's resources. Roadshow directors also offered a course titled "Best Practices in STEM Outreach Engagement" to 8 UW graduate students last semester. The Roadshow is also collaborating with SER to develop middle and high school curriculum that focuses on Uranium and Carbon Capture. Lastly, the Roadshow has received another generous \$10,000 grant from the WY Department of Health Aging Division to continue STEM outreach work in senior centers across the state.

IMPORTANT DATES

- STEM-ology in the new STEM Sandbox - The SI Roadshow will be bringing engaging, hands-on STEM experiences to all ages. Each month, participants will explore a new STEM-related theme. For times, dates, and more information, see the next page of the newsletter.
- Spring 2025 LAMP Coffee and Curriculum kicks back off on Friday, February 14th. Please join us at 8am on select Fridays. These sessions are held on [Zoom](#). Please see the [schedule](#).
- Fall 2025 [applications](#) for the LAMP Learning Assistants (LA) program are open, and are due on April 28th.

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STEM-ology: Themed STEM Engagement in the New STEM Sandbox

The SI Roadshow is bringing STEM to life with engaging, hands-on experiences for all ages, inspired by exciting monthly themes! Programs are designed to spark curiosity, inspire creativity, and make science, technology, engineering, and math fun and interactive.

Where: STEM Sandbox - SI Building Room 4003 (a part of the new SCROLL)

Monthly Themes: **February** - Marine Biology, **March** – Physiology, **April** – Geology, **May** - Space-ology

Toddler Tuesdays: 10:00 am –10:30 am, Dates: 2/11, 3/4, 4/8 & 5/6

Join us for Toddler Tuesdays, where little ones can explore the world through hands-on activities and sensory play. Each session is designed to engage toddlers in a fun and interactive way, sparking curiosity and building foundational skills. Parent attendance is required.

Senior Science Fridays: 10:00 am –11:00 am, Dates: 2/14, 3/7, 4/11 & 5/9

Senior Science Fridays offer a fun and engaging way for older adults to explore the wonders of science! Each month features a new theme with hands-on activities and discussions tailored to spark curiosity and foster lifelong learning in a welcoming, interactive environment.

Science Saturday: 10:00 am -12:00 pm, Dates: 2/15, 3/8, 4/12, & 5/10

Science Saturday is a fun-filled family day designed for all ages! Each month brings a new theme, where families can engage together in hands-on activities, experiments, and challenges. It's the perfect way to spend a Saturday learning and exploring as a family.

Shared Resource Facilities Updates

CASI (Center for Advanced Scientific Instrumentation)

Between October 1, 2024, and December 31, 2024:

- CASI instruments were booked for a total of 2,512 hours.
- 44 users utilized the instruments, supporting 25 projects across 23 research groups.
- Seven training sessions were conducted for eight users.

During the Fall 2024 semester:

- Additionally, two classes were taught on the SEM and TEM operation during the Fall 2024 semester, which trained 10 new SEM users and 18 new TEM users.
- CASI also organized five outreach events, including group tours and presentations to departments such as Petroleum Engineering, Mechanical Engineering, Molecular Biology, and INBRE, showcasing its capabilities to broader audiences.
- Four lab tours were conducted to demonstrate CASI's advanced instrumentation and support faculty recruitment during interviews.

During all of 2024, CASI registered 37 active projects and served 140 users from 46 research groups.

PGPF (Plant Growth & Phenotyping Facility)

A fully functional website for the PGPF was launched on 2/2/2024, with the equipment/facility booking opening on May 1, 2024. Since May 2024:

- 268 participants joined guided tours.
- Over 25 meetings were held with CEA companies to plan future educational and research activities.
- A two-day workshop on high-throughput phenotyping was hosted in May 2024, attended by 39 participants.
- The 14 research spaces at PGPF had a 78% utilization rate from May to December 2024, with 65 users registered.
- PGPF served as the center for the first interdisciplinary class in CEA (AGRI 4990) at UW, involving faculty from 10 departments and culminating in student internships at Plenty Unlimited, Inc.
- PGPF supported over 20 research projects in 2024, submitted 10 proposals (four awarded totaling over \$4M), and became a NCERA-101, USDA Committee on Controlled Environment Technology and USE member station.

