



UNIVERSITY OF WYOMING

COLLEGE OF ENGINEERING AND APPLIED SCIENCE

# FORESIGHT

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Alumni—Investing  
in the Future  
(see story, page 3)



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Wyoming shall be considered without regard to race,  
color, religion, sex, national origin, disability, age,  
veteran status, sexual orientation, or political belief.*

## MESSAGE FROM THE EDITOR



Entering my fifth year as editor of *Foresight* magazine, it occurred to me that I have not had the pleasure of meeting most of our readers. Let me take this opportunity to share some of my background, and at the same time ask

for your assistance in identifying ways that we can improve our publication. I am to provide you with the most valuable, up-to-date information possible.

I was born in Sheridan, Wyoming, and family lived on the UW Experimental Farm until I was five years old, then moved to Laramie. My parents, Ross and Marge Richardson, purchased the family ranch southwest of Laramie from my grandparents in 1970, and I grew up learning the value of hard work in the hayfields. My mom, brothers Rod and Bill, sister Kari, their spouses, and I continue to operate the ranch. Every summer I can generally be found in the hayfield.

Like most ranch kids in the area, I was involved in 4-H and student leadership through high school. I graduated from Laramie Senior High School and attended the University of Wyoming for a short time before moving to Washington State for several years. While in Washington State, I held a position with a communications consulting company and was able to dive into the digital world, learning various software programs including graphic design, presentation and statistical chart preparation. Additionally, I was the stock transfer agent and public relations liaison between the administration and board of directors of a large bank and the shareholders of the corporation.

Knowing that my heart (family and friends) was always in Wyoming, I returned in 2002, and joined the UW Foundation as an office associate. My time at the College of Engineering and Applied Science began in August 2004, with duties focusing on event coordination and writing of press releases for the College. Since that time I have continued to coordinate events and added the responsibilities of editing and writing for *Foresight* magazine and managing the website and Facebook content for the College.



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I graduated from UW with a B.S. in Communications in May 2008, and plan on continuing my education at UW this fall, seeking an M.A. in Communications.

Last year I had the great pleasure of saying “I do” to a wonderful man, Robert Page, of Casper, Wyoming. Robert and I were married in April 2009, and both of us enjoy working on the UW campus. Our extra time is spent working on our house and with family. We especially enjoy spending time with our combined families, including daughters Kari and Kirstie, and new grandson Hayden.

My community involvement includes membership and service in the various activities at the Laramie Elks Lodge, past-president and member of the Albany County Cow-Belles, past secretary-treasurer of the Pioneer Canal–Lake Hattie Irrigation District, and member of the UW Alumni Association and National Collegiate Honors Society.

## LET US HEAR FROM YOU!

**One of the biggest challenges of today is meeting the demands of our readers while trying to also provide the most economical and timely way of providing up-to-date information. If you enjoy Foresight, let us know - if you have suggestions for how we can improve our publication and/or suggestions on what type of stories you would like to see, we would also appreciate your input. Submit letters, stories about your history with the College, or career changes to [engevents@uwyo.edu](mailto:engevents@uwyo.edu) or by regular mail to:**

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## ON THE COVER:

“Alumni–Investing in the Future” story on page 3, Bruce and Carla Pivic of Rock Springs establish the R. Kenneth Beach Laboratory in Electrical and Computer Engineering. Pictured from left to right are Bruce Pivic, with electrical engineering students Travis Lairscey of Laramie, Wyo.; Eric Hudson of Casper, Wyo.; Rob Streeter of Saratoga, Wyo.; Jordan Ellis of Newcastle, Wyo.; and Tyler Ambrosino from Laramie, Wyo.

## ALUMNI—INVESTING IN THE FUTURE

*By Thyra Page*

Bruce Pivic (B.S. electrical engineering 1984) and his wife Carla Pivic (B.S. accounting 1982), owners of Infinity Power & Controls, Rock Springs, Wyoming, helped the Department of Electrical and Computer Engineering establish an Industrial Control Laboratory. Their gracious gift allowed development of this unique laboratory facility which significantly enhances the educational program in industrial controls. Expertise in the design of programmable logic controller (PLC) based industrial control systems is especially vital to the energy, minerals, and other industries of Wyoming. With thoughts of the excellent education Bruce received at the University of Wyoming, Bruce and Carla stressed the importance of helping other students succeed. The lab, to honor the memory of the late Professor Beach who taught for the Department of Electrical and Computer Engineering through 1984, is located in the College of Engineering and Applied Science, and “is a great way to honor an excellent educator, as well as meet the needs of future generations,” says Bruce.

Professor Beach was a native of Lusk, WY, and received a degree in electrical engineering from UW in 1940. His graduate work was completed at the Illinois Institute of Technology, and he worked for Curtis Wright Aircraft Co. during World War II. Following the War he returned

to Wyoming to teach in the Department of Electrical Engineering. He was also a past president of the Wyoming Engineering Society. Over the years Professor Beach and his wife, Charlene, have continued to support the College by making generous contributions to the R. Kenneth Beach Scholarship, which was established upon his retirement from UW, with contributions made by alumni, students and faculty from the College of Engineering and Applied Science.

In his senior year, Bruce Pivic came to UW from Western Wyoming Community College where he was studying music. With a deep seated interest in electrical controls he switched to engineering upon entering UW. Struggling with a 1.73 GPA, he shared that he was actually suspended from his studies at UW. His fiancé Carla was awaiting a wedding date, and was concerned that if Bruce did not return to UW, they may not get married. So, with more than a little encouragement from Carla, he petitioned to get back into UW and made the promise to his Advisor and Professor John Steadman, that he would work hard and pass all his classes if given a chance. With a second chance, a will to succeed, and guidance from Professor Beach, Bruce lived up to his promise and obtained a B.S. in electrical engineering from UW in 1984.





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"The last day of finals, I walked into class and sat down with a small cooler next to me. Although I didn't have to take the final, I remained in the room until all the students were finished," says Bruce. "I then locked the door and pulled out a bottle of Champagne and 8 glasses (there were 7 students in the class) and said "cheers to the last class, taught by a great man." It was important that I let Professor Beach know how much he was appreciated," says Bruce. "Professor Beach saved my life."

