

UW Top-Tier Science Initiative Wyoming Research Scholars Program (WRSP)

Summer 2016 Progress Report

The Wyoming Research Scholars Program (WRSP) is a university-wide program that pairs undergraduate science students with faculty mentors to participate in cutting-edge research starting as early as their freshman year. These mentored research experiences represent the pinnacle of active learning for students. Research Scholars will be more competitive for jobs and graduate programs following graduation because they have already gained the research skills and experience necessary to be practicing scientists. More information can be found at the WRSP website (<http://www.uwyo.edu/wrsp>).

Table 1. List of the 2016-17 Wyoming Research Scholars

Name	Department	Hometown
Sarah Brannon	Zoology & Physiology/Environment & Natural Resources	Westminster, MA
Jordan Brophy	Chemistry	Wray, CO
Isabella Buongiorno	Plant Sciences/Environment & Natural Resources	Cheyenne, WY
Delta Burchi	Zoology & Physiology	Laramie, WY
Ella DeWolf	Molecular Biology	Laramie, WY
Logan Eicholzer	Environment & Natural Resources	Liverpool, NY
Logan Fairbourn	Microbiology	Cheyenne, WY
Olivia Glasscock	Molecular Biology	Buffalo, WY
Samantha Haller	Zoology & Physiology	Cheyenne, WY
Logan Jensen	Physics & Astronomy	Greybull, WY
Lukas Lindquist	Geology	Ft. Collins, CO
Kenny Madsen	Chemistry	Cheyenne, WY
Brittany Nordberg	Zoology & Physiology	Cody, WY
Kianna Olson	Physics & Astronomy	Laramie, WY
Ryan Parziale	Physics & Astronomy	Littleton, CO
Ashleigh Rhea	Zoology & Physiology	Dillon, MT
Darbi Schlenker	Chemistry	Meeteetse, WY
Aaron Strom	Chemistry	Rock Springs, WY
Heather Townsend	Botany (Biology)	Douglas, WY
Narisse Trippel	Mechanical Engineering	Worland, WY
Kasey Trotter	Chemistry	Ft. Collins, CO
Rex Yeigh	Physics & Astronomy	Buffalo, WY

Table 2. List of 2016 Summer Mini-Grant Awardees

Name	Department	Hometown
Rebecca Brenner	Zoology & Physiology	Harrisburg, NE
Kadi Cooley	Zoology & Physiology	Powell, WY
Logan Fairbourn	Molecular Biology	Cheyenne, WY
Rida Fatima	Molecular Biology	Casper, WY
Tim Halstead	Geology	Lusk, WY
Sawyer Letourneau	Chemical Engineering	Fairfield, ME
Jaycey Lindsey	Animal & Veterinary Science	Wright, WY
Katie Nelson	Molecular Biology; Chemical Engineering	Louisville, CO
Zach Parsons	Zoology & Physiology	E Wenatchee, WA
Holly Ramseier	Chemical Engineering	Cody, WY
Susan Schmidt	Molecular Biology	Albin, WY
Mary Uselmann	Chemical Engineering	Anchorage, AK

2015-16 WRSP graduates include:

- Dianna Brutsman, from Cheyenne, WY – research internship at the Topeka Zoo in Kansas this summer.
- Rachael Coleman, from Cheyenne, WY – starting graduate school at Cornell University.
- Jazlynn Hall, from Rawlins, WY – starting graduate school at Columbia University.
- Vivek Jain, from Bangalore, India – research internship in physics at the University of Minnesota.
- Rhiannon Jakopak, from Scotland, SD – studying wildlife in Kenya this summer and returning to UW next year for graduate school.
- Annie Krueger, from Stevensville, MD – research position with Bayer; then pursuing a PhD in environmental toxicology.
- Thomas Rochais, from Flers, France – starting graduate school at the University of Pennsylvania.
- Rachel Schambow, from Janesville, WI – attending the UW-Madison School of Veterinary Medicine.
- Jordan Turner, from Marietta, GA – beginning graduate school in astronomy at UW.
- Matthew Lehmitz, from Laramie, WY – enrolled in a master’s degree program with the UW Botany Dept.

