



Greetings Alumni & Friends!

Spring 2019

News from the High Plains



Last fall, we welcomed Dr. Jifa Tian to the department. Jifa joined us as an Assistant Professor and he's accompanied by his wife Fei Tan and daughter Cindy. He is an expert on experimental condensed matter physics focusing on quantum behaviors of electrons in novel topological materials, 2D materials and their heterostructures. He obtained his PhD from the University of Chinese Academy of Sciences & Institute of Physics, Chinese Academy of Sciences and was a postdoctoral research associate at Purdue University and the National Institute of Standards and Technology before he came to Laramie. He and his graduate students are busy building up a state-of-the-art laboratory where they will be able to look at how electrons behave at a temperature below 2 Kelvin and in a magnetic field of 12 Tesla.



Dr. Aysenur Bicer joined the Department as an assistant lecturer starting in January 2019. She obtained her PhD degree from Texas A&M University. She will be mostly teaching intro-level general physics and is also very much interested in interacting with our majors and taking an active role in outreach and as an advisor. Aysenur is married to Ali Bicer, who is an assistant professor in the School of Teacher Education at UW. Aysenur and Ali have five children ages from 3 to 9. Aysenur's hobbies are reading books, watching science-fiction movies, and travelling around the world.



We also welcome Jessica Andrews, Kathy Webb and Ashely Vannelli in our shared Business Office this year. Jessica has been working in accounting for a number of years prior to joining UW, and she is excited to be a part of the shared business staff center. She has 3 boys, Aaron, Toby, and Nathan. Her husband is Peter and he is the head mechanic for Pete Lien. She is an Accountant and the manager of the Shared Business Office of Department of Physics & Astronomy and Department of Chemistry.



Kathy Webb started at the end of February 2018. She has also worked for UW Accounts Receivable and UW Apartments. Before moving to Laramie with her family in 2007, she worked in Accounts Payable at Washington State University for 8 years. Kathy along with her husband, Eric, loves to travel and spend time visiting their 2 daughters and son along with 2 granddaughters and a grandson born in February.

Ashley Vannelli is our newest Office Associate. She just started after the New Year. Before coming to the shared Business Office, Ashley worked as a Human Resources Specialist in the UW Human Resources department. Ashley has lived in Laramie since 2004. She is also a University of Wyoming alum and graduated with bachelor's degrees in Political Science and Philosophy in 2009. Her hobbies include various outdoor activities, playing card games, and reading.

We are thrilled to have all of them here. Indeed, they have been so critical to the research, education and service mission and the smooth operation of the Department.

continued

COLLEGE OF ARTS & SCIENCES
Department of Physics & Astronomy
(307) 766-6150
physics@uwyo.edu

UWYO.EDU/PHYSICS

Tom Grandy, Professor of Physics Emeritus and former Head of the Department, passed away on December 27, 2018. He was 85. Dr. Grandy was a great man and great physicist. We deeply appreciate his contributions and leadership as a faculty member and the Department Head. He will be remembered by us all.

The Department is doing very well. We had a large increase in the freshmen and transfer students this fall. A number of our students were given prestigious awards for their academic and research achievements, not to mention that the University of Wyoming chapter of the Society of Physics Students (SPS) has earned the designation of a SPS Notable Chapter! Please see below for a complete list of the student awards and honors.

P&A faculty continues to build a strong record of excellent grantsmanship. Many of our faculty members have received new federal grants. Faculty members were also awarded various internal grants from the A&S College, UW Academic Affairs, and School of Energy Resources. These grant will allow us to continue to support students to gain research experience.

Please let us know about your career path (physics@uwyo.edu). We post these updates on our alumni page <http://physics.uwyo.edu/Alumni/alumni.html>. Also, please send us your email if you are interested in receiving an electronic copy of these newsletters.

Jinke Tang
Department Head

Department News:

After stepping down from the Department Head and taking a break for a semester, Danny is serving as the Associate Dean for the College of Arts & Science. He started his new job in January 2018.

Connor O'Malley left us at the end of December. He has taught most of the algebra-based general physics for us for the last two and half years. We thank him for his service and wish him the best.