A background working as a mine electrician with Black Butte Coal in Point of Rocks Wyoming, , working holidays, spring breaks, and every other opportunity during school, helped Bruce land a job as a project engineer following graduation. Continuing to advance his career, he worked on a coal project in China, and later as a power systems project engineer. He relocated to be a power engineer with Allied Chemical (now General Chemical) for 15 years. With his automation specialty, he branched out on his own, starting Infinity Power and Controls, in 1998.

A thriving company of 44 employees, Infinity Power and Controls (IPC) writes code for paint booths for Ford and Basic Food Flavors, who makes the flavor packs for Top Ramen Noodles. Conscious of the growing

**The lab "is a great way to honor an excellent educator and meet the needs of future generations."**

**– Bruce Pivic**

environmental problems, the company is helping provide products and business to several water treatment plants around the State of Wyoming. Presently IPC is busy with their new patented environmental products for oil productions with VOC and BETX Flares. The company is a generous supporter of UW programs through gifts in-kind.

Milward Simpson Society members of the UW Cowboy Joe Club, generous supporters of UW Athletics, and big Cowboy fans, they share their pride in Wyoming by promotion of their new hot air balloon which proudly displays UW's logo. Both Bruce and Carla are extremely dedicated to supporting higher education and have offered several scholarships to students attending UW and Western Wyoming Community College. Bruce and Carla have two children. Their son Jeff works for the UW Athletics Department and their daughter Jillian is pursuing a bachelors in Music at UW

*Far left on previous page, Bruce Pivic, Dean Rob Ettema, Charleen Beach, and Carla Pivic perform the ribbon cutting during ceremonies for the new lab on May 4. Previous page, right, Bruce Pivic enjoys a demonstration of the new lab capabilities from electrical engineering students Jordan Ellis of Newcastle, Eric Hudson of Casper, Rob Streeter of Saratoga, and Tyler Lairscey of Laramie. Below left, Bruce and Carla Pivic accept a donor recognition plaque for their investment in engineering education. Below right, Charleen Beach and Ray Jacquot enjoy the R. Kenneth Beach dedication photo display near the lab, T. Page photos.*



# HELPING STUDENTS THROUGH THE LIKWARTZ ENDOWMENT

*By Thyra Page*

Friends and family of Don J. Likwartz have set up an endowment to honor the contributions of Don to the petroleum industry. Don retired in January, 2009, after 11 years of service to the Wyoming Oil & Gas Conservation Commission. Don, now 69, is originally from Rock Springs, Wyoming. He earned a B.S. in 1963, and M.S. in 1966, in petroleum engineering from the University of Wyoming, where he was an active member of Sigma Alpha Epsilon fraternity.

Along with his studies at UW, Don was the lead guitar in a rock band which played at local night clubs, basketball tournaments, and school dances. The tips and scheduled gigs helped him and his friends, Joe Meyer (sax), Vern Swain (bass), Jim Georgis (piano) and Art Greeno (drums), supplement their college tuition while gaining friends and having a lot of fun at the same time.

While attending UW, Don received most of his inspiration from two professors. "Professor Don Stinson put us under a lot of pressure and made us think and search around for answers instead of making things easy which really had a positive impact and influence on my studies," says Don. "Stinson often left out information for exams, so we had to find the clues and justify our answers, which led to using critical thinking and problem solving skills." Don taught labs and wrote his master's thesis under the guidance of Professor Charlie Smith. "Smith challenged me to do the very best on every task while providing support and encouragement for my efforts. We reconnected in 1998, since he owns an oil field near Casper, and he and his wife Beth graciously entertained Judy and me in Houston when I began my original chemotherapy treatments for colon cancer."

With an interest in the sciences, Don turned toward petroleum engineering after learning from several faculty members that it was one of the highest paying disciplines. He shared that he has never regretted that decision and working with the Commission was the best job a person could have. Prior to his retirement, Don served as supervisor of the Commission, where he ensured that the State recovered the maximum value for its oil and gas resources.

Before working for the Commission, Don had the opportunity to travel the world for 33 years as an engineer for some major international oil companies as both project manager and project development engineer. His journey included a stop in the Caribbean, where he served as chief engineer for the American Oil Company or Amoco (now



*Don and Judy Likwartz, courtesy photo.*

BP) offshore oil drilling program for many years. He worked with Amoco in Iran and other locations in addition to his work in the North Sea oil fields. He is a licensed professional engineer, a Senior Member of the Society of Petroleum Engineers, and former Interstate Oil and Gas Compact Commission Vice Chairman.

Don married his grade school friend, Judy Cox, (B.S. Sociology 1994, B.S. Social Work 1995) in 2004. Don has three children and six grandchildren. Both are active in their church, and Judy has been an ordained Deacon in the Episcopal Church for over 10 years. Judy was also the first graduate from online Education for Ministry. When asked about their obvious love and caring for one another, Judy replied, "Don has more integrity than anyone I have ever known. He is the love of my life."

Honored and surprised about the endowment set up in his honor, Don admitted that he is proud of his education at UW and feels that another Wyoming resident should have the same opportunities. The endowment will offer student support for any student from Wyoming entering the petroleum engineering discipline.

The endowment fund is still in need of support to reach its full potential. Please consider your gift to the Don J. Likwartz Endowment. Gifts may be mailed to the UW Foundation, 1200 East Iverson Street, Laramie, WY 82070.



# CIVIL ENGINEERS PARTICIPATE IN COMPETITIVE CONFERENCE

*By Thom Edgar*

The UW Chapter of the American Society of Civil Engineers had a successful outing at the Student Conference held in Las Cruces, New Mexico on April 8-10, 2010. Twenty eight students ranging from sophomores to seniors attended the event. Every student was involved in some aspect of the conference activities. There are seven primary activities associated with the Student Conference (which many people will remember as the ASCE Regional Conference), a technical paper, a non-technical paper, a Pre-design competition, a Canstruction, a Mystery design, and the well-known Concrete Canoe and Steel Bridge competitions.

