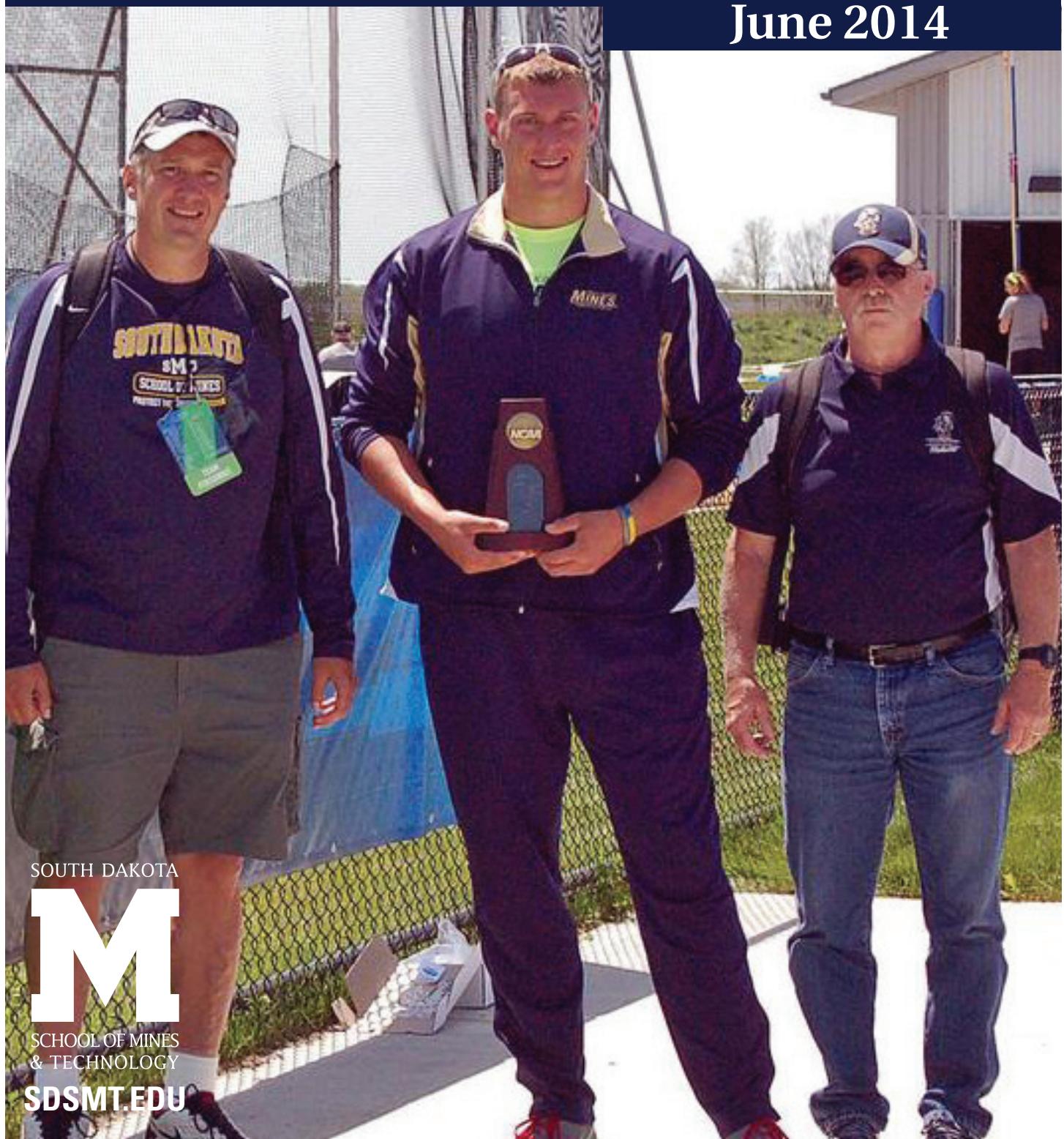


South Dakota School of Mines & Technology

# Legacy News

June 2014



SOUTH DAKOTA

**M**

SCHOOL OF MINES  
& TECHNOLOGY

**SDSMT.EDU**

## Alumnus lead author on national climate assessment



Timothy M. Bull Bennett, a School of Mines alumnus, recently briefed the nation's leaders in Washington as a lead author on the Third National Climate Assessment.