Congratulations to Jessica Sutter, Dylan Kloster and Riley Jordan! Their team was selected as participants in the 2018 John P. Ellbogen Faculty Summer Institute on Developing Research through the Scholarship of Teaching and Learning. The Summer Institute was held from May 21 to 23, 2018.

Congratulations to Hannah and the SPS leadership team (Nick Trimble, Aman Kar, Ryan Parziale, and Jesse Winner) for earning the designation of a Society of Physics Students Notable Chapter!

Noah Cowper and Logan Jensen were selected as the 2018 Outstanding Graduates of the College of Arts and Sciences. Congratulations!

Jesse Winner, William Scougale, Anh Nguyen and Bryant Jerome were awarded Cinnamon Undergraduate Scholarship. Super!

Brad Lyke, David King and Riley Jordan received Outstanding TA awards. Congrats!

A&S Board of Visitors Student Service awards were presented to Dani Schurhammer and Jordan Turner. Thank you guys!

Aman Kar was selected to receive the SPS Leadership Scholarship!

Graduate student Aaron Wang received an Outstanding Poster award at the Front Range Advanced Magnetism Symposium (FRAMS) held in Colorado Spring in August. Cool!

Ryan Parziale was selected to serve on the A&S Curriculum Committee as a student member. Thank you!



Bill Rice demonstrates the art of making ice cream at the WIRO Open House

Graduate students Henry Wladkowski, Riley Jordan and Robert Nielsen were awarded A&S Dean's Graduate Scholars for 2018 -19. Way to go!

Undergraduate student Rachel Tenney won one of the outstanding poster awards at the APS four corners section meeting held in Salt Lake City. You can see her poster on the second floor hall way.

Professor Rudi Michalak took 13 undergrads to the APS Four Corners Section Meeting in Salt Lake City in October. Students gave 3 presentations at the conference.



Students attending the American Physical Society Four Corners Section meeting in Salt Lake City, UT

Three cheers for TeYu Chien who received an A&S Extraordinary Merit in Research Award in 2018!

Congratulations to Hannah! She has been elected to the American Astronomical Society Board of Trustees for 2019-2022, term that begins in June.

Chip and Jim Verley received the PIE award that promotes intellectual engagement in students' first year. We appreciate your effort!

Great news! P&A's assessment level has been elevated to Tier 1 status for both the BS and PhD programs. We have implemented several assessment methods for our programs and continued to collect relevant data. Let's thank Chip for leading this effort.



Major Grants Received by Faculty Last Year:

Shawna McBride is the lead PI on a National Science Foundation grant of \$649,991 entitled "Combining Project-based Learning, Citizen Science, and Authentic Research to Enhance the Success of STEM and STEM Education Majors".

Danny Dale received a NASA Earth and Space Science Fellowship! The fellowship will be given to Jessica Sutter and is renewable for a total of three years with a total of \$135,000.

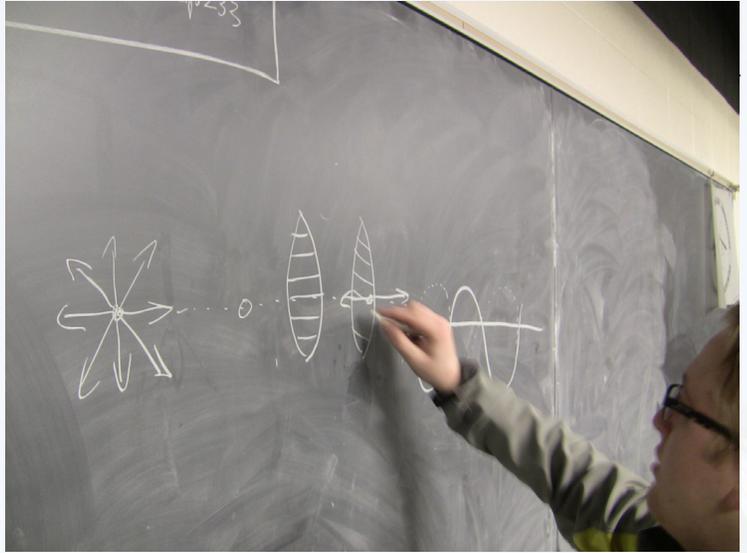
Congratulations to Mike Brotherton for a new \$375K 5-year NSF grant! Adam is a Co-PI on the grant so let's congratulate Adam as well!

