

MISSOURI
S&T
MAGAZINE

SPRING 2017 VOL. 91 NO. 1

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AND

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MINERS DIG DEEPER

to make a difference

April is Philanthropy Month at S&T

Join us in celebrating what it means to step up, show your pride, serve others — and dig deeper. Throughout April, Missouri S&T will spotlight the spirit of giving with student activities, special events, crowdfunding and a whole lot of gratitude for the generous support of our alumni, friends and partners.



\$10.6 million

Amount raised from donors in FY2016

6,360



S&T alumni made donations



2,688

Scholarships awarded to 1,972 students

\$3.9 million



Amount raised in support of scholarships

Visit facebook.com/PhilanthropyMonth for more information. Make a difference with an online gift at giving.mst.edu. Your tax-deductible contribution in celebration of Philanthropy Month will multiply 30 days of gratitude by 365 days of giving power.



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Richard, CE'63, and Barbara Jaquay.

7,834

Students enrolled at Missouri S&T on the first day of the spring semester in January.

\$1.4 million

Federal funding S&T received from the U.S. Department of Transportation to establish a University Transportation Center that will develop robotic tools to inspect and maintain bridges and highways. See page 6.

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Awards *Missouri S&T Magazine* earned from the Council for the Advancement and Support of Education (CASE) during CASE's annual awards ceremony in December. The overall magazine won the Grand Gold Award and the "Miners of Invention" issue won a Gold Award for Editorial Design. In all, Missouri S&T won 12 awards for various University Advancement initiatives.

MISSOURI S&T BY THE NUMBERS

15,000

Gallons of water in the tank Missouri S&T's Engineers Without Borders students installed in Nahualate, Guatemala.

12-8-16

Date the roof of Emerson Hall caught fire. Investigators ruled that the fire was accidental and likely caused by a circuit junction box that powered an electric motor attached to a cooling station on the roof.

38,000

Apartments in Paris that were looted by Nazis during World War II, according to S&T historian **Shannon Fogg** in her new book, *Stealing Home: Looting, Restitution, and Reconstructing Jewish Lives in France, 1942–1947*.

41

Missouri S&T faculty honored for outstanding teaching in 2015–16.

MISSOURI S&T MAGAZINE

Missouri S&T Magazine is written, edited and designed by the staff of the Missouri S&T Marketing and Communications Department and the Miner Alumni Association.

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Missouri S&T Magazine (ISSN 1084-6948) is issued three times per year (April, August, December) in the interest of the graduates and former students of the Missouri School of Mines and Metallurgy, the University of Missouri-Rolla and Missouri University of Science and Technology. *Missouri S&T Magazine* is published by the Miner Alumni Association, Missouri S&T, 1100 N. Pine St., Rolla, MO 65409-0650.

Missouri S&T Magazine is printed by LSC Communications, Liberty, Mo. Covers are printed on 114 lb. — 7 pt. Sterling White; interior pages are printed on 60 lb. Sterling White.

Missouri S&T Magazine is printed using soy-based ink.

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Q&A

Why Rolla?

“Why did you choose to attend MSM-UMR-Missouri S&T?”

*Historian **Larry Gragg**, Curators’ Distinguished Teaching Professor of history and political science, posed this question to Miner alumni this past fall. Here are a few of your answers.*

ROI. Period.

End of story.

Joshua Young, CE’08, ArchE’08
St. Louis

It was close to home and had a stellar reputation. Also, **my high school trig and calculus teacher had a degree from there and talked it up, telling us we’d never make it there.**

I was, of course, driven to prove him wrong. He may have been recruiting with reverse psychology.

Lori (Bartlett) Davis, CSci’83
Ballwin, Mo.

Great engineering program and when I took my first tour, it felt like home!

I wanted to be surrounded by other people who were eager to learn, grow and be challenged.

Lacey Reames, CE’12
Belleville, Ill.

I chose to attend UMR (now Missouri S&T) in 1997 because **it was (and still is) the most challenging and prestigious public university in Missouri.**

Cori (Lock) Nelson, MgtSys’02
Leawood, Kan.

During a sixth-grade math competition, my teacher said I should consider being an engineer.

I was crushed, wondering why he thought I should drive a train! I shrugged it off until career day with the microfiche. At the time I thought that making \$60K a year I would buy a Jaguar XJS.

Bart Shivers, EE’92, MS EMgt’98
Wylie, Texas

I attended an eight-week National Science Foundation program at Rolla during the summer of 1960.

One of our classes was taught by Dr. **Ed Lorey**, professor emeritus of ceramic engineering. He was a great teacher who convinced me that ceramic engineering was the field for me. Plus, I loved the campus. I applied for admission that fall, entered in the fall of 1961 and stayed all the way through a Ph.D. in 1968. Attending Rolla (MSM in those days) was the best decision I ever made.

James E. Shelby, CerE’65, MS CerE’66, PhD CerE’68
Bridgewater, N.J.

I was invited to attend a youth dinner hosted by various faculty

when I was in sixth grade. The focus was on getting more children engaged in STEM earlier. Following that dinner I was hooked. Took multiple drafting and CAD classes in high school and went on to UMR. I own my own engineering consulting business now.

Tim Peters, AE’10
Derby, Kan.

Legacy —

I’m third generation, No. 14, if I counted right, in my family to attend. I knew I wanted engineering, and obviously my family knows where to go.

Brian Sandhaus, MinE’09
York, Pa.

CORRECTIONS

Harlan R. Ashton, CE’80, MS CE’87, was incorrectly listed in the memorials section of the Fall/Winter magazine. Mr. Ashton is not deceased, but his wife, Joyce, died March 28, 2008. She is listed correctly in the Miners Remembered section of this issue.

The photo that accompanied the memorial for **Ralph B. Weiss**, GGph’53, on page 61 of the Fall/Winter magazine was actually a photo of Mr. Weiss’ brother **Nicholas M. Weiss**, ChE’56, MetE’58. The correct photo appears in this issue with Ralph’s memorial on page 44.

We apologize for the errors.



OGS HEADS TO THE ROCKIES

Members of the Order of the Golden Shillelagh will meet in the Mile High City on Oct. 5–7 to celebrate two special events: the U.S. Department of Energy’s Solar Decathlon (S&T’s Solar House Design Team is one of 13 teams competing) and the 40th anniversary of OGS. For more information, contact Sarah Jones at jonessarah@mst.edu or 573-341-6359.



KATIE PAYNE — FUTURE M.D.

The daughter of a logger and a school teacher, **Katie Payne**, BSci'14, knew she wanted to make a big impact on the world, but it took an anatomy class at Cuba (Mo.) High School to guide her decision to go into medicine.

