



March 2013

News from the High Plains



Spring 2012 graduates with Prof. Kobulnicky



Prof. Thayer with 2012 A&S Outstanding Graduate
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Greetings Alumni & Friends,

We have seen several interesting personnel changes this year, with the two most prominent being the upcoming changes of guard in the UW President and the Dean of Arts & Sciences. On a more local level, theorist Adrian Feiguin left for Northeastern University but we were fortunate this year to hire an experimentalist who specializes in materials science and Scanning Tunneling Microscopy. Dr. TeYu Chien, currently a postdoctoral scholar at Northwestern University, will start this August. We are also happy to announce that this August Dr. Rich Barrans will move to a more permanent position in our department as Academic Professional Lecturer.

Plans are underway for a major renovation of our planetarium. Thanks to a major initial gift from a local foundation, we plan to replace our venerable Spitz 'star ball' with a new digital projection system. Our goal is to also significantly upgrade the dome, lighting, audio, seating, and entryway. I hope to provide you with a more comprehensive update in the next newsletter.

You may recall that Professor Emeritus Ron Canterna ran a successful NSF REU (Research Experience for Undergraduates) program for 22 years in our department, from 1987 through 2008. That program created great exposure for the Department, and the 6-7 students annually selected from across the country provided lots of fresh energy to our program each summer. After a three-year hiatus, we were able in 2012 to bring back an NSF REU program once again. This coming summer the REU cohort will work with Professor Kobulnicky and myself to carry out spectroscopic observations at WIRO in order to constrain the properties of massive binary star systems.

This year we have been fortunate to have several of our alumni come visit and give presentations on their research career paths. We have been especially pleased to welcome back former students now working in industry who can provide job placement tips to our current students. Please let us know if you would be interested in making a similar visit. Finally, congratulations to James Allen (Ph.D. 1974) who has been selected as an A&S Outstanding Alumnus for 2013!

All the best,
Danny Dale
Department Head





**AndersonMasonDale
Architects**

Enzi Education Facility (STEM)

ENZI EDUCATION FACILITY

A technology teaching laboratory that will provide University of Wyoming students an opportunity to receive valuable training for post-graduation careers will be built on the north side of the UW campus.

The \$55 million Michael B. Enzi STEM (science, technology, engineering and mathematics) facility will be constructed on UW property located north of Lewis Street between 10th and 11th Streets. Groundbreaking occurred in March 2013.

The STEM facility is for teaching laboratories for introductory courses in physics (1st floor), biology (2nd floor), and chemistry (3rd floor) as well as other large-enrollment laboratory courses involving more than 100 students per semester. The facility will not house research laboratories.

“The facility will address modern and emerging technologies and teaching methods in the sciences, in light of which many of UW’s existing teaching labs are outdated,” said Douglas H. Vinzant, UW Vice President for Administration.

He says botany laboratories were last remodeled in the 1950s, while zoology and physiology, chemistry, and physics laboratories remain essentially the same as when constructed nearly 45 years ago. UW has spent maintenance funds to meet the basic health and safety requirements associated with its existing facilities, Vinzant says, but expenditures “fall well short of providing truly modern lab facilities.”

A completed scoping study estimates that the facility will be more than 98,000 square feet, which will house approximately 28 laboratories, 10 preparatory rooms and about eight offices.

Adapted from UW News

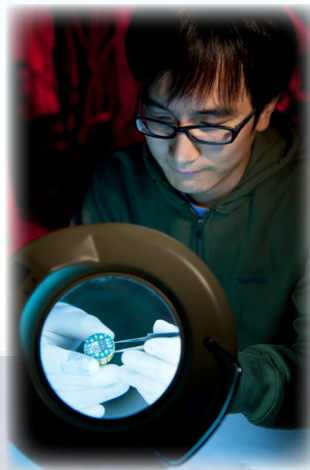


WiMSE (Women in Math, Science, and Engineering) is a new program that was started this year by the Wyoming NASA Space Grant Consortium in partnership with the UW Women’s Center, McNair Scholars Program, Wyoming EP-SCoR, Science Posse, School of Energy Resources, INBRE, Engineering, and SEO. WiMSE provides resources and support to undergraduate women on campus involved in mathematics, science, and engineering. Resources include monthly seminars on topics such as: getting ready for graduate school, writing a personal statement, resume and CV development, building self-confidence in the science environment, STEM resources on campus, career panel with women scientists and engineers, the importance of internships, and more. All seminars are held over lunch with food provided. The seminars give students information about campus resources, interactive discussions on topics, and a support system, including peers and professional women on campus. Surveys received by the UW Women’s Center indicated a need for additional resources for undergraduate women in the sciences and WiMSE is hoping to fill that need. Thus far, we have had four seminars that were well-attended and well-received and we plan to continue building the program next semester and into the future.