WRSP by the Numbers

Total Students Served (including 2016 graduates): 46

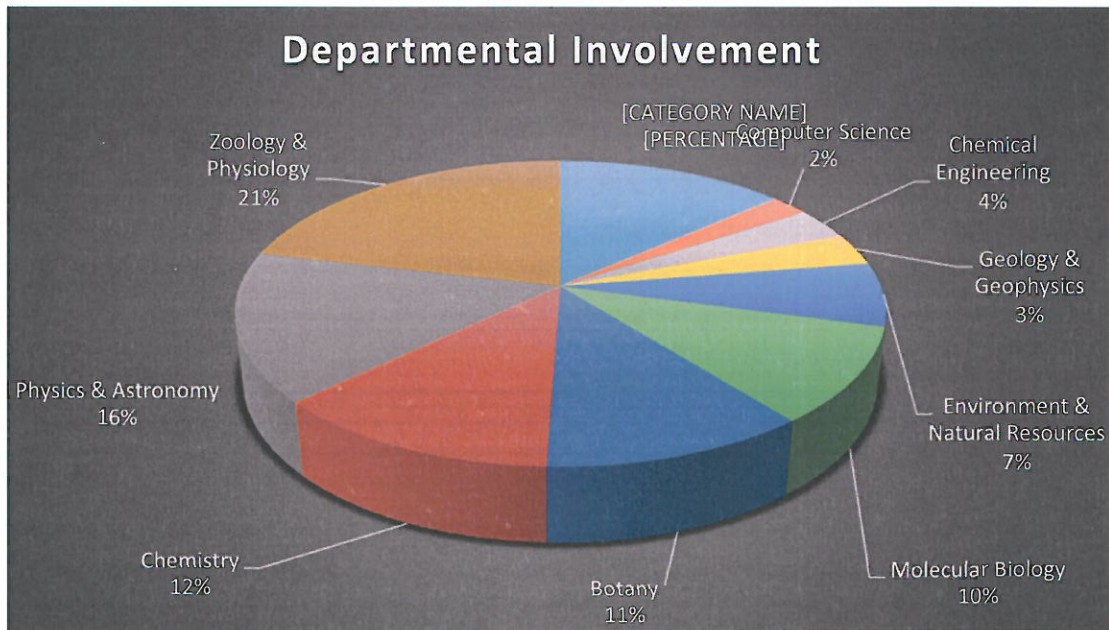
Number of Departments Served: 23, and includes the following:

- | | | |
|-------------------------------------|-----------------------------------|------------------------|
| ▪ Animal Science | ▪ Environment & Natural Resources | ▪ Neuroscience |
| ▪ Anthropology | ▪ Geography | ▪ Pharmacy (School) |
| ▪ Botany | ▪ Geology & Geophysics | ▪ Physics & Astronomy |
| ▪ Chemical Engineering | ▪ Kinesiology and Health | ▪ Plant Sciences |
| ▪ Chemistry | ▪ Mathematics | ▪ Psychology |
| ▪ Computer Science | ▪ Mechanical Engineering | ▪ Veterinary Sciences |
| ▪ Electrical & Computer Engineering | ▪ Microbiology | ▪ Zoology & Physiology |
| | ▪ Molecular Biology | |

Student Hometowns: 27 students from Wyoming; 19 students from out-of-state

Student Gender Ratio: 31 female: 15 male

Figure 1. Student and Faculty Mentor Departmental Breakdown



* Category comprises departments with 1% each

**THE SCIENCE INITIATIVE
LEARNING ACTIVELY MENTORING
PROGRAM (LAMP)
LARGE-SCALE ACTIVE LEARNING**

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. LAMP will enable all science teaching faculty and graduate and undergraduate teachers to become trained in best practices / active learning strategies by 2022.



Twenty-two faculty members and graduate students from the SI departments participated in the 2016 Summer Institute on Active Learning in the Sciences

THE 2016 SCIENCE INITIATIVE SUMMER INSTITUTE (SI²) FOR FACULTY AND GRADUATE STUDENTS

The first annual Science Initiative Summer Institute (SI²) was held June 7th through the 12th; it was considered a massive success by mentors, faculty and graduate students alike. The diversity and collaborative nature of the group led to unprecedented articulation, collaboration and innovation beyond that anticipated/predicted. Fellows described the experience as being "transformational", "jump starting [their] active learning knowledge" and inspiring them to help other instructors. Fellows presented their plans for launching innovative curriculum during the 2016-2017 academic year and with continued LAMP support, they look forward to spreading the ripples of their revolutionized teaching and learning environments.