Mike B has also just secured a \$83,671 NASA Chandra Cycle 20 observing grant for studying "X-ray Properties Extreme Super Eddington Accreting Massive Black Holes".

Adam has a new three-year \$205K DOE grant entitled: "EBOSS AND DESI: LSS CATALOGS, TARGETING AND SPECTROSCOPIC CONTAMINANTS".

Danny Dale received \$72K from NASA's Hubble Space Telescope for "PHANGSHST: Linking Stars and Gas throughout the Scales of Star Formation."

Congratulations to Danny (PI) and Chip (Co-PI) for getting the renewal of their NSF astronomy REU grant (3 years & \$260k)!



Three cheers to Chip for recently striking up a relationship with a Jackson resident during a Rotary Club visit there. This gentleman was excited by what Chip had to say about the outreach we do in our department and across campus. He has committed \$50k/year for 5 years toward a STEM academy (see story on the Teton STEM Academy).

Bill Rice was awarded by the Ellbogen Foundation a \$25K outreach grant for the Science Kitchen for 2018-2019.

Chip Kobulnicky, Samantha Ogden, Megan Candelaria & Shawna McBride received an InReach grant - STEM Scholars Saturday 2019. A&S will provide a \$4,000 support for the project.

Shawna McBride, Megan Candelaria, Samantha Ogden & Michele Turner also received an InReach grant - 2019 Women in STEM Conference with a \$4,000 support from the A&S.

Bill Rice received two A&S Seed Grants this year (\$25K each). One is as PI to observe quantum spin liquids in two-dimensional magnetic nanoporous frameworks, and the other is a Co-PI with Brian Leonard in Chemistry to study novel layered two dimensional (2D) tungsten oxychloride materials with tunable properties.

Chip has again secured a \$10K domestic graduate recruiting initiative award from the Academic Affairs. Thank you, Chip.

Bill Rice and Jinke Tang have both received additional funding from the School of Energy Resources to work on its state funded Carbon Engineering Initiative.



Congratulations to Chip and Hannah for getting a "Women in Graduate Education GA GA award"!

Chip, Bill and Danny received an Under-Represented Domestic Minorities (URDM) GA award. Congratulations!



Graduate student Jessica Sutter is one of eight astrophysics students across the country to receive a NASA Earth and Space Science Fellowship. (Story adapted from UW Institutional Communications)

Jessica Sutter, a third-year graduate student in the University of Wyoming's Department of Physics and Astronomy, is one of eight astrophysics students, out of 177 applicants, to receive a \$45,000 NASA Earth and Space Science Fellowship (NESSF).

Sutter's faculty adviser, Professor Daniel Dale, will serve as the principal investigator of their project, "Determining the Nature of [CII] 158 Micron Emission: An Improved Star Formation Rate Indicator."

Sutter's research focuses on the rate at which galaxies form new stars, and that information, ultimately, will help astronomers replay the events that created our own Milky Way galaxy.

"To do this research, I use data from the Herschel Space Telescope to measure how bright nearby galaxies are in a specific wavelength or 'color' of light," explains Sutter, who is from Portland, Ore. "By determining what portion of the light I observe is produced by very young stars, which also are the brightest and hottest stars, I can estimate how many new stars a galaxy is forming -- or the star formation rate of the galaxy."

Essentially, astronomers measure two types of galaxies in the universe. Spiral galaxies comprise a flat, rotating disk with several young stars, while elliptical galaxies are football-shaped and have very few young stars. Among the issues Sutter aims to address is why elliptical galaxies form fewer stars than do spiral galaxies.

Using tools including Atacama Large Millimeter/submillimeter Array (ALMA), a radio telescope that is tuned to higher-frequency radio waves (nearly as high as infrared light), Sutter will be able to detect light from galaxies up to 30 billion light years away.