The university's first Native American doctoral student, Bennett earned his Ph.D. in Atmospheric, Environmental and Water Resources in 2005.

He was joined with fellow co-convening lead authors on May 6 at the White House and on May 7 at both houses of the U.S. Congress to brief the nation's leadership on the assessment's official release.

The 841-page document is the effort of multiple agencies to assess the impacts of climate change on the regional, environmental and economic sectors of the country. It includes input from more than 300 contributors from federal, state and regional government, as well as academic, tribal and private sources.

"Climate change is happening now. It is impacting all sectors of society, but we cannot lose hope. As a society we have opportunities to reduce future impacts by reducing our greenhouse gas emissions and prepare for changes that are already happening," Bennett said.

At Mines, Bennett's dissertation examined monitoring and assessing sustainable bison management practices. Since earning his Ph.D., Bennett worked at the North Dakota Association of Tribal Colleges as the science programs coordinator and then as the president and CEO. He is currently president and CEO of Kiksapa Consulting, LLC, providing professional consultation in climate impacts, environmental science, natural resource management, technology and education and emergency response.

The assessment can be read at <http://nca2014.globalchange.gov/report> a website published by the U.S. Global Change Research Program.

## Freed first Hardrocker to earn NCAA Div. II All-American status



School of Mines senior Brian Freed's collegiate career came to a triumphant close with an All-American honor and national rankings in the men's hammer throw and men's discus competitions at the NCAA Div. II Outdoor Championships.

Freed is the first Hardrocker student athlete ever to earn NCAA Div. II All-American status as well as the first to compete in an NCAA Div. II post-season championship.

The civil engineering major from Staunton, Va., earned All-American status in the men's hammer throw when he finished seventh overall with a toss of 194-feet-5-inches. Freed was also highly competitive in men's discus and narrowly missed another All-American honor after taking 11th place with a mark of 169-9.

"Brian is the first Hardrocker to become an NCAA All-American. He has worked very hard at his sport, and we're proud of him for his athletic achievements as well as his accomplishments as a young engineer," said Mines President Heather Wilson.

Hardrocker track and field head coach Jerry Schafer knew Freed would excel at the Div. II level and redshirted him two years ago just so he would have this opportunity.

"Brian did a good job, and I am very proud of him," Schafer said. "He had a great season

and he finishes his college career as an All-American – like I hoped he would. I couldn't be more proud of him."

Heading into the hammer throw, Freed was nationally ranked 12th and holds the SD Mines school record at 199-0 (2014). In the men's discus, Freed came in with the No. 1 national ranking at 180-6 and also holds the school record at 184-2 (set in 2013).

"It was such a great honor to work with and coach Brian. Just being at Nationals and competing at this level is a great way for him to finish off his career," said Hardrocker Throwing Coach Jim Stephens. "Brian works really hard and has been a great leader for the rest of the team. His work ethic will certainly transfer to what he plans to do next."

Freed was the only member of the Hardrocker track and field team to qualify for the national meet and had an outstanding outdoor track and field season. Along with being an All-American, Freed earned All-Region honors earlier in the season for being ranked in the Top 5 of the NCAA Div. II South Central Region. He was first in the discus and fifth in the hammer throw.

The university is in its first full year as an NCAA Div. II member after making the transition from NAIA.

# Museum of Geology awarded nearly \$500,000 grant



The Museum of Geology has been awarded a \$499,887 grant to curate and digitize three recently acquired collections of modern and Neogene-age invertebrates and protists.

The collections represent ancient and recent shallow-marine environments from the last 23 million years and form a foundation for conservation paleobiology and historical ecology research. The grant was awarded by the National Science Foundation's Collections in Support of Biological Research program.