MORF (Model Organism Research Facility)

As of January, all substantive construction is finished on MORF (located on floor 1 of the Science Initiative Building). Finishing elements including equipment are now being installed. A manager for the facility has also recently been hired and operations will be ramped up over the spring 2025 semester.

People in SI Programs



WRSP Scholar

Dani Jones

Hometown: Gillette, WY

Major: Environmental Systems Science

Faculty Mentor: Dulcinea Groff

Dani is working with postdoctoral researcher, Dulcinea Groff, in the Shuman Lab. They are researching factors that may influence interpretations of paleoclimate proxies using sedges in the Rocky Mountains. This research can be used to better understand the application of plant-based paleoclimate proxies. Dani has also presented her research at the European Geological Union Conference in Austria. This year she has also served as the president of the Wyoming Undergraduate Research Coalition (WURC) RSO.



Roadshow Outreach Assistant

Macei Engelke

Hometown: Casper, WY

Major: Kinesiology and Health Promotion

"I am a junior studying Kinesiology and Health Promotion, considering applying for an Exercise Physiology PhD program after my undergraduate degree. Alongside the Outreach Assistant program, I am a Learning Assistant for the General Biology course, as well as a cycling instructor at Half Acre Gym. I am particularly passionate about exercise and nutrition and showing others the effects of both. A common theme among my roles at UW is facilitating the learning of individuals of all ages, from elementary students to faculty. As an OA, I have enjoyed providing children with a basic understanding of Anatomy and Biology. It's been fulfilling seeing others become interested in my area of study and knowing that I've impacted their early education."



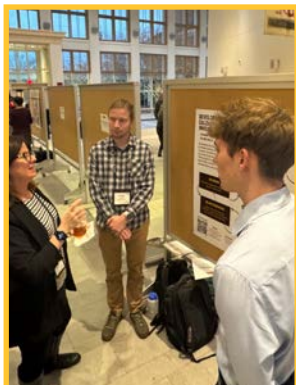
LAMP Learning Assistant

Madds Corbitt

Hometown: Rock Springs, WY

Major: Animal & Veterinary Science

The featured LAMP LA is Madds Corbitt. Madds serves as a learning assistant for Organic Chemistry and a teaching assistant for General Microbiology. Madds's teaching philosophy centers on kindling student curiosity and supporting students' capacity to handle the inevitable stress of STEM degrees. Madds states, "My goal as an LA/TA/tutor is for my students to leave as confident, passionate learners who can utilize healthy stress to achieve their own goals. I know I've succeeded when they begin asking me questions far beyond the scope of my knowledge. It has been an honor to assist with STEM education at UW." The instructors for both microbiology and organic chemistry relate gratitude for Madds's facilitation of student learning. Professor Willingham states, "Madds is an incredibly mindful, empathetic, and creative person. As evidenced by her creation of new and useful resources, such as infographics and tutorials, it is clear that she cares deeply about making learning accessible to all students."



LAMP Fellow

Cedar Wiseman

Assistant Lecturer, Mathematics & Statistics, UW

Cedar Wiseman is the Fall 2025 featured LAMP Fellow. Not only does Cedar teach Calculus I, he oversees all sections of the course. During his tenure as a LAMP Fellow (2023-2024), Cedar redesigned Calc I to encompass student learning outcomes across Bloom's higher level cognitive and affective domains. Through these outcome shifts, he overtly supported students in embracing a growth mindset. Cedar's course redesign was heavily assisted by his LAMP learning assistant (LA) Liam Royle-Grimes. After Cedar completed his LAMP fellowship, he was accepted as a member of the LAMP educator learning community. Throughout this intense yearlong effort, Cedar, along with his undergraduate LA, Jaden Cook, have begun the process of developing a holistic Calculus Concept Inventory aiming to measure students' conceptual understanding and problem-solving skills rather than their rote memorization. In order to accomplish this feat, Cedar and Jaden have first begun a SoTL study involving math, science, and engineering instructors as well as industry partners, and students in the development of the concept inventory. Cedar is an evidence-based practitioner, a student-centered professor and a budding educational researcher!