"When I started telling people I wanted to be a doctor, because I come from a small town with no family background in healthcare, their first reaction was to tell me how impractical this was," Payne says.

Her choice to attend Missouri S&T started out as an economical one, but when she saw how caring the faculty were, and started on her first research project, she knew she was in the right place.

"I have been very fortunate with research opportunities in college," says Payne, who worked as a research assistant for Rolla dermatologist Dr. William V. Stoecker. "The job allowed me to collect data directly from patients and analyze it."

Payne graduated with eight research publications on her resume. Her favorite, which was published in the November 2014 *Journal of the American Medical Association Dermatology*, examined the way pain is transmitted in a patient with a brown recluse spider bite.

Now in her third year of medical school at the University of Missouri-Kansas City, Payne is still conducting research. She works with a neurologist and headache specialist at Children's Mercy in Kansas City to use trigeminal nerve stimulation to treat chronic migraines in kids.

"Medical school is challenging but very rewarding," Payne says. "I spend most of my time trying to find a good balance between work and play, which I think is common to most careers."

"MEDICAL SCHOOL IS
CHALLENGING BUT
VERY REWARDING."

Payne plans to graduate in May 2019 and begin her residency that June. This past March, she started clinical rotations at Truman Medical Center, a safety-net hospital in Kansas City. She was thrilled to get out of the classroom.

"Working with patients at Truman Medical Center is a humbling experience," she says. "It really adds a new perspective to medicine."

HONORING NEW ACADEMY MEMBERS

In October, 10 alumni and friends were inducted into Missouri S&T academies. Academy membership recognizes careers of distinction and invites members to share their wisdom, influence and resources with faculty and students. Some academies hold induction ceremonies in the fall, others in the spring.

Academy of Mechanical
and Aerospace Engineers

Andrea C. Dorr, AE'92

James R. Friend, ME'92, MS ME'94, PhD ME'98

L. Wayne Garrett, ME'72

Michael Ludwig, ME'78

David C. McMinds, ME'88

Jeff Thornburg, AE'96

Academy of Miner Athletics

Laurie Behm, LSci'84

Donald Hahn, ME'72

David "Willie" Vonarx, CE'89

David Wisch, CE'75, MS CE'77

GOLDEN ALUMNI REUNION

The Class of 1967 will celebrate its 50th anniversary at the Golden Alumni Reunion May 16–17 at Hasselmann Alumni House. In addition to reconnecting with each other, alumni will tour their academic departments and learn more about what is happening on campus today. The highlight of the event is a grand recognition ceremony, where class members receive their 50-year pins and certificates.

If you are a member of the Class of 1967 and have not received your invitation, or if you are from another class but would prefer to celebrate your Golden Alumni Reunion with the class of 1967, please contact the alumni office at alumni@mst.edu or call 800-JO-MINER (800-566-4637) for more information.



HAVE A SEAT IN THE CHAIR OF THE FUTURE

Recent studies report that the average person spends 13 hours a day sitting. That's a lot of time spent in a chair.

But what if that chair could help detect not only your daily behavior, but your mental state, too?

That's exactly what the "Care Chair" designed by computer scientists **Debraj De** and **Sajal K. Das** is designed to do.

The researchers have developed a chair that could help detect the behavior and mental state of elderly people at home or in assisted-living facilities — specifically those people who are susceptible to dementia.

The device, which slips over a chair's backrest, uses four sensors to track functional and emotion-based behaviors throughout a day.

"When we move, subtle movements can indicate our mental state," De says. "We can detect these subtle movements through these sensors. It's almost like a lie detector."

It uses the same principle as law enforcement interrogators or customs agents who detect micro facial expressions that last only a fraction of a second but can reveal a person's true emotions.

For the study, De had participants engage in 19 sedentary activities in the chair. He tested static activities like napping and sitting still; and movement-based activities like looking back left and right, moving their head side to side, nodding and waving hands. He also tested user-functional activities like talking, sneezing, coughing, drinking, eating and hiccups; and emotion-based activities like crying, laughing, shouting, weeping, yawning and yelling. Each activity triggered the sensors in unique ways, giving the researchers a baseline for comparison.

De and Das are working with Phelps County Regional Medical Center on testing. The team is collecting and analyzing data for cognitive health assessment in elderly people prone to dementia, and in slowly rehabilitating patients with cognitive impairments, like stroke victims or cancer survivors.

On a wider scale, Care Chair sensors could give doctors, nurses and home healthcare providers a better understanding of their patients' activity level, which in turn could help determine the best level of care needed.



Photo courtesy Washington State Department of Transportation

ROBOTIC BRIDGE INSPECTOR COULD SLASH TRAFFIC DELAYS

Missouri S&T received a \$1.4 million University Transportation Center (UTC) tier 1 grant to develop robotic tools to inspect and maintain bridges and highways. These tools, which could be used from the air or from the side of a structure, will make such inspections faster, safer and more reliable.

"Once this technology is developed and in use, we will never need to close traffic for bridge or highway inspection and preservation," says **Genda Chen**, the Robert W. Abnett Distinguished Chair in Civil Engineering at Missouri S&T and director of the new UTC.

Instead of closing a bridge for inspection, robotic unmanned aerial vehicles or robots that can climb along the sides of bridges will inspect or fix these structures without disrupting traffic. Embedded sensors and microwave cameras could detect potential flaws inside bridge beams and decks before they become a problem.

Missouri S&T will lead a consortium of 10 colleges and universities in the effort. The grant is one of 35 five-year grants awarded under the UTC program, which was reauthorized under the Fixing America's Surface Transportation Act (FAST Act).

In addition to the tier 1 grant, Missouri S&T is a partner in the Mid-America Transportation Center, which is a regional UTC that also received grant funding from the U.S. Department of Transportation. This consortium is led by the University of Nebraska-Lincoln.

DOE RUN DONATES \$40,000 FOR XRF SPECTROMETER

A \$40,000 donation from Doe Run Co. helped boost the experiential learning options for students in S&T geology and mining and metallurgical engineering programs.

The donation helped purchase an X-ray fluorescence spectrometer, which will allow students to measure and analyze the chemical makeup of solids, liquids, alloys, powders and thin films. It will also help students process complex mineral sources and study bioactive glasses and new steelmaking methods.

"Missouri S&T has needed an XRF for more than 15 years, but the equipment requires a significant investment," says **Michael Moats**, MetE'92, MS MetE'95, dean's scholar in the College of Engineering and Computing at Missouri S&T. "Through Doe Run's generous gift, and the support of other funders, Missouri S&T will be able to fill this need for our undergraduate and graduate students."

