

**2020-21**

# **ANNUAL REPORT**





# REVOLUTIONIZING SCIENTIFIC EDUCATION AND DISCOVERY IN WYOMING

The University of Wyoming's Science Initiative enables 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 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.

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## WHO WE ARE

**Mark Lyford**, Director, UW Science Initiative; Senior Academic Professional, Lecturer, Botany

**Greg Brown**, Deputy Director, UW Science Initiative; Professor, Botany

**Rachel Watson**, Director, Learning Actively Mentoring Program; Senior Academic Professional, Lecturer, Chemistry

**Jamie Crait**, Director, Wyoming Research Scholars Program; Assistant Academic Professional, Lecturer, Botany

**Karagh Brummond**, Director, Engagement and Outreach; Instructional Professor, Honors College

**Tabatha Spencer**, Executive Business Manager, UW Science Initiative

**Ryan Goeken**, Project Coordinator, Sr., UW Science Initiative

**Svetlana Sergiojan**, Project Coordinator, UW Science Initiative

## LETTER FROM THE DIRECTOR

2020 and 2021 were certainly years to remember, and most likely ones few will ever forget. The global pandemic fundamentally altered how we worked, taught, and learned, as well as the means by which we interacted, with the lasting impacts yet to be truly realized or understood. Our sense of normalcy was certainly shaken during this academic year, with the majority of in-person activities shifted to the online environment. In spite of the challenges presented during these unprecedented times, the Science Initiative faculty, staff and students not only rose to meet the challenges, but enthusiastically fostered new opportunities to advance STEM education and research at UW and across the state.

Under the direction of the Learning Actively Mentoring Program (LAMP) Director Rachel Watson, our LAMP instructors and learning assistants worked diligently to develop engaging online and hybrid learning opportunities for their students, and also assisted STEM and non-STEM faculty across campus and at the community colleges to help develop effective learning experiences. While we had to cancel our 2020 LAMP Summer Institute, we have a bumper crop of faculty and graduate students participating this year, offering both in-person and online Summer Institute experiences. To date, LAMP instructors have improved student learning and success for nearly 21,000 learners across 464 active learning courses at UW.

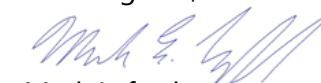
In spite of COVID-19, the Wyoming Research Scholars Program (WRSP), facilitated by Director Jamie Crait, supported the largest class since its inception. Faculty and graduate student mentors worked closely with 63 undergraduate scholars to provide rich research opportunities, whether continued in person or adjusted for online participation. Students continue to rave about the program, noting its positive influence on their current and future educational and career opportunities. These accomplished students continue to present at national conferences and publish in leading peer-reviewed journals, which further supports their future success. 135 UW students have now had the opportunity to engage in the most authentic form of active learning through the WRSP.

Though the SI Roadshow was limited to one in-person visit at the end of the academic year, our team connected with K-12 teachers and students who sought out engaging STEM education opportunities during a year of limited contact. Under the leadership of Roadshow Director, Karagh Brummond, our growing team of enthusiastic undergraduate and graduate students developed and offered a variety of synchronous and asynchronous online learning experiences. Through SI outreach and engagement activities, we have also helped foster the formation of a graduate student Community Outreach Program for STEAM Engagement (COPSE) aimed at drawing more graduate students into learning about and implementing high-quality K-12 outreach programs. The reach of the SI Roadshow continues to grow, having connected with close to 5,000 teachers and students across Wyoming.

Finally, construction on the new SI building has proceeded with minimal impact from the pandemic, with an opening date set for February, 2022. This state-of-the-art building will provide an incredible step-change for our faculty and students. Modern, cutting-edge research facilities will support the incredible research the SI faculty conduct and will encourage new lines of interdisciplinary research, providing WRSP students with unparalleled access to leading research in the nation. The 200+ seat active learning classroom will be one of the largest and most modern of its kind, allowing LAMP faculty to fully utilize the full spectrum of active learning strategies to support student success. As a whole, the SI building will foster transformational interdisciplinary practices in teaching and research, setting a new standard for UW.

With that, I hope you enjoy reading about all the wonderful achievements of the Science Initiative from the 2020-2021 academic year!

Best Regards,

  
Mark Lyford

## GIVE TO THE SCIENCE INITIATIVE

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

[uw.uwyo.edu/scienceinitiative](http://uw.uwyo.edu/scienceinitiative)



### CONTACT US

University of Wyoming

A&S Room 331

Dept. 3254

Laramie, WY 82071

(307) 766-4415

SI@uwyo.edu

[uwyo.edu/science-initiative](http://uwyo.edu/science-initiative)

Facebook University of Wyoming Science Initiative





## ENGAGEMENT

This year the SI Roadshow continued its commitment to Wyoming K-12 students and teachers by engaging learners through multiple modalities, including synchronous virtual outreach, asynchronous virtual outreach, and one in-person, outdoor outreach event at the end of the school year.



The SI Roadshow brought active learning to

**1,157**

K-12 students during

**13**

synchronous school visits (12 online, 1 in-person)

The SI Roadshow secured

**\$13,250**

in grant funding from external industry and foundation partners to bring active learning to K-12 students across the state



The SI Roadshow created

**22**

Youtube videos that brought active learning experiences to

**1,312**

learners



## LEARNING ACTIVELY MENTORING PROGRAM (LAMP)

LAMP Fellow Lori Howe was awarded the **Ellbogen Award** (UW's highest teaching award).

A second LAMP Fellow, McKensie Harris, was named the **UW Gold Teacher of the Year**.

**4 of the 18** professors named "Top Prof" by Mortar Board Seniors were LAMP Fellows.

LAMP-trained professors taught

**4,376**

students in UW active learning courses



LAMP hosted a weekly webinar get-together for educators across the state called *Coffee & Curriculum* where educators collaborated, shared instructional strategies, and formed community in the context of teaching and learning.

## WYOMING RESEARCH SCHOLARS PROGRAM (WRSP)

WRSP saw its largest cohort of scholars yet, with 63 scholars from 16 states



**36**

WY scholars from

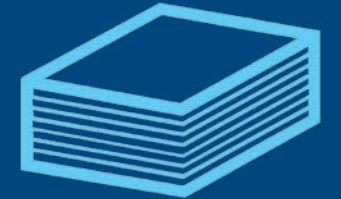
**10**

WY counties

WRSP scholars did

**13,494**

hours of research



WRSP scholars contributed to

**6**

articles published in peer-reviewed journals

In a final evaluation survey for graduating students, on average, WRSP scholars reported a

**GREAT GAIN**

in competence and confidence related to research skills

"I had done some....research before being accepted into WRSP, so I was already wanting to attend graduate school. But the research I did through WRSP confirmed that choice and helped me acquire many research skills. I should be able to jump into graduate school with both feet and begin utilizing research skills that many first year graduate students don't have yet."

## OTHER HIGHLIGHTS

In May of 2021, the SI Roadshow facilitated a 3-day field research experience at Curt Gowdy State Park for 7th graders from Snowy Range Academy (SRA) in Laramie. Students carried out their own field research projects and presented the results to parents, students, and teachers at SRA.



The Faculty Innovation Grant Program has supported research experiences for

**27**

UW students



**20**

UW students gained research experience in the second year of the Course-based Undergraduate Research Experience (CURE)



The Science Initiative facility is nearing completion, with an opening date of

**SPRING 2022**



# GOING ONLINE



## INNOVATING & SUPPORTING LEARNERS & EDUCATORS DURING THE COVID-19 PANDEMIC

The COVID-19 pandemic necessitated new and innovative strategies for teaching and research, and the Science Initiative was committed to supporting educators, students, and researchers across the state in the midst of uncertainty. The SI leveraged multiple online modalities and strategies to continue to bring rich learning experiences to learners across Wyoming. When possible, we look forward to face-to-face interactions and learning experiences, but we will take the lessons learned during this academic year to increase accessibility to rich learning and research experiences to diverse educators and learners in the future.

### ENGAGEMENT



- Synchronous Virtual Roadshow Outreach – Over the academic year, the Roadshow team brought active STEM learning experiences to 1,142 K-12 students through synchronous virtual learning environments (mostly through Zoom). This allowed students to engage directly with UW faculty and student researchers and gave the SI opportunities to continue building relationships with educators and schools across Wyoming.
- Asynchronous Virtual Roadshow Outreach – Over the academic year, the Roadshow team produced 22 Youtube videos for teachers and students of all ages to employ in the classroom and at home. UW student research was spotlighted and K-12 students were given the opportunity to connect with research in a new way.

### RESEARCH

- WRSP worked with faculty mentors and students to continue to support WRSP scholar research and give them the tools they needed to do research remotely.
- WRSP hosted a virtual research symposium in November of 2020 to give students an opportunity to present their research online to other UW students, faculty, and the general public.



## TRAINING



- LAMP Coffee & Curriculum – LAMP hosted weekly webinars, in which LAMP Fellows presented on active learning techniques and research they were implementing in their classrooms. The weekly meetup gave space for the exchange of ideas and for the formation and strengthening of community in a time when many educators and students felt isolated.
- Assisting faculty teaching online – Throughout the year, LAMP director Rachel Watson, LAMP Fellows, and LAMP Learning Assistants assisted faculty at UW and across the nation with initiatives to bring active learning into virtual spaces and to enrich student learning outcomes in an uncertain educational landscape.
- LAMP Summer Institute online – This summer, new LAMP Fellows were given the option to attend the LAMP Summer Institute in-person or online.

