

CLEAR VIEW

CONGRATULATIONS 2004 FELLOWSHIP RECIPIENTS

Wyoming NASA Space Grant is pleased to announce the recipients of the 2004 Undergraduate and Graduate Research Fellowships and Faculty Grants. Research fellowships provide an opportunity for students to gain firsthand experience in science and engineering research and encourage them to pursue careers in these fields. Undergraduate students are paid an hourly wage while working on their research; graduate students receive an academic year stipend. Faculty grants provide funding for curriculum development or research.

UNDERGRADUATE RESEARCH FELLOWSHIPS

Andrew Curtis, *Computer Engineering and Mathematics*, Advisor: *Bryan Shader*
External and Semi-External Algorithmic Analysis of Massive Graphs and Digraphs

Ruben Mares, *Zoology & Physiology*, Advisor: *Merav Ben-David*
Climate change and the wolf management plan in Wyoming: forecasting effects of changes in precipitation and temperature on wolf livestock depredations by 2025

Lindsey Mehlhaff, *Mechanical Engineering*, Advisor: *Mark Garnich*
Analysis of Anisotropic Elastic-Plastic Properties of Titanium Tubing

Susan Pitts, *Geology & Geophysics*, Advisor: *Ron Marrs*
Rock and Mineral Identification by Raman Spectroscopy

Greg Sarchet, *School of Pharmacy*, Advisor: *Delwar Hussain*
Sustained Released Progesterone from Liposomes to Control Ovarian Cancer

Brian Scoggins, *Physics & Astronomy*, Advisor: *Mike Brotherton*
BALQSOs: Different Species or Different Angle?



UG Fellowship Student, Susan Pitts testing the Raman Spectrometer

Eric Tretter, *Zoology & Physiology*, Advisor: *Patricia Colberg*
Bacterial Fe (II) Oxidation in Alpine Lake Sediments: A Window to Earth's Microbial Past?

Lisa Ann Weber *Chemistry*, Advisor: *Patrick Sullivan*
The Effects of Humic Substances on Iron and Manganese Redox Cycling

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Contact Us!
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COMMUNITY COLLEGE SCHOLARSHIPS

In 2002 Wyoming Space Grant initiated a new program to encourage community college students in science, math, and engineering fields to pursue degrees in these fields. Selection criteria are based on academic record, student declared major in science, mathematics, engineering, or technology, and a written statement regarding educational and career goals. This program is currently underway at Casper College and Laramie Community College and is being extended to include other community colleges as well.

Eight students at Laramie County Community College have received \$1000 each to apply toward their educational expenses for the Fall and Spring term.

2004-2005 SCHOLARSHIP RECIPIENTS

Peter Garza, *Biology (Pre-Med)*
Jay Matter, *Engineering*
Brian Molan, *Chemistry*
Joshua Montoya, *Math/Computer Science*
Krista Tafoya, *Pre-Pharmacy*
Trisha Walker, *Engineering*
Barry Williams, *Engineering*
James Worthen, *Computer Science*

For more information on these opportunities for Community College students, please visit our website: www.wyomingspacegrant.uwyo.edu or contact our office at (307) 766-2862.

COMMUNITY COLLEGE TRANSFER SCHOLARSHIPS

Beginning this Fall semester, Wyoming Space Grant started a new program that provides scholarship funds of up to \$5,000 to be applied to school expenses to students transferring to the University of Wyoming from one of the Wyoming community colleges. Recipients are selected based on their academic record, personal essays, teacher/counselor recommendations and academic and long-term goals. This academic year, Space Grant has provided funding to four students transferring from community colleges across the state.

