A DECADE OF SCIENCE FOR WYOMING

THE UW SCIENCE INSTITUTE & SCIENCE INITIATIVE

2015 - 2025

10

REVOLUTIONIZING SCIENTIFIC EDUCATION AND DISCOVERY IN WYOMING

The University of Wyoming's Science Institute & Science Initiative enable world-class research and education that will strengthen the foundations of Wyoming's present and future economy. Through integrated, interdisciplinary science, Wyoming's current and future researchers and entrepreneurs will revolutionize areas of Wyoming's economy including mineral extraction, agriculture, tourism, resource management, and emerging technology, while also preserving Wyoming's greatest natural resources and unique biodiversity. The Science Institute & Science Initiative will provide UW students with a flexible, pioneering skill set, giving them the resources to invent a Wyoming future whose details cannot be fully known.

Our reports usually only include data for the previous academic year, but because we are celebrating 10 years since the Science Initiative's founding, for some programs, we are providing an overview of the last 10 years of our impact, and taking a deep dive into data that shows a larger picture of our impact on students, UW researchers, and the state.

CONTACT US

University of Wyoming
SIB Room 2030
Dept. 4325
Laramie, WY 82071

(307) 766-4415
SI@uwyo.edu
uwyo.edu/science-initiative

Facebook University of Wyoming Science Initiative

WHO WE ARE

Jinke Tang, Director, UW Science Institute; Professor, Physics & Astronomy

Mark Lyford, Associate Director of Engagement, UW Science Institute; Senior Academic Professional, Lecturer, Botany

Rachel Watson, Director, Learning Actively Mentoring Program; Senior Faculty Development Professional, Kinesiology & Health

Jamie Crait, Director, Wyoming Research Scholars Program; Associate Instructional Professor, Botany

Karagh Brummond, Co-Director, Engagement and Outreach; Assistant Instructional Professor, Honors College

Erin Klauk, Co-Director, Engagement and Outreach; Assistant Lecturer, Geology & Geophysics

Ami Wangeline, Course-based Undergraduate Research Experience Coordinator; Associate Instructional Professor

Tabatha Spencer, Executive Business Manager, UW Science Institute

Ryan Goeken, Information Specialist, Sr., UW Science Institute

Jay Fahlsing, Administrative Associate, UW Science Institute

Brenna Anderson, Administrative Associate, UW Science Institute

Brandoch Cook, Director, Center for Advanced Scientific Instrumentation

Qian Yang, Assistant Research Scientist, Center for Advanced Scientific Instrumentation

Carmela Rosaria Guadagno, Director, Plant Growth & Phenotyping Facility; Director, Controlled Environment Agriculture Center Operations

Michael Baldwin, Assistant Research Scientist, Plant Growth & Phenotyping Facility; Controlled Environment Agriculture Specialist

Jennie Cook, Animal Care and Facility Manager, Model Organism Research Facility

Chameera Keerthirathne, Senior Laboratory Assistant, Model Organism Research Facility

Bryce Dutcher, Facility Manager, Science Initiave Building

GIVE TO SCIENCE INITIATIVE PROGRAMS

HELP SUPPORT STUDENT SUCCESS IN THE CLASSROOM, IN THE LABORATORY, AND AROUND THE STATE:

www.uwyo.edu/giveonline

LETTER FROM THE DIRECTORS

Dear Friends of the Science Initiative,

This past year, we celebrated the 10th anniversary of the establishment of the Science Initiative. It has truly been a remarkable decade, and we thank our friends and all stakeholders for their incredible support! We invite you to explore this annual report to discover the exciting developments that took place at the Science Institute and Initiative over the past year.

The Science Initiative Programs continue to provide Wyoming students and community members with transformational opportunities in STEM engagement. The WRSP welcomed 70 new undergraduate students into apprenticeships with UW's top researchers. 243 students have benefitted from this experience over the past decade, with graduates attributing much of their success to their experiences as a Wyoming Research Scholar. Spring 2025 welcomed our next class of incredible LAMP Fellows, as we continue to transform how students learn at UW and across the Wyoming Community College system. At UW alone, nearly 40,000 students have engaged in learning in the nearly 1,000 active learning classes led by LAMP Fellows, with notable increases in student success across all courses. The SI Roadshow continues to excite and engage citizens across Wyoming, reaching 9,200 individuals this past year spanning Pre-K to citizens at senior centers. While the Roadshow continues to focus on outreach across the state, it has also been a leader in showcasing UW's STEM programs on campus, notably through the annual UW STEM Carnival and with new programs that engage community members in immersive STEM experiences in our STEM Sandbox. Finally, as we look to the future, we are expanding the ability for undergraduates to be transformed by research opportunities within STEM classrooms by hiring a new Coordinator of Course-based Undergraduate Research Experiences.

The Science Institute currently supports five innovative research centers and three service centers. These research centers bring together interdisciplinary teams of experts from across campus to address some of Wyoming's most pressing needs and emerging opportunities — from controlled environment agriculture, rural resilience, and wildlife to energy materials and quantum information science and technology. Several of these centers have already secured major external grants and demonstrated sustained growth. The service centers — including the Plant Growth & Phenotyping Facility, the Center for Advanced Scientific Instrumentation, and the Model Organism Research Facility — provide state-of-the-art equipment and facilities that enable cutting-edge research across Wyoming. The newest of these service centers became operational last year. Today, the Science Initiative Building serves as a hub where faculty and students from diverse disciplines collaborate and conduct groundbreaking interdisciplinary research. Last year, we supported 11 PhD fellowships to help build a pipeline of top scientific talent for Wyoming's future. Looking ahead, the Science Institute will continue to advance the goals of the Science Initiative and catalyze new scientific discoveries that strengthen Wyoming's economy. For example, we are currently conducting a new round of ideation events aimed at identifying Wyoming's emerging challenges and forming collaborative teams and centers to address them.

These achievements are made possible by an extraordinary team whose passion for science and STEM education shines through in everything they do. The dedicated efforts of program directors, center directors, faculty, scientists, and staff — who have poured their hearts into creating transformative experiences for students at UW and in communities across the state — are fundamentally reshaping how science is conducted, taught, and communicated throughout Wyoming. We remain deeply committed to excellence, innovation, and service as we continue to elevate STEM education and research at UW and across our great state.

Best Regards,

Jinke Tang
Director

Mark Lyford
Associate Director of Engagement

UW SI 2024-2025 YEAR IN REVIEW

GOAL 1: SUPPORT STUDENT SUCCESS

WRSP included 70 scholars from 12 US states and 1 other country

48
WY WRSP scholars from
13
WY counties

WRSP scholars did
15,255
hours of research

WRSP scholars contributed to
17
articles published in peer-reviewed journals and contributed to
21
presentations at professional conferences

11
UW graduate students are enrolled in the PhD Fellows program, which gives awards to support 3 years of graduate studies. These fellows support research within the Science Institute's centers as well as take part in Science Initiative educational programs.

The Center for Controlled Environment Agriculture (C-CEA) offered its second year of an interdisciplinary CEA course.
10
students from UW, CWC, and Sheridan College were enrolled and gained hands-on experience in CEA from UW professors and local industry partners.

LAMP-trained professors taught
5,114
students in UW active learning courses

Interviewed LAMP-trained educators across UW's campus and across the state say that, with active learning, they see improvement in students' understanding of course material, can meet the needs of many types of learners, and see community-building among students and educators that strengthens educational outcomes.

On average, classrooms with LAMP-trained instructors saw a
6.1%
HIGHER
pass rate than classrooms with instructors not trained in active learning, marking an increase in student understanding and providing them skills that help them persist in their STEM degrees

GOAL 2: INCREASE RESEARCH PRODUCTIVITY & CONNECTIVITY

"Being housed in the Science Initiative Building has been transformative for both my research and my students' success. The collaborative and energized environment... has enhanced productivity and creativity across the board....My students have especially benefited from the collaborative spirit fostered here. We've developed partnerships and research collaborations that likely wouldn't have happened elsewhere." -Research faculty member housed in the SIB

"The proximity of our lab to [other faculty labs], as well as MORF and CASI, have greatly strengthened collaborative ties, elevated cross-disciplinary training opportunities for SIB students from different departments, and ensured easy access to world-class core facilities." -Research faculty member housed in the SIB

During the 2024-25 academic year, SI research centers have submitted **72** grant proposals (of which **17** have so far been funded), published **27** peer-reviewed journal articles, presented **30** times at professional research conferences, supported training and research of **42** students, and created partnerships across campus, with WY community colleges, and with governmental and private industry partners across the nation and the world.

Between 2019-2020 and 2023-2024, research connectivity among core science faculty members (as measured by journal publications in collaboration with other faculty members at UW) has increased
16%

GOAL 3: EXPAND STATEWIDE OUTREACH & ENGAGEMENT

The SI Roadshow brought active learning to
9,200
PreK-12 students, community members, and senior citizens during
93
outreach and inreach events in schools and other venues, increasing our reach by over a third compared to last year

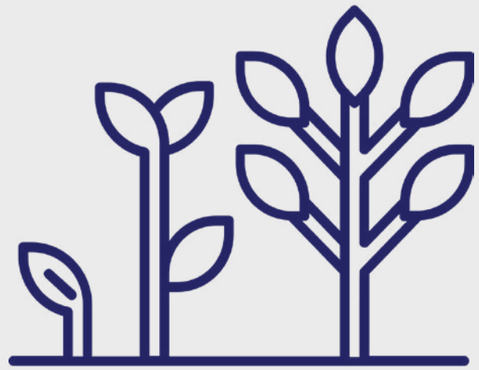
Livingston Elementary in Cody has partnered with the SI Roadshow to enhance their RIDE (Reimagining and Innovating the Delivery of Education) Initiative goals because they want their "K-5 students to get real-life experiences... so that they can apply what they learn at school and what they are learning... outside of school to their futures. [This approach to education] opens kids' minds to things that are available here. That's the goal - we want to grow them, [help them] come back to our community, and raise their families right here in Wyoming."

- Allison Lewis, Principal, Livinston Elementary, Cody, WY

Thanks to a grant from the Wyoming Department of Health's Aging Division, the SI Roadshow brought hands-on STEM activities to
222
older adults at
17
senior centers in
9
WY counties during the 2024-2025 academic year

SI TIMELINE

Since its ideation in 2014 and its inception in 2015, the UW's Science Initiative and Science Institute have innovated programming to enhance student success in STEM statewide and create infrastructure and capacity for research that strengthens the state's economy.



2014

TASK FORCE ESTABLISHED

- Wyoming Legislature adopts budget section directing Governor to appoint task force to develop plan for SI
- Governor Mead issues Charge Letter creating SI Task Force

2015

SCIENCE INITIATIVE ESTABLISHED & WRSP BEGINS

- Task Force (in collaboration with UW Campus Leadership Team) submits report to the governor
- Wyoming Legislature appropriates one-time funds for programs and SIB
- WRSP program inception with inaugural group of scholars

2016

SIB PLANNING, FIRST ROUND OF ONGOING FUNDING & LAMP BEGINS

- Level I Planning report completed for SIB
- Wyoming Legislature appropriates first round of ongoing programmatic funding and a portion of costs for the SIB
- LAMP program inception with inaugural class of Fellows

2017

MORE SIB PLANNING & ROADSHOW BEGINS

- Wyoming Legislature appropriates second round of costs for SIB construction
- Roadshow begins bringing active learning to Wyoming schools and communities

2018

SIB GROUNDBREAKING & CONTINUED PROGRAM GROWTH

- Wyoming Legislature appropriates final round of costs for SIB construction
- SIB groundbreaking
- PhD Fellowships pilot program launched

2019

PILOT OF SEED GRANTS, LAMP ELCs, & CURE

- A pilot of the SI seed grant program funds 13 interdisciplinary projects for $1M total
- LAMP's ELC begins at UW
- CURE begins enrolling students

2020

SI SUPPORTS ONLINE LEARNING ENVIRONMENTS & SIB CONSTRUCTION BEGINS

- LAMP supports educators with online learning necessitated by COVID-19
- SI Roadshow introduces Youtube learning videos
- SIB construction begins

2021

LAMP ELCs BEGIN AT COMMUNITY COLLEGES

- LAMP expands ELCs to community colleges across the state

2022

SIB OPENING & INAUGURAL STEM CARNIVAL

- SIB ribbon-cutting ceremony and opening for use
- SI Roadshow puts on inaugural UW STEM Carnival in cooperation with the Office of the President

2023

SI PROGRAMS FULLY FUNDED & SCIENCE INSTITUTE INAUGURAL IDEATION EVENT

- Wyoming Legislature fully funds all SI programs
- Science Institute hosts inaugural ideation event to create research centers

2024

PHASE I OF SI COMPLETED & SCIENCE INSTITUTE CREATES FIRST CENTERS

- Phase I of SI completed
- First Science Institute Director hired
- First round of Science Institute research centers created
- All SIB construction finished
- PGPF & CASI begin serving users

2025

STEM SANDBOX OPENS FOR INREACH IN SIB & SEEDING OF MORE RESEARCH CENTERS

- SI Roadshow begins offering STEM Sandbox community inreach activities in SIB
- MORF begins serving users
- Science Institute hosts second ideation event to seed more research centers

GOAL 1:
SUPPORT STUDENT SUCCESS

- Provide opportunities for undergraduate students to take part in high-quality, productive research experiences
- Improve the quality of UW undergraduate education through active learning faculty development and implementation
- Increase undergraduate graduation rates in core science departments
- Increase the number of doctoral students graduated in core science departments

KEY HIGHLIGHTS

Science Initiative programming and Science Institute support have given undergraduate and graduate students more opportunities to do high-quality and productive research while also supporting student success in hundreds of classrooms across the university.