## LEARNING EXPERIENCES FOR UW STUDENTS

- LAMP director Rachel Watson led an effort to help the university secure \$40,000 in generous CARES Act funding from the state to give students access to Labster, university-wide. Labster enables students to actively experience high-end labs, immersing students in a narrative that asks them to solve a problem within a virtual research lab.



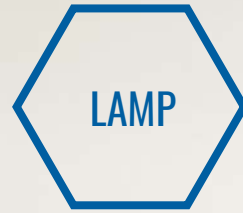
## LOOKING TO THE FUTURE



- The Roadshow will continue to create more multimodal engagement experiences to make active learning education accessible to diverse learners.
- LAMP will continue training educators in virtual and multimodal active learning practices.
- The WRSP will give undergraduate researchers extra opportunities to share research and gain skills giving virtual presentations.



SI'S SIGNATURE  
PROGRAMS



# LEARNING ACTIVELY MENTORING PROGRAM

IMPROVING STUDENT RETENTION,  
SUCCESS, AND ENGAGEMENT IN UW STEM  
CLASSROOMS THROUGH COMPREHENSIVE,  
SUSTAINED MENTORING AND PROFESSIONAL  
DEVELOPMENT FOR FACULTY







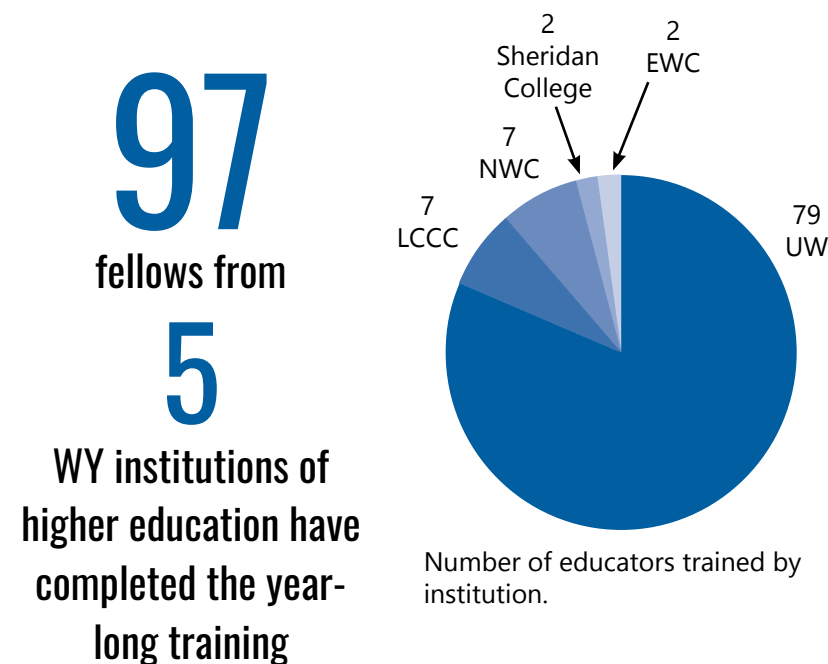
**LAMP** is a comprehensive, sustained mentoring and professional development program with an emphasis on how to best adopt active learning strategies in large-scale active learning classrooms at UW and in classrooms across the state's community colleges.

**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 by 2022.
3. Conduct research on active learning in STEM classrooms to investigate relationships between teaching practices and student success, literacy, engagement, and inclusion.
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 FELLOWS THROUGH TIME (2016-2021)

The LAMP Fellows Program is an immersive, year-long educational development opportunity designed to facilitate instructors' incorporation of active learning techniques into the STEM courses they teach at UW and at community colleges across the state. The program began in the 2016-2017 academic year and enrolls a new class of educators each year (although this past year, 2020-2021, COVID-19 necessitated a one-year pause on enrolling new educators).



Since 2016, **79** LAMP-trained educators at UW have impacted **20,993** students in **464** active learning classes

## PREVIEW OF LAMP FELLOWS 2021/2022

At the end of December 2020, the 2021-2022 LAMP Fellows class was selected, which is comprised of 34 members. 21 faculty members, 11 graduate students, 1 staff member and 1 Wyoming Department of Education affiliate comprise this class. 5 faculty members hail from Wyoming's community colleges: 2 from Eastern Wyoming College, 1 from Central Wyoming College, 1 from Northwest College, and 1 from Casper College.

Throughout the spring 2021 semester, fellows became familiar with the LAMP Active Learning Spectrum, found on LAMP's website, which is comprised of 32 distinct strategies for active learning. Fellows attended Friday Coffee & Curriculum sessions, during which prior LAMP fellows shared about their active learning strategies, assessments and holistic stories. Many of these Coffee & Curriculum sessions are now embedded on the Active Learning Spectrum. Also on Fridays, LAMP fellows were invited to optional discussions. In these sessions, they shared about their learning, discussed blog posts written by prior LAMP fellows, became familiar with techniques of collaborative communication and began to workshop their teaching philosophy statements. These statements, which are submitted as a part of the LAMP application, evolve throughout the fellows' yearlong learning journey.

At the end of February, the LAMP fellows made a decision as to whether they would be participants in the in-person Summer Institute or the online Summer Institute. The former was held from May 24-28 at the Table in the Wilderness Recreation Camp outside of Centennial, Wyoming. Immersed in Place-based Education (PBE), the fellows came ready to experience what it would be like to be a student in a PBE classroom. They completed their pre-institute preparation (called the pre-party) first. This involved watching two videos, one that introduced a phenomenon and one that was more content leveling. Both centered on lichens of Wyoming. When fellows arrived at the Summer Institute, they were ready to further investigate the phenomenon, create consensus models, and come to more deeply understand the process of inquiry. Throughout the remainder of the Summer Institute, fellows were students of Experiential Learning, Problem-based Learning (PBL), and they practiced Backwards Course Design and implementation of inclusive pedagogies (including Universal Design for Learning). During the final two days of the Institute, each fellow synthesized an instructional strategy and presented a poster detailing that strategy. They will implement these approaches in their upcoming fall and spring courses.

The online Summer Institute was held from July 12th through the 16th. Online fellows were also immersed in place-based education and met the same learning outcomes as in-person fellows, but their dispersed locations enabled them to enrich their understanding through the inclusion of diverse, and sometimes under-acknowledged ecosystems and natural histories.





In the 2020/2021 academic year, 42 LAMP-trained educators at UW impacted

# 4,376

students in

# 122

active learning classes

Student enrollment by discipline in LAMP fellow-taught active learning classrooms, academic year 2020/2021.

DISCIPLINE	ENROLLMENT
Biological Sciences	1,950
Physical Sciences	1,302
Mathematics	370
Honors College	206
Agriculture	205
Air Force ROTC	121
Education	76
Environment & Natural Resources	65
Engineering	61
Health Sciences	22

Student enrollment by subject description in LAMP fellow-taught active learning classrooms, academic year 2020/2021.

SUBJECT DESCRIPTION	ENROLLMENT
Life Sciences	1,279
Chemistry	878
Zoology & Physiology	435
Mathematics	370
Honors	206
Physics	122
Air Force	121
Geography	96
Botany	90
Agricultural Economics	85
Geospatial Information Science Technology	81
Pathobiology	79
Food Science	63
Petroleum Engineering	61
Earth Systems Science	55
Outdoor Recreation & Tourism Management	52
Astronomy	43
Animal Science	40
Molecular Biology	36
Elementary Education	34
Microbiology	31
Educational Studies	29
Soil Sciences	27
Pharmacy	20
Secondary Education	13
Environment & Natural Resources	13
Renewable Resources	11
Agroecology	6



When asked how they had changed so far in their LAMP journey, educators in this year's LAMP Fellow class said:



...I am loving the learning, and am excited about trying to use many of the skills LAMP is offering. I am finding out much that I did not know... I am excited and grateful for this opportunity to meet and work with others who have such cool ideas and are so kind in sharing what they know.



I have changed in the way that I now consider affect in my instructional strategy. Planning for how to influence students' feelings towards my course content has been transformational. What has changed the most for me is being inspired by other amazing instructors, and wanting to take more pride in my work.



Discovering the LAMP community has reminded me of the inspiring human network found at University of Wyoming... This workshop has gone way beyond knowledge transfer, it has made me aware of my own core values as well as privileges, humbled me by exposing me to amazing things [that] my peers, mentors and program founders value and have accomplished, and in general made me more confident about my choice to become a teacher/instructor.







## LAMP FELLOWS MAKE BIG IMPACTS AND ARE AWARDED WITH HIGH HONORS

Prior LAMP fellows continue to utilize their training to make big impacts. Lori Howe (2018-2019 LAMP fellow) was named this year's Ellbogen Award winner. This is the highest teaching award given by the University of Wyoming. Throughout the 2020-2021 year, one of the fellows has been featured in each issue of UWyo Magazine. Tawfik Elshehabi (2019-2020 LAMP fellow and 2019-2021 ELC member) was featured on the front cover of the winter edition and McKensie Harris (2019-2020 LAMP fellow and 2019-2021 ELC member) won the UW Gold Teacher of the Year and was featured in the spring edition of UWyo. 4 of the 18 professors named "Top Prof" by Mortar Board Seniors were prior LAMP fellows, as well.