STUDENT PROFILES

Graduate Student Pan Liu

Stoichiometric EuO is a well known ferromagnetic semiconductor with a Curie temperature (T_c) of 69 K and a band gap of about 1.2 eV. There are some spectacular phenomena for this material with electron doping, such as a metal-to-insulator transition and colossal magnetoresistance. The Curie temperature can also be enhanced significantly by electron doping via rare-earth atoms and oxygen vacancies. Pan's studies demonstrated that we can obtain stoichiometric or oxygen deficient europium oxide films by controlling the deposition conditions, which opens an easy route to the preparation of this interesting material. Pan's current research focus on the growth condition of EuO films doped or without doping on single crystal silicon substrate and other substrates via pulsed laser deposition, and also the relation of deposition parameters with the quality of films is also being investigated.



Graduate Student Jessie Runnoe

Quasars are notable for emitting their substantial radiation over the entire electromagnetic spectrum. To get an accurate picture of a quasar requires assembling data from all wavelengths into one diagnostic tool: the spectral energy distribution. Collecting the data for the SED of a single quasar is challenging, no single telescope can do it; it requires extensive time on as many as ten telescopes and instruments. Jessie's dissertation research uses a sample of 85 quasar SEDs to investigate the whole quasar picture. She is studying the orientation dependence of the scaling relationships that are commonly used to determine quasar black hole masses. In some quasars, radio observations will reveal the kiloparsec-scale radio jets and lobes, allowing her to determine the object's orientation. She finds that in objects that are viewed more face-on, black hole masses are often underestimated. Jessie will finish this July and then begin a postdoctoral position at Penn State.



Undergraduate Rachel Smullen

This summer, I worked at the National Radio Astronomy Observatory in Charlottesville, Virginia. I was assigned a project entitled "Imaging the Spatial Density Within Starburst Galaxies"; essentially, we were looking for compact formaldehyde structures in nearby star-forming galaxies. Formaldehyde has been shown to be a good tracer of molecular hydrogen within our own galaxy, so my advisor, Dr. Jeff Mangum, wanted to turn to other galaxies. He observed 13 galaxies with formaldehyde signatures with the Green Bank Telescope. The GBT is sensitive only to the spectral information, so he gave me five formaldehyde-strong galaxies observed with the Extended Very Large Array to look for structure in the formaldehyde signal. We found compact structures in two of the five galaxies in our sample. We extracted column densities and number densities of molecular hydrogen in our galaxies using the observed emission and absorption.

But research was not the only thing I did at NRAO. I made new friends among the other interns, and we banded together to go on grand adventures. We went to the local sights: Monticello, DC, Virginia Beach, the Shenandoah, and more. Also, my advisor arranged for amazing opportunities to visit both the GBT and the EVLA. We went on maintenance days (when the dishes were down for work), so we got to clamber all over the equipment and take pictures. Normally, pictures are not allowed at these telescopes because cameras emit radio signals that interfere with data collection, and visitors almost never get to climb onto the surface of the dishes and the receiving platforms. My time at NRAO was an amazing experience that I will never forget.



ALUMNI NEWS

Jerry Harder (1987) I have been a Research Scientist at the University of Colorado since January 1988, first at the Cooperative Institute for Research in the Environmental Sciences (CIRES) studying the spectroscopy of reactive trace species in the troposphere and stratosphere, and then in 1997 I joined the Laboratory for Atmospheric and Space Physics (LASP) to participate in the NASA-sponsored Solar Radiation and Climate Experiment (SORCE). SORCE is a satellite mission to study solar spectral and total irradiance variations over the course of Solar Cycle 23 and now into Cycle 24. I am the instrument scientist for the Spectral Irradiance Monitor (SIM). SORCE observations are used extensively to study the origins of solar irradiance variability, a topic important to both solar physics and the solar influence on the Earth's climate. SORCE has just completed ten years of observations with plans to continue for as long as spacecraft subsystems allow. While not at work, my wife and I enjoy the outdoors and frequently visit the Snowy Range, still one of the most beautiful places I have ever been.

Matthew Greenhouse (1989) has served on the James Webb Space Telescope senior staff as Project Scientist for the JWST science instrument payload since 1997. He specializes in infrared imaging spectroscopy, development of related instrumentation and technologies, flight project science, and technical management.

Matt is an avid sailor in Annapolis, Maryland where he keeps his Alberg 30 sloop and lives with his wife of more than 30 years. They have two children. Matt volunteers his time for support of youth sailing in Annapolis, and other K-12 student activities such as Destination Imagination and FIRST Robotics.

Roland Lamberson (1965) I am retired from being a mathematics professor and director of Environmental Systems graduate programs at Humboldt State University where I spent the last 25 years of my career. I have also retired from being editor of the international journal Natural Resource Modeling but I remain on its editorial board and the editorial boards of the Journal of Biological Dynamics and Mathematical Modeling and Complexity. In addition, I am executive secretary of the International Resource Modeling Association. During my career I held many visiting positions: University of Perugia, Italy; University of Natal, South Africa; International Center for Theoretical Physics, Italy; University of British Columbia and University of Victoria, Canada; and Colorado State University. In 1993 I was awarded the Humboldt Medal as Humboldt State University's outstanding scholar.

Presently my wife and I do lots of traveling and divide our time between our home on the redwood coast of far northern California and a small ranch in Nebraska that we own. In my spare time I build furniture, bicycle, and am involved in various charitable activities.

If you would like to contribute to our Student Support Fund, or to the department in general, please visit uwo.edu/foundation/

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