Senior Matt Vickrey, Strasburg, Colorado, presented the technical paper, which he named "HSS-HSS Moment Connections" based on the connection design on this year's Steel Bridge. Sophomore Margaret Kimble of Lakewood, Colorado, gave the non-technical paper which was based on this year's Mead Paper topic and was entitled "An Ethical Education." Mystery Design is a no-point based challenge which acts as a mixer for students from different schools to meet and work together on a project. This year's project was to determine the height of a flag pole using simple tools. Each school can enter one or two students in every team. Six Wyoming students were in the top three teams.

The Canstruction Project was a "Landmark." Jessica Troemner, Centennial, Colorado, and her team built Devil's Tower. Afterward, the cans are donated to the local food bank.

Allysa Hitschew from Laramie, Wyoming, led the Pre-design contest with a hydraulic ram pump. This interesting device

takes a low head and relatively high flow rate to pump water to a high head with a low flow rate based on water hammer and valving. It is an intriguing design, not at all common, but useful in some situations. In this case, the driving water had a head of six feet and lifted the water to 32 feet. With her team's innovative design, they took first place.

James Winters from Pinedale, Wyoming, was the concrete canoe chair. He presented his talk at breakneck speed, showed mastery of his material and was awarded third place for presentation and for paper. He and his team tried a new geotextile with a triangular pattern rather than rectangular, but placement problems still occurred and there was a significant central bending deformation when the canoe was on the display stands. When it was loaded back on the trailer, it became another articulated two section canoe.

Matt Vickrey based his technical paper on the connections for the steel bridge, which he worked on extensively in the fall and his team constructed during the spring. The design was significant, however, because while not having the fastest construction this year as in the past, the bridge was first in stiffness and second in lightness. These combined to make the most efficient bridge and when combined with the first place display, the bridge came in second place overall. The team is heading to Purdue University for the National Competition, the fifth national competition in ten years.

Overall, the student chapter came in fourth place overall, an excellent showing from the fourteen schools in the region which extends from New Mexico to South Dakota and Utah. Congratulations Team!

*UW civil engineering students made a good showing at the recent ASCE Conference (left). Bridge team members include: Ryan Wells, Fort Collins, Colo.; Aaron Triebenbach, Rochester, Minn.; Collin Fossen, Lander, Wyo.; Matt Wilder, Byron, Wyo.; and Matt Vickrey, Strasburg, Colo., courtesy photos.*





# ASSESSING EARTHQUAKE DAMAGE—CHILE 8.8

*Courtesy of Jennifer Tanner*

Civil engineering professor, Dr. Jennifer E. Tanner, was a member of the Earthquake Engineering Research Institute (EERI) investigation team that traveled to ground zero of the February 27, 2010 magnitude Mw 8.8 earthquake in Chile to assess structural failures and successes of the buildings affected by the earthquake.

According to a New York Times article, “While this earthquake was far stronger than the 7.0 – magnitude one that ravaged Haiti six weeks ago, the damage and death toll in Chile are likely to be far less extensive, in part because of strict building codes put in place after devastating earthquakes.” Because earthquake magnitude is measured on a log scale the wave amplitude of a magnitude 8.8 earthquake is roughly 65 times amplitude of a 7.0 earthquake. It should be noted that the forces generated by this ground shaking exceeded the design forces in the Chilean code for buildings with periods between 1 and 3 seconds. USGS reports that Chile has experienced large earthquakes approximately M8 or larger on several occasions (1906, 1922, 1943, 1960, 1971, 1985 and 1995).

Dr. Tanner spent over a week in Chile and worked with colleagues from the Pontific Catholic University of Chile and the University of Chile. Her travels covered 1200 kilometers within Chile, with observations made in the

following cities: Santiago, Constitución, Concepción, Talcahuano and Chillán.

As a member of the EERI team, Dr. Tanner hopes to assess damages in earthquake-prone nations where they have strict building codes to prevent extensive earthquake damage and loss of life. The goal of the team is to learn from the performance of structures in Chile and use this information to teach students and further the research and development of earthquake resistant structures. One of the toughest aspects of a trip like this was talking with home owners who had seen extensive damage to their homes. She has presented initial findings at University of Wyoming, South Dakota School of Mines and Technology, and University of Colorado at Denver.

Dr. Tanner is an associate professor in the Department of Civil and Architectural Engineering at UW. She received a B.S. in civil engineering from Oklahoma State University, M.S. from the University of Costa Rica, and Ph.D. in structural engineering from the University of Texas at Austin.

Along with specializing in masonry design, Dr. Tanner’s research interests cover scale testing, earthquake-resistant concrete and masonry buildings, and strengthening concrete and masonry using fiber reinforced polymers.





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She has authored or co-authored 15 technical papers and reports and is a member of the American Society of Testing Materials, Earthquake Engineering Research Institute, The Masonry Society, and the American Concrete Institute (ACI).

As an educator and researcher, she is committed to partnering with Latin American countries in part due to her experience in Costa Rica. She has attended seminars on both Concrete in the Americas and Masonry in the Americas. These conferences are designed to promote collaboration between US investigators and those in Latin America. One of her service goals at UW is to develop international relationships to recruit highly qualified graduate students to UW. She is working with the International Office to develop new partnerships for the International Engineering Program to promote international exchanges for UW undergraduate students. Dr. Tanner believes that the experience of living in a foreign country affords unique opportunities that extend beyond what is presented in the classroom.

This spring Dr. Tanner was awarded an ACI Young Member Award for Professional Achievement based on “contributions to concrete and masonry technology, including technical publications, convention presentations, educational initiatives, and service on ACI technical committees.” This award was established in 1997 for the purposes of recognizing the contributions of younger members of the Institute, and for professional achievement.



*Dr. Jenny Tanner receives the ACI Young Member Award for Professional Achievement from Florian Barth, American Concrete Institute President, courtesy photo.*

*Previous page, Dr. Jenny Tanner is shown during her assessment of a confined masonry wall subject to out-of-plane failure. Below, left shows the loss of a section of reinforced masonry pier within a home in Chile. Below, right is the classic failure of a shear wall subject to reversed cyclic loads. Photos courtesy of Jenny Tanner.*



# THE AFTERMATH OF THE HAITI 7.0 QUAKE

*By Brian Koerner*

I recall sitting in Dr. Jay Puckett's Structural Dynamics graduate class at the University of Wyoming during the 1995 – '96 school year when he presented photographs from the Northridge Earthquake. I was in awe of the devastation that an earthquake brings to an area. Little did I know that fifteen years later, I would be heading to assist in the evaluation of buildings that withstood an earthquake.