McKensie Harris



Tawfik Elshehabi

## EDUCATOR'S LEARNING COMMUNITY

In 2019, six LAMP fellows decided to continue their pedagogical journey with membership in the "Leaving the Light On" Educator's Learning Community (ELC). McKensie Harris, Reshmi Singh, Deepthi Amarasuriya, Tawfik Elshehabi, and Amy Rhoad have deepened their knowledge of Change Theory, theories of student resistance to learning, and learner-centered pedagogies. Simultaneously, they have engaged in individual SoTL (Scholarship of Teaching and Learning) research. McKensie's research centers on the use of knowledge surveys to measure student learning gains as they compare across units and summatively throughout the duration of a course. Tawfik's work compares the effectiveness of the developed visual and multimedia models in comparison to the traditional written philosophy and its significance in empowering students' success in diverse classrooms. Reshmi is assessing barriers that educators across the state may feel when designing learning experiences that nurture collaborations between students, community partners, and faculty. Deepthi designed, developed, and assessed a new layered approach to active learning in her Physics class at Northwest College. Amy launched case studies in her microbiology course and is assessing their impact on students' critical thought.

The educators in the ELC were accepted after a rigorous peer-review process to present their research at the Original Lilly Conference for College Educators in Oxford, Ohio at Miami University. This conference takes place from November 18-21, 2021. Social network analysis by Rachel and Christi (ELC mentors) continues to show that ELC members felt a transition from isolation to connection with more connected social networks. Educators also felt more confident and indicated greater pedagogical knowledge.

## LEARNING ASSISTANTS

The LAMP Learning Assistants Program began in Spring 2018 and provides UW undergraduate and teaching certificate 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.

This year was a year of growth for the LAMP LA program. In order to support professors as they transitioned to COVID-necessitated remote teaching, LAMP supported 12 LAs during the summer of 2020. The Learning Assistants were immersed in best practices for active learning online. They assisted professors with migrating activities into Zoom and WyoCourses. In the 1-credit course, Best Practices in Active Learning, the LAs collaborated to generate new content for the LAMP Active Learning Spectrum. During the spring of 2021, we welcomed our largest ever group of LAs. 26 LAs partnered with 19 professors to support more than 1,000 students.

Since Spring 2018,  
**63**  
UW students have been LAs for  
**131**  
active learning courses

This academic year,  
**40**  
UW students have been LAs for  
**50**  
active learning courses



## HOWARD HUGHES MEDICAL INSTITUTE (HHMI) INCLUSIVE EXCELLENCE AWARD

Led by LAMP director Rachel Watson, UW has been invited to participate in Phase 1 of the HHMI Inclusive Excellence 3 Learning Community (IE3LC) along with 14 other institutions nationwide and will receive a \$30,000 IE3 Learning Grant. Participants are working on re-envisioning inclusive collaborations between 2-year and 4-year institutions.



SI'S SIGNATURE  
PROGRAMS



# WYOMING RESEARCH SCHOLARS PROGRAM

PROVIDING UNDERGRADUATE STUDENTS WITH  
CUTTING-EDGE RESEARCH OPPORTUNITIES AND  
FACULTY MENTORSHIP





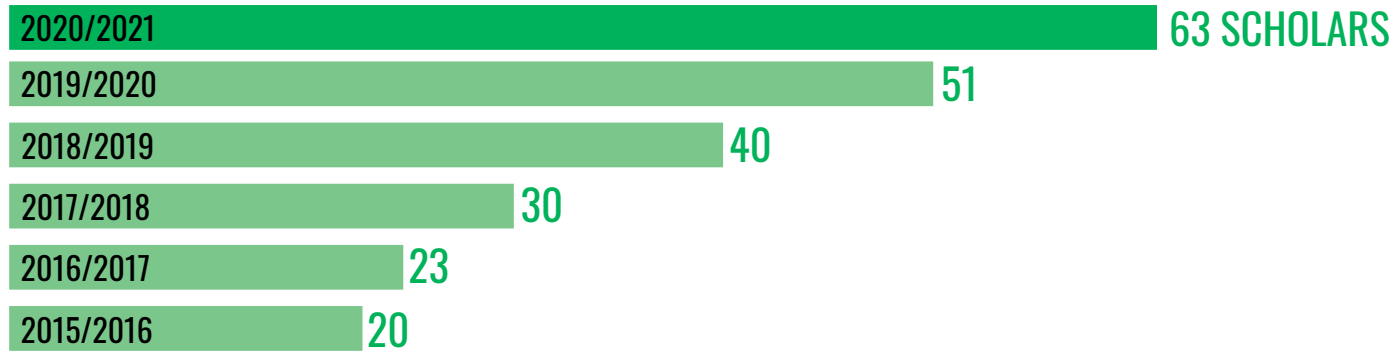


The **Wyoming Research Scholars Program (WRSP)** pairs undergraduate students with faculty mentors to participate in their own cutting-edge research project starting as early as their freshman year. Research experiences through WRSP build confidence and competence in young scholars at a formative stage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

**Program Goals:**

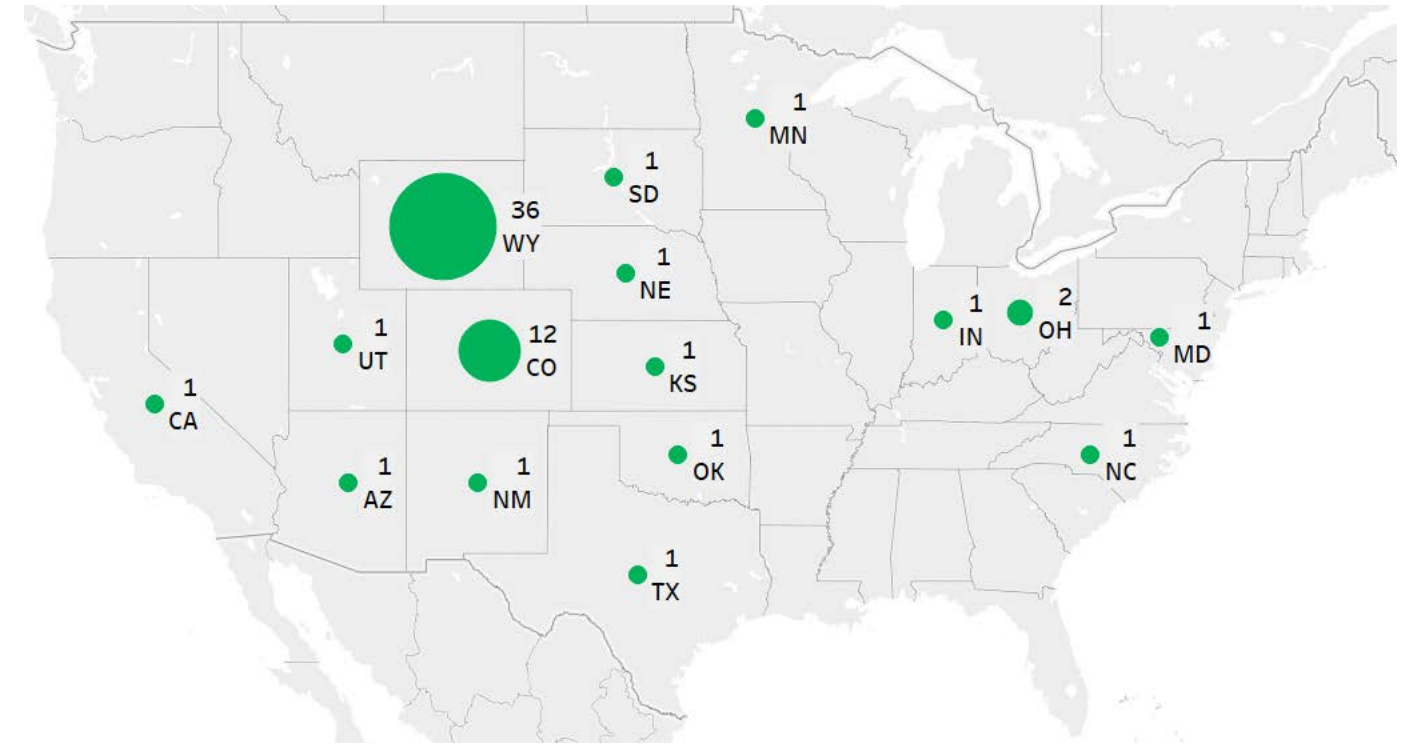
1. Attract high-achieving high school graduates and community college transfer students to UW.
2. Retain promising students in the sciences at UW through early involvement in hands-on science research, department seminars, and public outreach events.
3. Pair talented students with a faculty mentor who 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 (2015-2021)

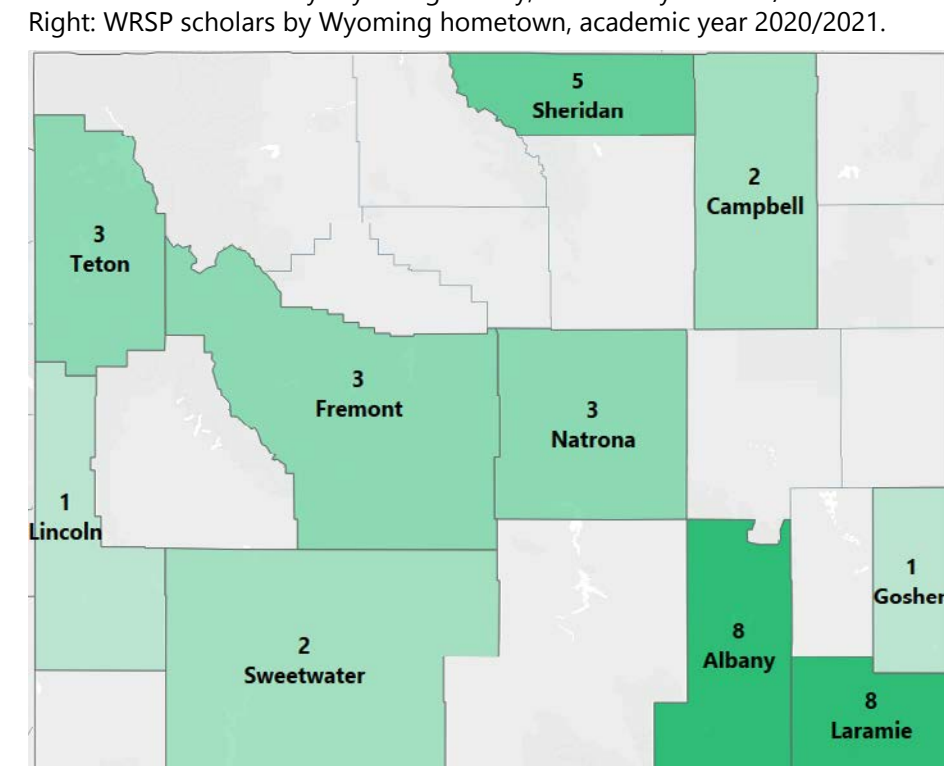


## WRSP SCHOLARS 2020/2021

WRSP scholars by state, academic year 2020/2021.