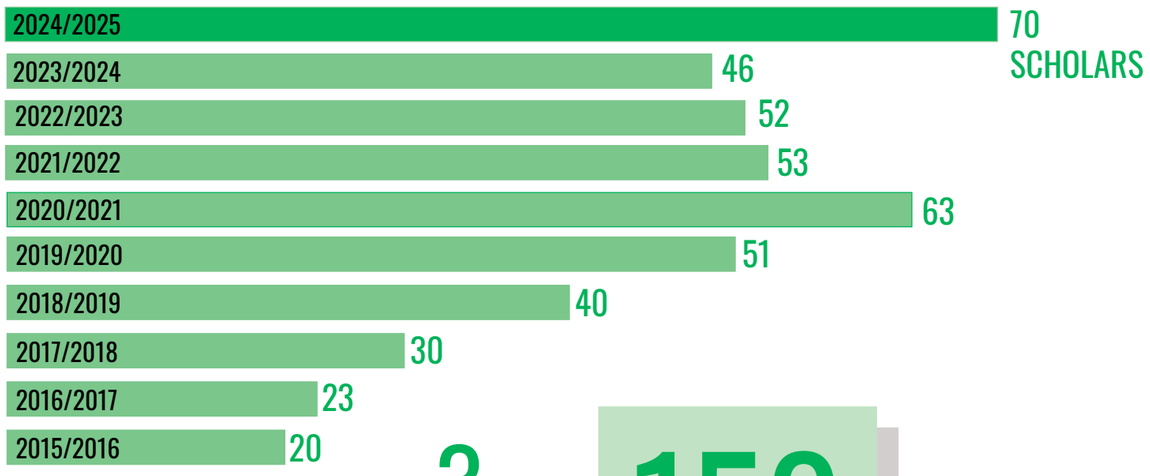
- The Wyoming Research Scholars Program (WRSP) has provided research experiences for UW undergraduates since 2015, serving 243 scholars, of which 150 were from Wyoming. Over time, scholars have given the program an overall rating of 9.2 out of 10 and have felt they have made considerable gains in scientific research and communication skills. Scholars have also been highly productive in research, contributing to 89 articles in peer-reviewed journals, and contributing to 135 research presentations. Alumni of the program feel invovlement gave them the skills they needed to get into graduate school and/or attain employment.
- The Learning Actively Mentoring Program (LAMP) has trained 164 college educators from across the state in active learning techniques. Since 2015, nearly 40,000 UW students have been enrolled in courses taught by these active learning faculty, and nearly 200 UW students have gained experience in teaching through assisting these educators in the Learning Assistant (LA) program. Pass rates in gateway science courses at UW increased by 6% due to active learning implementation, helping thousands of students persist and move forward in their STEM degrees.
- Over the last 10 years, the ratio of degrees awarded to enrollment has increased for all UW undergraduate majors, including those in STEM and the core sciences.
- Over the last 6 years, the number of PhDs awarded in STEM programs at UW has decreased slightly, but PhD Fellowships awarded will help stabilize this number. A concerted effort across campus will be needed to increase the number of PhDs awarded in STEM degrees.

WYOMING RESEARCH SCHOLARS PROGRAM (WRSP)

The **Wyoming Research Scholars Program (WRSP)** pairs undergraduate students with faculty mentors to participate in their own cutting-edge research project starting as early as their freshman year. Research experiences through WRSP build confidence and competence in young scholars at a formative stage in their training.

Program Goals:
1. Attract high-achieving high school graduates and community college transfer students to UW.
2. Retain promising students in the sciences at UW through early involvement in hands-on science research, department seminars, and public outreach events.
3. Pair talented students with a faculty mentor who can model the scholarship, teaching, service, and outreach activities of a professional scientist.
4. Develop transferable professional skills such as science writing, data analysis, and oral communication through participation in research and public outreach events.

WRSP SCHOLARS THROUGH TIME (2015-2025)



243 total scholars FROM **3** countries AND **34** US states and territories

150 scholars from **20** Wyoming counties

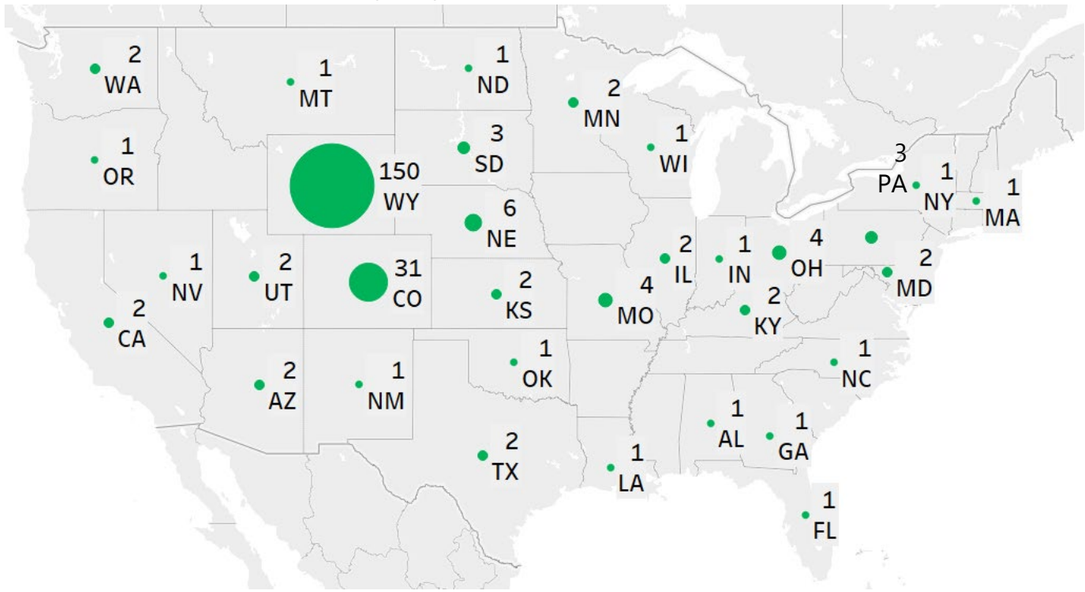
43 different primary majors spanning the disciplines

89 articles published in peer-reviewed journals

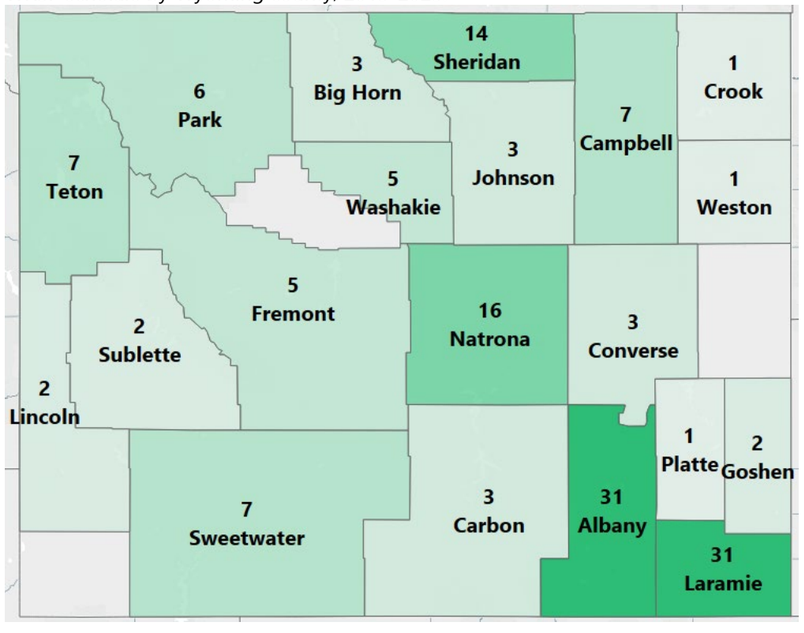
13 articles with WRSP scholars named as first authors

135 research presentations at professional conferences

WRSP scholars by state, 2015-2025. Additionally, 3 scholars from Alaska, 2 from India, and 1 each from the Northern Mariana Islands, France, and Zimbabwe participated in WRSP.



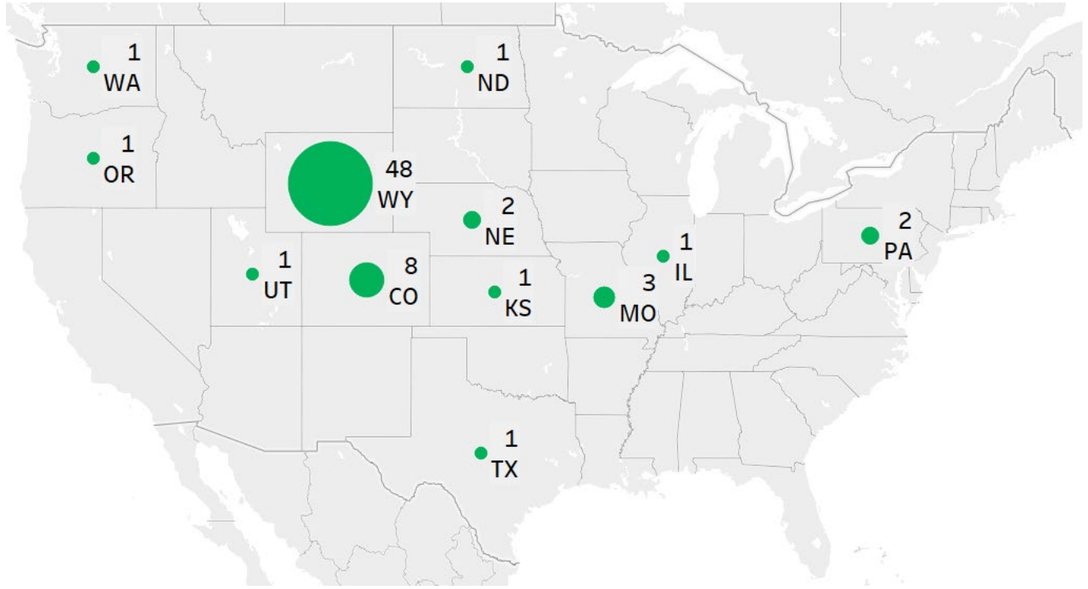
WRSP scholars by Wyoming county, 2015-2025.



Wyoming scholars came from **35** Wyoming communities

WRSP SCHOLARS 2024/2025

WRSP scholars by state, academic year 2024/2025. Additionally, 1 scholar from Zimbabwe participated in WRSP.



Below: WRSP scholars by Wyoming county and hometown, academic year 2024/2025.

WY COUNTY	WY CITY	# OF SCHOLARS
Albany	Laramie	7
Campbell	Gillette	2
Fremont	Lander	1
	Pavillion	1
Goshen	Torrington	1
Johnson	Buffalo	1
Laramie	Cheyenne	8
	Granite Canyon	1
Lincoln	Afton	1
Natrona	Casper	8
Sheridan	Sheridan	6
Sublette	Pinedale	2
Sweetwater	Green River	1
	Rock Springs	2
Teton	Jackson	3
Washakie	Ten Sleep	1
	Worland	2

WRSP scholars did

15,255

hours of research

WRSP EXIT SURVEYS

Since 2020, WRSP has administered an exit survey, where undergraduate students exiting the program are given an opportunity to reflect on their journey through the program, specifically related to the skills they feel they developed, their development of self-concept as a science researcher, and the quality of the program as a whole. Since 2020, 68 scholars have completed the survey. A summary of the results is below.

4.4 on a scale of 1 - 5 for the increase in research skills scholars obtained

3.9 on a scale of 1 - 5 for the increase in understanding of their self-concept as a researcher

9.2
overall program rating (out of 10)

SCHOLARS' MOST IMPACTFUL SINGLE EXPERIENCES

SCHOLARS' PERCEIVED STRENGTHS OF THE PROGRAM

A large support network outside of their laboratory - this allowed students to change research plans if needed

Being paid to do research gave students the ability to focus on it instead of needing another job

Quality trainings and resources for how to present their research, as well as opportunities to do so

WRSP ALUMNI SURVEYS

Once a year since 2020, we have sent a survey to all alumni of WRSP that asked questions about alumni's current employment and education status and any comments they had on how WRSP affected their research, education, and employment journey. 96 alumni have responded to the survey. Below is a summary of the data.

ALUMNI SCHOLARS IN GRADUATE SCHOOL

55
alumni pursuing and/or have finished graduate degrees

- **22** pursuing and/or finishing PhDs
- **22** pursuing and/or finishing master's degrees
- **11** pursuing and/or finishing other doctorate degrees (MDs, JDs, etc.)

9 pursuing and/or finishing graduate degrees at UW

ALUMNI SCHOLARS' EMPLOYMENT

41 alumni scholars included information about their employment. These scholars were employed in the following ways:

- **20** STEM field in private industry
- **14** STEM higher education academic field
- **4** STEM K-12 teacher
- **4** Non-STEM field

HOW ALUMNI SCHOLARS FELT WRSP HELPED THEM

- Helped them get into graduate school
- Skills they gained in the program helped them attain employment
- Made connections with other researchers and develop a sense of belonging
- Program resources gave them access to opportunities they wouldn't have had

WRSP ALUMNI SHARE THEIR EXPERIENCES

UW and WRSP Alumna Finds a Passion for Wildlife Conservation in Wyoming

Rhiannon Jakopak was one of WRSP's first scholars, doing wildlife research during the 2015-16 academic year. After graduating with her bachelor's degree in 2016, she completed a master's degree at UW and continued on as a Research Scientist with her master's advisor, Dr. Kevin Monteith. Following this, she took on two major roles with Wyoming Game and Fish Department, translating science into important policy for conserving Wyoming's wildlife.

"The project [I worked on during my time in WRSP] was focused on trying to understand whether remotely sensed measures of vegetation corresponded to on-the-ground measures for mule deer forage…I learned to code and developed an interactive tool that I could use to take the measurements… I was also introduced to various forms of analysis and presented my work at a couple of conferences. [The data did not show] a super strong 1 to 1 relationship, but it was a strong enough relationship that we felt we had ground truth. We will rarely accurately capture [total] reality in field ecology, where we're working in field settings, but [the outcome of my project showed that this was] our best approximation of reality. **[This project during my time in] WRSP really made me grapple with uncertainty, and the complicated nature of science and knowing things about our world.**

When I left the university last fall, it was for a position with the Wyoming Game and Fish Department, as the State Wildlife Action Plan coordinator. I revised [this] strategic planning document for conservation of species of greatest conservation need throughout the state. **To be able to successfully [lead] the revision, they needed someone who was an ecologist, someone who knew how to work with many different kinds of people, design processes, and then translate this information into policy. Now I am the Wildlife Policy and Legislative Affairs manager for the Department. For me, this is the next step in building on a true love for learning and a true love for ecology, conservation, and wildlife."**

UW and WRSP Alumnus Helping to Develop In-Home Medical Device

Austin Stephen, a UW alumnus graduating with Computer Science and Statistics degrees, was a part of the WRSP program from 2019 – 2023. "I was working under Lars Kothoff in computer science. We focused on systems that help people design machine learning models. A big outcome [from my time in the lab] was that we contributed to an article in the Stanford AI Index Report. **[My time in the WRSP] was a really formative experience for me. I learned a ton from Lars - from abstract concepts like how to think about problem solving to the very methods we were using - I use what I learned in my work now in an applied context.**"

Austin is currently the Lead Software Engineer for startup Eye to Eye Telehealth, which is headquartered in Cheyenne, with some operations in Denver. The company is currently developing an in-home tonometer, a device used to monitor the pressure inside a patient's eye, which is a test crucial for diagnosing and monitoring glaucoma. "The standard of care right now is that a patient goes into their doctor's office and has their eye pressure checked there. We built a tonometer that's handheld and looks a bit like a pair of binoculars. It's sent with patients and lets them measure their eye pressure at home, and then streams their eye pressure data to their doctor so that they can monitor their disease asynchronously, as opposed to having to go into the clinic."