2004-2005 UW CC TRANSFER SCHOLARSHIPS

Zachary Gutierrez, *Casper College*
Joslyn Hiatt, *Laramie Co. Community College*

Christer Karlsson, *Casper College*
Chiwah Lam, *Eastern Wyoming College*

UW STUDENT SPENDS SUMMER AS JPL INTERN

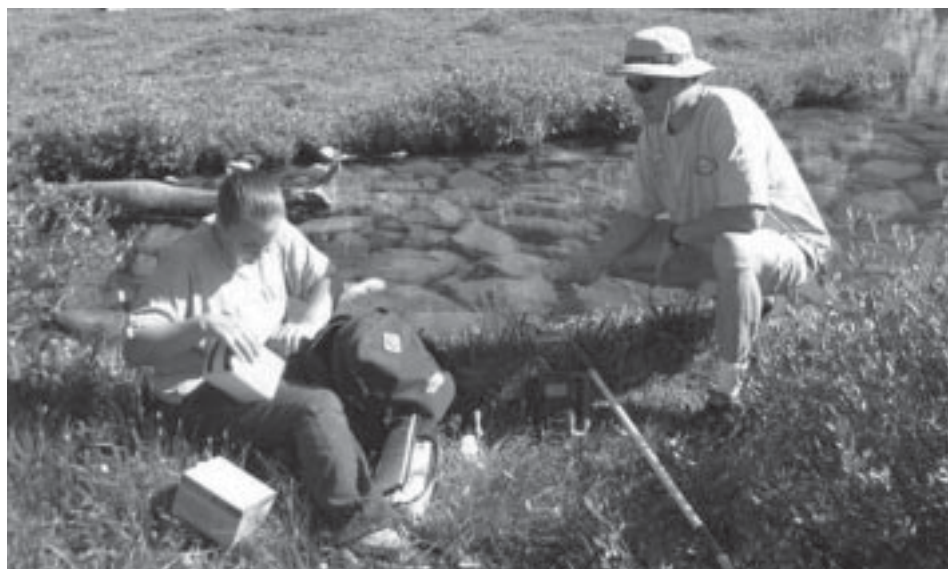
UW Physics and Astronomy third year graduate student, Dan Kiminki recently returned from a summer internship with the Jet Propulsion Laboratory (JPL) in California. Funded by Space Grant, Dan spent 10 weeks working one-on-one with Dr. Robert Carlson (Galileo NIMS team leader) building and testing an MSL (Mars Science Laboratory) instrument for spectrochemical and mineralogical investigation of Mars habitability. This instrument has been named Lucina after the Roman goddess of light and birth. Lucina is a Fourier transform interference mid-infrared spectrometer designed to replace the Alpha Particle X-ray Spectrometers aboard the current Opportunity and Spirit rovers. The mission of both instruments is to determine if life ever existed or currently exists on Mars through the examination of Martian rocks and soil. Lucina will do this while being less demanding on resources and more capable in its use of spectrochemical and mineralogical analysis.



Dan Kiminki

Preparation of the sample will not be needed and more information will be obtained by using the IR part of the spectrum. Lucina is currently in the field-testing stage of development. As an intern at JPL, Dan was expected to work as a member of the MSL team. His main task was to design and build the 'mock up' of the field instrument, and provide input on future construction. This involved calibration of instruments, general design of the 'mock

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Chemistry undergraduate student Lisa Weber and graduate student Chris Borman taking Iron and Magnesium samples for their fellowship research projects.

SPACE GRANT UPDATE

This has been an eventful year for Wyoming Space Grant – highlights include a changeover in Space Grant staff, a five-year review of the program (1998-2002), successful competition for additional NASA funds, and the initiation of several exciting new programs.

STAFF

We want to extend a warm welcome to Kristen Scheel, our new Associate Director, who began working with us in September. Kathleen Harper, who is still acting as a program consultant, moved to Missoula, Montana, this summer.

Laura Dalles is our Project Coordinator. She has been with Space Grant since July, 2004. Laura is primarily responsible for our outreach and education portion of the program.

REVIEW

NASA conducts reviews of each state's Space Grant program every 5 years. We submitted a report summarizing our programs during the review period (1998-2002) in October, 2003. We received feedback on the review this summer and have formulated a plan to address several areas for increased effort in the coming year. We are hoping that this review will help us to identify areas for growth in our program.