The project will focus on 1989-2011 field collections of principal investigator Laurie Anderson, Ph.D., museum director and head of the Department of Geology & Geological Engineering, and dissertation collections of co-principal investigator Christina Belanger, assistant professor in the Department of Geology & Geological Engineering, as well as an orphaned collection from the former University of South Dakota-Springfield.

Products of this project will include well-curated collections, digitized and georeferenced records, including ancillary data, and illustrated faunal lists. "The targeted collections are exemplars of ancient and historical shallow-marine systems and are crucial for understanding the development of modern ecosystems, calibrating ecological impacts of environmental disturbance, and interpreting ecological and evolutionary processes over long time scales," Anderson said.

Additionally, because both Anderson and Belanger use bulk-sediment sampling techniques in their field work, these collections provide records of entire fossil assemblages that can be used to independently measure environmental information and biotic responses to environmental changes geographically and through time.

Outreach and educational activities related to the project will include

training graduate and undergraduate students in modern curatorial techniques. The School of Mines offers the only master's degree in paleontology in the country.

"Dr. Anderson's excellent work in geology and paleontology adds to the outstanding reputation the School of Mines has had for over 100 years in these fields," said President Heather Wilson.

Mines students will also be involved in designing exhibits for use in outreach to middle and high school students.

Additionally, the targeted specimens will be used in course development for the training of the next generation of museum curators, including students from state and tribal colleges.

The grant was announced at the 2014 Conference on Fossil Resources, which was attended by more than 120 paleontological experts from around the world. The conference focused on partnerships between federal and non-federal agencies in managing fossils found on public lands.

The university's Museum of Geology has been a repository for federal, tribal and state fossils for many years. Its 33,000-square-foot Paleontology Research Laboratory holds more than half a million specimens in mineralogy/petrology, paleobotany, invertebrate paleontology, micropaleontology, biology and vertebrate paleontology.

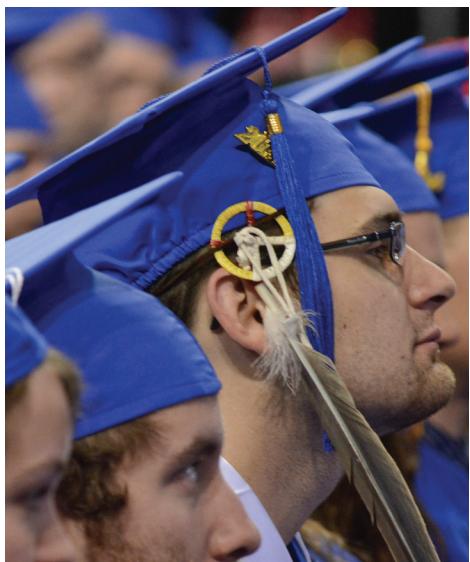
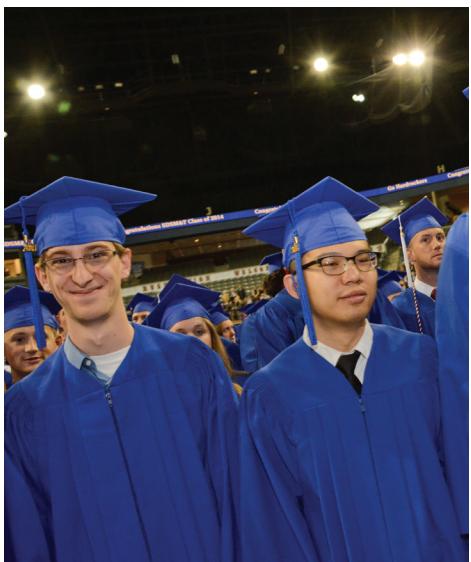
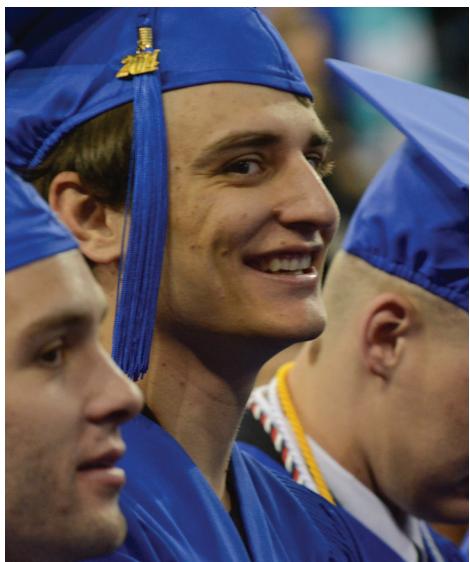
In October, the Museum of Geology received funding from the Institute of Library and Information Services to digitize collections from the Cretaceous Western Interior Seaway.