Austin says that research through WRSP helped shape his thoughts about what he would like to do after graduation. "I had done an internship as a generic software engineer at a big bank, and that was probably the default path for me, if I hadn't been involved in research. I would have probably worked at a financial institution, writing code for credit card risk, **but my experiences in the WRSP gave me the skills and confidence to try something more creative and demanding."**

Lastly, Austin says, "[Being a part of WRSP] was a highlight of the University of Wyoming for me. It made me a more competent researcher, developer, and programmer, and those are big things."

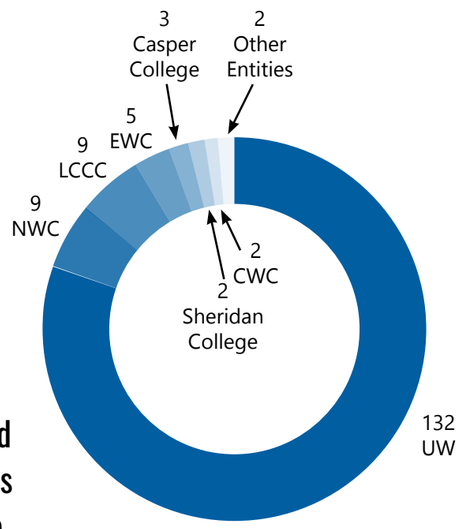
LEARNING ACTIVELY MENTORING PROGRAM (LAMP)

LAMP is a comprehensive, sustained mentoring and professional development program with an emphasis on how to best adopt active learning strategies in large-scale active learning classrooms at UW and in classrooms across the state's community colleges.

Program Goals:
1. Improve student retention, success, and engagement in STEM classrooms.
2. Enable all new and most existing STEM teaching faculty and teaching assistants at UW to become trained in active learning strategies.
3. Conduct research on active learning in STEM classrooms to investigate relationships between teaching practices and student success, literacy, and engagement.
4. Establish professional development and collaboration opportunities for science instructors across the state, including community college instructors and K-12 teachers, to improve learning experiences for all Wyoming students.

LAMP THROUGH TIME (2016-2025)

164
fellows from
7
WY institutions of higher education and 2 outside institutions have completed the yearlong training



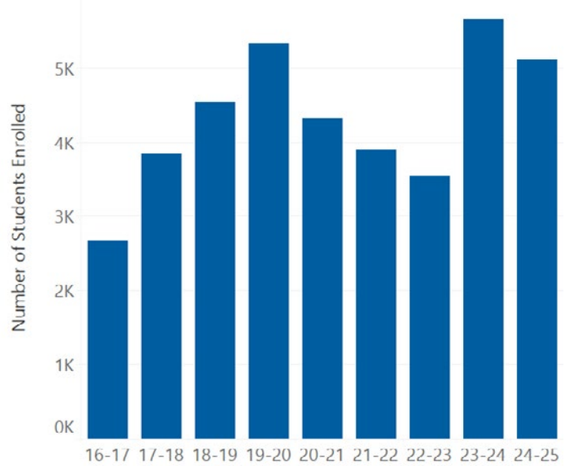
Number of educators trained by institution.

Since 2016, 132 LAMP-trained educators at UW have impacted
39,130
students in
1,043
active learning classes

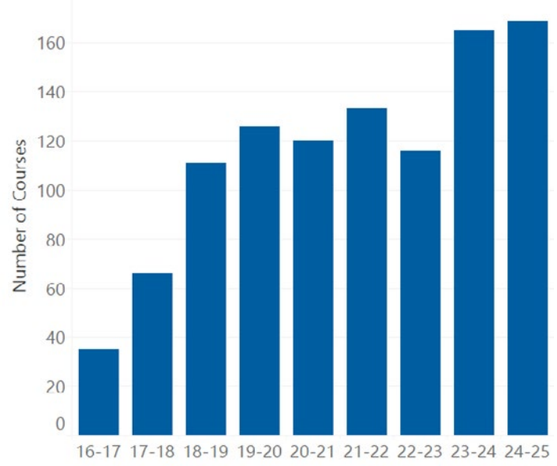
Fellows from UW came from
40
departments/units across
7
colleges and schools

LAMP Fellow participants at other institutions included
12
different academic programs

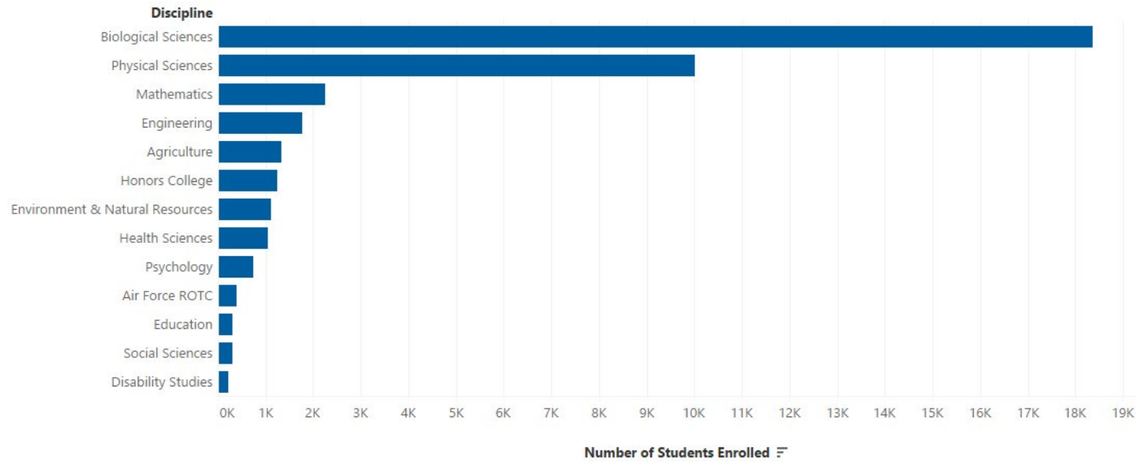
Student enrollment in active learning classes taught by LAMP-trained educators at UW by academic year (Fall 2016 - Spring 2025).



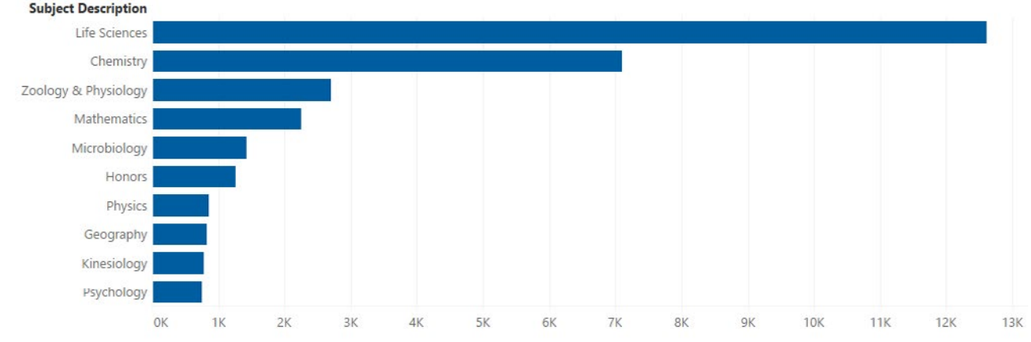
Number of active learning classes taught by LAMP-trained educators at UW by academic year (Fall 2016 - Spring 2025).



Student enrollment by discipline in LAMP fellow-taught active learning classrooms (Fall 2016 - Spring 2025).



Student enrollment by subject description (10 with highest enrollment) in LAMP fellow-taught active learning classrooms (Fall 2016 - Spring 2025).



In the 2024/2025 academic year, 55 LAMP-trained educators at UW impacted

5,114

students in

169

active learning classes

Student enrollment by discipline in LAMP fellow-taught active learning classrooms, academic year 2024/2025.

DISCIPLINE	ENROLLMENT
Biological Sciences	1,795
Physical Sciences	1,008
Engineering	491
Health Sciences	417
Agriculture	294
Environment & Natural Resources	285
Psychology	278
Mathematics	197
Honors College	165
Education	79
Disability Studies	45
Social Sciences	39
Humanities	21

Student enrollment by subject description (including subject descriptions with an enrollment of 10 or more) in LAMP fellow-taught active learning classrooms, academic year 2024/2025.

SUBJECT DESCRIPTION	ENROLLMENT
Life Sciences	1,092
Chemistry	908
Kinesiology	408
Zoology & Physiology	333
Psychology	278
Construction Management	265
Microbiology	255
Mathematics	197
Honors	165
Environment & Natural Resources	148
Agricultural Economics	130
Plant Sciences	102
Architectural Engineering	93
Earth Systems Science	92
Molecular Biology	77
GIS Technology	72
Secondary Education	51
Electrical Engineering	48
Food Science	48
Wyoming Institute for Disabilities	45
Outdoor Rec. & Tourism Management	45
Civil Engineering	38
Botany	35
Engineering Science	22
Creative Writing	21
Elementary Education	19
Geology	17
American Studies	16
Petroleum Engineering	15
Gender & Women's Studies	12
Renewable Resources	11
Native American/Indigenous Studies	11
Geography	11
Computer Science	10

LEARNING ASSISTANTS

The LAMP Learning Assistants Program began in Spring 2018 and provides UW students with opportunities to assist teaching in large introductory science courses taught in active learning classrooms at UW. Learning Assistants (LAs) act as peer mentors to help facilitate team-based and other types of learning. As many LAs are pursuing employment as K-12 STEM teachers, the program also integrates active learning into their training and gives them valuable teaching experience. Since Spring of 2018, 191 UW students have served as LAs for 337 active learning courses. This academic year, 37 UW students have been LAs fo 50 active learning courses.

EDUCATOR'S LEARNING COMMUNITIES AT UW AND THE STATE'S COMMUNITY COLLEGES

LAMP led 7 educator learning communities (ELCs), 3 at UW and 4 throughout the state of Wyoming. These communities educated 55 college instructors on active, inclusive pedagogies. The four statewide learning communities built positive affect networks between 2-year colleges (NWC, WWCC, LCCC, Casper College) and the University of Wyoming and facilitated instructor capacity to build universally designed learning environments. These communities are funded, in part, by a grant to UW (administered by LAMP) from the Howard Hughes Medical Institute Science Education Program as part of the Inclusive Excellence 3 (ie3) Initiative.

The first UW ELC educated instructors on theories of change and resistance and supported them in becoming change agents and performing SoTL (Scholarship of Teaching and Learning) research. The second UW ELC supported the Science Institute PhD Fellows in gaining capacity to thrive across all pillars of academic scholarship: research, teaching, service and outreach. Finally, 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 NSF MOOC (Massive Open Online Course).

ACTIVE LEARNING TRAINING FOR FACULTY ENHANCES STUDENT SUCCESS IN GATEWAY SCIENCE COURSES

The implementation of active learning in introductory (or "gateway") science courses has been shown to decrease a course's DWF rate, which is defined as the percentage of students that receive a final grade of D, W, or F. Many introductory science courses traditionally have high DWF rates, which affects students' ability to progress in their major and can lead to students retaking courses and delaying their graduation, major changes to non-science fields, or even student attrition. One of the main goals of LAMP is to provide training to faculty members to boost student success in gateway courses and therefore retain more students in STEM. In the following analysis, we looked at the difference in DWF rates in courses and compared between sections where instructors were not trained by LAMP vs. instructors who were (data to right). 14 of the 19 courses we analyzed saw lower DWF rates when LAMP-trained faculty were teaching. We also did a second analysis including professors' DWF rates in a single course, before and after LAMP training (data below). 9 of the 14 courses we analyzed saw lower DWF rates after instructors went through LAMP training. Data includes 445 courses (of which 116 were taught by LAMP-trained faculty) from Fall of 2016 - Spring of 2025.