Six years ago, I was asked by a good friend if I would be willing to donate my structural engineering services to aid in the design of a new community health center in Thomassin, Haiti. Like so many other design professionals, I was happy to offer up my time towards such a worthwhile opportunity. The health center was funded by the Functional Literacy Ministry and the Building Goodness Foundation, a Charlottesville, Virginia based non-profit that works with communities across the world to construct projects designed to build community and improve lives.

In January 2010, I was devastated to hear about the loss of life of so many people in Haiti. When I received the call from the Building Goodness Foundation asking for

an engineer to head to Haiti to assist in the evaluation of some of their past projects, I offered up my services.

Upon landing in Port-au-Prince, the devastation was all around. Tent villages were abundant and non-governmental agencies (NGO's) were everywhere. As we left Port-au-Prince and went up into the mountainside communities, fewer NGOs were present, but the devastation was still around us.

At the site of the House of David Community Health Center, we were pleased with the condition of the building. There were no apparent deficiencies in the structure. The evaluation of the structure was only one of the goals of the trip.

Other goals included the installation and testing of a generator for power to the health center, surveying the adjacent lot for a future building, evaluation of projects on an as-needed basis, and the reconnaissance of building materials and building construction practices. During my visit to Haiti, I evaluated the condition of a school, a church, and a home of a Canadian missionary and provided recommendations for the necessary repairs to the structures.





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Typical construction for most Haitian buildings involves concrete columns, slabs, and roof. Exterior walls are typically unreinforced masonry. A majority of the structures have column rebar protruding through the roof for future additions. During our trip, very few structures were observed to be constructed of wood or wide flange steel shapes. Common failures of buildings involved failure of concrete reinforcement, inadequate shear walls, and failure to provide a continuous load path in structures.

Several projects are planned for Haiti with the assistance of the Building Goodness Foundation. Based on recent conversations, the empty lot next to the House of David Health Center may be developed into a trade school. This would provide career training for both men and women. By using the failed buildings as a teaching tool, better practices will be developed and incorporated into the new construction.

By reviewing the buildings, we were able to give comfort and security to the users of the buildings. During our visit, several people were still sleeping out in the streets because they were scared of being in their house during an earthquake. Every person we talked to had a story of where they were when the earthquake occurred and the friends and family that they lost. "It was amazing seeing how Haitians picked themselves up and were already starting the process of rebuilding a little less than a month later."

This article was submitted by Brian Koerner, PE, co-founder and co-owner of Engineering Solutions & Construction Management, PLC, a multi-discipline engineering firm located in Harrisonburg, Virginia. He graduated in 2000, from UW with an M.S. in civil engineering. For additional information on upcoming trips for Building Goodness Foundation, please visit their website at [www.buildinggoodness.org](http://www.buildinggoodness.org)

*Upon arrival in Port-au-Prince at the Toussaint Louverture International Airport, we observed cracking in the masonry walls (opposite page, left). All seating was moved outside due to the poor condition of the building. A pedestrian walkway located between two governmental buildings that failed (opposite page, right). Below left, a multi-story building in Port-au-Prince with walls that completely disintegrated and collapsed. Below, right is a photo of our host from Haiti near a destroyed stoplight. When the light turned green, the two vehicles in front of him were buried by the building (rubble shown in the center of the photo) as it toppled onto the cars, photos courtesy of Brian Koerner.*





# JUNE SUMMER PROGRAMS

## ENGINEERING SUMMER PROGRAM

The College of Engineering and Applied Science along with the Wyoming Engineering Society, J. Kenneth and Pat Kennedy Endowment, Hewlett Engineering Schools Initiative, Mr. Paul N. Scherbel, and UW Academic Affairs offer high school juniors an opportunity to participate in an Engineering Summer Program (ESP) of hands-on experiences in various engineering fields. The summer program begins June 13-19, on the UW campus, and students will have opportunities to learn about building digital circuits, studying solutions to environmental issues, programming robotic devices, and designing timber trusses.

The field of engineering can be an excellent foundation for advanced degrees and careers in medicine, law, business, as well as the various fields in engineering. Engineering is built on the principle of solving problems in the world around us and improving the quality of life for the human race. ESP is committed to exploring the field of engineering, the development of leadership skills, and improving human service characteristics in each participant.

For additional information about the ESP contact Jeff Anderson at (307) 766-3180 or by e-mail to [esp@uwyo.edu](mailto:esp@uwyo.edu).

## MIDDLE SCHOOL GIRLS CAMP

Middle school age girls (6th-8th grade) will have the opportunity to express their interest in math, science, and engineering at the upcoming Middle School Girls Camp June 6-11 on the UW campus. The camp gives the girls an opportunity to experience the campus and gain interest in attending UW upon graduation from high school. The girls have a great time making new friends and learning new things that relate to engineering around them.

Participants will gain hands-on exploration in areas such as robotics, digital electronics prototyping, computer programming, and Applied Mathematics (they will also have lots of time for hiking, movies, bowling, swimming, and wall climbing).

Campers will stay in a chaperoned wing of the residence halls and participate in workshops at the College of Engineering and Applied Science. The cost of room and board and all activities is covered by the Hewlett Foundation ESWI program so the only cost to campus is transportation to and from the campus.

For more information about the Middle School Girls Camp please contact David Whitman at (307) 766-6466 or by e-mail to [whitman@uwyo.edu](mailto:whitman@uwyo.edu).





# GROUNDBREAKING CO<sub>2</sub> SEQUESTRATION RESEARCH

*Courtesy of Mohammad Piri*

Recently Dr. Mohammad Piri, an Assistant Professor in the Department of Chemical and Petroleum Engineering, and his graduate student, Morteza Akbarabadi, have carried out an extensive set of reservoir condition flow experiments in various rock samples, some indigenous to Wyoming, with supercritical CO<sub>2</sub> and brine revealing critical properties relevant to sequestration of this greenhouse gas in deep saline aquifers. The study shows that significant portions of the injected CO<sub>2</sub> can be permanently trapped reducing the risk of leakage drastically.