Additional information about the museum and may be found at: <http://www.sdsmt.edu/MuseumCollections>

# Congratulations, Mines graduates!

Nearly 300 students received their Associate of Arts, Bachelor of Science, Master of Science or Doctor of Philosophy degrees at the South Dakota School of Mines & Technology's 169th commencement ceremony. Glenn Kellow, president and chief operating officer of Peabody Energy, delivered the commencement address and was awarded an honorary doctorate. Civil engineering major Spencer Ferguson, of Sioux Falls, delivered the senior class message.

Monte Dirks, M.D., a 1974 School of Mines graduate in metallurgical engineering, received the Guy E. March Medal award for his positive interaction with students, the institution and alumni. Also recognized were graduates from the class of 1964, celebrating their 50-year anniversary.



## SD GEARUP to begin 2014 honors program

The South Dakota GEARUP (Gaining Early Awareness and Readiness for Undergraduate Programs) honors program has returned to the School of Mines campus for its 22nd year. The six-week residential program began May 31 and will continue through July 14, providing a rigorous curriculum in a college setting to increase Native American and low-income student graduation rates from high school and acceptance into post-secondary educational institutions.

Nearly 295 high school students will participate in the SD GEARUP program. About 60 percent of the students are female, while 85 percent are Native Americans. Students represent all nine tribes in South Dakota: Cheyenne River, Crow Creek, Flandreau-Santee, Lower Brule, Oglala, Rosebud, Sisseton-Wahpeton, Standing Rock and Yankton. Students are selected based on academic achievement and teacher recommendations. Of those students who graduate from the program, virtually 100 percent will also graduate from high school, 85 percent will attend college and 7 percent will enter the military. Of those who go on to college, most will be first-generation college students.

The GEARUP curriculum at the School of Mines will include math (algebra, trigonometry, pre-calculus and college algebra), science (physical science, biology, chemistry and physics), English, computers and life skills (goal setting, leadership, study skills, personal finance and college preparation). Students will also participate in field trips, recreation and sports, college visits and cultural activities. A middle school component will involve students and their parents touring campus and learning about the programs available at Mines.

Much of the funding for the program comes from a federal GEARUP grant through the State of South Dakota Department of Education, operated through the Oceti Sakowin Education Consortium and 24 partner schools across the state.

For further information and opportunities for involvement, contact Carter Kerk at (605) 394-1295 or [Carter.Kerk@sdsmt.edu](mailto:Carter.Kerk@sdsmt.edu) or Travis Kowalski at (605) 394-6146 or [Travis.Kowalski@sdsmt.edu](mailto:Travis.Kowalski@sdsmt.edu)

## Student awarded \$10K to update Homestake-era ventilation at Sanford Lab



Long before the days of dark matter, the Sanford Underground Research Facility was the Homestake gold mine. While the facility currently operates its original ventilation system, Mines mining engineering senior Tyler

Artz has been awarded a \$10,000 RESPEC Undergraduate Research Grant to create a new ventilation model 4,850 feet underground.

Artz's research will focus on producing an up-to-date computer model of the facility's ventilation system, which currently uses fans designed for the old gold mine, making a reevaluation of the quantity and quality of air crucial. This model can then be used to analyze the current underground environment and find areas for improvement.