ON AVERAGE, CLASSROOMS WITH LAMP-TRAINED INSTRUCTORS SAW A

6.1% LOWER

DWF RATE THAN CLASSROOMS WITH INSTRUCTORS NOT TRAINED IN ACTIVE LEARNING

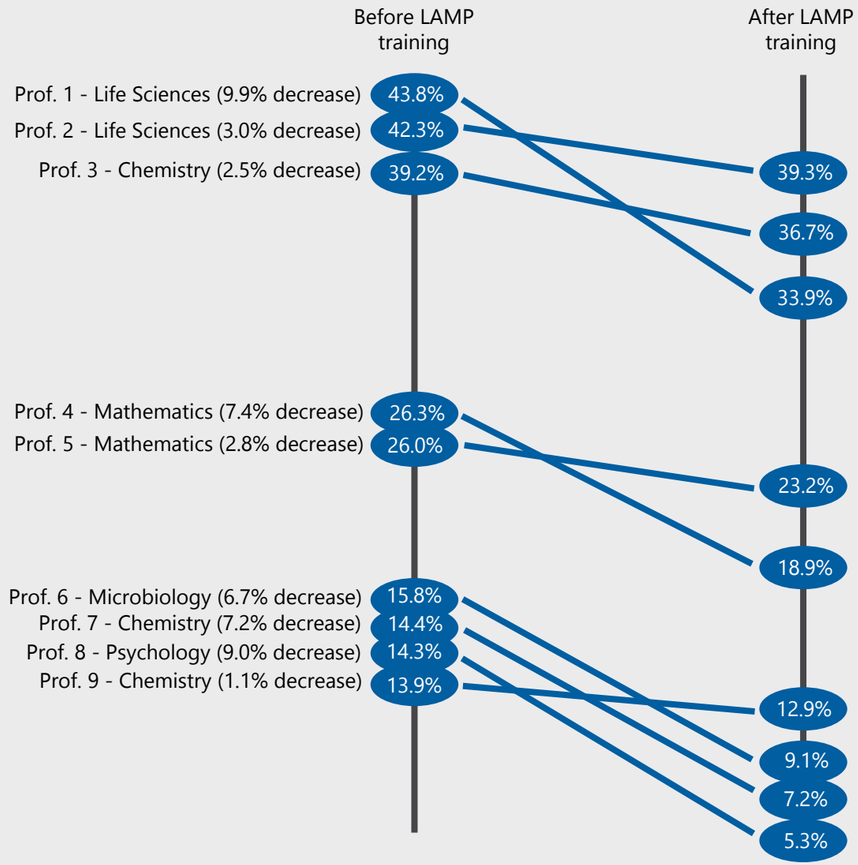
ON AVERAGE, INDIVIDUAL LAMP-TRAINED INSTRUCTORS SAW A

4% DECREASE

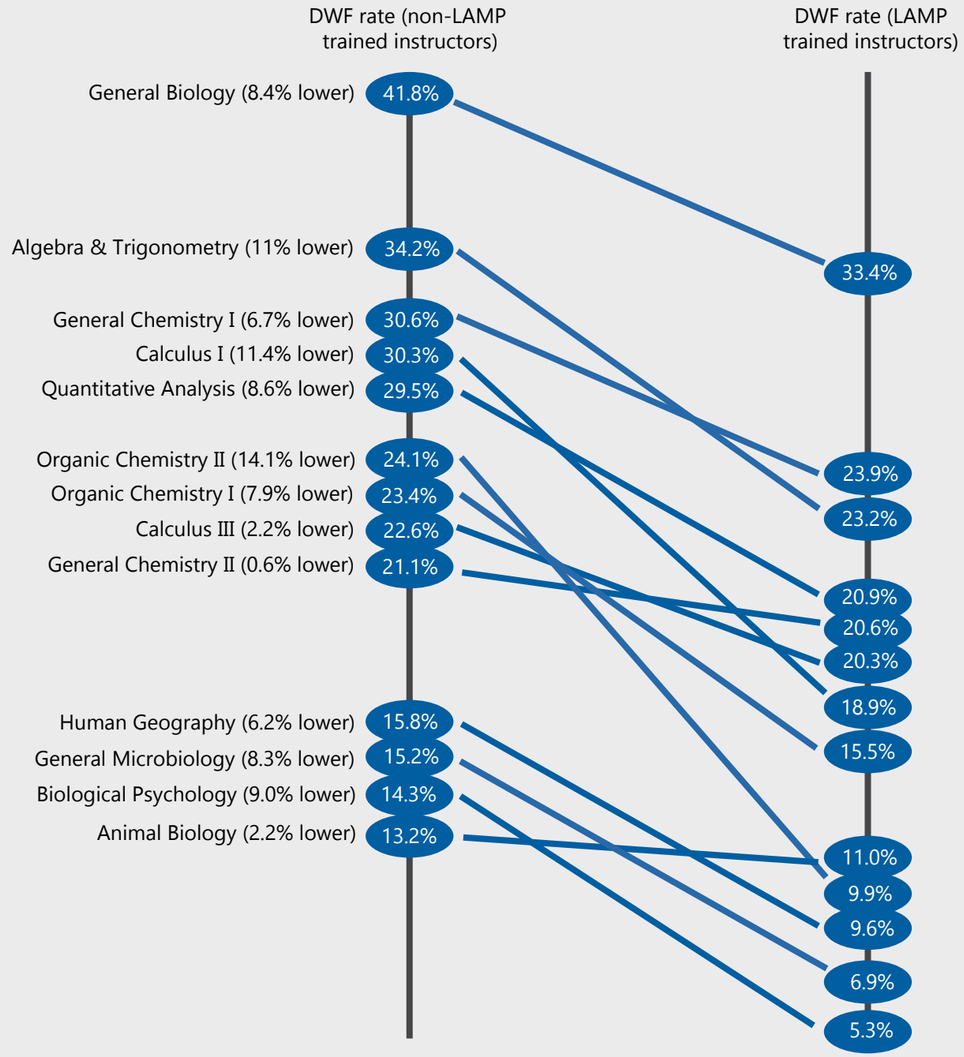
IN DWF RATES AFTER LAMP TRAINING

DWF RATES DECREASE FOR INDIVIDUAL INSTRUCTORS AFTER LAMP TRAINING

Professors are listed anonymously here with a reference to the subject description of the course they taught. Data is for a single course that each professor taught.



DWF RATES ARE LOWER IN COURSE SECTIONS WHERE INSTRUCTORS ARE TRAINED IN ACTIVE LEARNING THROUGH LAMP



LAMP FELLOWS AND LEARNING ASSISTANTS SHARE THEIR EXPERIENCES

LAMP Fellow Sees Increased Student Engagement in Chemistry Classroom

Ginka Kubelka, an Associate Lecturer in the Chemistry department at UW, teaches Organic Chemistry I and II, as well as Introduction to Organic Chemistry, and oversees all Organic Chemistry laboratories. Ginka took part in the LAMP yearlong training during the 2019-2020 academic year and was a part of UW's Educator's Learning Community the following year.

She says, "One of the biggest impacts LAMP has had on my teaching is introducing me to the concept of the flipped classroom. Using this approach, students interact with preparatory material before class, which allows us to focus on problem-solving during class. I think it's had a major impact on my students' engagement and confidence. **This approach is student-centered, encouraging them to take responsibility for their learning. When students go to a traditional lecture they sit, listen, and write notes. In the flipped classroom, they know they're expected to work in their groups, so they have to be prepared.**

They are also interacting more with each other and me, which helps me get to know them better. It helps me understand their individual needs, as their in-class interactions often reveal their knowledge more than their [exam performance] does. Previously, I taught in a traditional lecture hall, and having a mass of students that never talked to me never led to much interaction. Now, because of interactions during class, most students feel comfortable to come to my office hours to ask questions. Also, one thing I have noticed is that, because I keep the student groups consistent throughout the semester or even both semesters (between O Chem I and II) as much as possible, students form a strong bond in their groups. Many of the groups form study groups outside of class. Especially in organic chemistry, it's just so beneficial to talk through things or practice working through problems together. Having a group that they feel safe to share ideas with, without fearing being wrong – that motivates students to keep going, even when the material is challenging.

Having learning assistants (LAs) is crucial for handling questions in larger classes. Many students are more comfortable asking LAs rather than me. My LAs really want to support the students so they can have a good learning experience. Along with LAs, teaching in the Active Learning Classroom (ALC) is necessary for how I teach the class. I really appreciate the space, and I know the students do too."

LAMP Fellow Builds Community Among Educators and Students

Randa Jabbour, Professor in the Plant Sciences department at UW, has seen LAMP create community among educators, between educators and students, and even among students. This interconnected web of teaching and learning has enriched her teaching as well as provided students with opportunities to grow.

One of the courses Randa teaches is Agroecology 1000 (Introduction to Agroecology). She collaborated with two educators who have been part of the LAMP community as mentors to bring an interdisciplinary element into the class. "We started incorporating sketching into the class. Bethann Garramon Merkle (a LAMP mentor, and director of WySci, the University of Wyoming Science Communication Initiative) does work on how sketching connects to science education, so we incorporated that." Randa also collaborated with faculty at the UW Art Museum, and students in agroecology created museum labels for different art pieces and artifacts related to agriculture in the museum, which integrated object-based learning, a modality of active learning, into the class. **"I've been able to diversify the techniques I use, but then also point students toward those experts across campus, and now students can see that science includes all of these things – you don't have to count yourself out of science because you like art, or something else. This community-building helps students make connections in their learning and among the people involved in their learning."** Speaking of the community she has built among educators, Randa says, **"I feel like everyone is helping mentor each other in the community, and these evidenced-based practices plus that community helped me be more confident about teaching the way that is best, [even if these best practices] are going against norms.**

Also, I teach an online asynchronous class, and I really have had to think about how to approach it in a way that helps students feel engaged. I respond to their assignments with comments, no matter what. When students turn in good work, they've gotten conditioned to not get feedback, they just get their grade. But I shifted to leave them a comment – maybe they didn't even realize they're actually hitting on a really important point, and so I would respond and share some sources with them and tell them there is a lot more related to this point you made. I think this makes them feel seen and like someone is really noticing their work."

Lastly, speaking about her agroecology course, "I had never really thought about how my teaching connected to my values. In my instructional strategy I wanted to prioritize building community in the classroom. In active learning there is a lot of group work, and on students' final reflections for this course, they said they made new friends in the class. **In my class they are doing science, and being scientists, but they're also being a community with each other.** The act of learning is the foundation that allows those relationships to form."

LAMP Fellow at EWC Makes Online Classes Accessible and Student-Centered

Sherri Warren acted as Department Head of the Math/Science department at the Douglas campus of Eastern Wyoming College, and now serves as an adjunct professor. She took part in the LAMP yearlong Fellow training during the academic year of 2023-2024.

Sherri says, "I completed both my bachelor's degree and master's degree totally online, which really helped me be a self-directed learner, and this is what I want for my students. This semester (Spring 2025), I have taught all my courses online and asynchronously. It can be challenging to integrate interaction in an asynchronous course, but I try to humanize the learners by leaving lots of constructive and encouraging messages on the online message board, and by meeting with students often on Zoom for office hours. I also utilize Universal Design for Learning (UDL) in all of my classes. **I had one student who came to me and said she thought she might have an undiagnosed learning disability. I encouraged her to get these learning disabilities documented so that she could receive all the possible accommodations she could need in my course, but she told me that my use of UDL covered all of those accommodations already." Sherri is truly an example of making her online classroom accessible to all.**

When speaking of her training as a LAMP Fellow, Sherri says, "One of the big things that has changed for me is thinking about the affective domain and how it affects students' learning. I ask students how they are feeling about tests before they are taking them – I have them write it on a piece of paper, ball it up, and throw it away before they take the test. Students do better on tests when they can express how they are feeling about it. I also let students talk about how they feel about a concept after they've learned it. I feel like this helps boost students' confidence and helps them see themselves as learners." Sherri also espouses a philosophy of "look how far you've come" when it comes to assessment and tries to share assessment with students directly as much as possible. "I do pre-, mid- and post-knowledge surveys and try to share these results with students as often as I can."

Sherri has stayed connected with the LAMP community after her yearlong training through different workshops. "Having a group around you cheering your growth and development on has gone a long ways in making me feel confident in my growth and leadership as an educator."

UW LAMP Fellow Leads Students Through the Research Process and Takes Part in Large-Scale Transformation in Teaching in the Life Sciences Program

Liana Boggs Lynch, Instructional Professor in the Botany department and for the Life Sciences Program, teaches a variety of biology and ecology courses at UW, as well as coordinating plant fungal and general biology labs every other semester.

Last year, Liana also co-taught the Microbiology Capstone course with Erin Bentley, a PhD student in the Program in Ecology and Evolution (PiEE). The class was designed by Rachel Watson, LAMP Director, to be a Course-based Undergraduate Experience (CURE) where students create their own research project and present their findings at the end of the semester. Of this course, Liana says, "Erin did the front half of the class where she was working on the writing portion and the NSF-style grant writing. And then I came in a little bit later, and I was helping with the actual research portion of the class. There's a lot of wrangling, working with agencies and trying to figure out [who to contact and what data you can access]. It was just such a joy [to teach] this class…that is so beautifully designed by Rachel and really see the advancement of the students, because it's something that is so unlike their normal classes. We do give them a general idea of what they can study just for the nature of practicality, but then they write their grant on it, and then we went out and collected and analyzed their results and gave a big presentation at the end.

It was sort of stressful for them because they were asking themselves, 'How do we succeed?'. In most classes, students can achieve a perfect result, say a perfect test score, or good results from an experiment. In those classes it's a pre-planned experiment, but in this case they were struggling with the idea that they didn't have perfect results at the end. They really struggled at first with the idea that failing sometimes is succeeding because you have to fail to learn. But because of that, we saw so much growth – they learned that this is what science really looks like."

Liana also reflected on her experience of how LAMP training has changed the culture of a large team of educators that work together to teach LIFE 1010 (General Biology) courses and laboratories. "It takes a village to run LIFE 1010, and so may classes feed out of that. With a class that big, it's a scary and challenging thing to pivot to more active learning, but we have been doing it, and it's been absolutely incredible. **Also, in the Life Sciences program as a whole, we are getting all of the instructors together and working to scale things across classes and across levels, brainstorming about how we can change [our teaching]. I am excited to see where that goes because it touches so many students."**

UW Undergraduate Develops as a Teacher and a Scholar as a Part of the LAMP Learning Assistant Program

Dawson Poteet, a UW undergraduate student from Laramie studying Psychology, has served as a Learning Assistant for many different courses. He has brought his unique perspective to help other students know that it's OK to try, fail, and try again, as well as conducting research on students' experiences in active learning classrooms.

"When I am working with other students, the first thing I always want to acknowledge is how important it is to remember that the ability to try again, even if things don't go well the first time, is super important. I realize some students might view me, as a Learning Assistant (LA), as the 'smart kid' in class and feel intimidated. I used to think that way too. But on the first day of Organic Chemistry, when the instructor, Ginka, asked us to share something about ourselves, I would say, 'I took a W in this course the first time I took it. I was really scared of this class.' For a lot of the students, it's really helpful for me to say this because I can more easily ask 'Hey, are you struggling with this?'. At first students would sit there and say no. **Then I would ask them a deeper question to get them to engage more. I would say that I understand you don't want to sound like you don't understand in front of all your peers at the table, but I guarantee 90% of them don't understand it as well. I would move from more closed to more open questions to kind of 'trick' them into [a deeper conversation about the topic so they could unlock their ability to truly learn]."**

Dawson was also the first undergraduate student to be a part of the LAMP Educator's Learning Community (ELC) in the 2023-2024 academic year. This community of educators takes their LAMP training a step further and continues educational research they began in their classrooms during their LAMP yearlong training. Of the experience, Dawson says "I felt in some active learning classes that some of my peers were not vibing with the teaching. They were wondering why they were asked to do certain things that took more time. Since I was part of the learning community, I studied why we were doing those things, and what the teacher was trying to accomplish. But if the student doesn't understand why, there is some resistance to active learning [because it seems like more work sometimes]. As part of the ELC, I was able to see teachers as people and see things from their perspective. They are still a person taking a lot of time to try and make learning better for us, because they care. Sometimes educators would try a learning technique, and it wouldn't work, even though all the research said it would work. Seeing behind the curtain made it so I didn't judge teachers as much. I saw that they prepared ten times more than they would if they were teaching a traditional lecture course."