This groundbreaking research was recently performed in the state-of-the-art Three-Phase Flow in Porous Media and Computed Tomography EnCana Research Laboratory also established by Dr. Piri. This world-class facility includes a medical CT scanner that rotates to the horizontal orientation allowing the experiments to be carried out through vertically-placed core samples. The CT scanner is used to measure in-situ saturations during flow experiments. It also includes a sophisticated top-of-the-line core-flooding system that allows fluids to be injected (together or separately) under pressure and temperature conditions of interest with high degree of control. This cutting-edge research also shows that the amount of permanently trapped supercritical CO<sub>2</sub> can be maximized under certain flow conditions. The results of this research have direct implications for large scale sequestration of CO<sub>2</sub> in geologic formations in Wyoming and elsewhere.

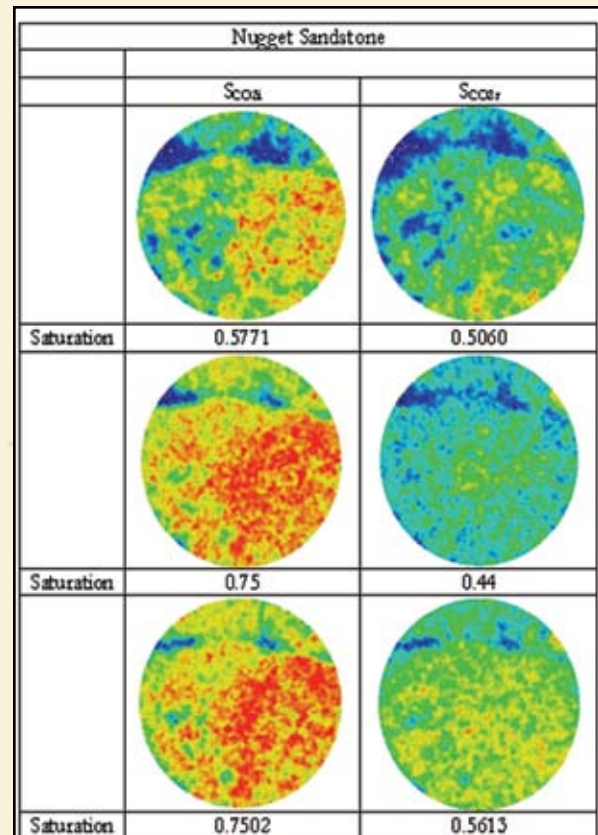


Figure 1: CT slices showing the variation of in-situ supercritical CO<sub>2</sub> saturation across the cross-section of Nugget sandstone. Dark blue represent S<sub>CO2</sub>=0 and deep red indicates S<sub>CO2</sub>=1. The experiments have recently been carried out in our world-class facility at 1,600 psig and 55 degrees celsius using scCO<sub>2</sub> and brine.

Graduate student Morteza Akbarabadi and Dr. Mohammad Piri conduct research using the CT scanner in the Three-Phase Flow in Porous Media and Computed Tomography EnCana Research Laboratory, T. Page photo.