"Light takes time to travel from these very distant galaxies, so looking at far-away sources is similar to looking back in time to what galaxies were like near the beginning of universal history," Sutter says.

"Sutter's work should break new ground in applying what we learn from nearby galaxies to the most distant reaches of the universe," Dale says.

These NESSF "training grants" go to universities and educational institutions to ensure continued preparation of a highly qualified workforce in disciplines that are needed to achieve NASA's scientific goals.

Depending on successful academic performance, research progress, the faculty adviser's recommendation and availability of funding, NESSF grants may be renewed for no more than two additional years.

Of the \$45,000 award, \$35,000 is designated as a student stipend; \$5,000 is allowed for student expenses, including travel that supports the research; and \$5,000 goes to university expenses. Sutter will use a portion of the grant money to attend conferences and meet with fellow astronomers who also study star formation.

"Prestigious graduate fellowships, like these, allow talented students to focus on their research," Dale says. "Graduate fellows do not need to expend additional energies seeking support for their graduate schooling, which, in turn, results in higher-quality work and a shorter time to finish their degree."



(pictured from left to right - top)
 Noah Cowper
 Zhuangen Fu
 Cristilyn Gardner
 Harrison Leiendecker



(pictured from left to right-bottom)
 Ashley Piccone
 Jason Rothenberg
 Piumi Samarawickrama
 Andrei Zadorozhnyi

This year we welcomed 8 new grad students.

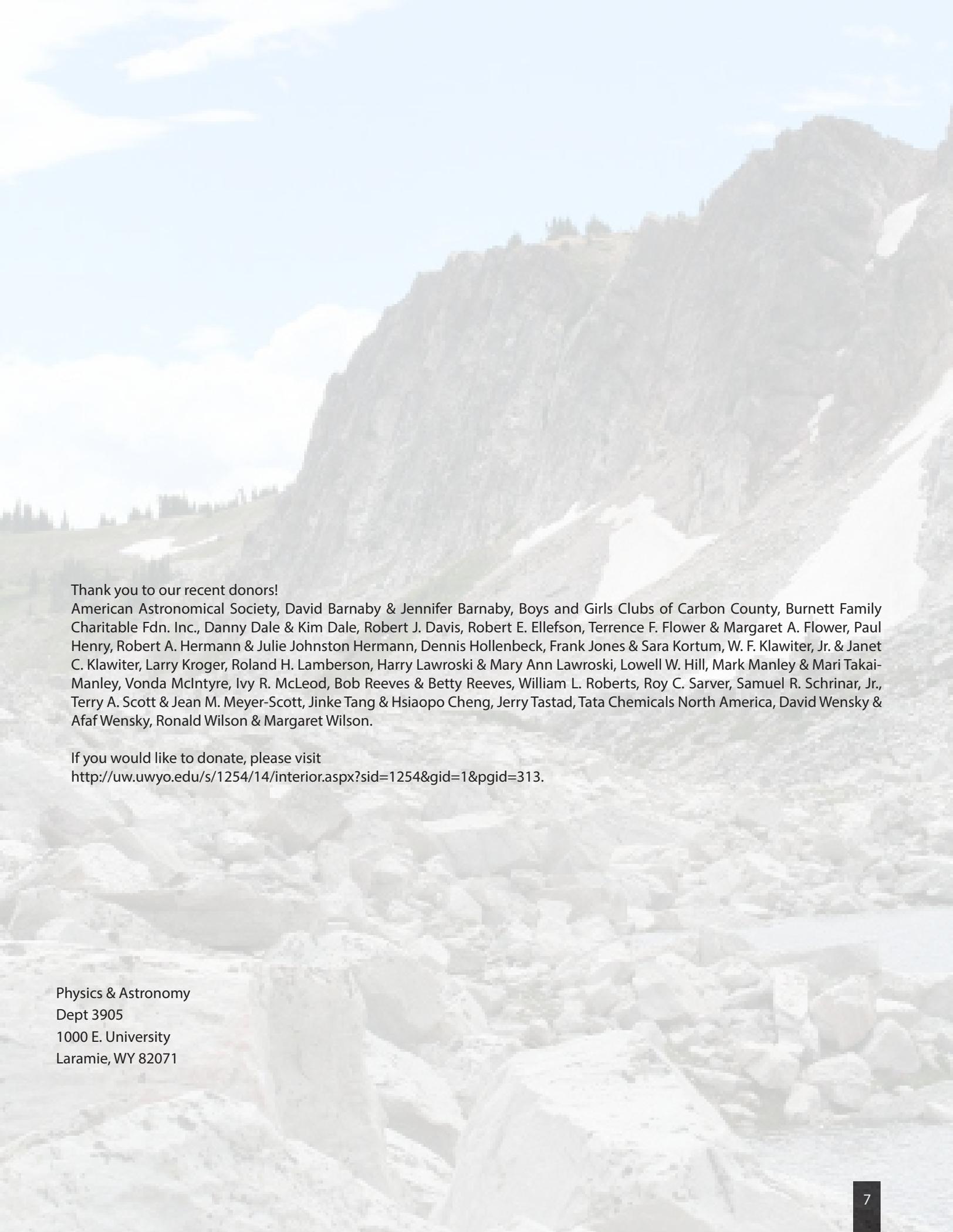
The Ivers Donate to P&A Again!