SAVE THE DATE: HOMECOMING 2017

Make plans now to return to Rolla for Homecoming 2017 Oct. 27–28. Reconnect with former classmates and enjoy the Miner spirit! More details will be published in the summer issue of *Missouri S&T Magazine*.

A DISTINCT HONOR

Missouri S&T presented two awards of professional distinction during commencement ceremonies in December. The awards recognized the following graduates for professional achievement:

Brian K. Donley, ChE'87
Thomas A. Selden, ME'70

DRIVING HOME DIVERSITY

"We need diversity because the world is changing, and the pace of change is only increasing," said **Thomas R. Voss**, EE'69, retired CEO of Ameren, a former member of the University of Missouri System Board of Curators and a current member of the Missouri S&T Board of Trustees, during commencement ceremonies in December. "Diversity makes all of us better. Diverse thinking takes courage, but it brings better solutions."





IMPROVING MINE SAFETY

Braden Lusk, MinE'00, PhD MinE'06, chair and professor of mining and nuclear engineering, was invited to serve on the National Academies of Sciences, Engineering, and Medicine committee to study occupational exposure to coal mine dust in underground mines.

The committee was formed when Congress called on the National Institute for Occupational Safety and Health to conduct a study with assistance from the Mine Safety and Health Administration. Their report is expected to be completed in January 2018.

Lusk, who studied the effects of coal dust during his time at the University of Kentucky, says the committee will also try to identify research gaps, find ways to fund research, and come up with best-practice methods for managing respirable dust in underground coal mining. And they'll try to do so in economically efficient ways.

"We need a safe environment that is most advantageous to health," Lusk says. "We have to minimize the effects of dust and minimize the risk of explosions."

The 10-member committee includes **R. Larry Grayson**, former chair of mining engineering at Missouri S&T.



CELLIST YO-YO MA PERFORMS AT S&T

On March 4, acclaimed cellist Yo-Yo Ma became the 32nd presenter in the university's Remmers Special Artist/Lecturer Series. Ma began studying cello at the age of 4, attended the Juilliard School and in 1976 graduated from Harvard University. He has received numerous awards, including the Avery Fisher Prize (1978), the National Medal of Arts (2001), and the Presidential Medal of Freedom (2010). In 2011, Ma was recognized as a Kennedy Center Honoree.

The Remmers Special Artist/Lecturer Series is supported through a fund established by the late **Walter E. Remmers**, MetE'23, MS MetE'24, and his late wife, **Miriam**, to bring renowned speakers and performers to the campus. The first Remmers Lecture was held in 1979 and featured former President Gerald Ford.

SUMMER PROGRAMS

Grades
K-12

Learn More – SUMMER.MST.EDU



A photograph of a man in a dark suit and red tie sitting on a set of concrete stairs. He is looking towards the camera with a slight smile. The background is slightly blurred, showing an indoor setting with a wooden handrail and some architectural details. A dashed blue line with an arrow points from the title area down to the first paragraph.

SAFER MINES AND CLEANER WATER IN GHANA

As a doctoral student in mining engineering, **Kenneth Bansah** works, learns and lives nearly 10,000 miles from his boyhood home of Tarkwa, Ghana, a gold mining hub in western Africa.

But even as he fine-tunes his dissertation on mitigating sinkhole hazards and other karst formations — and takes care of three children ages 4 and under while his wife completes her own graduate studies in Michigan — the subsistence gold miners of Ghana are never far from Bansah's mind.

Or his heart.

It's known as "galamsey," illegal mining by untrained workers who routinely brave dangerous conditions and toxic exposure to feed their families. In some cases they use picks and shovels to sift through the leftovers ignored by industrialized mining operations. The term is derived from the English phrase, "gather them and sell."

The World Bank estimates that more than 20 million people globally living in the "poorest and most remote rural areas, with few employment alternatives" practice what's also known as small-scale or artisanal mining.

In Ghana, such mining (both legal and illegal) accounts for nearly one third of gold production in a nation that before gaining its independence

60 years ago was known as the Gold Coast. Diamonds are also mined in Ghana, although on a much smaller scale.

Government regulations enacted in the late 1980s to monitor artisanal mining have failed to keep pace with the growth of the market. An example of that is the arrest and expulsion of thousands of illegal Chinese miners in 2013. Armed with crude excavators and pumps, the modern-day gold rushers left behind pockmarked forests, abandoned mines susceptible to collapse, and rivers contaminated by the mercury used to extract gold.

The artisanal miners who remain often engage in those same harmful practices, albeit on a smaller scale, says Bansah. Many are women whose children are also forced by economic necessity to work. Pulled from school at an early age, the children usually remain trapped in the cycle of poverty, he explains.

"I was fortunate," says Bansah, a police officer's son who taught at the University of Mines and Technology in his home country after earning an advanced degree there. "But there are many

people in my country who have no source of income other than subsistence farming. They can't take care of their children. So they look at mining as a means of survival."

In 2016, Bansah enlisted several colleagues, including former students, to create the nonprofit group Mining & Community Research. Its goal: using scientific rigor and technical expertise to promote sustainable development.

Over the recent winter break, he returned to Ghana to work on three projects: a series of "Getting Children Out of Galamsey" community workshops; skills training for female artisanal miners; and an infrastructure improvement effort to raise money for a village's new clean water drinking system.

"Often times, we do a lot of research that is not directly affecting the lives of the people we do the research about," Bansah says. "You spend a whole lot of money doing research, and the reports gather dust on a shelf."

Neil Anderson, Bansah's thesis advisor, describes him as an "exceptionally mature" scholar whose dedication to improving his homeland is uncommon among the ranks of more singularly focused graduate students.

"Very few students are broad-based enough to look around and understand there are other important issues (beyond their dissertation)," says Anderson, a professor of geological engineering.

A photograph showing a man in profile wearing a black EEG headset with multiple sensors. A researcher in a blue checkered shirt is adjusting the headset on his head. The man is smiling. The background is a blurred laboratory or office setting.

S&T RESEARCHER WANTS TO PICK YOUR BRAIN, ELECTRONICALLY

Keng Siau wants to cut out the middle man in market research gathering — paper and electronic surveys — and go straight to your brain to get your opinion.

Siau, chair and professor of business and information technology, is using an electroencephalogram (EEG) headset to scan brainwave patterns. He says it gives more accurate information.

"I receive a lot of questionnaires. But do I have time to fill them out? Most of the time, I don't. I just put them aside," says Siau.

He uses the common problem of getting accurate survey responses as an example.