Featured Research Centers

Near the end of 2023, the Research and Economic Development Division (REDD) established the Science Institute, which manages the Science Initiative, the SI building's research facilities, and awards seed funds to help establish interdisciplinary research centers and programs that focus on Wyoming and UW-relevant issues. In late 2023/early 2024, \$2.375M was awarded (over multiple years) to establish 5 research centers and 5 research programs. Below are profiles on 3 of the research centers.

Center for Controlled Environment Agriculture - CEA

uwyo.edu/research/si/centers/cea

Director Name & Department - Liping Wang – Civil & Architectural Engineering & Construction Management

Description - Controlled Environment Agriculture (CEA) is a technologically advanced and intensive form of agriculture where plants grow within a controlled, enclosed environment to optimize horticultural practices. It includes several indoor farming styles from single-level greenhouses to more compact vertical farming. CEA can produce a high yield of crops per unit area all year round, creating a resilient and robust supply chain for fresh produce to build nutrition security in remote areas. CEA will support research and education in the field, generate a skilled workforce, and build out training and applied learning.

Updates

- Liping Wang will serve as PI for a \$405K grant from the NSF to support a 3-year REU program hosted by UW in the area of CEA. This novel program supports eight rising sophomores, including five Native American students, per year to conduct convergence research in CEA. Students will pursue one of the three research themes: (1) modeling and operation for resource-efficient CEA, (2) computer vision for monitoring crop growth and analyzing nutrient contents in CEA, and (3) a CEA feasibility study for tribal communities. REU students will gain firsthand experience through site visits, semi-interviews, and live discussions with industry partners.
- Carmela Rosaria Guadagno, director of the PGPF and associate director of CEA, will lead UW's efforts on a \$16M NSF grant supported by the University of New Mexico (of which \$2.08M is allocated to UW) entitled "Harnessing Controlled Environment Agriculture to Secure Sustainability and Economic Growth".

Center for Energy Materials - CEM

Directors' Names & Departments - John Hoberg and Jing Zhou - Chemistry

Description - The Center for Energy Materials will add value to Wyoming resources by developing advanced technologies for rare earth element extraction (REE) and separation, creation of REE-based permanent magnets, and REE-based catalysts, helping to diversify Wyoming's economy.

Updates

- CEM faculty researchers also include Brian Leonard (chemistry), Laura de Sousa Oliveira (chemistry), Jinke Tang (physics), and Kam Ng (civil engineering). The center also includes 2 graduate students - Rosa Melinda and Felix Gboyero.
- CEM researchers Laura de Sousa Oliveira and John Hoberg contributed to 2 separate articles recently published in the prestigious Journal of the American Chemical Society.
- CEM has partnered with UC San Diego's Paesani Group to support graduate student training and collaborate in designing a workflow for simulating desalinization via reverse osmosis through porous materials.
- CEM researchers Jing Zhou, Jinke Tang, Caleb Hill, and TeYu Chien, as well as researchers from Louisiana State University and the Brookhaven National Laboratory are working together to develop a core research program centered at UW in catalysis by earth-abundant elements to be used in emerging applications related to clean fuels, chemical productions, and environmental controls.

Center for Quantum Information Science & Engineering – C-QISE

<https://www.uwyo.edu/research/si/centers/qise/>

Director Name & Department - Jifa Tian – Physics & Astronomy

Description - C-QISE will advance technological components of quantum sciences and computing, and also positively impact material science and engineering as well. C-QISE is also developing education programs at both the undergraduate (Minor in QISE) and graduate levels (MS in QISE), helping create a workforce in the QISE field at UW and across the state.

Updates

- C-QISE is currently working on 9 different research projects with a total external funding amount of \$7.59M (of which \$2.6M were launched during FY 2024).
- C-QISE-affiliated graduate students and faculty have published groundbreaking research in prestigious journals such as Nature Communications, Advanced Materials, and Nano Letters.
- The course "Introduction to Quantum Computing" (EE 4800) is being offered online, in collaboration with Q-CTRL, for the