Below: WRSP scholars by Wyoming county, academic year 2020/2021.



Right: WRSP scholars by Wyoming hometown, academic year 2020/2021.

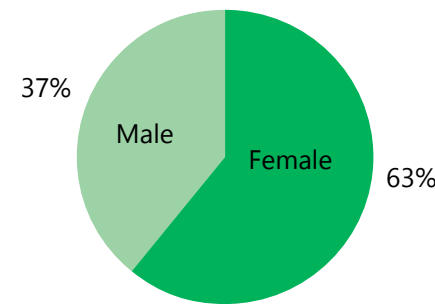
WY CITY	# OF SCHOLARS
Buford	2
Burns	1
Casper	3
Cheyenne	7
Dubois	1
Etna	1
Gillette	2
Green River	1
Jackson	3
Lander	2
Laramie	6
Rock Springs	1
Sheridan	4
Story	1
Torrington	1



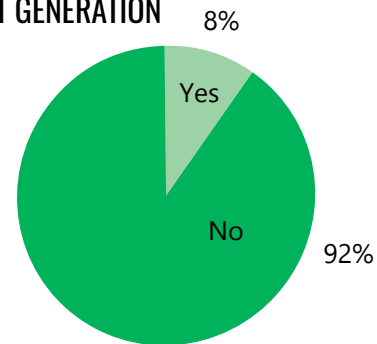


WRSP scholars did  
**13,494**  
hours of research

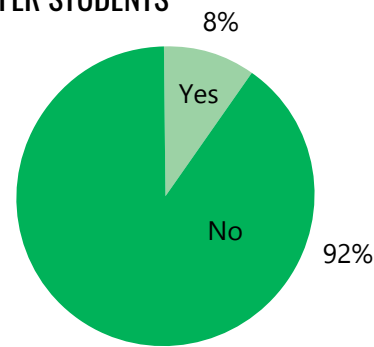
GENDER



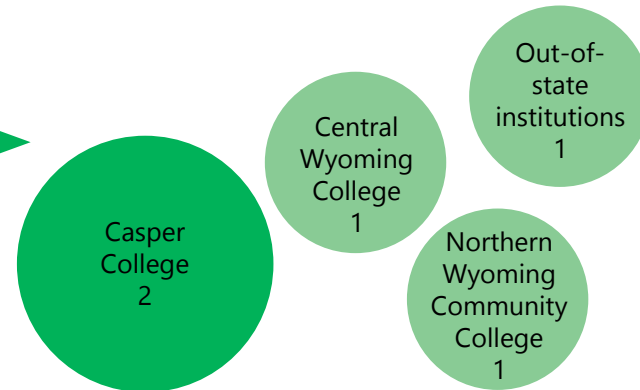
FIRST GENERATION



TRANSFER STUDENTS



# OF SCHOLARS  
FROM



Primary majors of WRSP scholars, academic year 2020/2021.

PRIMARY MAJOR	# OF SCHOLARS	PRIMARY MAJOR	# OF SCHOLARS
Animal & Veterinary Science	2	History	1
Astronomy & Astrophysics	3	Kinesiology & Health Promotion	1
Biology	3	Mechanical Engineering	1
Botany	1	Microbiology	5
Chemical Engineering	2	Molecular Biology	3
Chemistry	2	Petroleum Engineering	1
Computer Science	5	Physics	3
Criminal Justice	1	Physiology	6
Electrical Engineering	1	Pre-Pharmacy	1
Energy Resource Management & Development	1	Psychology	1
Environmental Geology & Geohydrology	1	Rangeland Ecology & Watershed Management	1
Environmental Systems Science	4	Speech Language & Hearing Science	1
Exploratory Studies	1	Wildlife & Fisheries Biology & Mngmt	3
Geology	3	Zoology	5

## WRSP SCHOLAR PUBLICATIONS AND PRESENTATIONS

The goals of WRSP include not only exposing undergraduate students to the work of a professional researcher, but giving them the opportunity and resources to actively contribute to these processes. This experience takes research from the theoretical to the practical realm and also provides students research products that greatly strengthen their prospects for further education and employment. Each semester, WRSP scholars report the products of their research, including publications, presentations, outreach, and other creative activities. This academic year, 38 scholars reported on their research activity. These data were augmented with online searches for other research products. This academic year, many professional conferences were cancelled, so the number of presentations and posters was limited; however, most WRSP scholars presented their research at the WRSP Virtual Symposium in November of 2020.

List of presentations and posters given at professional conferences to which WRSP scholars contributed, academic year 2020/2021.

PRESENTATION TITLE	EVENT/CONFERENCE NAME
Analysis of Socio-Environmental Influences on COVID-19 Outcomes in Wyoming	American Society of Microbiology - Rocky Mountain Branch Meeting
Statistical Visualizations Suggest Food Environment Variables Play a Role in COVID-19 Outcomes in Wyoming	American Society of Microbiology - Rocky Mountain Branch Meeting
The Effects of High-Intensity Interval Training (HIIT) on Mood in College Students with and without ADHD	Association of Behavioral and Cognitive Therapies (ABCT) Conference
Assessing the Effects of Intrinsic Factors on Behavioral Traits in a Wild Population of Song Sparrows ( <i>Melospiza melodia</i> )	North American Ornithology Conference
Parasites Infecting <i>Bombus</i> in the Intermountain Region	Entomological Society of America Conference

List of published articles to which WRSP scholars contributed, academic year 2020/2021.

ARTICLE TITLE	JOURNAL TITLE
The Completed SDSS-IV Extended Baryon Oscillation Spectroscopic Survey: Large-Scale Structure Catalogues for Cosmological Analysis	Monthly Notices of the Royal Astronomical Society
The Sloan Digital Sky Survey Quasar Catalog: Sixteenth Data Release	The Astrophysical Journal Supplement Series
The Wind Beneath My Wings. I. Spectral Types and Multiplicity of the Central Stars Supporting Stellar Bow Shock Nebulae	The Astrophysical Journal Supplement Series
Monitoring AGN with Hbeta Asymmetry. II. Reverberation Mapping of Three Seyfert Galaxies Historically Displaying Hbeta Profiles With Changing Asymmetry: Mrk 79, NGC 3227, and Mrk 841	The Astrophysical Journal
Historical Data Provide Important Context for Understanding Declines in Cutthroat Trout	North American Journal of Fisheries Management
Cocaine Memory Reactivation Induces Functional Adaptations Within Parvalbumin Interneurons in the Rat Medial Prefrontal Cortex	Addiction Biology





## WRSP SCHOLAR EXIT SURVEY

Each semester, scholars who complete their fellowship with the WRSP (most by graduating) fill out an exit survey which asks questions about learning outcomes related to their WRSP research, teaching, and outreach. Also included are questions about future educational and employment plans and questions about WRSP in general. Below are some notable results from the 16 Fall 2020 and Spring 2021 graduates who completed the survey.

Out of 10, WRSP scholars gave the program an overall rating of

**9.6**

**15**

scholars plan to pursue graduate education and/or employment in their field of study. Scholars remarked that the program gave them confidence in their choices for the future.

On average, scholars reported a **GREAT GAIN** in confidence and competence related to research skills

I think getting accepted into WRSP has been one of my proudest achievements of undergrad...being able to get my hands into research has really shaped my overall educational experience here. Classes that did not seem important were...given a real world context, I gained a better understanding of the importance of colleges themselves, and school [was] overall...a lot more fun when I had the lens of research to look at it through. WRSP has allowed me to embrace this more fully than I would have otherwise. The semester I joined WRSP I was volunteering in two labs, conducting research through the Honors College, taking 17 credit hours, and working 15-30 hours a week as a server. Being able to quit that serving job was such a weird but wonderful experience. I already knew that I enjoyed research, I was doing so much of it for fun, but it was strange...that I was now getting paid for it. Jobs are allowed to be fun...Who knew?

## WRSP'S RESPONSE TO COVID-19

The COVID-19 pandemic impacted numerous undergraduate researchers and their projects throughout the academic year. WRSP assisted students during this crisis by providing guidance and updates on UW research policies. WRSP students were consulted individually about specific challenges imposed on their projects by shutdowns of research. Because students in the program represent a broad range of STEM disciplines, the level of disruption to student research varied significantly. Numerous spring 2019 research presentations were interrupted by the pandemic. For example, UW's annual celebration of undergraduate work, "Undergraduate Research and Inquiry Day", was cancelled and several students were unable to attend and present their results at professional conferences. Consequently, the SI hosted a Wyoming Research Scholars Program Virtual Symposium in Fall of 2020 so that WRSP students had the opportunity to present their work. WRSP will continue to assist undergraduate researchers and their faculty mentors throughout the summer and into the fall as the university transitions to fully in-person instruction and activities.

## COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES (CUREs)

In the Fall of 2019, CUREs were piloted at UW by WRSP Director Jamie Crait with assistance from an interdisciplinary team of instructors. CUREs have also been developed at other universities as a way to engage students in research at a "scale that is not possible through apprenticeships in faculty research laboratories" (Rodenbusch et al., 2016)<sup>1</sup>. Currently, UW's CURE program is being developed as a sequential, three-course series for freshman and sophomore-level students, moving students towards more autonomy in research. The first course in the sequence introduces students to research through developing skills in primary literature analysis, data analysis and visualization, and scholarly communication. The second course gives students deeper knowledge in a specific discipline and training in research methods. The third course focuses on applying skills and knowledge in the context of a research project. After a student finishes the series of courses, instructors help facilitate further research opportunities for students, such as working in faculty labs or participating in internships. Students who finish the sequence will also have the opportunity to serve as peer mentors for new students.

In Fall of 2020, the First Year Seminar LIFE 1101: Introduction to Ecological Research was offered for the first time. This class is positioned as the first in a three-semester sequence of CUREs for UW students early in their college careers. For the Fall 2020 course, students carried out a variety of research projects, including the use of game cameras to monitor wildlife activity in different habitats and water quality assessments of streams around the Laramie area. We were fortunate to be able to offer this as a face-to-face learning experience despite the challenges imposed by the pandemic. Students presented results of their research at the end of the course and were highly engaged throughout the semester.

In the Spring of 2021, the LIFE 2200 Research in Action CURE course was offered. Since the COVID-19 pandemic, deaths from Alzheimer's disease and other related dementias have increased 16% compared with the average number of deaths over the past 5 years, and care facilities have been disproportionately impacted by the pandemic as highlighted across the globe. Because of this, the students in LIFE 2200, taught by Karagh Brummond, designed a study to investigate the impacts of COVID-19 induced isolation on Alzheimer's disease progression in residents living at care facilities in Wyoming. The students were particularly interested in determining how isolation in these facilities affected the residents' abilities to engage in exercise programs, group activities, and visits from family members - all aspects indicated as playing a role in the progression of Alzheimer's disease. The students developed a survey as their method of investigation. The class collaborated with the Alzheimer's Association Wyoming Chapter to facilitate the distribution of the survey to care facilities across the state. During the course, the students also learned how to communicate their research to diverse audiences, wrote a scientific review paper on their research, and completed a mock grant application.

<sup>1</sup>Rodenbusch SE, Hernandez PR, Simmons SL, Dolan EL (2016). Early Engagement in Course-Based Research Increases Graduation Rates and Completion of Science, Engineering, and Mathematics Degrees. *CBE - Life Sciences Education*, 15(2), 1-10.



SI'S SIGNATURE  
PROGRAMS



# SCIENCE INITIATIVE ROADSHOW

BRINGING ACTIVE LEARNING TO  
K-12 STEM CLASSROOMS ACROSS  
WYOMING



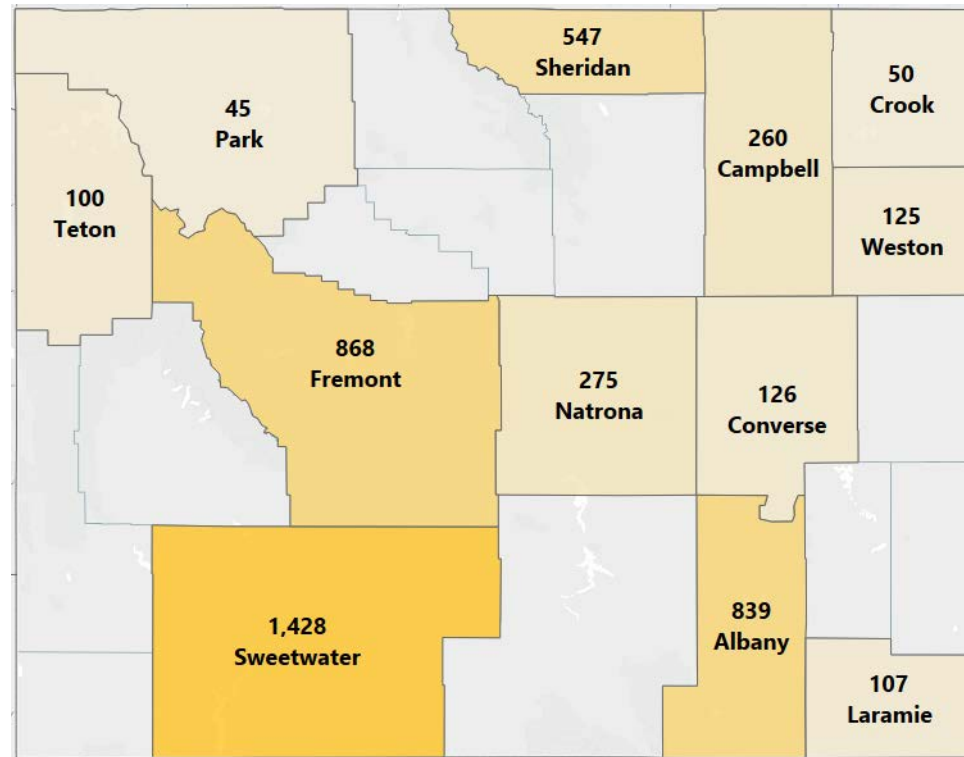




Teams of undergraduate and graduate students from UW, including WRSP Scholars and LAMP Learning Assistants, facilitate in-person and virtual learning in K-12 STEM classrooms across the state using active learning techniques through the **Science Initiative Roadshow**. The teams from UW work with K-12 teachers to integrate learning experiences into existing curricula in order to achieve assigned learning outcomes. This collaborative approach exposes Wyoming students and teachers to innovative active learning techniques and creates links between UW and schools across the state to improve STEM teaching statewide.

## THE SCIENCE INITIATIVE ROADSHOW THROUGH TIME (2017-2021)

Number of K-12 students reached, 2017-2021.



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

# 4,770

K-12 students from  
**11**

Wyoming counties

# 41

school visits

# 23+

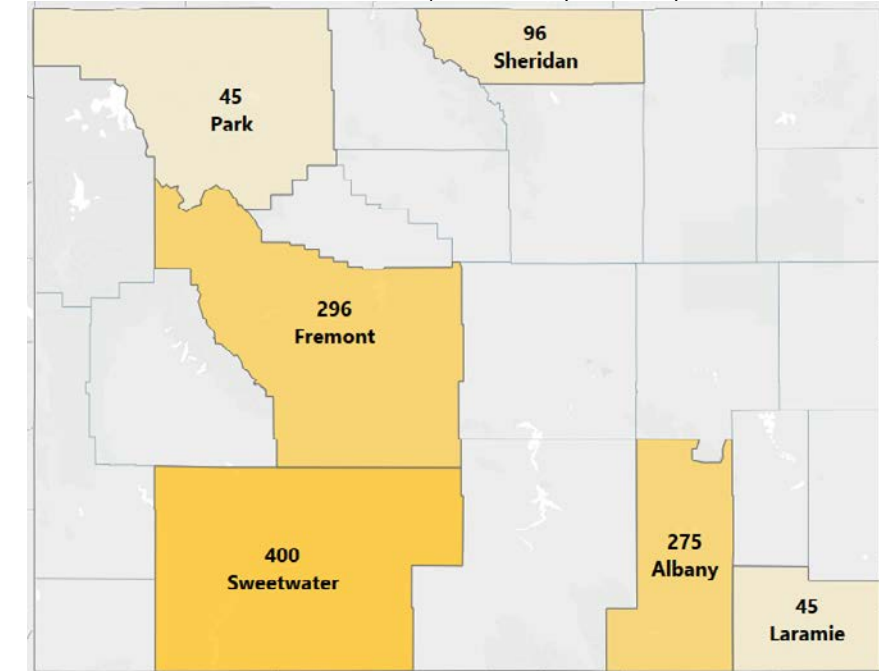
schools

# 16

WY communities

## THE SCIENCE INITIATIVE ROADSHOW 2020/2021

Number of K-12 students reached, academic year 2020/2021.



In the 2020/2021 academic year, the Science Initiative Roadshow brought active learning to

# 1,157

K-12 students from

# 6

Wyoming counties

DATE	CITY	SCHOOL	# OF STUDENTS
6/17/2020	Riverton	Riverton Middle School	20
6/23/2020	Riverton	Riverton Middle School	20
9/23/2020	Rock Springs	Rock Springs High School	200
10/16/2020	Riverton	Riverton Middle School	180
10/21/2020	Rock Springs	Rock Springs High School	200
11/11/2020	Powell	Southside Elementary School	45
11/17/2020	St. Stephens	St. Stephens Indian School	25
3/8/2021	Laramie	Laramie High School	100
3/24/2021	Cheyenne	Cheyenne Central High School	45
3/30/2021	Sheridan	Sheridan Junior High School	96
4/14/2021	Laramie	Laramie High School	160
4/29/2021	Riverton	Riverton Middle School	51
5/19/2021	Laramie	Snowy Range Academy	15





## THE ROADSHOW EMPLOYS MULTIPLE MODALITIES OF ACTIVE LEARNING IN 2020-2021

Because of the continued COVID-19 pandemic, multiple modalities were needed to continue to engage Wyoming K-12 students and support Wyoming K-12 teachers, including synchronous virtual outreach, asynchronous virtual outreach, and one in-person, outdoors outreach event at the end of the school year. Many outreach events focused on synchronous virtual lessons carried out through Zoom. The Roadshow team, comprised mainly of LAMP LAs, launched the Virtual Roadshow website, as well, to provide asynchronous virtual lessons. The LAMP LAs implemented their knowledge of active learning best practices to create videos that invited learner-centered, hands-on activities. Finally, one in-person field research experience was employed in Curt Gowdy State Park. The SI plans to continue to leverage all of these modalities in the future to make hands-on, active science outreach available to a diverse range of learners across the state.