Dawson's experiences as a student, an educator, and a researcher have contributed a tremendous amount to not only students' experiences in the classroom, but to the LAMP program as a whole. He has also served as an LA for the LAMP program itself, assisting the program director with curriculum development for undergraduate courses, as well as helping to facilitate faculty development retreats.

UW Undergraduate Meets Students' Unique Learning Needs as a Peer Mentor in the LAMP Learning Assistant Program

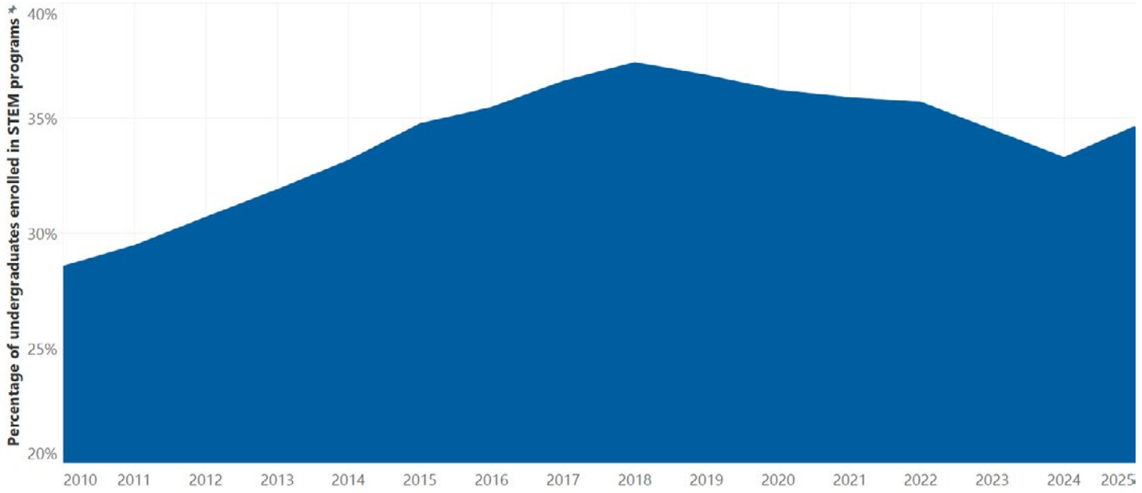
Jesica Tzompa-Martinez has always been an educator and has brought her life experience to help students succeed in the Genetics class at UW. Jesica is an undergraduate student from Jackson who is double majoring in Entrepreneurship and Molecular Biology.

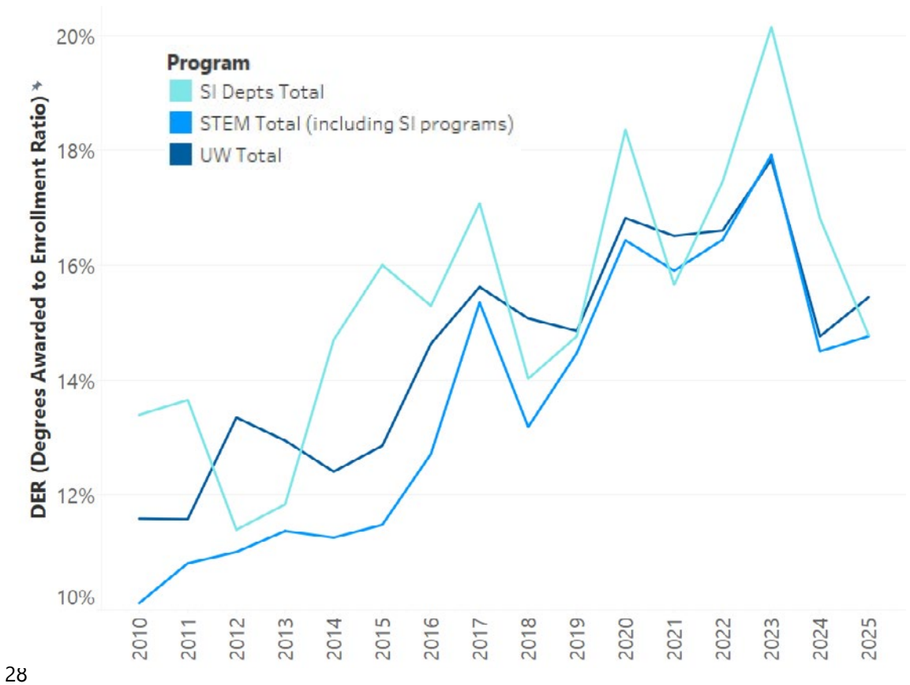
She says, "As a part of my training for becoming an LA, I took Rachel's (the LAMP program director) class (Secondary Education 4900: Best Practices in Active Learning). The class helped me build my teaching philosophy. I've never been put in the position of being a teacher in a formal setting before, but in my teaching philosophy, I was able to use a lot of examples from when I was younger [to inform my philosophy]. When I was younger, I was in ESL classes, and when I started school, it was a little bit hard to pick up on the language. I really wanted to help my younger siblings and make the transition [to school] easier for them. That was my first real experience of teaching. Also, in high school, I was a part of karate, and once you reach a certain rank, you're expected to help out teaching. That really inspired me to look after students. **I feel like when you have someone who really supports you and who really believes in you, that makes the whole process of learning a little bit easier."**

Jesica has brought her formative experiences in teaching, as well as her training in the Best Practices course, into the classroom at UW. As the sole LA In a large Genetics class with an enrollment of over 100 students, Jesica says, "I sit with a different table every day just to get to know them a little better. I build a relationship with them so that they know that I'm there for them." Her first semester as an LA, she shared the classroom with another LA, who she was able to learn a lot from. "I really enjoyed working with him. One of the things I learned from him was how to help students figure out the answer to their questions without giving it away. When students would ask a question, the LA I previously worked with would ask them another question to see what they already understood so they could build from there. **A lot of times if a table is not understanding a concept, I try to find one student that understands what is going on and get them to explain the concept so they can teach it to themselves once again and to the rest of the group. Getting to work with students one-on-one or by table in this way helps us really assess where students are and 'shrink the room' more than a single professor can, so we can practice more differentiated instruction, and meet each students' unique learning needs."**

UNDERGRADUATE ENROLLMENT AND DEGREES AWARDED IN CORE SCIENCE & STEM PROGRAMS

One of the Science Initiative's main goals is to attract, retain, and award degrees to undergraduate students in what have been identified as core science departments and programs at UW. These departments and programs include the following majors: Astronomy & Astrophysics, Biology, Botany, Chemistry, Microbiology, Molecular Biology, Physics, Physiology, Wildlife & Fisheries Biology & Management, and Zoology. As the reach of the Science Institute and Initiative continues to grow, other STEM majors are affected, as well. Enrollment in UW undergraduate programs continues to decrease since a high point in 2013, but slowed down between 2022 and 2024 and is now holding nearly even. STEM program enrollment has also decreased during this time, but





absolute numbers of students have not decreased as much as total undergraduate enrollment. This can be seen in the percentage of undergraduates who are enrolled in STEM programs (in proportion to total undergraduate enrollment) - this proportion has increased from 29% in 2010 to 35% in 2025.

The silver lining is that a general upward trend in Degree to Enrollment ratio (DER) continues over time. DER for SI department programs, all STEM programs (including SI programs), and for total UW undergraduate programs has averaged 17%, 16%, and 16% respectively over the last 3 years. This metric shows that the last decade has seen a marked increase in undergraduate student success through degree completion at UW and in SI academic programs.

DOCTORATE DEGREES AWARDED IN CORE SCIENCE & STEM PROGRAMS

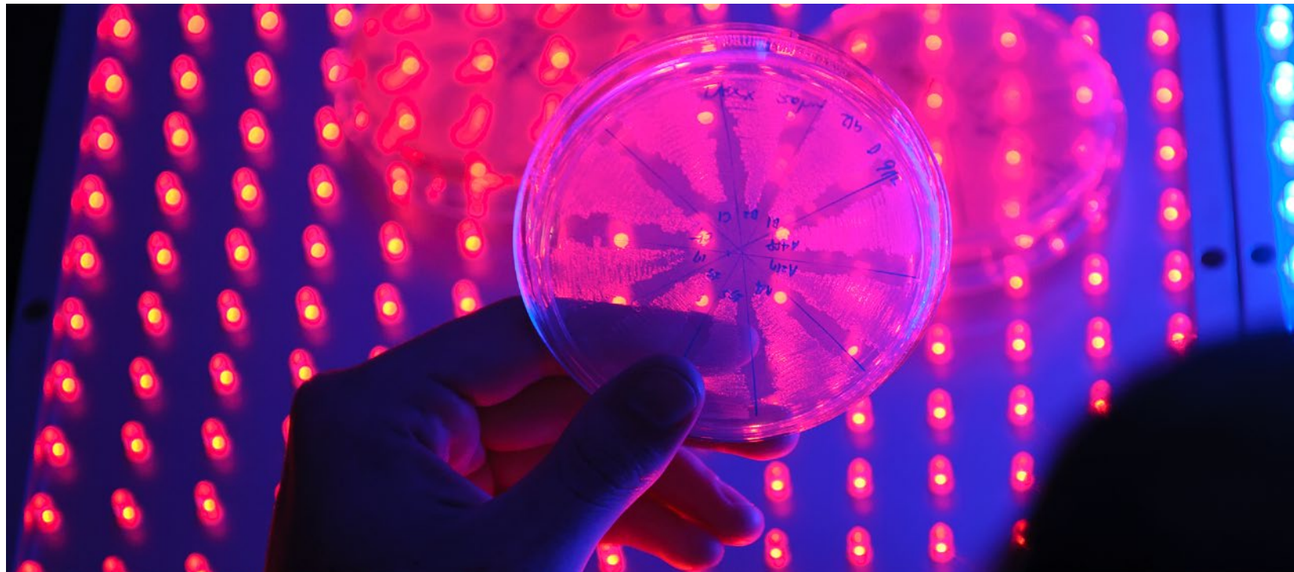
With the creation of the Science Institute, funding has been allocated to 19 PhD fellowships to increase enrollment and degrees awarded in STEM programs. This funding will help in helping core science academic programs reach this goal.

Number of PhDs awarded per tenure track/tenured faculty members in STEM programs.

	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
All STEM programs	0.37	0.45	0.43	0.38	0.36	0.28

In the last 6 academic years, an average of 98 PhD candidates have graduated from UW STEM departments.This number has seen a fairly steady decline over this time period. We expect to see the number of PhDs awarded in these departments increase as PhD fellows begin to graduate in the coming years, but these graduates will only comprise a 5-10% increase in the number of degrees awarded, so a larger and more concerted effort including other stakeholders on campus will be needed to see this number increase substantially.

During the time period above, STEM programs have accounted for 46% of total doctorate degrees awarded at UW.



GOAL 2:
INCREASE RESEARCH PRODUCTIVITY & CONNECTIVITY

- Increase dollar value of grants and contracts indexed to federal research funding awarded to STEM researchers
- Increase the number of published peer-reviewed manuscripts by STEM faculty
- Increase connectivity and collaboration among UW researchers

KEY HIGHLIGHTS

Science Institute research centers, Science Initiative Building (SIB) shared resource research facilities, and the co-location of researchers within the SIB's open-concept laboratories are helping researchers at UW create impactful research relationships at UW and across the state and world, as well as compete for federal grants and train the next generation of Wyoming scientists.

- Science Institute research centers are leading the way in interdisciplinary, Wyoming-relevant research that strengthens critical aspects of our economy and protects our unique biodiversity. These research centers are highly productive hubs for innovation, student training, and have built and strengthened relationships with colleges and universities, governmental agencies, and industry partners across the state, nation, and world.
- CASI, PGPF, and MORF, the SIB's 3 shared resource research facilities, support UW researchers through training and access to state-of-the-art equipment that boosts their productivity and precision, all under a sustainable model that prioritizes impact by centralizing resources.
- Since FY2019, STEM programs at UW have seen a 140% increase in funding indexed to federal funding agencies.
- Since 2020, connectivity and collaboration among faculty and students are on the rise, resulting in the creativity needed for interdisciplinary problem solving.

SCIENCE INSTITUTE RESEARCH CENTERS

As a part of its focused strategy to develop Wyoming-relevant, nationally competitive, and globally preeminent expertise, in late 2023, the Science Institute developed its first batch of five interdisciplinary research centers to address specific areas of relevance to Wyoming and UW, awarding seed grants to launch these centers, and awarding fellowships to PhD students to conduct research in these centers. Seed funding from the Science Institute will expire in June of 2026 for most of these centers, after which external funding will sustain these efforts.

During FY2025 (July 2024 - June 2025), personnel in these research centers:

- **Submitted 72 grant proposals, of which 17 have been funded so far**
- **Published 27 peer-reviewed journal articles**
- **Presented 30 times at professional research conferences**
- **Supported the training and research of 15 graduate students and 27 undergraduate students**
- **Created and nurtured research, training, outreach and other connections, including relationships with:**
  - **New UW faculty affiliates from departments across campus**
  - **Other departments, units and colleges across campus**
  - **Other SI research centers**
  - **Wyoming community colleges**
  - **Other US universities**
  - **Foreign universities**
  - **National laboratories**
  - **US governmental entities**
  - **Private industry partners, and**
  - **International governance committees.**

CENTER FOR ENERGY MATERIALS

The Center for Energy Materials (CEM) 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.

During FY25, CEM:

- Identified key research areas and promoted research and education. Current key research areas include:
  - Extraction and separation of REEs. CEM-supported graduate student, Felix Gboyero is collaborating with the Lawrence Livermore National Laboratory (LNLL) to develop a much more efficient way to extract REE from aqueous streams.
  - REEs as the basis for permanent magnets. CEM-supported graduate student Afnan Islam is exploring novel 2D and rare-earth materials and their magnetic properties.
  - REEs' use in petroleum refining. CEM-supported graduate student Rosa Melinda is working on the preparation of promising rare-earth based materials and the manipulation of elemental composition to tune their performance in applications including thermochemical CO_2 splitting with water for fuel production and value-added chemicals.
- Focused on team-building within and outside the center to expand the scope of their research and its themes. The center has created new relationships with UW's SER, two different national laboratories, and has begun working on a large grant proposal in conjunction with another SI research center, C-QISE.