He will use these findings to dilute the contaminated air of radon, dust and diesel particular matter; control the temperature and humidity to create a comfortable work environment; and maintain an adequate supply of air flow – all while optimizing fan production and reducing costs.

The RESPEC award will also allow Artz to present his research at two conferences next spring: the Society of Mining, Metallurgy, and Exploration in Denver, Colo., and the Application of Computers and Operations Research in the Mineral Industry in Fairbanks, Alaska.

Artz, of Redfield, explained there is a shortage of ventilation professionals in the mining industry, and he looks forward to the opportunity to become one of them. With an eye towards a master's degree and his career, he noted "this ventilation project will be a great step towards my future endeavors in the mining industry." Artz said he looks forward to collaborating with Bryce Pietzyk, ventilation engineering at Sanford Lab, and paving the way for other students to pursue research opportunities there.

"Thanks to our industry partners, a deserving student will have the opportunity to explore an important research topic his senior year, underscoring the value of a research experience in science and engineering education," Mines President Heather Wilson said.

The award comes as part of a larger commitment by RESPEC of \$250,000 over five

years to the School of Mines' research efforts. RESPEC has committed to match employee donations up to a combined total of \$50,000 per year for five years. A portion of the funds will be used immediately to support research, and the remainder will be endowed for the same purpose. Endowments allow the principal to be invested with the earnings funding the annual awards, thus enabling the fund to continue in perpetuity.

"We are truly excited about the impact this program has achieved in a very short time. The quality of the proposals speaks to the growing need to support research at the undergraduate level. It is getting more difficult to identify a single proposal to support. This program is a great example of the power that can be achieved through public/private partnerships," said Todd Kenner, Ph.D., president and CEO of RESPEC.

Mike Selzer, president of the SDSM&T Foundation, underscores the importance of this collaboration. "The partnership between RESPEC and the university continues to be a way that we can work with companies to provide outstanding graduates and great employees. We hope other companies will see this as a way to further their interests and get them connected to the university's best and brightest students."

The first RESPEC grant was awarded to Aditya Chivukula Venkata, whose research focused on the feasibility of implementing fly ash as a sportive barrier for the neutralization and remediation of acid mine drainages and mine tailings.

A Rapid City company founded in 1969 by five School of Mines professors, RESPEC has grown to become an acclaimed national leader in mining and energy, water and natural resources and information technologies. It has eleven other offices throughout the United States and annual revenues of more than \$35 million.

The company counts more than 50 Mines graduates hired since 1972, with 36 alumni currently employed by RESPEC. Five Mines alumni serve on RESPEC's Board of Directors.

Learn more about RESPEC at [www.respec.com](http://www.respec.com)

# Fossil conference draws 120

The School of Mines hosted the 2014 Conference on Fossil Resources, attracting nearly 120 paleontological experts from around the world.

The conference focused on partnerships between federal and non-federal agencies in managing fossils found on public lands. The university's Museum of Geology has been a repository for federal, tribal and state fossils for many years.

"We are considered by several of the agencies to be a poster child for good professional relations between museums and agencies, especially now that our Paleontology Research Laboratory is open," said Sally Shelton, associate director at the museum and conference chair.

The conference highlighted the history of Fossil Cycad National Monument, the only National Park Service unit ever decommissioned because its main resource was removed or stolen.

Other conference highlights included sessions on monitoring/mitigation paleontology, when experts work to salvage fossils from construction, highway and industrial sites, as well as law enforcement issues when sites are damaged and fossils are stolen.

Attendees came from the United States, Canada, Uruguay and the United Kingdom. Representatives of the Cheyenne River Reservation's and Pine Ridge Reservation's Tribal Historic and Cultural Heritage Preservation offices will discuss paleontology resource management issues. "One of our priorities is training the next generation of tribal paleontologists in this region," Shelton said.

About a dozen Mines paleontology students are highly involved in the conference. The School of Mines teaches the only graduate/undergraduate course in paleontology resource management in the country, preparing students for industry jobs in monitoring paleontology, federal, state agency and tribal jobs, and paleontology law enforcement jobs.