## DANA FOUNDATION GRANT FOR VIRTUAL NEUROSCIENCE OUTREACH BENEFITS 145 WYOMING HIGH SCHOOL STUDENTS

Since 2016, SI Engagement & Outreach Director Karagh Brummond has been leading a neuroscience engagement program called the Brainy Bunch for Laramie High School and Cheyenne Central High School students. In January 2021, Karagh received a \$1,500 outreach grant from the Dana Foundation to extend this work and build virtual neuroscience outreach for high school psychology students. Brummond recruited long-time outreach partners Neuroscience PhD candidate Emily Jorgensen and Dr. Paige Morgan (McNair Scholars co-director and Neuroscience PhD graduate) to assist.

Over the course of 2 full school days on March 8th and 9th, 100 students at Laramie High School took part in outreach funded by the grant. The outreach began with a virtual laboratory tour of a neuroscience lab on campus complete with ongoing brain slice experiments, behavioral testing, and a vivarium tour of the research rats. Students then engaged with hands-on activities to further build on their understanding of 3 of the 5 senses: taste, touch, and vision. On March 24th, 45 Cheyenne Central High School students took part in outreach funded by the grant. This virtual visit also began with a tour of the neuroscience laboratory. Next, the team walked the students through a simulation in which they were recruited to come up with a solution to a Zombie Apocalypse. Students were divided into small groups to develop a drug to cure the zombies, and presented to their classmates on how the drug worked.

## UNION WIRELESS AND ROCKY MOUNTAIN POWER GRANTS

A generous \$1,750 grant from Rocky Mountain Power was used to help purchase recording headphones for on-site (field-based and lab-based) videos as well as video editing software. This supported the creation of 22 instructional, active learning videos that gained over 1,300 views by students across the state. Another generous \$10,000 grant from Union Wireless is yet to be spent, but will be instrumental in supporting active learning experiences for K-12 students statewide in the near future.

## 3-DAY FIELD RESEARCH EXPERIENCE FOR LARAMIE 7TH GRADE STUDENTS

Over three days (May 19-21), the 7th grade students at Snowy Range Academy (SRA) in Laramie embarked on a field-based scientific investigation to learn and apply the scientific method. Karagh Brummond collaborated with the 7th grade teacher, Kadria Drake, to align the outreach opportunity with the teacher's curriculum needs. The 15 SRA students were divided into three groups to begin field research in Curt Gowdy State Park. UW and

SI faculty Jamie Crait and Mark Lyford oversaw two of the groups with assistance from LAMP learning assistant Austin Bernard and UW graduate student Elle Wimmer. Two UW graduate students, Marie-Pier Poulin and Emily Geltzer, led the third research group.

On the first day of the field research experience, the students spent the day hiking in Curt Gowdy, making observations relevant to their area of research. The UW researchers helped to draw attention to potentially relevant observations and create questions about the landscapes and phenomena around them. By the end of the first day, the students determined their group research questions from their observations and determined which methods they would need to use to collect data needed to address those questions.

The students then spent the entire second day in the field collecting data. Later that night, the UW researchers, students, parents, teachers, and the SRA principal all attended a BBQ night at SRA. At the BBQ, the students were able to learn about galaxies with Dr. Jessica Sutter, a recent PhD graduate from the UW Physics and Astronomy department. The SI also collaborated with the UW Planetarium to set up their mobile telescope for the students to observe the moon and Mercury.

On the third and final day of the outreach experience, the researchers and students met at SRA to analyze and draw conclusions from the data they collected in the field. The students and researchers then worked together to create a 20-minute presentation, which they gave to their classmates, SRA teachers, principal, and researchers. Topics of research included ungulate habitat usage, water quality and aquatic invertebrate changes over a stream gradient, and soil moisture and tree density differences across the park.

## COMMUNITY OUTREACH PROGRAM FOR STEAM ENGAGEMENT (COPSE)

Rachel Watson continued to serve as the faculty mentor for the Community Outreach Program on STEAM Engagement (COPSE). This team of graduate students was grant funded through the Berry Biodiversity Novel Outreach Grant program. The team sought training in curriculum development and assessment; they designed, developed, and implemented integrated science and art curriculum for high school students. They will host a symposium in August of 2021 which will bring together K-12 STEAM educators with UW outreach programs.

## STUDENTS IN UW MICROBIOLOGY CAPSTONE COURSE PARTNER WITH THE STATE HEALTH LABS AND CREATE NOVEL OUTREACH EXPERIENCES FOR WYOMING K-12 STUDENTS

Students in Rachel Watson's CURE (a microbiology capstone course) partnered with Wyoming Public Health labs to use computational epidemiological approaches to investigate factors affecting both the disproportionate impacts and underreporting of COVID-19 in Wyoming. Using systems-based, transdisciplinary, team science approaches, students developed Shiny apps visually communicating important findings that are helping guide statewide responses to the pandemic. These students presented their research at the Shepard Symposium on Social Justice and at the Regional American Society (RMB-ASM) for Microbiology Conference. At the RMB-ASM, the students won first prize in the undergraduate poster category and third prize in the oral. These students developed outreach curriculum that has been implemented at Laramie High and Riverton Junior High and was shared with underrepresented students at Jackson's Teton Literacy Center in collaboration with Perfectus Biomedical Labs. Over the course of a full week, Teton Literacy students performed a full research study; they made hypotheses, cultured environmental samples and body samples, worked in the Perfectus Biomed labs and finally, made data visualizations to communicate their findings.



SI'S SIGNATURE  
PROGRAMS

SEED  
GRANTS

# FACULTY INNOVATION GRANT PROGRAM

PROVIDING SEED GRANTS FOR  
NATIONAL-LEVEL FUNDING  
OPPORTUNITIES





In March of 2019, the Science Initiative launched a pilot version of the **Faculty Innovation Grant Program**, designed to stimulate and bolster submission of competitive interdisciplinary grant proposals to federal agencies, such as the National Science Foundation (NSF), Department of Energy (DOE), Department of Defense (DOD), United States Department of Agriculture (USDA), National Institutes of Health (NIH), and United States Geographical Survey (USGS).

PI & UW DEPT	CO-PIs & UW DEPTS	PROJECT TITLE	TOTAL AWARD
<b>Mike Brotherton</b> , Physics & Astronomy	<b>Daniel Dale</b> , Physics & Astronomy <b>Ruben Gamboa</b> , Computer Science	Accelerating the computational investigation of supermassive sub-parsec binary black holes candidates	\$45,000
<b>Carrie Eberle</b> , Plant Sciences	<b>Steve Paisley</b> , Animal Science	Establishing <i>Crotalaria juncea</i> as a new forage crop for the sustainable intensification of the Wyoming agricultural industry	\$89,992
<b>Brian Leonard</b> , Chemistry	<b>Elliott Hulley</b> , Chemistry <b>William Rice</b> , Physics & Astronomy <b>John Ackerman</b> , Chemical Engineering	Understanding intercalation chemistry to design novel 2D materials	\$90,000
<b>Merav Ben-David</b> , Zoology & Physiology	<b>Brian Cherrington</b> , Zoology & Physiology <b>Vikram Chhatre</b> , Molecular Biology	Genomic analyses of embryonic diapause in the Musteloidea with an eye towards improving assisted reproductive technologies	\$77,366
<b>Amy Navratil</b> , Zoology & Physiology	<b>Jay Gatlin</b> , Molecular Biology	Understanding how the tubulin code regulates reproductive function of gonadotrope cells	\$90,000
<b>John Oakey</b> , Chemical Engineering	<b>Daniel Levy</b> , Molecular Biology	Nuclear size in 3D cancer cell migration	\$52,000
<b>Ginger Paige</b> , ESM	<b>Melanie Murphy</b> , ESM <b>Fabian Nippgen</b> , ESM <b>Brent Ewers</b> , Botany	Tracking eco-hydrologic changes in the hyporheic zone to improve water resource management	\$88,740
<b>Daniel Laughlin</b> , Botany	<b>Dan Tekiela</b> , Plant Sciences	The first experimental test of a new paradigm in ecological restoration	\$69,232
<b>Catherine Wagner</b> , Botany	<b>Bryan Shuman</b> , Geology & Geophysics <b>Amy Krist</b> , Zoology & Physiology <b>Annika Walters</b> , WY Game & Fish Cooperative Unit	The tempo of ecological and evolutionary change: response to predator introduction in alpine lakes of the Wind River Range	\$89,537
<b>Don Jarvis</b> , Molecular Biology	<b>Jason Gigle</b> , Molecular Biology <b>Jonathan Fox</b> , Veterinary Sciences	Assessing the impact of a viral contaminant on the biosafety profile of the baculovirus-insect cell system	\$89,580

PI & UW DEPT	CO-PIs & UW DEPTS	PROJECT TITLE	TOTAL AWARD
<b>Simone Runyon</b> , Geology & Geophysics	<b>Susan Swapp</b> , Geology & Geophysics <b>Erin Philips</b> , SER <b>Carol Frost</b> , Geology & Geophysics <b>Robert Gregory</b> , WY State Geological Survey	REE enrichment in Wyoming Roll-Front uranium deposits	\$89,996
<b>Te-Yu Chien</b> , Physics & Astronomy	<b>Maohang Fan</b> , Petroleum Engineering and SER	Synthesizing graphene-related materials and carbon nanotubes from coal through microwave treatments	\$90,000
<b>Ellen Currano</b> , Botany	<b>Laura Viette</b> , Geology & Geophysics <b>Mark Clementz</b> , Geology & Geophysics	Back to the future: interdisciplinary research on 50 million year old ecosystems will allow WY to better prepare for the year 2140	\$82,931

As of June 2021, Science Initiative faculty innovation grants have seeded \$512,820 in grants from outside agencies, including a \$274,610 grant from the NSF for Dr. Simone Runyon's grant proposal titled "Processes Influencing Critical Element Enrichment in Alkaline Magmatic Systems". Additionally, Dr. Daniel Laughlin's original seed grant proposal was successfully funded at \$480,000 over four years by the USDA-NIFA between the seed grant awarding and starting period, and the seed funding was shifted to bridge funding that project and seeding other projects in Dr. Laughlin's lab.