Elliot Hulley, Dave Anderson, Brian Leonard and John Hoberg of the

Chemistry Department work together to develop instructional strategies during the 2016 Summer Institute on Active Learning in the Sciences

UNIVERSITY OF WYOMING

ACTIVE LEARNING
INCREASES
MOTIVATION, RETENTION, AND SUCCESS

A+

Raised grades
by half a letter

55%
Lower Fail Rate

INCLUSION
& DIVERSITY

MARGINALIZATION
& FAILURES

+ SCIENTIFIC THINKING
+ WRITING SKILLS
+ MOTIVATION

NURTURES LIFE-LONG LEARNING

IMPROVED INTERPERSONAL
COMMUNICATION & SELF-ESTEEM

AT THIS POINT IT IS
UNETHICAL
TO TEACH ANY OTHER WAY

- Clarissa Dirks
(US National Academies Scientific Teaching Alliance)

Created May 2016, UW LAMP Student Group

THE 2016 -2017 FACULTY AND GRADUATE STUDENT FELLOWS:

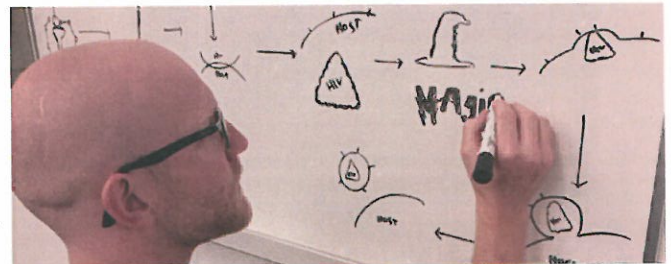
Dave Anderson	Chemistry
Morgan Balabanoff	Chemistry
Brian Barber	Biodiversity Institute
Jamie Crait	Life Sciences /WRSP Director
Ellen Currano	Botany
Melissa Gelwicks	Chemistry
Jesse Hinshaw	Molecular Biology
John Hoberg	Chemistry
Abigail Hoffman	Botany
Joshua Holmes	Molecular Biology
Elliott Hulley	Chemistry
Hayley Lanier	Zoology and Physiology
Michele Larson	Zoology and Physiology
Brian Leonard	Chemistry
Hilary Madinger	Zoology and Physiology
Jaya Maithil	Physics and Astronomy
Michelle Mason	Physics and Astronomy
Kali Nicholas Moon	Botany
Chris North	Botany and Life Sciences
Kristopher Parker	Molecular Biology
Jonathan Prather	Zoology and Physiology/ Life Sciences Director
Sean Stettner	Molecular Biology

MENTORS:

Danny Dale	Physics and Astronomy
Monia Haselhorst	Life Sciences Program
Bethann Merkle	Science Illustrator
Ed Nuhfer	Retired Geologist and Faculty Developer
Sarah Prather	Museum Consultant
Brianna Wright	Life Sciences Program
Rachel Watson	Molecular Biology / LAMP Director



"Overall, the science initiative fellowship has reawakened my passion for teaching and made me more aware of how much I missed the creative experience of designing curriculum."



"The idea of allowing students to develop their own opinions and ways to approach problems, with help in groups or individual, was eye-opening...The group activities negate the professor-student dichotomy, which drives students' critical thought, promotes metacognition, and can enhance the classroom experience."

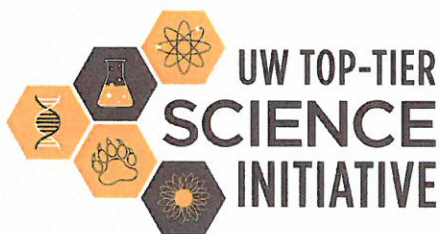
"I implemented many more active learning techniques during the lecture period and saw an increase in student response and attentiveness. It was great to have immediate (especially positive) responses to my new classroom techniques."