"I am very proud of the students. They will get a terrific chance to talk to and network with the experts in these fields," Shelton said. Mines has been asked to contribute to a textbook on mitigation paleontology. The book's lead authors attended the conference.

The conference was dedicated to the memory of longtime museum volunteer Bill Schurmann in honor of his many years of volunteer service to the museum and the School of Mines.

The conference was sponsored by the Museum of Geology at the School of Mines, Bureau of Land Management, National Park Service and U.S. Forest Service.

## Senior awarded \$68K NASA Space Technology Research Fellowship



School of Mines senior metallurgical engineering major Ian Markon, Rapid City, has been awarded the prestigious 2014 NASA Space Technology Research Fellowship. The \$68,000 fellowship will start this August, as Markon begins his master's degree in materials engineering and science, and will cover research and associate travel expenses.

Markon's research will focus on determining whether or not the inks and substrates used for 3D printing of electronic circuits are capable of withstanding the harsh environment of space. Though most of his research will be conducted in the Direct Write Lab and Department of Materials & Metallurgical Engineering on campus over the course of the next year to year and a half, Markon will get the opportunity to spend several weeks at a NASA facility.

Markon is also the graduate representative for the local chapter of Material Advantage.

## Senior lands three scholarships totaling \$16K and coveted summer internship



Senior metallurgical engineering major Myriah Santistevan has been selected as the recipient of three prestigious scholarships in the area of extractive metallurgy totaling more than \$16,000 – one of which had not been awarded to a South Dakota School of Mines & Technology student in more than a decade.

Supported by the copper industry, the \$10,000 Copper Club Scholarship is awarded to 12 students nationwide. Santistevan is the first Mines student to have won the scholarship since 2003. The award aims to prepare exceptional students for careers in fields related to maintenance and expansion of the copper industry.

Santistevan has also been awarded the Society of Mining, Metallurgical and Exploration – Mineral Processing Division "Richard Kliment" Scholarship, a \$2,500 nationally competitive scholarship given to students pursuing education in mineral processing.

The final \$3,800 scholarship was awarded by Freeport-McMoRan, the natural resource company where she will spend her summer interning in the organic side of its solvent extraction plant and a new start-up facility, both located in Morenci, Ariz. She left her mark on the company this past academic year, leading a team of students on industry-driven research focused on separating iron and aluminum to improve their sequential metals extraction process in order to produce copper. As part of her design experience, Freeport-McMoRan flew Santistevan and her team to Arizona to visit their operation – leading to her upcoming internship opportunity.

"Myriah represents the next generation of extractive metallurgical engineers," said Michael West, Ph.D., associate professor and head of the Department of Materials & Metallurgical Engineering. "During her career at SDSM&T, she has been active in many student organizations on campus," including as a member of the mini-Baja team, treasurer of the American Welding Society and president of Material Advantage, where she has led many outreach activities to interest young students in science and engineering.

Santistevan has also had a wealth of real-world experience to match her impressive academic career, having interned at both Nucor Steel Nebraska and Newmont Gold Mining and participated in the Research Experience for Undergraduates at Mines.

"Mines has one of the top metallurgy and mining undergraduate programs in the nation. These scholarships are a credit to Myriah, our faculty and those who support our program," said Mines President Heather Wilson.

# Hardrocker Janelle Strampe awarded prestigious NCAA postgrad award

Janelle Strampe, a School of Mines double-sport scholar athlete who excels in women's volleyball, has been awarded the 2013-14 National Collegiate Athletic Association (NCAA) Postgraduate Scholarship, becoming the first student-athlete at Mines to receive the prestigious honor.

A chemical engineering major from Green River, Wyo., Strampe graduated with the top honor of summa cum laude at the May 10 commencement ceremony.

Strampe, also a standout basketball player, will use the \$7,500 NCAA award in pursuit of a master's degree in biomedical engineering from the School of Mines. She plans to eventually pursue a doctorate degree.