"A lot of times, we want to get information from CEOs, but CEOs don't have the time and just pass it to their administrative support staff. They are the ones that fill out the questionnaires, not the CEOs. And their opinions will be somewhat different from the opinion of a CEO."

He also finds that people often answer survey questions based on what they think the surveyor wants to hear. When an individual's brain activity is monitored, however, "it's harder to lie, it's more instantaneous and unfiltered," Siau adds.

Cognitive neuroscience is an emerging field in information systems and marketing research. Siau and his former research assistant, **Yeli Zhao**, MBA'14, reviewed several neurophysiological tools used in this field, including the EEG, as well as functional MRI (fMRI), positron emission tomography (PET) and magnetoencephalography (MEG). They outlined the strengths and weaknesses of each tool and highlighted future research directions

in the January 2016 edition of the *Journal of Database Management*.

As expected, Siau and Zhao found a strong correlation between cost and effectiveness among the tools. For example, an EEG headset can only scan the surface of the brain, while a functional MRI can penetrate deeper to retrieve thoughts and emotions. But at \$50,000, the cost of a good quality EEG headset is relatively cheap compared to a state-of-the-art MRI scanner, which goes for about \$2 million to \$3 million.

Siau called the comparative and review research "a starting point."

"It's a new way of thinking about and researching previous research questions," he says. "We have been using surveys as a technique for data collection. Now we have a new technique called cognitive neuroscience that will look at brain activity."

"It opens up new dimensions to study cognition in information systems research," Siau adds.

ENVIRONMENT AND ENERGY ARE FOCUS OF NEW S&T CENTER

On Jan. 1, the Energy Research and Development Center and the Environmental Research Center at Missouri S&T combined to form the Center for Research in Energy and Environment.

The center, which is led by **Phil Whitefield**, chair and professor of chemistry at Missouri S&T, will focus on environmental research, energy technologies and energy security, and will build upon existing partnerships with industry, national laboratories and other universities.

S&T GARNERS NATIONAL RECOGNITION FOR FUNDRAISING PROGRAM

Missouri S&T was recognized this past fall by the Council for the Advancement and Support of Education (CASE) for excellence in fundraising.

S&T and the University Advancement Division received a 2016 CASE Sustained Excellence Award in Fundraising for Overall Performance based on judges' analysis of three years of fundraising data submitted to the Council for Aid to Education's annual Voluntary Support of Education Survey. The award recognizes S&T's "exemplary fundraising programs and activities."

ALUMNI ASSOCIATION CELEBRATES NEW GRADS

On Dec. 8, the Miner Alumni Association hosted a Grad Finale celebration for graduating seniors at Hasselmann Alumni House. Students celebrated their graduation with a free spaghetti dinner, music and photo booth fun. Over 70 graduates attended and were welcomed into the Miner Alumni Association.

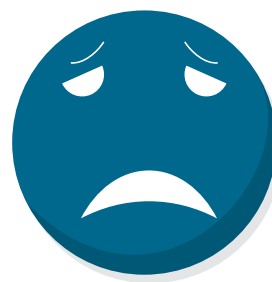


SOLAR HOUSE APPEARS IN JULIA CHILD BOOK

When you think of classic gourmet cooking, you think of Julia Child ... and Missouri S&T. Well, not typically, but in October, one of S&T's solar houses was featured in a new book inspired by the famous chef.

The Nest Home, S&T's entry in the 2015 U.S. Department of Energy Solar Decathlon, was featured in *In Julia's Kitchen: Practical and Convivial Kitchen Design Inspired by Julia Child*. Pamela Heyne, one of the book's co-authors, toured the home and says she chose to include it in the book because of its compact and efficient kitchen.

"Julia would have been so pleased to see these young people enjoying each other's company and eating artfully prepared food," Heyne says.



3-D EMOJIS ARE THE FUTURE

Using a single layer of metallic film at the nanometer scale, mechanical engineering assistant professors **Xiaodong Yang** and **Jie Gao** are creating vivid full-color, high-resolution holographic images. The research could lead to 3-D floating displays — like emojis — and big data storage, but also shows promise for credit card security marking and biomedical imaging.

The pair of researchers use focused ion beam milling to drill tiny rectangular holes in the film layer. Under a scanning electron microscope, the hologram they produced looks like a needlepoint pattern.

Different combinations of red, green and blue laser light on the surface at various orientation angles allow the researchers to produce holograms within the entire visible color range.

Their work was published in the journal *ACS Nano* in September.

CHANCELLOR CHERYL B. SCHRADER: A LEGACY OF PROGRESS



After 5 years at the helm of Missouri S&T, Chancellor **Cheryl B. Schrader** will step into a new leadership role on July 1, when she becomes president of Wright State University in Fairborn, Ohio.

"It has been a tremendous privilege to lead Missouri S&T over the past five years, and I'm very proud of all we have accomplished to position our institution as a top return on investment among the nation's research universities," says Schrader, who joined Missouri S&T as chancellor in April 2012. She was the 21st leader of S&T and the first woman to lead the campus. She also will be the first woman to hold the presidency of Wright State.

Wright State announced Schrader's appointment in early March. University of Missouri System President **Mun Choi** congratulated Schrader for her contributions to the entire UM System. "She has significantly advanced our mission for excellence in research, education, outreach and economic development," Choi said. "Missouri S&T is more vital and resilient as a result of her leadership and the many contributions of the faculty and staff."

Prior to joining Missouri S&T, Schrader served as associate vice president for strategic research initiatives at Boise State University. She also served as dean of the College of Engineering at Boise State from 2003 to 2011 and previously held academic positions at Rice University and the University of Texas at San Antonio.

Top: Officials from Missouri S&T and Honeywell Federal Manufacturing & Technologies signed a master collaboration agreement in 2015, one of many new agreements formed during Chancellor Cheryl B. Schrader's tenure. Other formalized partnerships made during her leadership include Boeing, Fort Leonard Wood and Phelps County Regional Medical Center.

Middle: A strong advocate for introducing students of all ages to STEM, Chancellor Cheryl B. Schrader welcomes students at the Missouri FIRST Tech Challenge championship each year. S&T has hosted the FTC since 2011.

Bottom: Chancellor Cheryl B. Schrader presents members of the Council for Graduate Students with the first Chancellor's Challenge Award for their work with Ignite Rolla, an event featuring a series of brief "TED Talk-style" lectures. The award recognizes leadership, strategic vision and notable efforts to implement the university's strategic plan.



MAJOR ACCOMPLISHMENTS

At Missouri S&T, Schrader emphasized the importance of investing in new faculty positions to meet the growing demand for S&T's degree programs and worked to bolster research and graduate programs. In 2013, she announced a plan to add 100 new faculty positions by 2020. The campus has since added 42 new positions and is recruiting 18 additional faculty toward the goal of 100.