"For me [the Summer Institute was] really transformational"
 – Dave Anderson,
 Chemistry Department Head

FOR MORE INFORMATION ON THE UW SCIENCE INITIATIVE, THE LEARNING ACTIVELY MENTORING PROGRAM AND THE SCIENCE INITIATIVE SUMMER INSTITUTE, PLEASE VISIT OUR WEBPAGE AT:

[HTTP://WWW.UWYO.EDU/SCIENCE-INITIATIVE/INDEX.HTML](http://www.uwyo.edu/science-initiative/index.html)

OR CONTACT RACHEL WATSON:
RWATSON@UWYO.EDU



University of Wyoming Top-Tier Science Initiative

<http://www.uwyo.edu/science-initiative/index.html>

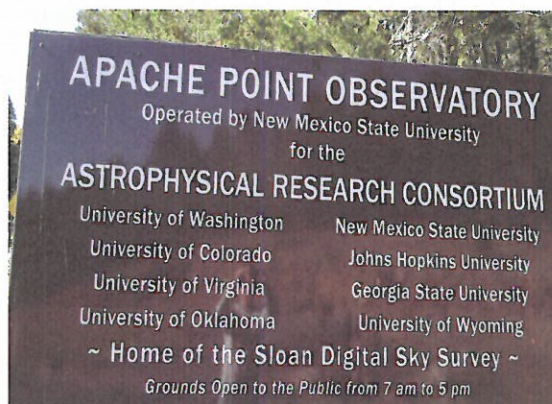
November 17, 2016

Dear University of Wyoming, Board of Trustees,

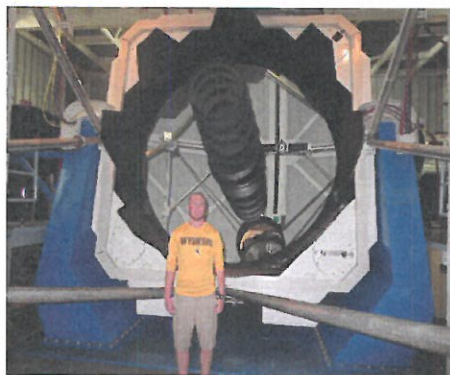
We write to convey our excitement at an early success from the UW Top-Tier Science Initiative! Pursuant to the Wyoming Governor's UW Top-Tier Science Program and Facilities Task Force report (page 12 and 13) regarding transformative research facilities, UW has exploited a target-of-opportunity to join the Astrophysical Research Consortium, placing UW among seven other top-quartile universities that operate one of the world's most advanced astrophysical observatories near Sunspot, New Mexico. The partnership enables UW access to world-class scientific instruments on the consortium's 3.5 meter telescope. It opens the door to collaborations and student exchanges with the University of Washington, Colorado, Virginia, Oklahoma, The Johns Hopkins, New Mexico State, and Georgia State. It also raises the profile of UW among U.S. flagship universities.

Top-Tier Status: Of the 225 Carnegie-classified "research-active" doctoral universities in the U.S., only 45 have access to a major research observatory. UW is now one of those institutions, placing UW Physics & Astronomy among a select group of top-tier universities. This ensures that UW faculty and students can conduct world-class research using top-tier facilities. It also provides our students with access to modern scientific instrumentation that will prepare them for challenging careers in strategic growth fields like remote sensing, digital imaging, computational analysis of large data sets, aerospace, instrumentation, electronics, and national defense industries.

Logan Jensen, a Trustees Scholar and junior from Greybull, WY, majoring in Physics & Astronomy is one beneficiary of UW's investment in top-tier scientific instrumentation. Logan has conducted research with several UW faculty since his freshman year at UW's Wyoming Infrared Observatory and now at the Apache Point Observatory. Logan says his access to UW faculty and research observatories was a major factor in his choosing UW over other universities. Logan is also supported by the SI's Wyoming Research Scholars Program (WSRP) as he conducts his undergraduate research.