# ATMOSPHERIC SCIENCE CONDUCTS AIRBORNE LIDAR TESTS

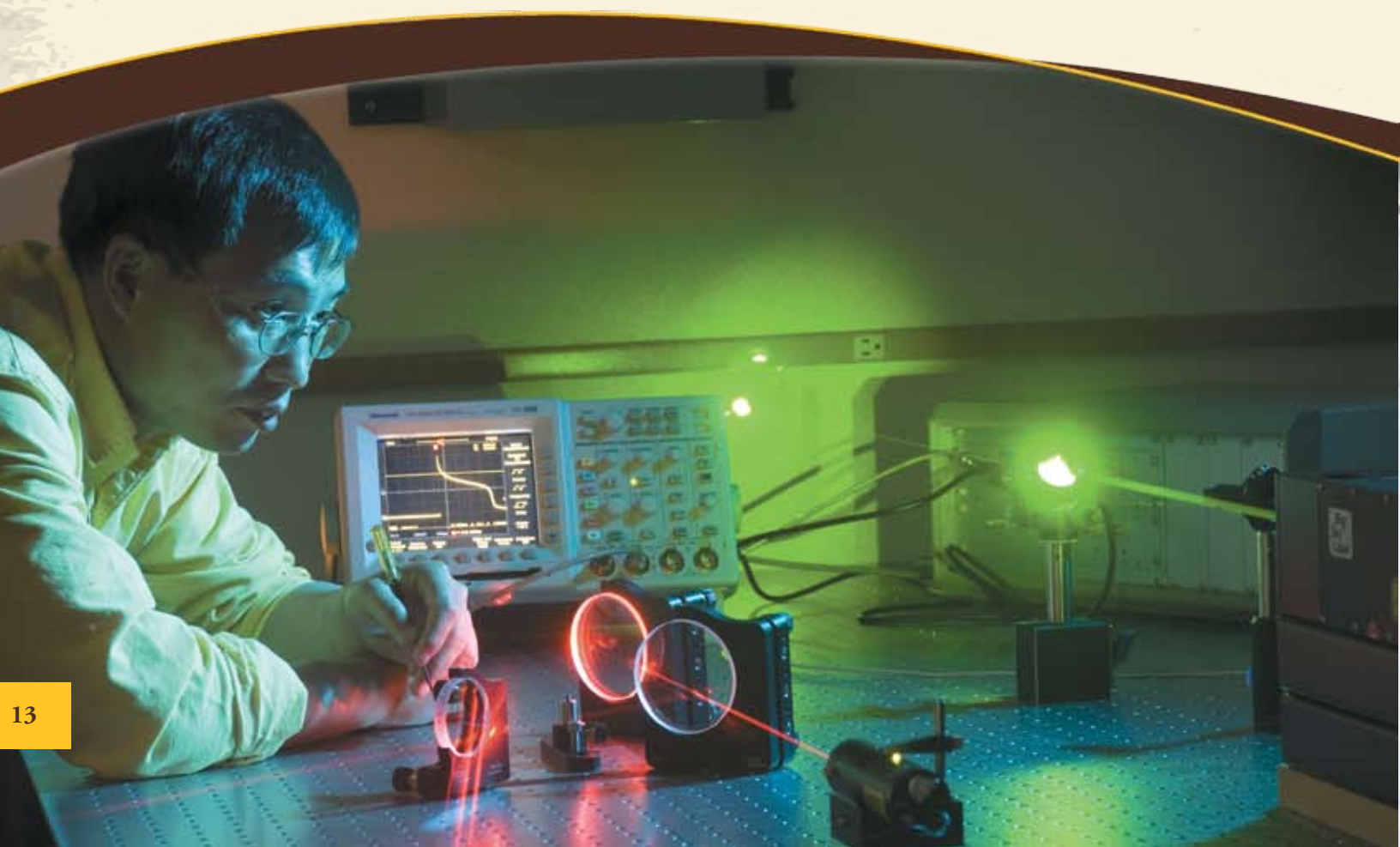
*By Al Rodi*

Professor Zhien Wang, Department of Atmospheric Science (pictured below) has been granted National Science Foundation (NSF) support for testing his new, small Raman LIDAR on the University of Wyoming King Air research aircraft. LIDAR (Light Detection And Ranging) is an optical remote sensing technology that measures properties of scattered light to find range and/or other properties of a distant target—in this case, the atmosphere below the aircraft.

The project, titled the Wyoming King Air PBL Exploratory Experiment (KAPEE), is based at the University Flight Center at Laramie Regional Airport. The overall goal of the experiment to be conducted this summer is to explore new airborne boundary layer observation capabilities by combining the new LIDAR with in situ aerosol and trace gases measurements from the King Air. The successful development of this observation capability will provide better data to study many important science questions: how aerosol chemical, optical, and (cloud) nucleational properties vary spatially and temporally; how surface inhomogeneities affect near surface water vapor and aerosol structure; and how cloud development interacts with the environment.

The new integrated capabilities will be available to a wide science community. Specific goals of the project are to measure PBL aerosol properties (extinction, backscattering and depolarization) and near aircraft (within 400m) water vapor with a downward compact Raman LIDAR; evaluate and improve LIDAR aerosol and water vapor measurements with in situ sampling; combine LIDAR and in situ measurements to better characterize the PBL aerosol chemical, optical, and (cloud) nucleational property distributions; and characterize aerosol and water vapor distributions over the complex terrain or surrounding clouds. This research is also supported by Prof. Wang's NSF five year Faculty Early Career Development grant (CAREER), NSF's most prestigious honor for young faculty members.

NSF established the CAREER program to support the early career development activities of teacher-scholars who are "most likely to become the academic leaders of the 21st century." Awardees are selected on the basis of creative, career development plans that effectively integrate research and education within the context of their institution's mission.





## !RunJoshRun! FUNDRAISING FOR CLEAN WATER

*Courtesy of Josh Fuller*

Saturday, March 27, was a day when most people should have been inside cuddled up with a blanket in front of a warm fire and a cup of hot chocolate in hand. For a select few, however, the inclement weather only provided an opportunity to make men out of boys; or as Coach Jim Sanchez puts it, "There are only two types of people in this world, distance runners and couch potatoes." The blizzard on Saturday proved his point.

Over 60 different people joined me, Josh Fuller, on the University of Wyoming track to support Engineers Without Borders-Wyoming (EWB-WYO) and my personal quest to log 100 miles in 24 hours. The runners flocked to the track from all corners of the state providing me with much needed accompaniment and several managed to set personal distance records in the process. While I fell short of my 100 mile goal, managing 71.25 miles (285 laps), it was one of the most enjoyable experiences of my life. There is nothing quite akin to getting a like-minded group of hard-core sports fanatics together to see what happens. When the dust, (snow) settled, EWB-WYO

had raised over \$5,000 in our pursuit to provide clean water to a village in rural Kenya and over 510 miles had been covered by some 60 people in a mere 24 hours. With not one, but two, articles in the local newspaper the event was a huge success in creating awareness of this specific challenge facing over one billion people in existence today.



As Confucius said, "A journey of a thousand miles begins with a single step." And step we did. The first one is always the hardest, but now the ball is rolling. With this single event, we not only changed lives here, but we now have the means to change lives in Kenya as well. A sincere thanks to all of those who helped coordinate and plan the event, and after your fingers and toes thaw from this snowy Wyoming spring, maybe we'll see you out on the trails.

*Josh Fuller (above) runs over 70 miles to raise money for the EWB-WYO project fund. Runners from left to right (below) are civil engineering senior Zeke Rios, faculty member Jeff French, mechanical engineering graduate student Chris Mertes, and Josh Fuller. Photos by George Rex.*



# ALUMNI, FACULTY AND STAFF HONORED AT TAU BETA PI HONORS BANQUET



*Dimitri Mavriplis*



*Anthony Denzer*



*Brenda Turner*



*Charles Dolan*



*Sally Steadman*

## **SAMUEL D. HAKES OUTSTANDING GRADUATE RESEARCH AND TEACHING AWARD**

A mechanical engineering professor at UW since 2003, **Dimitri Mavriplis** received his B.S. and M.S. from McGill University in mechanical engineering and his Ph.D. from Princeton University in mechanical and aerospace engineering.

Dimitri's research interests lie in the areas of computational aerodynamics, computational fluid dynamics, and applied mathematics. He has developed a sequence of graduate courses in his specialty area of computational fluid dynamics which are taught regularly in the Department of Mechanical Engineering.

## **OUTSTANDING UNDERGRADUATE TEACHING AWARD**

**Anthony Denzer** began at UW as an assistant professor in 2005, and continues to teach undergraduate classes in architectural engineering. He teaches architectural history, architectural design, building materials and construction methods, and fundamentals of building performance. His current research in architectural history focuses on experimental solar houses prior to 1973.