To strengthen graduate education and research, in 2014 she secured \$3 million in additional state funding to support doctoral and master's student recruitment and development. By 2016, nearly 350 graduate students held nationally competitive compensation packages and 25 held premier packages.

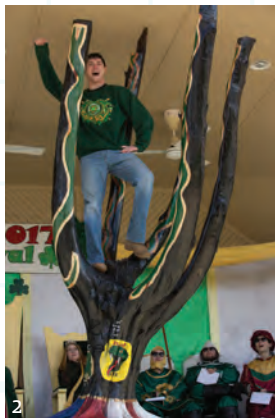
Under her direction, the university established four "signature" areas to strengthen research and education. The four signature areas are Advanced Manufacturing, Advanced Materials for Sustainable Infrastructure, Enabling Materials for Extreme Environments, and Smart Living.

Known for saying that she was "committed to always having a crane on campus" as a symbol of progress, Schrader oversaw the completion of several capital improvement projects, including the geothermal energy system, the October 2014 dedication of James E. Bertelsmeyer Hall, the March 2015 dedication of Hasselmann Alumni House and the October 2016 dedication of the Kennedy Experimental Mine Building. During her tenure, Missouri S&T's outdoor athletic and intramural fields were converted to artificial turf through financing made available by the geothermal project, student fees and donors. And Schrader's interest in campus beautification was realized through the addition of the University Promenade connecting the Havener Center to Curtis Laws Wilson Library.

During a time of tight state budgets, Schrader worked with Missouri legislators and former Missouri Gov. Jay Nixon to secure funding to renovate Schrenk Hall. S&T received \$12 million in state funds for the second phase of a multiphase renovation of the building and secured \$6 million in UM System and campus funds for the project.

Many of the accomplishments during Schrader's tenure were the result of a comprehensive strategic planning effort involving thousands of stakeholders. The plan, called "Rising to the Challenge: Missouri S&T's Strategy for Success," focuses on providing a top return on investment to Missouri S&T's key customers. ■





ST. PAT'S: S&T GOES GREEN

For a few days in March, the Missouri S&T campus — and the Rolla community — paint the town green. Here are a few scenes from the 109th Best Ever St. Pat's. See more photos from the weekend at [flickr.com/missourisandt](https://www.flickr.com/photos/missourisandt/).

1. During Follies, students competed to see how many St. Pat's sweatshirts they could put on in a minute.
2. St. Pat and his court judged show shillelaghs during Follies on Wednesday.
3. Students volunteered for community service projects around town for Gonzo Gives Back.
4. This year's traditional court photo with Chancellor Schrader was snapped with campus and community members at Coterie's annual St. Pat's Ball.
5. Just before dawn on parade day, St. Pat's Committee members and alumni painted Pine Street green.
6. The weather was beautiful, and the parade drew an impressive crowd all along Pine Street.
7. Following the parade, alumni and friends gathered at Hasselmann Alumni House for an old-fashioned pig roast.
8. Neal Grannemann, Chem'61, and his wife, Lynn, visited during breakfast before the parade.

RETURN TO THE CAVE

Chances are, if you went to school in Rolla during the 1960s and early '70s, you probably heard, or maybe even partied to the music of the Jaguars and Miller's Cave.

Initially formed around 1964, The Jaguars were a combination of Rolla High, Dixon High and Missouri S&T (then UMR) students. Playing the music of the day, they were popular on campus and even won the "Campus Talent '66" show. Between graduations and a very active military at the time, there were continual changes in the band's line-up, but the music continued.

Fast-forward to 1969, when there was a name change to Miller's Cave. This evolution played at many of the eating clubs and fraternities in Rolla, as well as many gigs in Fort Leonard Wood, Columbia and St. Louis.

"It was a way that we made money as students," says former Miller's Cave member **Hugh Cole**, EMgt'72. "Many of us depended on band income to pay for school."

This year at St. Pat's, after a 46-year hiatus, the bands re-formed at the Black Box Theatre in Castleman Hall to play and record this special occasion.

Band members in attendance included:

Hugh Cole, EMgt'72
Dean Park, EE'72
Herb Smith, AE'72, PhD ME'79
Dale Waltermann, EMgt'71
Gerry Hart, EMgt'71
Dave Trost, Engl'72
Jim Labit, ME'69
Chuck Miller, CE'68, MS CE'70
Lee Testorff, Phys'68
Bill Meeker, ME'68
Don Bowman, a 1966 Dixon High School graduate and a 1976 Missouri State University graduate.





HONGLAN SHI: WATER WOMAN

Honglan Shi has gained a national reputation as the go-to drinking water quality expert.

Shi, a research professor in chemistry at Missouri S&T, and her team are testing water to find and correct taste and odor problems and to screen for algal toxins and other harmful compounds.

Water treatment plants often use large amounts of activated carbon to control taste and odor, and that gets expensive. Shi's team is trying to determine the most effective active carbons to use, while also removing harmful pesticides and herbicides.

Shi says the research is important because the Missouri River provides drinking water to more than 60 percent of Missourians, and the river water frequently has taste and odor problems.

"Treatment plants along the Missouri River have to use large amounts of activated carbon to control taste and odor," Shi says.

The more carbon used to treat the water, the more money spent by the utility. These costs are often passed on to the customers.

While drinking water taste and odor problems might cause consumers a bit of apprehension (or make them hold their noses), Shi says a greater threat looms.

"The worry right now from the whole world is that algal blooms are becoming more and more serious," Shi says. Certain algae are associated with illness and environmental issues.

"Everywhere, people are trying to figure out what to do if a harmful algal bloom happens. Because whenever they bloom, they spread very quickly and no one can drink the water."

Toxic algae blooms are especially prevalent in hot seasons and eutrophicated water. Eutrophicated water lacks oxygen, and eutrophication is caused by the addition of excess nutrients such as nitrogen and phosphate into an aquatic system.

The most frequently reported type of toxic algae is *Microcystis*, a freshwater cyanobacteria often called "blue-green" algae. Ingestion or

“THESE STUDENTS ARE SOLVING REAL-WORLD PROBLEMS TO HELP THE PEOPLE OF MISSOURI, THE UNITED STATES AND THE WORLD.”

inhalation of *Microcystis* may, within several hours after exposure, lead to abdominal cramps, nausea, vomiting, diarrhea, fever, sore throat or hay fever-like symptoms. The Missouri Department of Natural Resources and the Tulsa Metropolitan Utility Authority are trying to stay ahead of this threat so that if there is a harmful algal bloom threatening drinking water supplies, they will know how to combat it.