Impacts caused by COVID-19 have delayed research processes and the majority of the seed grants have been granted one-year extensions through June 2022. As of June 2021, the Science Initiative has received communication that a total of 11 grant proposals totaling \$3.6M have been submitted to the National Science Foundation (NSF), the US Department of Agriculture-National Institute of Food and Agriculture (USDA-NIFA), the US Department of Energy (DOE), the National Institutes of Health (NIH), and the American Chemical Society (ACS). The SI expects 10+ more grant proposals to be submitted through 2021 and into 2022.

Funds from Science Initiative seed grants have supported research experiences for 27 students. These experiences help undergraduate students gain critical skills and clarify their future plans, and assist Masters and PhD students in completing their degrees by funding projects that aid thesis and dissertation completion. Funds from Science Initiative seed grants have also supported researchers with 4 publications (with 7 more in process) and 15 presentations. Dr. Catherine Wagner's group's project was also the subject of a Wyoming Public Media article in 2019 titled "UW Researchers Investigate Possible Rapid Evolution of Stocked Fish".

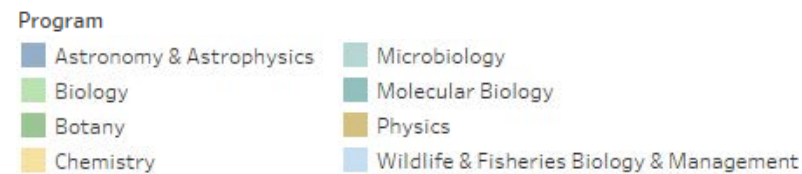
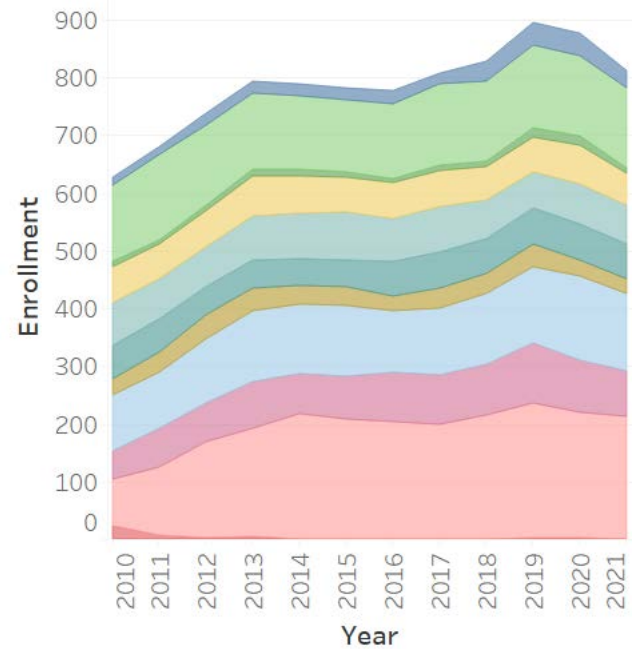


## ENROLLMENT AND DEGREES AWARDED IN UNDERGRADUATE SCIENCE INITIATIVE PROGRAMS

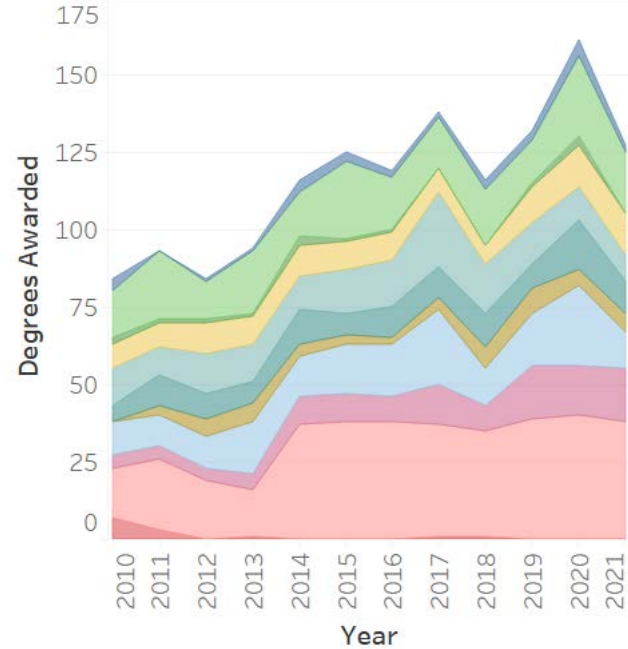
One of the Science Initiative's main goals is to attract, retain, and award degrees to undergraduate students in what have been identified as core science departments and programs at UW, which include Botany, Chemistry, Life Sciences, Microbiology, Molecular Biology, Physics & Astronomy, and Zoology & Physiology. These departments and programs include the following majors: Astronomy & Astrophysics, Biology, Botany, Chemistry, Microbiology, Molecular Biology, Physics, Physiology, Wildlife & Fisheries Biology & Management, and Zoology (Zoology & Physiology were previously one integrated major, but are now split into two).

Enrollment numbers below are based on Fall numbers, and degrees awarded are based on Spring numbers from the same academic year (for example, Fall 2015 enrollment is shown as enrollment for 2016, and degrees awarded in Spring 2016 are shown as degrees awarded for 2016). For the purposes of this data, we can think of the Science Initiative as beginning in 2016 as programming for students began in Fall of 2015.

### ENROLLMENT BY SI UNDERGRADUATE PROGRAM



### DEGREES AWARDED BY SI UNDERGRADUATE PROGRAM



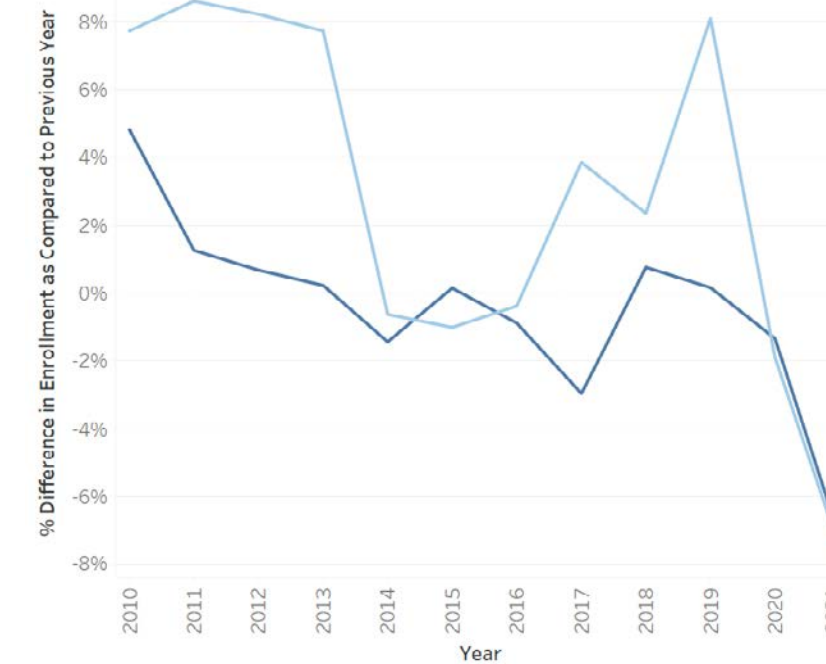
In the period from 2010-2021, UW's total undergraduate enrollment peaked in 2013, after which there was a slow decline, followed by a more pronounced decline in 2021, with the COVID-19 pandemic most likely being the biggest driver. Enrollment in undergraduate SI programs saw 2 periods of growth (2010-2013, 2017-2019) with a plateau between (2014-2016), reaching a peak in 2019. Over 12 years, year over year enrollment change was more positive in 8 years for SI programs than for UW undergraduate programs overall. In 2020 and 2021, however, SI and overall UW undergraduate enrollment change rates mirrored each other (decreasing more sharply), most likely due to the pandemic.