"This is such a great honor and I owe a big thanks to many individuals at the School of Mines who helped make this possible," Strampe said. "The NCAA is an outstanding organization that helps young adults further their studies. I am so happy they have awarded this gift to help me advance my education, and I'm honored to have had the opportunity to compete in NCAA Div. II athletics."

The NCAA Postgraduate Scholarship was created in 1964 to promote and encourage postgraduate education by rewarding up to 174 of the most accomplished student-athletes – 87 men and 87 women – through their participation in NCAA championship and/or emerging sports.

"Janelle is a great role model as a scholar, athlete and leader. This is a prestigious honor, and I'm very glad she will be continuing her education at Mines," said university President Heather Wilson.

The scholarships are awarded to scholar athletes who excel academically and athletically and who are in their final year of intercollegiate athletics.

For the Hardrocker volleyball program, Strampe was a four-year starter and two-year team captain where she tallied career totals of 928 kills, 2,751 attacks, 40 aces, 720 digs and 145 blocks.

"This award truly spotlights the type of scholar athletes the School of Mines is producing," said Tiffany McCampbell, Head Women's Volleyball Coach, Senior Women's Administrator and Assistant Athletic Director. "Janelle is the quintessential scholar athlete we recruit at the School of Mines, and I am honored to have been able to coach Janelle over the past four years as she has added so much personality to our volleyball program and athletic department."

The scholarship program aims to reward students whose dedication and effort reflect characteristics necessary to succeed and thrive through postgraduate study in an accredited graduate degree program.

"A refreshing aspect at the School of Mines is that essentially all of our athletes are genuine scholar athletes pursuing degrees in engineering, science and mathematics," said Hardrocker faculty athletics representative and industrial engineering professor Carter Kerk. "Janelle is an outstanding example of our scholar athletes and truly represents the best of the best. She does this on the court, in the classroom, in the lab and in the community – usually with a big grin."

Strampe received a number of academic honors at Mines, including: seven consecutive semesters on the Dean's List, Tau Beta Pi GEICO Scholar, three-time SDSM&T Richardson Scholar, four-time SDSM&T



Presidential Scholar, and Air Force Outstanding Math and Science Award. Her GPA in the chemical engineering program was 3.976, and she received the four-year volleyball team academic award for highest GPA and the D2 Athletic Directors Association Academic Achievement Award

"Janelle is an outstanding student who is a pleasure to have in class," said David Dixon, chemical and biological engineering professor and Strampe's academic advisor. "She is very deserving of this honor as a scholar athlete due to her excellent work ethic, but also for the contributions she has added to this university."

Among Strampe's other campus and community endeavors: Engineers & Scientist Abroad mission trip, job shadowing at Black Hills Orthopedic and Spine Center under Dr. Clark Duchene, M.D., volleyball SAAC representative, vice president of Tau Beta Pi, member of Engineering Honor Society, member of Society of Women Engineers and Phi Eta Sigma. Strampe also worked at Cornerstone Rescue Mission and Youth and Family Services.

## Military discount in MOG giftshop

The Museum of Geology is participating in the Blue Star Museums program this summer. The museum will offer a 10 percent discount off any gift shop purchase with a military ID.

Blue Star Museums is a collaboration among the National Endowment for the Arts, Blue Star Families, the Department of Defense and more than 2,000 museums across America. The program will run until Labor Day, Sept. 1.

The program is available to any bearer of a Geneva Convention common access card, a DD Form 1173 card (dependent ID) or a DD Form 1173-1 ID card, which includes active duty military: Army, Navy, Air Force, Marines and Coast Guard, as well as members of the National Guard and Reserve, U.S. Public Health Service, Commissioned Corps, NOAA Commissioned Corps and up to five family members.

# Puszynski receives Life Achievement Award



School of Mines Vice President for Research Jan Puszynski, Ph.D., received the Life Achievement Award from the Navy and Air Force Cartridge and Propellant Actuated Device (CAD/PAD) Joint Program. The award was presented during the 10th Technical Exchange Workshop held May 20-22 at Andrews Air Force Base, which is now a joint base with Naval Air Facility Washington.