Paul Johnson, Kristen Scheel, & Laura Dalles

FUNDING AND NEW PROGRAMS

Wyoming Space Grant received funding from NASA for two projects designed to strengthen the Wyoming math, science, and engineering workforce. One proposal requested funds for several new initiatives involving community colleges, including an expansion of our student scholarship program to additional campuses, a new community college transfer scholarship program at UW, and funding for professional development grants to community college faculty. We are also involved in a multi-state grant to provide geospatial training to Native American groups. We are currently working with individuals involved with use of geospatial data and analysis on the Wind River Reservation to design several workshops to address current training priorities.

National Space Grant has recently been awarded a contract to take over responsibility for NSIP (National Student Involvement Program) advertising and competition. Look for increased visibility of the Space Grant role in this well-established premiere opportunity for K-12 students and classes to become involved in the excitement of NASA missions and research. For more on the program, visit the NSIP website at nsip.org.

WYOMING NASA³ SPACE GRANT CONSORTIUM

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and Fellowship Program.
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Affiliates
Casper College
Casper Planetarium
Laramie County Community
College
Embry-Riddle Aeronautical
University
Sheridan College
Wickman Spacecraft and
Propulsion Co.

Wyoming Space Grant Consortium supports strengthening of a science and technology workforce in Wyoming, emphasizes the participation of students in research, and promotes communication of the benefits of science and technology to the public.

CLEAR VIEW Editors

Laura Dalles
Kathleen Harper
Kristie Scheel

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2005 Wyoming Space Grant Fellowships and Grants

Proposal deadline

February 18, 2005

Undergraduates

Student salary of up to \$5000 for summer and/or academic year to conduct research with an advising faculty member. Faculty member or student may apply.

Graduate Students

Academic year stipend of \$13,500 - \$18,000 plus summer stipend in conjunction with full tuition waiver and health insurance. \$1,500 for students conducting MS research and \$2,000 for students conducting PhD research.

Faculty

Research Initiation Grants and Education Enhancement Grants to fund scientific research or course development. Awards are up to \$8,000 for summer salary.

Students and faculty at UW and Wyoming community colleges are eligible to apply. Students must be U.S. citizens

For proposal criteria and guidelines visit our website. wyomingspacegrant.uwyo.edu

Continuing the partnership with Space Science Network Northwest (S2N2) as a broker/facilitator for NASA's Office of Space Science (OSS) keeps the Wyoming Space Grant office abuzz in the areas of education and outreach. The goal of S2N2 is to increase awareness of and participation in OSS missions and education and public outreach programs by creating collaborative pipelines between educators, scientists and E/PO program coordinators. Current S2N2 projects in Wyoming include the Women in Science Forum, Astro Camp, teacher's workshops at the Wyoming Department of Education School Improvement Conferences, and Wyoming Math and Science Teachers Association. We are also collaborating with various museums across the state of Wyoming and the Casper Planetarium.

S2N2 also acts as a clearinghouse for OSS mission information and related education products.

OSS is the branch of NASA responsible for solar system missions, astrobiology and space science research satellites such as the Hubble Space Telescope and the Chandra X-ray Observatory.

Information, resources and educational materials related to any and all NASA missions can be obtained through the Wyoming Space Grant office: Physical Science 210, UW Campus.

S2N2 broker/facilitators Hawaii Space Grant will be hosting an Astrobiology workshop June 14 - 18, 2005. Wyoming Space Grant will send one secondary science teacher to this workshop - all expenses paid. For application information please contact Laura Dalles at dalles@uwyo.edu or call 307-766-2862.

SMART GIRLS ROCK!

Seventh and eighth grade girls from Wyoming are stepping out and exploring possibilities in math and science careers by participating in the annual Women in Science Forum. The 2004 forum, held last Spring, was attended by over 260 young women scientists from Cheyenne, Kaycee, Lusk, Rawlins and Laramie - and came to UW to explore possibilities in math, science and technology. These future scientists were given opportunities to actively explore hands-on what it would be like to be a physicist, and engineer, a botanist even a forensic scientist. The day was filled with several activities. In addition to providing a session on pursuing a college career in science and technology, Shari Meisel of the DeVry Institute of Technology offered advice about planning for higher education in her keynote address. Students attended science laboratories around campus, and had a lunch hosted by UW President Phil Dubois. "The intent of WIS is to provide young women with an interest in math or science an opportunity to explore their interests and meet other women scientist in a non-intimidating environment and establish a relationship with these scien-



Women In Science participants testing blood samples in the Wildlife Forensics lab session facilitated by the Wyoming Game and Fish Department's forensics specialists

tists that will hopefully turn into a mentoring relationship in future years." says Laura Dalles, coordinator of the event.