That’s where Shi and her research team come in. They have been collecting water from the different treatment facilities, bringing the water samples to Shi’s lab, and spiking the water with different types of toxic algae they cultured in their lab.

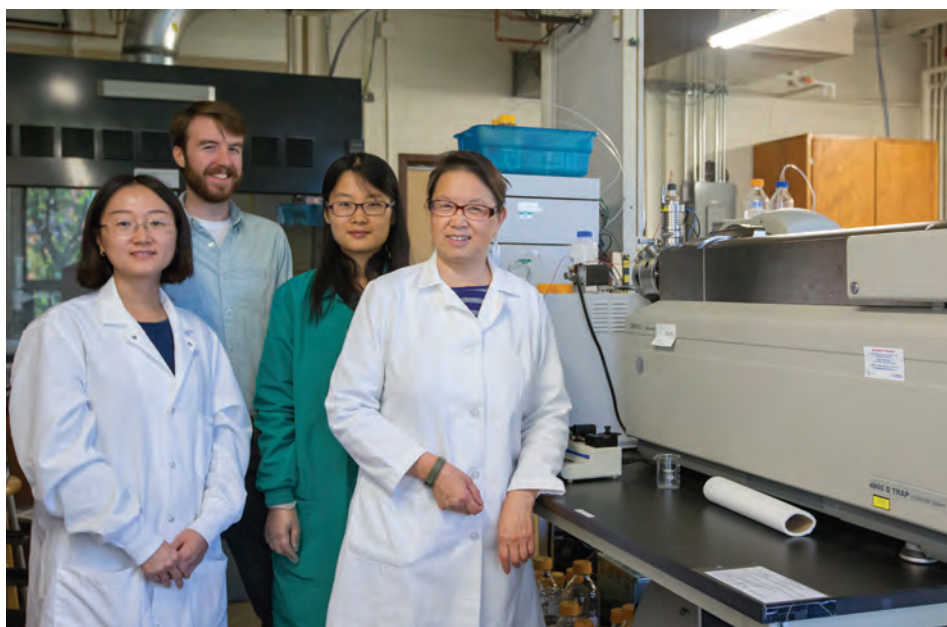
“The real problem is the toxin, but the toxin comes from the harmful algae,” Shi says. “So, how do we kill the algae, control the bloom, while at the same time not let the toxins leach out? There are a lot of factors and a lot of different experiments to perform.”

For now, Shi is happy that her research is valuable to her students and the public.

“These students are solving real-world problems to help the people of Missouri, the United States and the world,” she says.

Her research is supported by funding from the Missouri River Water Supplies Association, the Missouri Department of Natural Resources and the Tulsa Metropolitan Utility Authority. ▣

In her Schrenk Hall laboratory, Honglan Shi and her students conduct water quality research. They grow tomato plants in different types of water, and use potassium permanganate (in the purple vial top right) to treat *Microcystis*, a freshwater cyanobacteria often called “blue-green” algae (top left). Potassium permanganate is used extensively to treat drinking water.





CHANGING THE GAME, ONE HAT AT A TIME

“If one week of feeling horrible can give someone else even one enjoyable day out of the hospital, I would do it as often as possible.”

That was **Ashley Allegri**’s mentality when she donated for “Be The Match,” a worldwide bone marrow transplantation network that provides support and resources for patients and donors. In September, Allegri spent five hours in a hospital bed donating bone marrow to an anonymous recipient.

“I joined the registry a couple of years ago after my dad, who had previously joined it, matched with someone and was asked to donate,” says Allegri. “I thought it was amazing to be able to help someone on such a deep level. I never

expected to be a match since the chance is so slim, but I am glad I was called on to help.”

Allegri, a senior in engineering management from Leawood, Kan., had a one-in-430 chance to match with a person battling cancer or other immune diseases. For patient confidentiality reasons, donors may never know who they donate to or if the recipient makes a full recovery.

It took Allegri a little over a week to fully recover from the procedure, but it didn’t stop her from competing this season as a member of the Lady Miners volleyball team. In fact, a month

after the procedure she set a new school record for serving 12 straight points, breaking the previous record of 10 that stood since 2008.

When told she set a new school record, Allegri was surprised.

“I never read our team news or look at stats,” she says. “I know when I’ve had a good game or not, and tend to not worry about a particular number or percentage.”

Besides being a bone marrow donor, Allegri leads efforts on campus for “Love Your Melon,” an apparel brand that works to provide a hat to every child battling cancer in the United States. Missouri S&T’s Love Your Melon group promotes sales of hand-knit winter hats which, when purchased with the Missouri S&T school code, provide funding for the S&T group to visit sick children in the area to give them hats and a day of entertainment. The S&T group hopes to become a recognized student organization within the next few years.

“I just always liked to help people,” Allegri says. “It is easy to see the need to help in the fight against cancer, so you need to help make the changes you hope to see.”



This past February, students in Missouri S&T's Ballet and Dance Club traveled through the sands of time as they took the Leach Theatre stage with a student production of *Aladdin*. Club members held two dance camps for local children aged 3 to 13, who performed a special dance during the show.