On October 17, 2018, faculty and students hosted Patrick and Nora Ivers. They visited the labs and chatted with faculty and students for 2.5 hours in the afternoon. They were shown the exciting programs and projects currently taking place in Physics & Astronomy at UW along with the faculty and students involved. After they made a major donation to the Department last year, the Ivers have just decided to give another \$25K contribution to us. It will be used to support our research effort. To honor their wish, we will use the \$25K donation as matching grant for faculty research proposals. Their generous donation will greatly enhance our research and graduate education. Thank you, Patrick and Nora!

Teton STEM Academy opened this summer!



The University of Wyoming Teton STEM Academy served 21 middle school youth from across Wyoming in its inaugural summer. Made possible by a generous gift from an anonymous donor in Teton County, the Academy is a free residential camp on the UW campus offering hands on learning on the fundamental principles of physical & life sciences, engineering, & mathematics. Prof. Chip Kobulnicky is the executive director, assisted by camp directors Samantha Ogden (UW's planetarium director) and Megan Candelaria (faculty from Laramie County Community College). Four UW science majors, serving as counselors, and three in-service school teachers delivered a rich interdisciplinary curriculum. Camp activities centered around the theme of planning a journey to Mars. Learning modules included analyzing chemical elements, constructing & using small telescopes, testing soil for signs of life, extracting DNA from cells, programming robots, and field excursions to the local forest and UW's research telescopes. The camp will continue in July 2019, serving rising 10th & 11th grade students who are Wyoming residents.



Thank you to our recent donors!

American Astronomical Society, David Barnaby & Jennifer Barnaby, Boys and Girls Clubs of Carbon County, Burnett Family Charitable Fdn. Inc., Danny Dale & Kim Dale, Robert J. Davis, Robert E. Ellefson, Terrence F. Flower & Margaret A. Flower, Paul Henry, Robert A. Hermann & Julie Johnston Hermann, Dennis Hollenbeck, Frank Jones & Sara Kortum, W. F. Klawiter, Jr. & Janet C. Klawiter, Larry Kroger, Roland H. Lamberson, Harry Lawroski & Mary Ann Lawroski, Lowell W. Hill, Mark Manley & Mari Takai-Manley, Vonda McIntyre, Ivy R. McLeod, Bob Reeves & Betty Reeves, William L. Roberts, Roy C. Sarver, Samuel R. Schrinar, Jr., Terry A. Scott & Jean M. Meyer-Scott, Jinke Tang & Hsiaopo Cheng, Jerry Tastad, Tata Chemicals North America, David Wensky & Afaf Wensky, Ronald Wilson & Margaret Wilson.

If you would like to donate, please visit

<http://uw.uwyo.edu/s/1254/14/interior.aspx?sid=1254&gid=1&pgid=313>.

Physics & Astronomy
Dept 3905
1000 E. University
Laramie, WY 82071