The National Weather Service Cheyenne office co-hosted the forum for the third year with the Wyoming NASA Space Grant Consortium. Other contributors included the Cheyenne Kiwanis Club, Wyoming Student Loan Corporation, the University of Wyoming Presidents' Office, NOAA, the College of Agriculture/Renewable Resources, the College of Agriculture/Molecular Biology, and the William D. Ruckelshaus Institute/School of Environment and Natural Resources.

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(GIRLS—Continued from Page 4)

The Wyoming Student Loan Corporation provided T-shirts to the attendees along with timely information about college career planning. The Cheyenne Kiwanis Club, in addition to funding school buses for students from Laramie County Wyoming, provided a \$300 scholarship for one lucky forum attendee. Ms. Hanna Milmont, a student from McCormick Junior High in Cheyenne, was the recipient of this \$300 scholarship. The award was presented in the form of a Coverdell Education Sav-

ings Account (formally known as an Education IRA).

Laboratory topics included Astronomy, Tree Rings, Computer Aided Design, Forensic Anthropology, Geology, GIS/Remote Sensing/Mapping, Mathematics, Plant Microscopy, Physics, Range Management, Robotics, Wildlife Forensics, Sports Medicine, Wildlife Biology, and Biology- Disease Transmission.

YOUNG ASTRONOMERS EXPLORE THE MAGIC OF PHYSICS AND STARS

The Department of Physics and Astronomy and the Wyoming Space Grant Consortium sponsored the Second Annual Wyoming Astronomy Camp this summer on the campus of the University of Wyoming. The camp provides an opportunity for youth in Wyoming to discover and experience the sciences. This experience has also given these kids not only an opportunity to experiment with technology, use a professional grade telescope, explore careers in physics and astronomy, but to learn more about the many possibilities in higher education.

Thirty-four children from the Boys and Girls Clubs of Casper and seventh and eighth graders from around the state attended this summer's camp. The camp was held on two consecutive weekends, one hosting the Boys and Girls Club members and the second hosting students who were required to submit an application and short essay stating why they wanted to attend this camp and what they hoped to take home with them once they had attended. These students truly have an interest in astronomy and most would like to pursue careers in this field.

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Young Astronomers designing their model rocket at Astro Camp

EDUCATION OPPORTUNITY

Astrobiology Laboratory Institute for Instructors (ALI'I)

**University of Hawaii
Manoa**

June 14 – 18, 2005

Purpose: Introduce in-service secondary science teachers to astrobiology.

This new multi-disciplinary field connects:

- Astronomy of stars and galaxies
- Physics of gravity and forces
- Geology of fossils in rocks on planets
- Chemistry of origin of elements and hydrocarbons
- Biology of amino acids and DNA and origin of life.

Sponsor: UH Manoa NASA Astrobiology Institute (NAI)

Led by Karen J. Meech, astronomer and 1993-2003 NSF TOPS director, and fourteen other major collaborators from:

Institute for Astronomy (IfA)

Hawaii Institute for Geophysics and Planetology (HIGP)

School for Earth and Ocean Sciences and Technology (SOEST).

These scientists conduct research on Mars missions, Moon rocks, protostars, Kuiper Belt Objects beyond Neptune's orbit (discovered in 1993 by a team member), and microbes surviving "extreme" environmental conditions called extremophiles.

For more information and to apply contact Laura Dalles at dalles@uwyo.edu or (307)766-2862

NASA Internship Opportunities

NASA Academy

Designed for students interested in leadership and science careers in the aerospace industry.