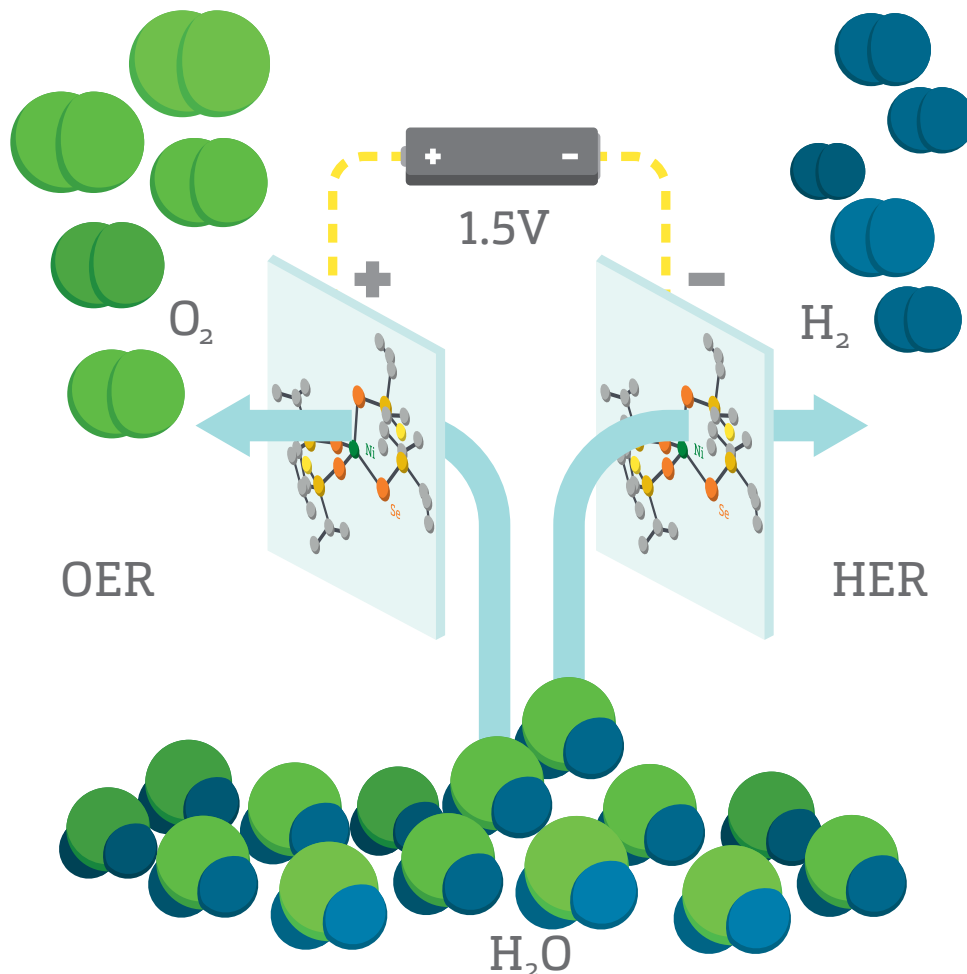
BURKEN JOINS EPA ADVISORY BOARD

Joel Burken, Curators' Distinguished Professor and chair of civil, architectural and environmental engineering at Missouri S&T, was chosen to serve on the EPA's Science Advisory Board (SAB). He joins a panel of experts from across the country in areas like epidemiology, public health, medical research, biology and other fields related to protecting human health and the environment.

Burken will serve through Sept. 30, 2019. He will provide independent expert advice on technical issues that lead to EPA policies and decision-making, particularly in the areas of hazardous waste remediation, water quality and the use of natural sustainable technologies, all areas of Burken's expertise.

IN PRINT

Stealing Home: Looting, Restitution, and Reconstructing Jewish Lives in France, 1942–1947 by **Shannon Fogg**, chair and professor of history and political science, was published in January by Oxford University Press.



SPLITTING WATER, PRODUCING HYDROGEN

Researchers at Missouri S&T believe they have found a way to make hydrogen fuel a more viable energy source. Their approach? An efficient and inexpensive way to split water into its elements, hydrogen and oxygen.

Most methods for producing hydrogen and oxygen from water require large amounts of energy and the use of expensive precious metals like platinum.

Manashi Nath, associate professor of chemistry at S&T, and her colleagues use an electrocatalyst that contains the metal nickel, found abundantly on Earth, and selenium to produce hydrogen and oxygen from water more efficiently — and at a lower cost.

"The novelty of this work is twofold," Nath explains. "First, nickel is the main catalytic center which is known to be Earth abundant, and second, that same catalyst can be used for both hydrogen and oxygen generation, which dramatically reduces complexity and cost of the device. Very few reports are available where the same catalyst can be used for both oxygen and hydrogen production."

Nath's work was published in the Nov. 17, 2016, issue of the journal *ChemSusChem*.

NAMESAKE OF WHITEMAN AFB WAS A MINER

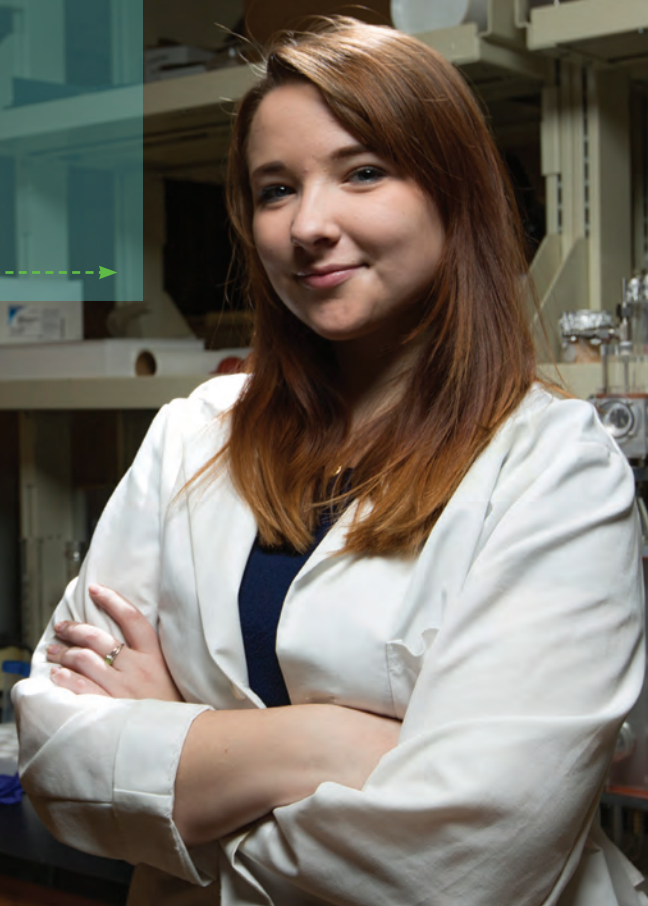
One of the first heroes of World War II was a Miner. He was also one of the first U.S. casualties of the war during the Japanese attack on Pearl Harbor 75 years ago.

George Allison Whiteman's plane was gunned down by Japanese "Zero" fighter pilots on that "day which will live in infamy," Dec. 7, 1941. Whiteman is considered the first American airman to die in aerial combat during World War II. But a half-decade earlier, Whiteman was a promising chemical engineering student at the Missouri School of Mines and Metallurgy.

Read more about Whiteman, his experience in Rolla and his military service online at rol.la/MinerWhiteman.

ALUMNA TACKLES WOMEN'S HEALTH ISSUES

"IT'S FULFILLING TO ME BECAUSE WE'RE WORKING ON ISSUES THAT CAN APPLY TO WOMEN AROUND THE WORLD."



Grace Deitzler's chosen field became clear when she took teacher Julie Ertmann's advanced placement biology class her senior year at University City High School in the St. Louis suburbs.

That class led Deitzler, BSci'16, to where she is today, a research scientist in the Washington University in St. Louis Lewis Lab of Microbial Glycobiology and Women's Health. And it is leading Deitzler to where she wants to be — a Ph.D. scientist and physician unlocking the secrets to treating infectious diseases.