Puszynski, who earned his Ph.D. in chemical engineering from the Institute of Chemical Technology in Prague, has been with the School of Mines since 1991, first as a chemical engineering professor and then a college dean. Previously he was a research professor at State University of New York at Buffalo.

Puszynski's expertise is in reaction engineering, energetic materials, materials science and mathematical modeling of reactive systems. He has served as principle investigator on several research projects funded by the Naval Surface Warfare Center, Indian Head Explosive Ordnance Disposal Technical Division, Indian Head, Md., and other Department of Defense organizations.

"The Navy and the Air Force use explosive components to save lives in emergencies for things like ejection seats, clearing escape paths, extinguishing fires and deploying certain types of parachutes. Dr. Puszynski's research has made these devices safer, easier to manufacture and more reliable," said Heather Wilson, president of the South Dakota School of Mines & Technology. "We are very happy that he has been recognized for his contributions."

Spending two sabbatical terms at Indian Head, he assisted in designing, building and testing a new way to produce aluminum nanopowders using a low pressure evaporation/condensation process. He was later involved in development of a new environmentally benign propellant replacing ammonium perchlorate. Puszynski was also responsible for troubleshooting key technological aspects of production of propellants for CAD/PAD devices.

In 2001, Puszynski and a team of researchers from three other U.S. universities received the Defense University Research Initiative on Nanotechnology grant from the Army Research Office, and his research group joined the Department of Defense Center on Nanoenergetic Research.

In 1999, Puszynski established Innovative Materials and Processes, LLC, a company that has grown with numerous direct contracts and projects funded by the U.S. Navy and U.S. Army. Puszynski and his team developed an automated process of water-based mixing and precise metering of nanothermite slurry into application hardware. Recently, this integrated process has been considered by the U.S. Army as an alternative technology for future large-scale production of small- and medium-caliber primers.

He has published over 175 scientific papers and presented more than 200 papers and invited seminars at national and international conferences. Puszynski is also a co-author of several patents and recipient of several national and international awards. He has served as a chair of the American Institute of Chemical Engineers Energetic Materials Group, which promotes research and education in the area of energetics, and was elected as an AIChE Fellow in 2010.

## Mines Math Contest promises fierce competition and fruitful rewards

More than 400 area middle and high students from western South Dakota and Nebraska converged on the School of Mines campus May 12 for the 64th annual West River Math Contest with the hope that their calculated moves would launch them into mathematics stardom.

The contest included five exams – Algebra I, Geometry, Algebra II, Advanced Math and The Masters Exam – all for a coveted award, given to the top five individuals in each exam and the top team in each class.

Winning an award is no easy feat. "This test is not multiple-choice so students can't just guess in order to score well. Very few contests like this are graded by hand and there are very few regional academic competitions," Kyle Riley, Ph.D., department head and associate professor of the Department of Mathematics & Computer Science, said.

Riley's commitment is no less commendable. "There are countless hours spent in preparation of this contest along with the editing the exams, printing costs and coordinating proctors to supervise administration of the tests." The mathematics and computer department writes the test, the faculty grades them and Julie Dahl, assistant professor in the department, coordinates with teachers and compiles the results.

At the end of the day, it's worth it for Riley. "Our mission is to promote mathematics and recognize excellence," and this year's contest promises to do just that.

For information on donating to support the West River Math Contest, please contact the SDSM&T Foundation at [foundation@sdsmt.edu](mailto:foundation@sdsmt.edu) or (605) 394-2436.

## About Legacy News

Legacy News is produced by the Office of University Relations the first Wednesday of each month. The newsletter is a compilation of news releases, photos and Web articles.

To submit news or story ideas or to subscribe to the email distribution list, please contact Fran LeFort, communications manager, at 605.394.6082 or at [fran.lefort@sdsmt.edu](mailto:fran.lefort@sdsmt.edu). For more Mines news, visit [news.sdsmt.edu](http://news.sdsmt.edu)