10 week summer programs available at Goddard Space Flight Center and Ames Research Center. \$5000 stipend.

This program provides a unique and rigorous educational and training curriculum related to the organization of NASA, its science and technology projects, and its collaboration with industry and academia.

Application deadline is January 31, 2005

www.nasa-academy.nasa.gov

NASA Undergraduate Student Research Program (USRP)

NASA-USRP provides research experiences in fields aligned with NASA research and development missions.

Internships are available at many NASA Field Centers.

10 week summer and 15 week fall sessions available. \$500/week stipend.

Application deadline will be mid January, 2005
www.vsgc.ou.edu

Interns must be U.S. citizens. For assistance with applications please contact the WY Space Grant Office.

CAMP, (Cont'd from page 5)

Camp coordinators Dr. Chip Kobulnicky and Dr. Danny Dale of the Physics and Astronomy Department, and Chad Sharpe, a volunteer with the BGC of North Casper and UW Physics Education major are excited about the future of this camp. "This is an opportunity for the University of Wyoming Physics and Astronomy Department to provide an integrated science program to the public. Through this outreach effort, this department and the university will be given more visibility," says Chip Kobulnicky. "This is a great recruiting tool." More importantly, "this is a great opportunity for youth to explore the sciences at no cost to them." Astro Camp is funded by educational/public outreach grants from NASA and the National Science Foundation and by an Office of Space Science E/PO grant from the Wyoming Space Grant Consortiums S2N2 partnership.

Beginning with a brief introduction and get to know you activities, and then moving on to the nuts and bolts of physics and astronomy proved to be a full weekend. Students built spectroscopes – an instrument that breaks light into a spectrum or colors. They built and launched model rockets, observed the sun through the STAR (Student Teaching and Research) observer and viewed the night skies at the Red Buttes Observatory, and at Veedawoo. One student was heard telling another "I learned so much today". "That makes it all worth while." says Kobulnicky.

Danny Dale was happily surprised by the energy

with which the students tackled Astro Camp activities. While the glue was drying on their rockets, students explored about two dozen hands-on physics experiments (Dale calls this the "Physics Magic Show"). "We actually had to cut them off after 30 minutes because it was time to go launch the rockets (and stay on track with our busy schedule)." says Dale. There wasn't a single student who looked bored or disinterested during the Magic Show, and that surprised the instructors a bit because they come from such diverse backgrounds—they were not pre-selected to be science aficionados. Dale believes they truly tapped into some latent interest, something that might not have happened if they had not been exposed to the activities at Astro Camp.

Students did get a chance to wind down before heading home, although the energy and enthusiasm generated during the planetarium show was literally a roaring success. The students were intrigued by its [spaceball] ability to quickly simulate how the sky changes on hourly, daily, and yearly timescales. The laser show portion of the planetarium show was clearly one of their favorite activities during the entire weekend. They really enjoyed the "Jock Jam" segment and its accompanying music.

Plans are underway for next year's camp – as well as the addition of an extended week long Astro Camp. We hope to continue offering this unique opportunity for kids to explore physics and astronomy and expose them to the many opportunities in other fields of science.

JPL INTERN (cont'd from Pg 2)

up', and programming an automated scanning and reduction process. This work was chiefly done individually with occasional help and direction from the team leader. He also provided help with smaller tasks associated with other team members. When asked about his experience, Dan said, "Working at JPL has renewed my curiosity and motivation for my own research. I am forever thankful to my mentor, Bob, and all others for pushing me to new levels and providing me with new useful skills for my own current and future research."

Kiminki is the 2nd UW student to spend his summer as a JPL intern. In 2003, Josef Pohl joined members of the Parallel Applications Technology (PAT) group at JPL in developing a parallel algorithm to process stream flow net-

works on a continent by continent basis using the Shuttle Radar Topography Mission dataset. This project was undertaken to provide seamless stream network models that can easily integrate into new and existing GIS watershed models. Speaking about the opportunity and experiences he had at JPL, Josef said, it was "an invaluable learning experience. The people at JPL were very dynamic, interested in experimenting new ideas, and allowed you to work on your own as well as working collaboratively."