CENTER FOR CONTROLLED ENVIRONMENT AGRICULTURE

The Center for Controlled Environment Agriculture (C-CEA) will accelerate food and nutrition security for diverse communities across the United States while achieving a broader use of controlled environment agriculture through education, research, and workforce development.

During FY25, C-CEA:

- Created the CEA network, which leverages UW's Plant Growth and Phenotyping Facility to provide hands-on training, industry partnerships, and testing for new technologies. The network connects partners to share knowledge, pursue joint research and grants, and offer student internships and experiential learning. Early partners include domestic farms, domestic agricultural technology companies, Wyoming community colleges, and international agricultural companies.
- Supported student research and training in the following ways:
  - Offered the second year of an interdisciplinary CEA course. 10 students from UW, CWC, and Sheridan College were enrolled.
  - Offered an NSF Interdisciplinary REU in CEA during the summer of 2024, led by former C-CEA director Dr. Liping Wang. Eight students from across the US gained research experience in various aspects of CEA.
  - Supported research and training of two graduate students.
  - Supported two undergraduate CEA ambassadors, who participate in research and outreach activities within the center.

In addition, center director Dr. Guadagno was selected by an international collaboration between FFAR (Foundation for Food and Agriculture Research) and NOW (Dutch Research Council) to sit on the committee for Greenhouses in Transition, a program that focuses on increasing regional sustainability of the CEA sector by developing transdisciplinary, cross-sector innovations within the food-energy-water nexus.

CENTER FOR QUANTUM INFORMATION SCIENCE & ENGINEERING

The Center for Quantum Information Science & Engineering (C-QISE) will advance technological components of quantum sciences and computing, and positively impact material science and engineering as well. C-QISE is also developing education programs at both the undergraduate and graduate levels, helping create a workforce in the C-QISE field at UW and across the state.

During FY25, C-QISE:

- Connected faculty, students, private quantum industry partners, and others in the following ways:
  - Formalizing collaboration with Taiwanese universities by signing an MOU between Taiwan and Wyoming focused on joint research and training in quantum science.
  - Deepening partnerships with industry, including companies such as Quantum Machines, Maybell Quantum, and Rigetti. These companies have joined C-QISE in preparing center-level federal proposals and brought on-site training opportunities to UW students.
  - Hosting the third Quantum Summer School, in celebration of the International Year of Quantum Science and Technology, bringing speakers from Taiwan, Europe and the US.
  - Hosting a hands-on quantum computing workshop at Atom Computing in Colorado, where faculty and students observed a real quantum computer in operation.
  - Creating a regional, Mountain West partnership network through Quantum Supply Chain Summits in Montana and Idaho.
- Launched two academic programs at UW, an M.S. in Quantum Information Science & Engineering, and an undergraduate minor is QISE.
- Engaged in high school outreach in Wyoming, giving them an introduction to what a physicist can do in Wyoming, and demystifying quantum science for the next generation of students.

CENTER FOR WILDLIFE, TECHNOLOGY, & COMPUTING

The Center for Wildlife, Technology, & Computing's (WyldTech's) vision is to leverage new technologies, big data, and computational advances to understand and conserve Wyoming's wildlife on working and changing landscapes. To achieve our vision, we build spaces supporting productive interdisciplinary collaborations that advance the frontiers of knowledge, provide management guidance for human wildlife coexistence, and yield products useful to the state of Wyoming and beyond.

During FY25, WyldTech:

- Expanded its engagement across campus, with 10 affiliate faculty (in addition to the 7-member steering committee), building representation from 9 units on campus from 4 colleges and schools. WyldTech also manages a list-serve with 59 members across the nation.
- Supported relationships with 16 state, regional, and national agencies and NGOs, and 5 industry partnerships.
- Collaborated with state and federal agencies at the Wyoming toad recovery team meeting, the Wyoming Game and Fish Pinedale Regional Office All Regions Meeting, the Cyberinfrastructure and AI for Ecology workshop, the Wyoming Game and Fish Department's annual pronghorn working group meeting, the Western Association of Fish and Wildlife Agency's Deer-Elk Workshop, as well as other meetings with the Wyoming Game and Fish Department and at national and international wildlife conventions.
- Awarded four, one-year seed grants (total investment of $50,000) to UW researchers who are using innovative, technological approaches to assist in conservation of Wyoming wildlife. These seed grants have resulted in new funding, 4 publications, and 9 presentations, as well as several new interactions with state and federal agencies. Lead researchers on these projects include faculty and graduate students from 6 different departments on campus.

CENTER FOR RURAL COMMUNITY RESILIENCE & INNOVATION

The Center for Rural Community Resilience & Innovation (C-RCRI) utilizes modeling and socio-technical approaches to establish a framework for understanding and addressing problems faced by rural communities over the next century. This research will lay a foundation for Wyoming to anticipate future scenarios and help communities prepare for a resilient future. The project will also create modular lesson plans to engage rural youth in technological advances.

During FY25, C-RCRI:

- Participated in the Digital Twins Workforce Panel at the Harvard Center for Geospatial Analysis' Digital Twins Symposium.
- Brought on a new master's student and post-doctoral research associate.
- Submitted two NSF grant proposals, including "Increasing the resilience of decision-making across scales in the arid Northern Great Plains", and "Smart and Connected Rurality - Digital twins for resilient small towns and rural communities". These grant proposals were submitted to the NSF R212 Regional Resilience Inovation Incubator, and the NSF Smart and Connected Communities Development Grant.

SIB SHARED RESOURCE RESEARCH FACILITIES

CENTER FOR ADVANCED SCIENTIFIC INSTRUMENTATION (CASI)

CASI is a staffed facility that houses state-of-the-art instrumentation that enables analyses of a diverse range of specimens. Vibration and light-sensitive instrumentation are housed in spaces on the 1st floor of the SIB. These rooms are designed to minimize vibrations and are electromagnetically shielded, ensuring high-quality imaging. Instruments that are less sensitive to vibration are housed in the CASI showcase and in other spaces throughout the building.

During FY25:

- CASI instruments were booked for more than 10,000 hours.
- The majority of users are from UW, while a small percentage are from Wyoming businesses, such as Tungsten Parts Wyoming, located in Laramie. UW users include people from 15 departments and programs located in 4 colleges and schools, the College of Engineering and Physical Sciences, the School of Computing, the College of Agriculture, Life Sciences and Natural Resrouces, and the College of Arts and Sciences.
- 36 peer-reviewed manuscripts have been published with data collected from CASI instruments.
- One patent was granted from the laboratory of Dr. Caleb Hill in the Chemistry department.
- CASI staff provided more than 30 training sessions to interested users. Dr. Qian Yang (CASI Assistant Research Scientist) also offered a graduate-level course on Scanning-Electronic Microscopy.
- Dr. Qian Yang also gave presentations, group tours, and led outreach events for multiple colleges across campus, as well as the UW lab school.
- Several different partnerships have facilitated purchase of new equipment for CASI, including a super-resolution microscope, sample preparation equipment, and a tabletop scanning electron microscope which will be used both by faculty researchers and UW students taking part in CUREs.

PLANT GROWTH & PHENOTYPING FACILITY (PGPF)

PGPF, located on the 5th floor of the SIB, includes 6,400 square feet of research greenhouses and an adjacent research penthouse housing two spacious walk-in chambers and a range of laboratory spaces to support the activities of all users. The research spaces are equipped with technology to provide tight environmental controls for plant growth and additional phenotyping applications.

During FY25:

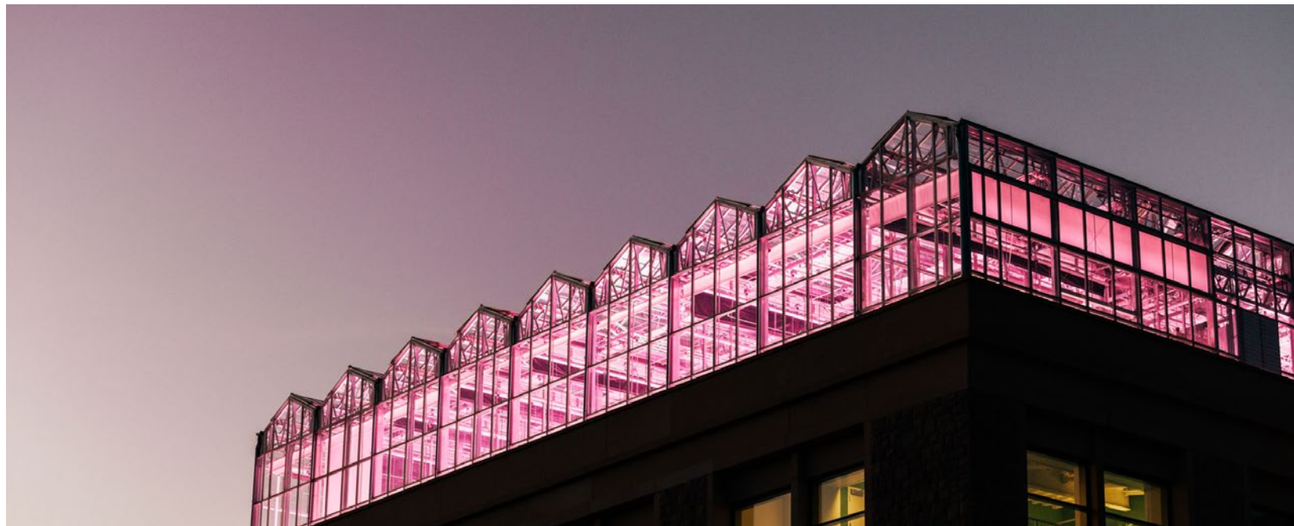
- PGPF hosted guided tours for UW students, faculty members, other UW personnel, students and professors from Wyoming community colleges, state agencies, and CEA business representatives.
- Utilization rate of research spaces within PGPF have been approximately 80%.
- More than 70 users have signed up to use PGPF's research spaces.
- In collaboration with CEA and faculty from 10 different departments, Facility Director Dr. Guadagno and Facility Manager Mike Baldwin coordinated the first interdisciplinary class in CEA - AGRI 4990 - within the PGPF. 10 students had the opportunity to do hands-on laboratory work, hear about the latest advancements in CEA from external business representatives, and spend two weeks doing an internship at Plenty Unlimited, Inc. in Laramie.
- Over $4 million in grants have been awarded to UW personnel to conduct research within PGPF.
- PGPF became a member station of the NCERA-101, USDA Committee on Controlled Environment Technology and Use.

MODEL ORGANISM RESEARCH FACILITY (MORF)

MORF, located on the ground floor of the SIB, provides modern care facilities for work with small mammals and amphibians

During FY25:

- Jennie Cook joined MORF as Facility Manager in February of 2025, and final construction on the facility was completed in April of 2025.
- In May 2025, MORF passed initial IACUC inspection and became operational.
- By July 2025, MORF completed onboarding of inaugural principal investigators, when they transitioned their research programs into MORF's terrestrial and aquatic housing systems. At the close of the fiscal year, MORF's terrestrial housing is operating at 60-65% capacity, while their *Xenopus* room is running at 40-50% capacity.
- To support un-interrupted animal care, MORF also expanded its team to include one full-time technician and one part-time student technician.



GRANTS & CONTRACTS

Increase dollar value of grants and contracts indexed to federal research funding awarded to STEM researchers.

Funding for centers and projects from the Science Institute for research and PhD fellows, in conjunction with core facilities, such as the Science Initiative Building (including CASI, rooftop greenhouses, etc.) are expected to augment research collaboration and capacity in STEM fields and contribute to increases in grant funding, as well.

For the purposes of this data, the university fiscal year was used, which begins in July and ends in June of the following year (so FY 2025 spans from July 1, 2024 to June 31, 2025). Originally, the Science Initiative focused mainly on those defined as the core sciences, including the departments of Botany, Chemistry, Molecular Biology, Physics & Astronomy, and Zoology & Physiology. As time has gone on, however, programs within the Science Initiative and Science Institute have gained capacity to support a larger diversity of STEM programs across campus (while continuing to serve core science departments). Therefore, grant funding numbers for all STEM programs and the original SI core science programs can be found in the table below.

As large-scale 4-5 year programs phase in and out, amounts within certain programs may fluctuate, but the general trend seen is an increase in funding over the period from FY 2019 - 2025. During this time STEM programs at UW have seen a 140% increase in funding ($43M of STEM funding in FY25 comes from a single grant given by the DOE to UW's SER to develop the Sweetwater Carbon Storage Hub in collaboration with Frontier Carbon Solutions, LLC - being the largest single competitive award in UW history), while original SI core science programs have seen a 17% increase in funding (although there was a pronounced spike in FY 2023 for SI core science programs).

Grant funding for STEM programs and SI research programs by university fiscal year.

PROGRAM SEGMENT	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
All STEM programs	$80,507,889	$91,883,645	$119,210,945	$99,864,216	$103,112.096	$127,850,273	$191,743,717
Original SI programs	$12,354,955	$12,277,234	$16,089,787	$16,354,940	$19,978,332	$15,538,707	$14,471,505

FACULTY PUBLICATIONS

Increase the number of published peer-reviewed manuscripts by STEM faculty.

Again, capacity-building programs, facilities, and partnerships facilitated by the SI aim to also increase research productivity. Faculty publications per tenure track/tenured faculty members for all STEM programs and the can be found in the table below. During the last five years, the number of journal articles published per faculty member in all STEM programs has stayed roughly stable, with a slight increase between 2020 - 2024.

Number of published peer-reviewed journal articles per tenure track/tenured faculty members by year in STEM programs.

	2020	2021	2022	2023	2024
All STEM programs	4.1	3.9	4.0	3.6	4.2

INCREASE IN UW RESEARCH FACULTY CONNECTIVITY & COLLABORATION

Another goal of the Science Institute and Science Initiative is to increase collaboration and connectivity among UW researchers. Both the construction of the SI Building, and the focus of Science Institute centers on interdisciplinary research show our commitment to this. As research questions and the problems they target become more complex and interdisciplinary, researchers reach outside of their "silos" and need to interact more and more with researchers from other disciplines. We recently carried out an analysis including 72 UW faculty researchers within the core science programs of Botany, Chemistry, Program in Ecology, Hydrologic Science, Molecular & Cellular Life Sciences, Molecular Biology, Neuroscience, and Physics. We counted the number of times each of these 72 researchers was named on a published, peer-reviewed article with another UW faculty research from any department on campus.