Tony received a Ph.D. in architecture (history/theory) from the University of California, Los Angeles in 2005. He also has a masters in architecture from the University of Kansas (1998) and a B.A. in journalism from the University of California, Berkeley (1991). He is a LEED Accredited Professional and a founding board member of the U.S. Green Building Council Wyoming chapter.

## **OUTSTANDING STAFF**

**Brenda Turner** was born in Thermopolis and spent most of her youth growing up in Wyoming. She graduated from Rawlins High School in 2002, and came to Laramie to attend the University of Wyoming. She earned a B.S. in Management as well as an unexpected minor in entomology in 2006. She currently works as an accounting associate, senior, in the Department of Chemical and Petroleum Engineering.

## **WYOMING EMINENT ENGINEER**

**Dr. Charles Dolan**, H.T. Person Chair and Professor of Civil and Architectural Engineering, has been a faculty member at UW since 1991, serving as head of the Department of Civil and Architectural Engineering from 1998 to 2001. He was appointed H.T. Person Chair in Engineering in 2002. A registered professional engineer and consultant in the design of structural concrete, he received a B.S. from the University of Massachusetts in 1965, an M.S. and Ph.D. from Cornell University in 1967 and 1989.

A Fellow in the American Concrete Institute and the Precast/Prestressed Concrete Institute, he is an internationally recognized leader in prestressed concrete, and the development of fiber reinforced polymers for concrete reinforcement. In private design practice for nearly 20 years, he was the project engineer on the Walt Disney World Monorail, the Detroit Downtown Peoplemover Guideway, and the Dallas-Fort Worth Airport transit system guideway. He is responsible for the conceptual structural design of the Vancouver, BC Skytrain system and the Dubai Palm Island monorail.

## **TAU BETA PI ALUMNUS EMINENT ENGINEER**

**Sally (Gronewold) Steadman**, a 1969 (B.S.) and 1994 (Ph.D.) graduate of the University of Wyoming, recently served as president of the Mortar Board National Council, the board of directors for Mortar Board National College Senior Honor Society. She currently serves as chair of the Mortar Board Foundation.

Steadman is currently employed by the University of South Alabama as an adjunct instructor of civil engineering. After graduating from the University of Wyoming in 1969, with a B.S. in civil engineering, Steadman obtained her M.A. in mathematics from the University of Denver in 1973, and her Ph.D. in mechanical engineering from the University of Wyoming in 1994. Steadman served on the faculty at UW from 1983–2003.

In addition to her involvement in Mortar Board, Steadman is also a member of Tau Beta Pi engineering honor society and the American Society for Engineering Education. She has been recognized nationally by both Tau Beta Pi and Mortar Board for exhibiting excellence in advising collegiate chapters. Additionally, Steadman is the recipient of the University of Wyoming Ellbogen Meritorious Classroom Teaching Award.

**Congratulations to these outstanding individuals!**



# STUDENT HIGHLIGHTS

**James Follum**, electrical engineering major from Laramie, was selected to receive a National Tau Beta Pi Scholarship in the amount of \$2,000 for the next academic year. The scholarship is the only national level scholarship for Tau Beta Pi offered to a UW student.

**Bradley Gal**, senior civil engineering major from Calgary, AB Canada, was recently awarded the UW International Undergraduate Student Award for Excellence in Internationalization for 2010. Formally recognized at the awards banquet in March, Bradley received a medal and a financial award in the amount of \$500.

**Everett “Ev” Koelling**, from Powell, Wyoming, was selected as the 2010 Tau Beta Pi Outstanding Junior. Ev graduated from Northwest College in Powell before transferring to UW and becoming a petroleum engineering major. He spent the last two summers working and learning about the heavy-oil reservoirs around Bakersfield, California. While his plans after graduation are uncertain, he plans either to pursue a master’s in engineering or go straight into the industry.

Mechanical Engineering students represented UW at the SAE Mini-Baja competition, placing 46th of 100 entries. Team members included **Cody Dykman, Robert Garland, Jesse Ramer, Doug Romoth, Jesson Salyards, Cory Sanner, Brett Schuler, Warren Starbuck, Josh Voorhees, and Kyle Werkele.**

UW Mechanical Engineering team of Charles Battisti, Anthony Garcia, Lori Sandberg, and Liz VanHoosen, placed 10th of 35 entries at the NASA sponsored Great Moon Buggy competition.



**Melinda Kolm** is the 2010 Tau Beta Pi Outstanding Sophomore. Melinda graduated co-valedictorian from Skyline High School in Longmont, Colorado. She is currently majoring in architectural engineering. In addition to her academic schedule, she is the president of the UW’s Women’s

Club Volleyball team and the student representative on the planning committee for the new Energy Resources Building. Her future plans include pursuit of a masters in engineering and perhaps eventually opening her own architectural engineering firm.

**Greg Ranft** was selected as the 2010 Tau Beta Pi Outstanding Member. Greg Ranft is a senior in architectural engineering from Ringwood, New Jersey. Following graduation, Greg plans to continue his education at UW, pursuing a masters in civil engineering and possibly completing his minor in music. Upon completion of his graduate degree program, he plans to move back to North Jersey and work for a structural engineering firm, and eventually hopes to work in New York City. Greg is a member of Tau Beta Pi and the UW Honors Program and was recently selected to serve as Tau Beta Pi Banquet Vice President next year.

The Joint Engineering Council at UW recently selected **Lori Sandberg** from Albin, Wyoming, as their outstanding senior. Lori is a mechanical engineering major at UW.



Lori is a member of the Tau Beta Pi Engineering Honors Society, American Legion Auxiliary volunteer for fundraising and local programs, Golden Key International Honor Society member, and a member of the UW Mechanical Engineering team for NASA’s Great Moonbuggy Race National Design Competition. She had the opportunity to work as a student researcher at the NASA Goddard Space Flight Center in Greenbelt, Maryland this past summer where she assisted with cryogenic testing on window seal and thermal tri-support testing for space flight programs.