For more information on internship application materials for JPL and other field centers, contact the Space Grant office for more information. Application deadline is February 2, 2005.

OPPORTUNITIES FOR COMMUNITY COLLEGE FACULTY

The Community College Faculty Development program is aimed at Wyoming community college science, engineering, and technology (SMET) faculty. This new program is intended to provide competitive professional development opportunities for full-time SMET instructors at the seven community colleges in the state. Through this program, SMET instructors will be able to pursue professional development appropriate to their situation and needs. This may include summer university courses or research experiences. This program aims to improve the overall quality and vibrancy of the SMET programs at the community college, and have a corresponding positive impact on the students in these programs. Please contact the Space Grant office for more information.

CHANGES AT NASA

NASA has recently undergone extensive restructuring in response to comments of the commission set up to review the Challenger accident and also in response to President Bush's initiative for renewed exploration of the Moon and Mars. Science at NASA is now divided into new categories: Aerospace, Science, Biological... Exploration. The main difference here is that "Science" now includes earth and space sciences. The Education Enterprise is now under the Office of the Assistant Administrator for Education.

THE 4TH ANNUAL WYOMING MATH AND SCIENCE TEACHERS CONFERENCE

The 4th Annual Wyoming Math and Science Teachers Conference will be held on **Friday and Saturday, January 7 and 8 at Casper College.**

The title of the conference this year is "High Quality Math and Science in the Equality State".

Wyoming Space Grant will be debuting the Solar System Educators Resource Trunk on Friday. A short workshop will brief teachers on how to use the materials, resources and curricula within the trunk. The trunk will meet state standards and identifies which benchmarks can be met by utilizing the trunk. The trunk will be available for check-out to teachers for a two week period at no cost.



One of the many rockets launched at the 2004 Astro Camp.

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GRADUATE RESEARCH FELLOWSHIPS

Jonathan Adelman, *M.S. Candidate, Botany*;
Advisor: Brent Ewers
Quantifying Spatial Variability in Forest Function Along Environmental Gradients: Coupling Large and Small Scales Using Remote Sensing and Geostatistics

Jeffrey Morris, *Ph.D. Candidate, Zoology & Physiology*; *Advisor: Joseph Meyer*
Using Photosynthetic Biofilm to remove Heavy Metals from Recycled Water during Extended Missions in Space

Joshua Schwartz, *Ph.D. Candidate, Geology & Geophysics*; *Advisor: Barbara John*
Crystal Evolution at Slow-Spreading Mid-Ocean Ridges, Atlantis Bank, Southwest Indian Ridge

Brian Uzpen, *Ph.D. Candidate, Physics & Astronomy*;
Advisor: Chip Kobulnicky
Spitzer Space Telescope Search for Circumstellar Disks Around Main-Sequence Stars

FACULTY GRANT RECIPIENT

Dave Williams, *Ph.D, Professor, Renewable Resources*
Net Carbon Exchange and Evapotranspiration in Sagebrush Steppe: Response to Extreme Summer Rainfall Events

INTERESTED IN REMOTE SENSING?

Wyoming SGC will be sponsoring several introductory remote sensing workshops during 2004/2005. These workshops are aimed to introduce and highlight the uses of some NASA satellite based remotely sensed data to federal, state and local government personnel in Wyoming. Dr. Ramesh Sivanpillai, Coordinator of the WyomingView program, will be conducting several workshops through out the state. For further information about the courses, dates and venues contact him at: sivan@uwyo.edu or 307-766-2721.

THE NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM

is a national network of colleges and universities working to expand opportunities for Americans to understand and participate in NASA's aeronautics and space programs by supporting and enhancing science and engineering education, research and outreach programs.



Wyoming Space Grant sponsors a short radio program on space science topics.

Air times on Wyoming Public Radio stations throughout Wyoming:

Monday-Friday – 8:58 AM & 2:56 PM

Saturday – 12:00 PM • Sunday – 6:00 PM

WYOMING NASA SPACE GRANT CONSORTIUM

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