During the years of 2019 and 2020, these researchers published with other UW researchers 338 times, while during the years of 2023 and 2024, these researchers published with other UW researchers 391 times. **This constitutes an increase of 16% in research interactions.** This collaboration is an important measure of research productivity, as it shows UW researchers in the sciences are working across departments more to solve important, complex problems and contributing substantially to interdisciplinary research across many themes.

In Fall of 2025, a short survey was also sent to faculty within the SIB to discern how being housed in the building has enhanced their research productivity and connectivity. Common themes that emerged included the following:

- **Being located within the SIB has helped them create new research relationships that likely would not have happened if they weren't co-located with other researchers in open-concept laboratories.**
- **Being located within the SIB has expanded their abilities to provide hands-on undergraduate and graduate student training that is cross-disciplinary in nature. It is much easier for faculty or students from other labs to provide this training.**
- **Being located within the SIB has given them convenient access to world-class instrumentation in CASI, PGPF, and MORF that would not have been affordable for them if UW had not made an investment in these core research facilities.**

A couple representative quotes include:

> *"Being housed in the Science Initiative Building has been transformative for both my research and my students' success. The collaborative and energized environment—surrounded by motivated PIs, graduate students, and postdocs—has enhanced productivity and creativity across the board.…My students have especially benefited from the collaborative spirit fostered here. We've developed partnerships and research collaborations that likely wouldn't have happened elsewhere. The state-of-the-art vivarium has also been a game-changer for our work. Having both the wet lab and vivarium in the same facility has dramatically increased efficiency, precision, and research quality—something I hadn't experienced in my seven years at the University of Wyoming. Overall, the Science Initiative space is fulfilling its purpose beautifully. It has elevated the impact and connectivity of my research program, and I'm deeply appreciative of the opportunity to be part of it."*

> *"I can say that the open-lab concept works very well for my group where we share instrumentation with others in the building. It has opened doors to enhance cross-disciplinary graduate and undergraduate student training opportunities. My students, with projects centered on reproductive biology and women's reproductive diseases, are learning a great deal about circadian biology, cardiovascular and metabolic functions, and developmental biology from our SIB collaborators. In turn, we routinely work with and train undergraduate and graduate students from other labs. My feeling is that the SIB can (and has) serve(d) as a cost-effective model to demonstrate the importance of shared space and instrumentation on campus. The proximity of our lab to [other labs], as well as MORF and CASI, has greatly strengthened collaborative ties, elevated cross-disciplinary training opportunities for SIB students from different departments, and ensured easy access to world-class core facilities."*

GOAL 3:

EXPAND STATEWIDE OUTREACH & ENGAGEMENT

- Bring hands-on STEM activities to schools and communities across the state and form networks of learning
- Create networks of innovation to support Wyoming's economy in critical areas

KEY HIGHLIGHTS

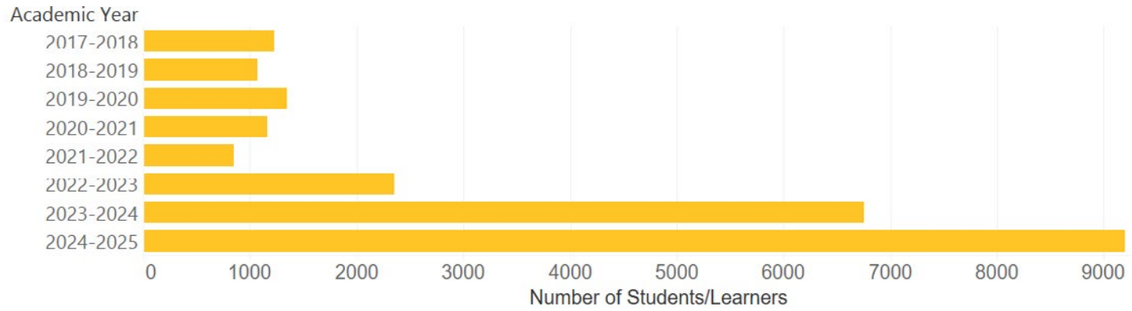
Both the Science Initiative Roadshow and Science Institute research centers provide students and Wyoming communities with hundreds of opportunities to engage in hands-on learning activities across STEM disciplines, as well as bringing awareness to and providing training for local career opportunities, while impacting key areas of Wyoming's economy.

- Since 2017, the SI Roadshow has brought hands-on STEM learning activities to nearly 24,000 Wyoming learners of all ages in 19 Wyoming counties and 36 communities.
- Wyoming educators at K-12 schools remark that the Roadshow has helped support their school-wide education initiatives, given them ideas for how to strengthen the effectiveness of their curriculum, and connected them with community partners that excite Wyoming youth about further training and education, as well as local job opportunities.
- The Center for Controlled Environment Agriculture (C-CEA) provides an NSF REU during the summer for students across the country, as well as an interdisciplinary summer course for students across Wyoming to explore multiple facets of CEA through hands-on research and training.
- The Science Institute's research centers have created networks of research and innovation with individuals and institutions across the state, nation, and world, elevating Wyoming's influence in key areas of the economy.

SCIENCE INITIATIVE ROADSHOW

Teams of undergraduate and graduate students from UW, along with UW and WY community college faculty and staff, in collaboration with partners across the state, facilitate in-person and virtual learning in PreK-12 classrooms, senior communities, and other community contexts across the state using active learning techniques through the **Science Initiative Roadshow**. In K-12 classrooms, the teams from UW work with teachers to integrate learning experiences into existing curricula in order to achieve assigned learning outcomes. This collaborative approach exposes Wyoming students, teachers, and community members to innovative active learning techniques and creates links between UW, schools, and other educators across the state to improve STEM teaching statewide.

Number of PreK-12 students , community members, and seniors reached, by academic year (Fall 2017 - Spring 2025).



SI ROADSHOW THROUGH TIME (2017-2025)

Since 2017, the Science Initiative Roadshow has brought active learning to

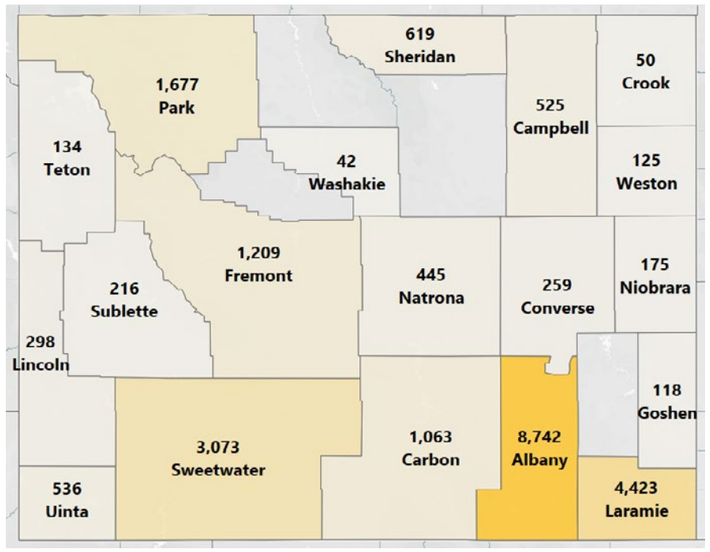
23,807

PreK-12 students, community members, & seniors from

19

Wyoming counties

Number of PreK-12 students, community members, and seniors reached, 2017-2025.



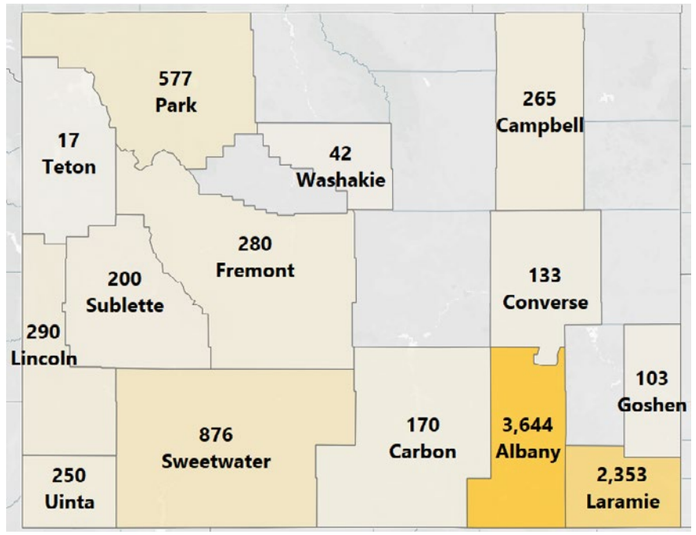
210
outreach & inreach events

90+
schools, senior communities, and other educational programs

36
WY communities

SI ROADSHOW 2024/2025

Number of PreK-12 students, community members, and seniors reached, academic year 2024/2025.



In the 2024/2025 academic year, the Science Initiative Roadshow brought active learning to

9,200

PreK-12 students, community members & seniors from

14

Wyoming counties

93
outreach & inreach events

54
schools, senior communities, and other educational programs

25
WY communities

FOUR YEARS OF THE UW STEM CARNIVAL

Each September since 2022, the Science Initiative Roadshow, in partnership with the Office of the President, and with the help of dozens of units across campus and other local businesses and institutions, has hosted the UW STEM Carnival. In the last four years, the STEM Carnival has brough hands-on STEM activites to nearly 4,500 K-12 students and community members from across the state.

2022: Grand Opening of the Science Initiative Building (SIB) & Inaugural Carnival
The first annual STEM Carnival coincided with the grand opening of UW's Science Initiative Building. The event featured a range of engaging STEM activities, hands-on demonstrations of instrumentation in the SIB, and presentations by faculty, students, and local businesses. Highlights included talks by UW President Ed Seidel, UW professor Ellen Currano, and Nobel laureate Carl Wieman.

2023: Expansion & EERB Focus
The 2023 STEM carnival celebrated the Engineering Education and Research Building (EERB), showcasing its modern instructional and research spaces. Over 40 UW units offered hands-on STEM experiences, including activities in specialized laboratories and with engineering simulators. Attendance surpassed 1,150.

2024: Agricultural Integration
The 2024 STEM Carnival took place at the Cliff and Martha Hansen Teaching Arena and Laramie Research and Extension Center, featuring agricultural research and extension centers. Attendance reached a new high with 1,345 participants, including over 1,000 K-12 students. 53 STEM tables and 10 agricultural activities were offered, engaging students in topics from precision agriculture to animal research.

2025: Health Sciences Spotlight
The 2025 STEM Carnival, hosted at the College of Health Sciences, expanded further, serving over 1,500 K-12 students from multiple counties (including Albany, Carbon, Converse, Goshen, Laramie and Sublette counties), including virtual and home-schooled participants. More than 50 STEM tables and 10 workshops highlighted health sciences and local healthcare partners.

TWO YEARS OF WORK IN WYOMING SENIOR CENTERS

In early 2024, the SI Roadshow was awarded a grant from the Wyoming Department of Health's Aging Division to expand their hands-on STEM activities and lessons into older adult-serving locations in the state. In 2025, the Roadshow received an extension and supplemental funding to continue the work. The grant is focused on increasing socialization and engagement in older individuals by offering hands-on, science- based activities that are focused on topics and learning opportunities of interest to this demographic. In addition, the Roadshow delivers these activities with UW students, both undergraduate and graduate, allowing older individuals the chance to engage in socialization with younger individuals that come from many of the same rural towns in Wyoming. When possible, the Roadshow also looks to incorporate cross-generational opportunities, bringing K-12 students and older individuals together to perform these STEM activities.

Over the last two years, the Roadshow has conducted 32 visits to 20 different senior centers and centers serving older adults. These visits have occurred in 13 counties and served nearly 500 adults. Activities spanned a range of topics, primarily focusing on pollinators and bees, geology, and neuroscience.

Pollinator and Bee Workshops: Led by graduate students and faculty, participants learned about the diversity and importance of bees, their role as pollinators, and the challenges they face. Hands-on activities included making seed bombs with native wildflowers, building and decorating bee houses, assembling weather stations, and using observation journals. These interactive sessions empowered seniors to contribute to pollinator health and provided experience with scientific observation and basic environmental monitoring.

Geology Workshops: Activities during geology workshops included identifying minerals, learning about rocks and fossils, examining geologic specimens, and discussing weathering processes. Participants worked with real fossils and minerals, performed simple tests, and engaged in discussions about local geology and the Earth's history.

Neuroscience and Brain Workshops: Seniors at multiple senior centers explored brain science through fact-or-fiction games, matching brain scan images to the different techniques used to image the brain, examining brain specimens, and learning about neurons. Some sessions featured the construction of model neurons out of craft materials and interactive sensory activities, like operating a robotic claw using neural signals.

WYOMING SCHOOL PRINCIPAL, TEACHERS, AND UW STUDENTS SHARE THEIR EXPERIENCES WORKING WITH THE ROADSHOW

Livingston Elementary, the SI Roadshow, and Local Community Partners Work Together to Bring Awareness to Local Career Opportunities

Allison Lewis, principal of Livingston Elementary in Cody, got her school involved in the Governor's RIDE (Reimagining and Innovating the Delivery of Education) Initiative in the Fall of 2023 to help make learning more student-centered while improving pathways to the workforce. The Roadshow helped Livingston with these efforts by facilitating 2 STEM Days during the 2023-24 school year. During a STEM Day, students spend the day rotating through different stations where hands-on learning activities are led by local community partners. This year, students learned how to tie flies with North Fork Anglers, study brains with an NWC professor, and interact with educators from the Buffalo Bill Museum of the West. The Roadshow reached out to these community partners to connect them to the school. Allison says, "[When students were] making flies, some kids got to show how they already knew how to do that. That activity [tied] right into a fly fishing unit that students were doing in PE, and it tied into a habitats unit our 2nd graders were doing. **So [these learning experiences] all connect together - it's cross-curricular, and it's applicable to [students'] lives outside the classroom. Overall, STEM Days [also connect us] to community members that we don't know yet and [gives students exposure] to all kinds of careers."**

As part of the RIDE Initiative, Livingston also has created three active learning spaces in their school, including a makerspace, a collaborative active learning classroom, and a computer science classroom. These facilities and the learning materials they include are a huge asset to the school, but in order to use them most effectively, teachers need to do a good amount of preparatory work and learning themselves. Allison said, **"When the Roadshow came the first time, they brought Sphero coding robots - it really helped our teachers see how to use those appropriately in the classroom and how it easy it was. This helped our teachers shift their teaching models from the traditional school model to a more hands-on and cross-curricular model.** Teachers realized they could accomplish four [learning outcomes] all at once. Now, instead of saying and writing letters over and over again, we can also learn to code, and it takes the same amount of time as the more traditional route."