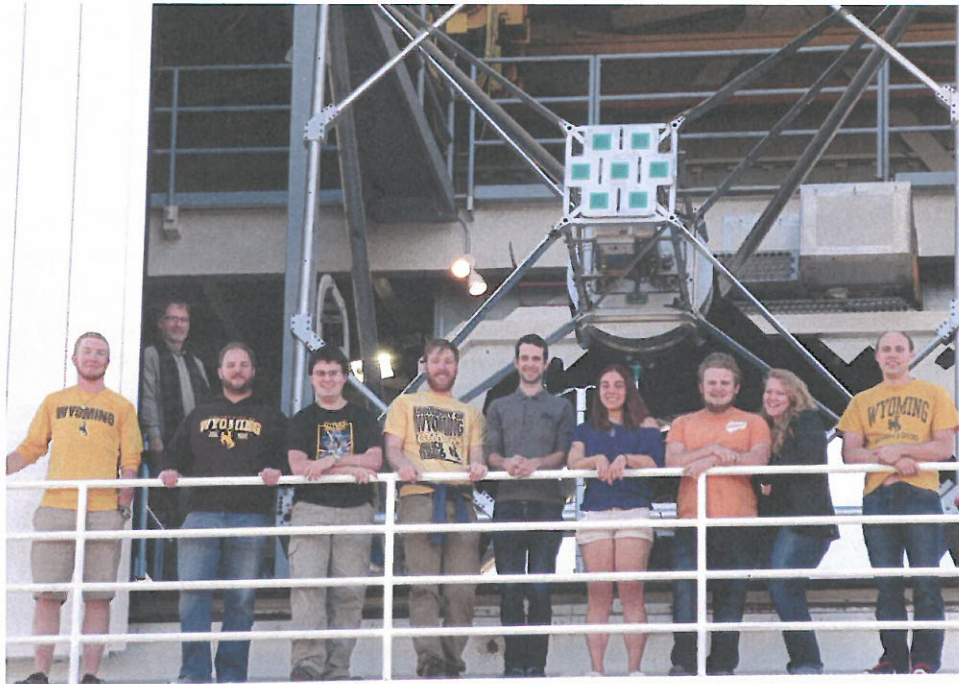


Consortium membership sign at Apache point, New Mexico, October 2016.



UW junior Logan Jensen (Greybull, WY) at the 3.5 meter Apache Point telescope.

Logan was one of nine physics bachelors, masters, and PhD students who made a three-day expedition to Apache Point in October for instruction in operation of the observatory. The observatory can also be controlled remotely from the UW campus by trained users.

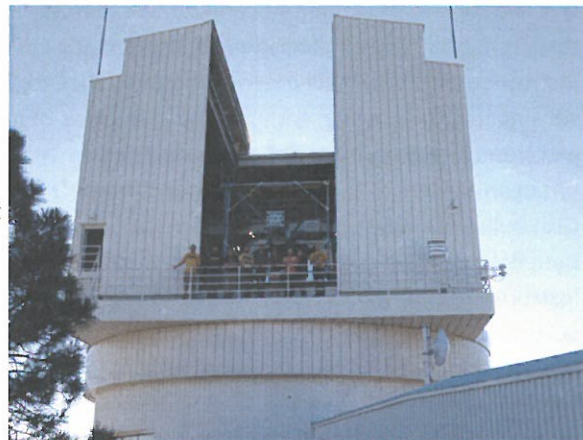


Wyoming bachelors, masters, and doctoral students show their Wyoming colors upon the rotating dome of the Apache Point 3.5 meter telescope. The students are, from left to right, Logan Jensen, William Chick, Daniel Baldwin, David Kasper, Joe Findlay, Jessica Sutter, Derek Hand, Stephanie Mapes, and (former UW varsity swimmer) Jordan Turner.

This is just an early example of how the Science Initiative is making Wyoming graduates more competitive for the highly skilled workforce needed to ensure a prosperous state and nation.

On behalf of the students whose futures are bright because of their preparation at UW, we thank you for your support of UW students and our State through the Science Initiative!

Sincerely,



Gregory Brown, associate dean, College of Arts & Sciences
Chip Kobulnicky, professor of Physics & Astronomy & director of UW Observatories
Logan Jensen, physics major, Trustees Scholar, Wyoming Research Scholar, & aspiring scientist