Department faculty members nominate students on the basis of continued success in academic studies, community service and leadership. Departmental nominees include architectural engineering, Bailey Brown, Burns, Wyo.; chemical engineering, Ben Anderson, Laramie, Wyo.; civil engineering, Christine Rumsey, Laramie; computer engineering, Jennifer Beman, Cheyenne, Wyo.; computer science, Christopher MacLellan, Cheyenne, Wyo.; electrical engineering, James Follum, Laramie; Energy Systems Engineering, Matt Haigler, Laramie; petroleum engineering, Joel Dill, Thermopolis, Wyo.; and at-large nominees Josh Fuller, Sheridan, Wyo., and Will Hensel, Cheyenne, Wyo., both civil engineering majors, and Max Nachtigal, Laramie and Bradley Leppert, Manassas, Virginia, both electrical engineering majors.

## IN MEMORIAM

Sadly since our last issue, we have lost the following alumni. Our sympathy goes out to the families of our valued alumni.

William W. Allen	B.S. petroleum engineering 1983	Casper, WY
William W. Baker	B.S. mechanical engineering 1959	Reno, NV
Roger B. Burtress	B.S. mechanical engineering 1950	Billings, MT
Louis M. Cummins	B.S. civil engineering 1949	Durango, CO
Franklin L. Farnsworth	B.S. mechanical engineering 1948	Wheatland, WY
Edward Fermelia	B.S. civil engineering 1957	Rock Springs, WY
John G. Grable	B.S. electrical engineering 1963	Lady Lake, FL
David K. Hankins	B.S. electrical engineering 1956	Tustin, CA
William H. Harrison, Jr.	B.S. civil engineering 1950	Casper, WY
James T. McLean	B.S. electrical engineering 1964	Clancy, MT
John J. Rees	B.S. mechanical engineering 1944	Private Listing
Milton A. Rosander	B.S. electrical engineering 1949	Rehoboth Beach, DE

## UW TOBIN MEMORIAL AWARDED TO COMPUTER SCIENCE STUDENT

**Christopher MacLellan** of Cheyenne, is the 2010 winner of the Tobin Memorial Award as the University of Wyoming's outstanding graduating man.

The annual award is based on academic excellence and achievement, service to the university, participation and leadership in the community and campus activities and citizenship qualities.

"I have met past recipients of the Tobin award and I have found them to be truly special students. I believe Chris is in that category," says Ruben Gamboa, UW Department of Computer Science associate professor. "I believe Chris embodies all the virtues that define a Tobin recipient as an outstanding scholar, student leader, community service volunteer and as an excellent citizen."

MacLellan, a computer science/mathematics double major and in UW's Honors Program, graduated in May. MacLellan says a talk with his father when he was eight set the course of his life's aspirations. He is the son of John and Roxane MacLellan of Phoenix, Arizona.

His next goal is to earn a doctoral degree in computer science.



*Christopher MacLellan and his mom, Roxane MacLellan, at the April Tau Beta Pi Honors Banquet in Laramie.*



## UW GRAD HEADS MECHANICAL ENGINEERING AT UNIVERSITY OF NORTH DAKOTA

*Courtesy of Matthew Cavalli*

Born in Cheyenne, Dr. Matthew Cavalli grew up in Laramie. His mother taught elementary school and his father was a consulting civil engineer. After graduating from Laramie Senior High School in 1994, Matt enrolled in the Mechanical Engineering Department at the University of Wyoming. While at UW, he was a member of Sigma Phi Epsilon fraternity as well as Mortar Board, Tau Beta Pi, Pi Tau Sigma and Phi Kappa Phi. He also worked part-time in Dr. David Walrath's laboratory, learning more about the properties of material and material processing.

In the fall of 1998, Matt enrolled at the University of Michigan where he completed an M.S. (2000) and Ph.D. degree (2003) in the area of fracture of adhesive joints. While in Michigan, he met and married his wife, Kristy, a social worker and children's therapist. Following graduation, he was appointed as an assistant professor in the Mechanical Engineering Department at the University of North Dakota (UND) in Grand Forks, hired primarily to teach courses in materials. At UND he taught courses ranging from ME 101: Introduction to ME through ME 542: Thermodynamics of Materials. For the past several years, he has facilitated a collaborative design project in a junior-level material selection course between his

engineering students and technology students at the two local high schools.

Matt serves as a member of the Grand Forks Public Schools Career and Technical Education Advisory Board. He received instructional and research funding from 3M, NASA, DOD, NSF and LM Glasfiber (wind turbine blade manufacturer). Research activities for Matt have ranged from the corrosion fatigue of welded aluminum structures to diffusion bonding of metals for high temperature applications to the performance of fiber composites. His research group currently includes five M.S. and two Ph.D. students.

Matt became the Graduate Director for the ME Department in 2007, and received tenure and promotion to Associate Professor in 2009. Fall 2009, he was named Deputy Chair of the ME Department and became Chair of the ME Department on June 1. A proud father of two, his daughter, Emma, began kindergarten last spring, and his son, Josh, turned two in April.



### **SIGN UP FOR YOUR [COWBOYS.UWYO.EDU](mailto:cowboys.uwyo.edu) E-MAIL**

We can offer a [cowboys.uwyo.edu](mailto:cowboys.uwyo.edu) e-mail address to anyone who would like to use a "uwyo.edu" address and have e-mail delivered to another e-mail account. The University does not store the e-mail, we offer the address which forwards your e-mail to your existing wyomail, gmail, yahoo or other e-mail account. The benefit of this is that when a preferred e-mail address changes, you only have to notify the UW Foundation about the update and all of your family and friends can continue to use the same e-mail address. To sign up, send your name, user name as you want it to appear, and the e-mail address of where you would like the e-mail forwarded, to [jthymian@uwyo.edu](mailto:jthymian@uwyo.edu).



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## **UPCOMING EVENTS**

Visit us at Booth #509 during the Energy Expo  
June 8-10  
Wyoming Center CAM-PLEX  
Gillette, Wyo.

H.T. Person Lecture  
September 17

Hall of Fame Induction  
September 18

Watch for further details on our fall events  
in the next issue!

Contact the Office of Communications at (307) 766-4248  
or by e-mail to [engevents@uwyo.edu](mailto:engevents@uwyo.edu) about upcoming events.

**Send News to**  
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*Steamboat and cowboy end zone photos by T. Page.*