To investigate degree completion in SI programs, DER (Degrees Awarded to Enrollment Ratio) data were used instead of 5-year graduation rates, as DER is more inclusive, including transfer and non-traditional students. 5-year graduation rates, as defined by IPEDS, include only the cohort of traditionally-aged, full-time, first-time freshman that have entered college directly after high school. For the purposes of the Science Initiative, we think DER is a better fit as, in Fall of 2020, 39% of UW's new undergraduate enrollees were transfer students. The DER chart shows an increasing trend in the DER for undergraduate degrees overall at UW and for SI

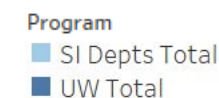
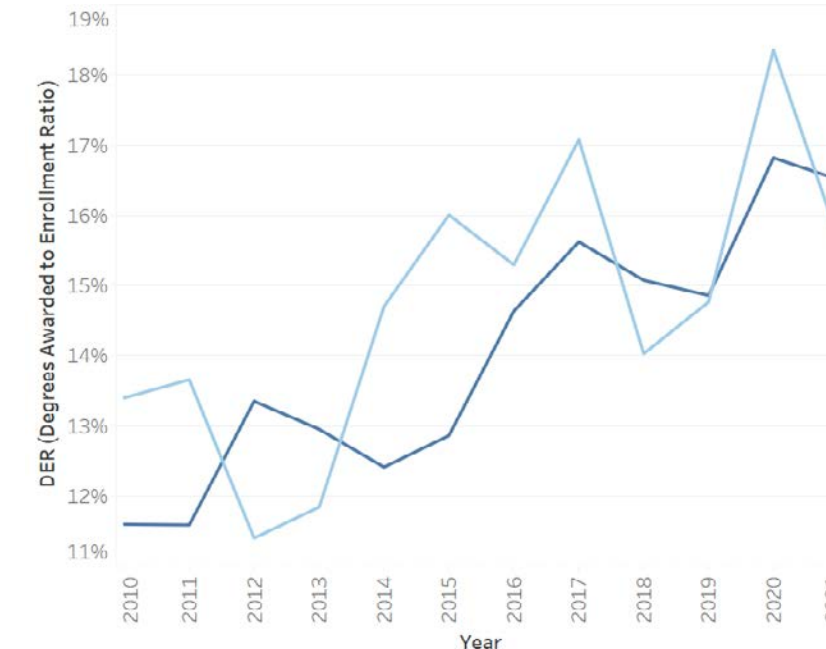
## UNDERGRADUATE ENROLLMENT - SI DEPARTMENTS VS UW TOTAL

Program	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SI Depts Total	627	681	737	794	789	781	778	808	827	894	877	811
UW Total	9,523	9,643	9,708	9,730	9,590	9,604	9,519	9,237	9,307	9,322	9,197	8,534

## YEAR OVER YEAR UNDERGRADUATE ENROLLMENT CHANGES - SI DEPARTMENTS VS UW TOTAL



## DER (DEGREES AWARDED TO ENROLLMENT RATIO) OVER TIME - SI DEPARTMENTS VS UW TOTAL



programs over the last 12 years. For 7 of those 12 years, the DER of SI programs was higher than that of UW programs overall, for 4 of those 12 years, the DER of UW programs overall was higher than that of SI programs, and for one year, the DER was roughly equal. Since SI program implementation (2016), DER has been higher in SI programs for 3 years, lower for 2 years, and roughly equal for 1 year.

Program implementation is still expanding for both the LAMP and WRSP programs. After 4 classes of LAMP Fellows, 20% of full-time faculty from SI departments (Botany, Chemistry, Life Sciences, Physics & Astronomy, Microbiology, Molecular Biology, and Zoology & Physiology) have participated in LAMP training. Preliminary evidence is showing that LAMP-trained educators' techniques are lowering DWF rates in introductory science courses (see LAMP LIFE 1010 DWF Rates report on the SI website) which can contribute to faster degree completion and persistence in STEM degrees. WRSP's goal is to enroll 110 students in hands-on, faculty-mentored research, with 63 currently in the program. An effort to launch multiple streams of CUREs, making research more accessible to all students within STEM programs, has begun, as well. Both one-on-one mentorship and CURE-based research have been shown to aid in degree completion and persistence in STEM, as well (see CUREs on page 25 of this document). In WRSP exit surveys, many students say that they are more confident and competent in research skills and feel better prepared for their classes. As SI programs continue to be more fully implemented, the SI plans to continue research on how programmatic elements affect enrollment and degree completion. We do expect that the benefits of all programs will be augmented by the opening of the SI facility this coming spring, as spaces meant to support each of these programs are included.

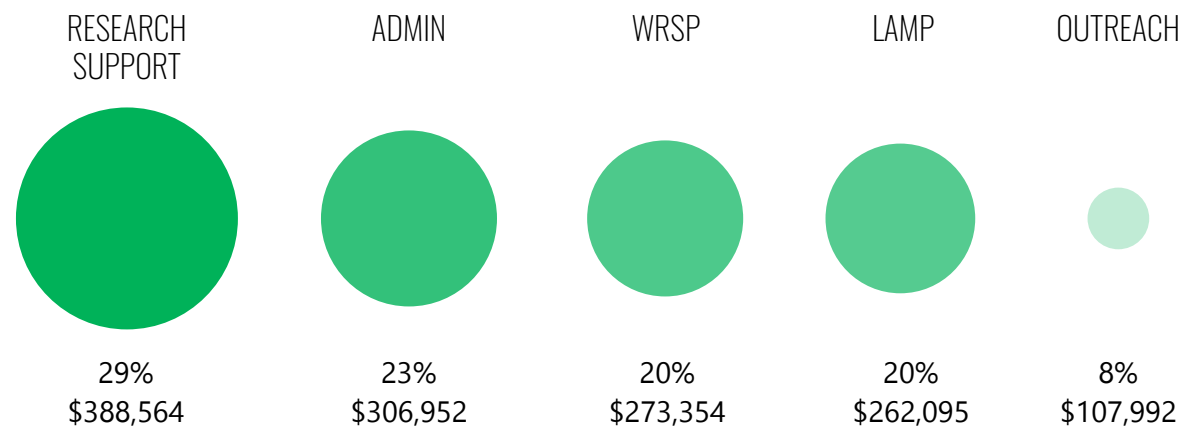


# FINANCIAL STATEMENT

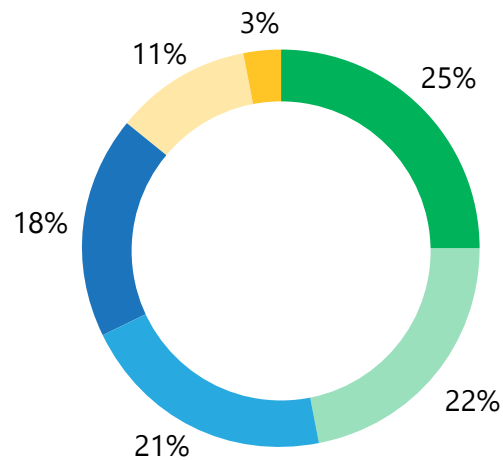
## THE PAST YEAR

Our primary financial goals for the year included expanding and enriching our active learning and student research programs, increasing outreach to K-12 students and Wyoming communities, and providing seed funding for novel faculty research, including allocating funds to necessary shifts to online environments for teaching, research, and outreach. We have also begun to work with outside agencies and donors to assist in funding our programming.

### ACTUAL EXPENSES FROM STATE FUNDING (FISCAL YEAR 2020/2021)



### RESEARCH EXPENSES BREAKDOWN



- Undergraduate Student Salaries
- Research Supplies & Services
- Graduate Assistant Salaries
- Student Tuition & Fees
- Research Facilities
- Research Travel

## VISION FOR THE FUTURE

Science Initiative programs are currently supported at **23%** of the full funding outlined in the 2014 Governor's Task Force Report

Fiscal year 2020/2021 budget vs. target budget set by Governor's Task Force and Science Initiative Leadership Team.

BUDGET SEGMENT	TARGET BUDGET	FY 20/21 ALLOCATED BUDGET	REMAINING ALLOCATION NEEDED	PERCENT FUNDED
Active Learning Training Programs (LAMP)	\$398,000	\$308,000	\$90,000	77%
Undergraduate Research Programs (WRSP)	\$900,000	\$339,000	\$561,000	38%
Administrative Staffing and Expenses	\$506,000	\$326,000	\$180,000	64%
Outreach and Engagement	\$200,000	\$39,000	\$161,000	20%
Research Support and Facilitation	\$817,000	\$124,000	\$693,000	15%
Core Instrumentation Facility (CASI) Staffing	\$510,000	\$14,000	\$496,000	3%
Specialized Building Staffing	\$160,000	\$0	\$160,000	0%
PhD Scholars Program	\$920,000	\$0	\$920,000	0%
Innovative Seed Grants	\$600,000	\$0	\$600,000	0%
<b>Totals</b>	<b>\$5,011,000</b>	<b>\$1,150,000</b>	<b>\$3,861,000</b>	<b>23%</b>

## LOOKING AHEAD

Science Initiative programming is primarily funded by a state allocation. The current allocation is \$1.15 Million per year. This figure represents about 23% of the total allocation outlined in the 2014 Science Initiative Governor's Task Force Report. Much of the unfunded programming is planned in conjunction with the new facility and will be revisited in future years. In order to expand existing programming given fiscal realities, we are planning to expand our revenue streams to include external and private funding. The plan for revenue diversification includes:

1. Engaging in partnerships with other units to broaden and expand reach
2. Targeting private funding efforts at direct funding of undergraduate students in the WRSP and the LAMP Learning Assistants Program, as well as state outreach efforts
3. Pursuing external funding for emerging programs including outreach programming, course-based research development, & innovative educational advancements