Allison says she has partnered with the Roadshow to enhance RIDE Initiative goals because she wants "her K-5 students to get real-life experiences… so that they can apply what they learn at school and what they are learning… outside of school to their futures. [This approach to education] opens kids' minds to things that are available here. That's the goal - we want to grow them, and [help them] come back to our community and raise their families right here in Wyoming."

STEM Days Help Students in Green River Find Their Unique Science Interests

Annie Mast, STEM teacher at Truman Elementary in Green River, says partnership with the Roadshow has helped her students grow through interest-based learning, as well as help her shift her teaching towards a more student-led, problem-solving based model.

"The Roadshow came in February 2024 and did a STEM Day, and it was such a great experience. During the STEM Day, the [students] built a beaver dam, took part in a deer CSI station where they used clues to determine how the deer died, used robots to solve problems, learned about solar power, and we had a great presenter from Game and Fish that had kids go through an obstacle course to show how animals have to migrate through Wyoming and avoid obstacles like traffic. In total we had 3 or 4 community partners from the local area involved.

I saw a lot of individual strengths come out [in students]. **After we had the Roadshow come, we talked about the stations that students liked and everyone had a different favorite, which I think really hits the nail on the head with how interest-based learning is so important. [Students are] still making connections even a year after the fact, which I think is huge.**

I also really believe in giving kids problems and letting them solve them on their own. All the [STEM Day] instructors did such a good job with that. The students experienced defeat and how to come back from that. I think that those are really important lessons. I use a curriculum called Project Lead the Way [in my classroom], and it's very teacher-led at the beginning. It's a lot of instruction at the front of the units, and then you gradually release the instruction as you go. So it's more of an 'I do, we do, you do' model. I think every time we see something like the Roadshow, it's such a good reminder that it doesn't have to be that way. It can be student-led more than teacher-led. [Students are] so much more engaged when it can be that way. We still use the curriculum, but I've tried to incorporate that idea into some of the lessons a little bit more."

About having the Roadshow visit her school, Annie says "It's a little daunting to invite someone to come in and speak or to do an activity, but the benefit is there for sure. The kids just loved it. They didn't want to go home at the end of the day. I think that that's a true testament of the power of doing these activities with the kids."

A Relationship with the Roadshow Creates More Opportunities for Hands-on Learning in Hanna

Kaitlyn Larson teaches science at Hanna-Elk Mountain-Medicine Bow (H-E-M) Junior/Senior High in Hanna, WY. The school serves grades 7-12 and enrolls around 80-90 students from the surrounding communities each year.

"The Roadshow has come to H-E-M 3 times, once a year for the last 3 years. Our school does Friday school once a month, and the Roadshow shows up once a year and does the whole day. Students rotate through classrooms and spend an hour at a time doing different hands-on, interactive activities, such as learning about ecology through skulls, learning about watersheds, learning about electrical impulses in our bodies, and more. The students really enjoy it.

Having a relationship with (Roadshow Co-Director) Karagh has been very helpful. She put me in touch with the USGS because they were doing research on past climate through core samples near us out on the Hanna Draw. Through this relationship, someone from the USGS came in and did a presentation, and we got to take the students out to actually see the site. The students got to see the testing sites, the samples they were bringing up, and the actual tests they did. Some of my juniors and seniors are college bound, and some want to go on to a career or technical school. It was fun for the students to see a wide range of people doing science at the site, from drilling technicians that went to a career college to geologists with PhDs. We got to talk with each person at the site and hear from them what their pathways to their careers were, which was really great for the students."

H-E-M's relationship with the Roadshow also opened up doors to other outreach and inreach opportunities with groups like the Science Kitchen at UW, as well. Kaitlyn says, "Setting up these visits has been super easy. Karagh just asks what type of schedule we want and how many people UW will need to bring." The Roadshow looks forward to continuing to work with rural schools like H-E-M and connecting them with local and outside partners. It is truly one of the things that makes this work so rewarding.

"Bee the Scientist" Inspires Older Adults at the Shoshoni Senior Citizens Center

A grant from the Wyoming Department of Health Aging Division helped the Roadshow, with programming led by UW PhD student Sabrina White, to bring hands-on bee activities to 14 different senior centers in 10 WY counties during the summer of 2024.

Jeannie Kroenke (pictured in the bee costume, alongside center director Rykki Neale) is the assistant director of the Shoshoni Senior Citizens Center located in Shoshoni, Wyoming. She says she was already an avid bee lover before the Roadshow came, but this visit only helped grow her and others' enthusiasm for the pollinators.

Of the Roadshow's visit in summer of 2024, Jeannie says, **"We were surprised at how many people out of such a small community (Shoshoni's population is 471) showed up for the activity. We had a dozen people show up. We even had a grandmother and grandson that came over for the activity and they were excited. These intergenerational bonding activities are so important for both seniors and young people – it brings us together, you know. And the Roadshow made it simple enough to where both little kids and older adults with mobility problems or arthritis in their hands can do it together.**

Our senior center just started a community garden project this spring, so we're just getting it up off the ground. The Roadshow showed us how to make seed balls – we took soil and mud and created a little ball with seeds in it, and planted those in our garden to establish good plants for pollinators. And we made little bee habitats out of paper tubes to help get them started. The Roadshow also helped us learn how to identify different species of bees, and we have used this information to identify 7 different bee species in our garden as it has become established.

We also made a weather station to measure things like our garden's temperature and humidity. We thought that 70 and 80 year olds might not feel confident with this technology, but the Roadshow people were so positive and they made us excited. It was simple, and I think it helped some of our seniors trust technology a little bit more."

Lastly, Jeannie says workers at the senior center used their newfound knowledge of bees in a community outreach trunk-or-treat event in Shoshoni. "Of course my costume was a bee! Our whole trunk was made to look like a beehive and we printed out and laminated information we learned from the Roadshow about bees. People were pretty amazed by some of the facts, like how it takes one bee an entire lifetime to make one teaspoon of honey."

UW Undergraduate Student Gains Science Communication Skills as Part of the SI Roadshow

Liz Lungren was a part of the Roadshow from 2022-2025. She grew up in Ten Sleep, WY, and during her time as an undergraduate student at UW, she has studied molecular biology and microbiology. After she graduated in Spring of 2025, she began her graduate school journey in the medical field.

She remembers two memorable activities she led as a part of the Roadshow: "At a STEM Day event in Cody in late 2024, I led an activity where we created models of DNA from candy. We also did an experiment where we extracted DNA from a strawberry. The teachers were all fascinated by that – I don't think they'd ever seen that before. I also remember an activity I did early on in my time with the Roadshow at Urie Elementary in Lyman. I led a human anatomy activity with plushy, stuffed organisms, and we even showed the students different real organs from a cow, including a brain, kidney, and eyeball. Some kids thought it was the coolest thing they had ever seen."

Liz says, **"Because of my time with the Roadshow, I definitely gained important skills. I remember the first outreach event I did, I was so scared to talk in front of kids – I was just so nervous. Since then, I have gained confidence to speak in front of a room, as well as adapt lesson plans and switch it up on the fly when I need to adapt to a new environment.** I definitely feel more well-rounded. I'm not going into education, but I do think scientists need to be good at communicating our science to people that are not directly involved in it, and I think I have grown there. And every time I teach a lesson, I usually learn something, too. **I am involved in quite a few different things on campus, but the Roadshow is the most meaningful experience that I participated in."**

UW Graduate Student Shares Her Research Passions with Wyoming Communities

Nancy Weinheimer, a Geology PhD student at UW, started working as an outreach assistant for the Roadshow in Fall of 2023. The experience has helped her gain skills in teaching and communication and has helped her rethink her future employment plans.

Of her time being a part of the Roadshow, Nancy says, "I've led multiple different lessons, but one of the most meaningful has to do directly with what I am studying. My research is funded by the NSF and deals with critical zone science. The critical zone is where life and the earth interact, encompassing the tree tops to the bottom of the water table. I had a poster board with the critical zone painted on it, and they could see an example of how bedrock breaks down into soil and then trees interact with this soil. And then we play a game where the students pretend to be nutrients in the soil. A couple of them stand in the middle of the room and pretend to be nutrients, and the rest of the students are rock, and they circle around the nutrients shoulder to shoulder. Then my co-leader would pretend to be tree roots and try to get to the nutrients, but the tree can't because the rock is too hard. Then I used a spray bottle to spray water on the rocks and they weather, which breaks down the rocks and creates gaps between them so the roots can get through to the nutrients. The students go nuts at that part! That is my favorite activity I lead right now since it's very connected to what I research – it means a lot to me.

I also think I have grown as a part of the Roadshow, having to think on the fly and taking questions as they come, because some students are so imaginative. **Before I joined the Roadshow, I didn't really think about what I wanted students to gain from a lesson, and now I really do. I think this experience has also made me feel more confident about teaching and sharing information with people that aren't in my bubble of researchers. It has made me more interested in teaching as a career, as well."**

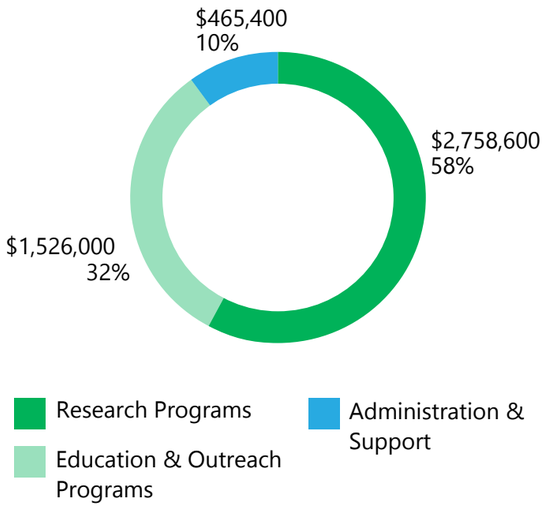
FINANCIAL STATEMENT

THE PAST YEAR

Our financial goals for the year focused on:

- Finishing construction on the last shelled out spaces in the SIB, including SCROLL, MORF and the Multidisciplinary Advanced Stimulation Laboratory (MASL).
- Outfitting spaces with scientific and educational equipment, including the Data X Studio (room 4030 in the SIB), the STEM Sandbox, SCROLL (some of it in conjunction with instrumentation in the CASI showcase), and MORF.
- Hiring a new director for the Science Institute, a coordinator for the CURE program, a CASI director, and a director for the PGPF.
- Expanding our PhD Fellows program to include 11 fellows that support research in SI's research centers.

BUDGET BREAKDOWN BY FUNCTION



BUDGET BREAKDOWN BY PROGRAMMATIC & SUPPORT ELEMENTS

FY25 budget for the Science Institute & Science Initiative.

BUDGET SEGMENT	TOTAL ANNUAL BUDGET	% OF FUNDING
Learning Actively Mentoring Program (LAMP)	$400,000	8%
Wyoming Research Scholars Program (WRSP)	$900,000	19%
Outreach and Engagement (SI Roadshow)	$226,000	5%
Graduate Fellows Program	$932,600	20%
Innovative Seed Grant Program	$600,000	13%
Research & Core Facilities Support[1]	$1,226,000	26%
Program Administration & Support	$465,400	10%
Totals	**$4,750,000**	**100%**

[1] *Includes dues for CASI service contracts and purchase/repair funds, CASI staffing, greenhouse staffing, and vivarium staffing, etc.*

DONATIONS, GIFTS, & GRANTS

Through external gifts and grants, the Science Initiative and Science Institute have been able to expand the reach of their programming to new areas and populations within the state, strengthening existing programs to enrich student learning and success, research, and outreach.

Active external grants and current donations for the Science Initiative and Science Institute.

PROJECT NAME	FUNDING SOURCE	PROJECT FUNDING AMOUNT	DURATION OF FUNDING
IMPACT STEM Transfer: Meaningful Partnerships for Cultivating Transformation in STEM Transfer	Howard Hughes Medical Institute (HHMI)	$235,333	11/1/2022 - 10/31/2028
WIP Phase II: Controlled Environmental Agriculture Industry Program (CEA)	Wyoming Governor's Office	$1,170,200	9/29/2023 - 6/30/2026
REU Site: Controlled Environment Agriculture (CEAfREU)	National Science Foundation (NSF)	$405,851	6/1/2024 - 5/31/2027
Tribal Community Resilience Under Climate Change: Harnessing CEA to Secure Sustainability and Economic Growth	National Science Foundation (NSF)	$1,060,678	9/1/2024 - 8/31/2028
Engaging the Aging Brain in STEM: Fostering Socialization and Health Promotion in Older Individuals through the Science Initiative Roadshow	Wyoming Department of Health - Aging Division	$47,348	3/21/2024 - 9/30/2025
Donations & Gifts to the Science Initiative (through UW Foundation)	Various donors	$81,480	
Total Grants & Donations		**$3,000,890**	

REVENUE GENERATED BY SHARED RESOURCE RESEARCH FACILITIES

The Science Initiative Building's three shared resource research facilities, including the Center for Advanced Scientific Instrumentation (CASI), the Plant Growth and Phenotyping Facility (PGPF), and the Model Organism Research Facility (MORF) provide instrumentation, facilities, and training for UW researchers and in some cases, outside users, to enhance their research enterprises. Access to these facilities is fee-based, ensuring that these facilities are economically sustainable, while providing access to resources that would be cost-prohibitive for single users to purchase themselves. Included here is a summary of revenue generated by these facilities during FY25 (July 2024 - June 2025). MORF's data is not included this year as it did not begin serving users until the very end of the fiscal year.

Revenue received by SIB shared resource research facilities, FY25.

FACILITY	REVENUE RECEIVED
CASI	$82,229
PGPF	$54,368

THE FUTURE

In the next year, we will select new transdisciplinary research centers for our second group of research centers and further expand the number of PhD Fellows. We will also continue to outfit our research and educational facilities, focusing on collaborations between SCROLL and CASI to obtain undergraduate-friendly, high-level instruments (to be housed in the CASI showcase). These instruments can be used by undergraduates as part of CUREs, but also will be widely available for users of CASI for usage fees.

UNIVERSITY OF WYOMING | Science Institute