She spent the summers in 2014–16 as an intern and research technician in the Lewis Lab tackling problems of urinary tract infections and bacterial vaginosis in pregnant women.

"I've always been interested in women's health," Deitzler says. "It's fulfilling to me because we're working on issues that can apply to women around the world."

The team at Washington University pushes her to be her best, Deitzler says, but the work is rewarding.

"I think maybe she says we challenge her because we think she is a gifted young scientist, she works hard and we think she can make important contributions to women's health," says Amanda Lewis, the lab's director.

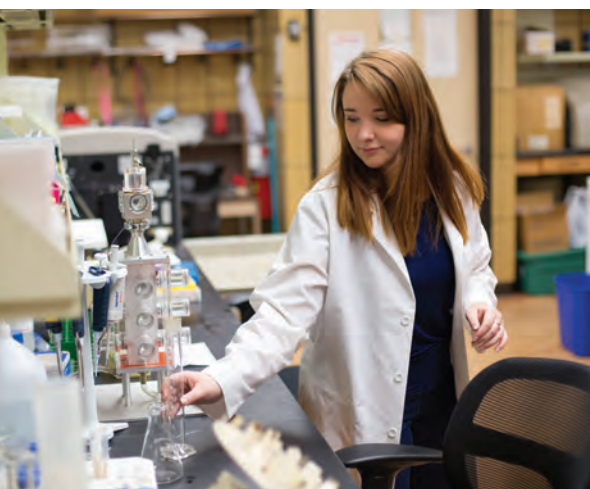
Deitzler was the lead author for two papers published on the American Society for Microbiology's Genome Announcements website. It is not typical, Lewis says, for undergraduates to be listed first on research papers.

Although Deitzler knows where she wants to go, she hasn't pursued that goal with a single-minded focus that excludes all other pursuits. She was editor-in-chief of the *Missouri Miner* and she worked on-air at KMNZ. The Helix Life Sciences Club, the Miner League Theatre Players/Alpha Psi Omega theater honors fraternity and the Phi Sigma biological sciences honors fraternity were other activities.

"One of her best qualities is curiosity," wrote Ertmann in a college letter of recommendation for Deitzler.

Deitzler gives Ertmann perhaps the best recommendation a teacher can receive.

"Her passion about the subject opened my eyes that biology was more than just a class I was taking," Deitzler says. "I want to be able to solve national and global problems of infectious diseases and other health epidemics."





GRAD SCHOOL

AND BEYOND

By Andrew Careaga, acareaga@mst.edu

Few would dispute that Missouri S&T's reputation for providing an outstanding undergraduate education is strong.

Since our earliest days, newly minted graduates left Rolla ready for the world of work and prepared to succeed in their careers and in life.

Somewhat overshadowed by that reputation, however, is the role of graduate education.

Students have been earning advanced degrees from our campus for well over a century. The first of them was **Victor Hugo Gottschalk**, who earned a master of science degree in general science in 1900 and went on to teach chemistry here. And more than 70 years ago — at the height of World War II — **William Smothers** of Poplar Bluff, Mo., became the first student to obtain a doctoral degree, earning a Ph.D. in ceramic engineering in 1944.

Through the years, legions of Miners have followed in these trailblazers' footsteps — and in growing numbers. The 1950s and 1960s saw a national emphasis in graduate education as campuses like the Missouri School of Mines grew into full-fledged research universities in need of bright students to work alongside faculty. As of last fall, 1,929 Missouri S&T students were pursuing graduate degrees — on campus and online. That number includes 624 Ph.D. students, an area of growing importance as higher education and research are seen as key elements for future innovation and economic success.

The reasons students choose S&T for advanced degrees are many and varied.

Many prefer this campus to larger research universities because of our close-knit environment. Students have unfettered access to their professors, and that access comes without sacrificing opportunities to conduct meaningful research on important national and global subjects, such as cybersecurity, environmental remediation and biomaterials to help save human lives.

Others come here to study in specialized disciplines available only at S&T or a few other institutions. Our Ph.D. program in explosives engineering is the only one in the world, and the master's and Ph.D. degrees in systems engineering are offered by only a handful of other universities. S&T was the first to offer a Ph.D. in that discipline entirely online.

Still other graduate students continue their education at S&T because they know an advanced degree will lead to greater opportunities in their careers. Many high-tech or specialized jobs in the private

sector, government and education require employees to hold a master's degree — or in some cases, even a Ph.D.

Research-minded students come to work with faculty who are among the best in their fields. Some of those students also hope to become professors or researchers themselves one day, and Missouri S&T, in partnership with the U.S. Department of Education, is focused on helping create a new generation of researchers through the Graduate Assistance in Areas of National Need (GAANN) program.

It's safe to say
that Missouri S&T's
reputation for
academic excellence
will continue to
grow and broaden.

Even students seeking degrees in less technical areas benefit from studying in an environment where science and engineering disciplines predominate. Grad students in our technical communication or MBA programs obtain a high degree of technical literacy due to S&T's emphasis on science and engineering.

And that's true even if they're not on campus. Today's master's or Ph.D. students aren't always hitting the books in Rolla. Nearly 40 percent of our graduate students — 761 out of 1,929 — are working on their degrees through S&T's distance education program.

Given the growing interest in and demand for graduate education, it's safe to say that Missouri S&T's reputation for academic excellence will continue to grow and broaden. No doubt Professor Gottschalk would be proud. ■

GRAD FACTS

1,929

S&T STUDENTS PURSUING
GRADUATE DEGREES — ON
CAMPUS AND ONLINE. THIS
INCLUDES

PH.D.
STUDENTS 624

40%

STUDENTS WORKING ON
THEIR GRADUATE DEGREES
THROUGH THE S&T DISTANCE
EDUCATION PROGRAM

A portrait of George Leno Holmes Jr., a young Black man with short hair and glasses, smiling and resting his chin on his hand. He is wearing a dark blue suit jacket, a gold sweater, and a blue patterned pocket square. The background is a perforated metal wall. A large green arrow points from the top left towards the title.

A FUTURE IN CONTROL

By Andrew Careaga, acareaga@mst.edu

As a high school senior, **George Leno Holmes Jr.**, ME'16, saw two clear paths for life after graduation. "I was either going to join the Air Force or become a mechanic," he says.

But his grandmother and a cousin saw a different path for the bright, mechanically inclined student.

"Granny," as Holmes calls her, had been saving money to send him to college. She and Holmes' cousin — whom he describes as "a brilliant engineer" who lacks a college degree — urged him to study engineering at Missouri S&T.

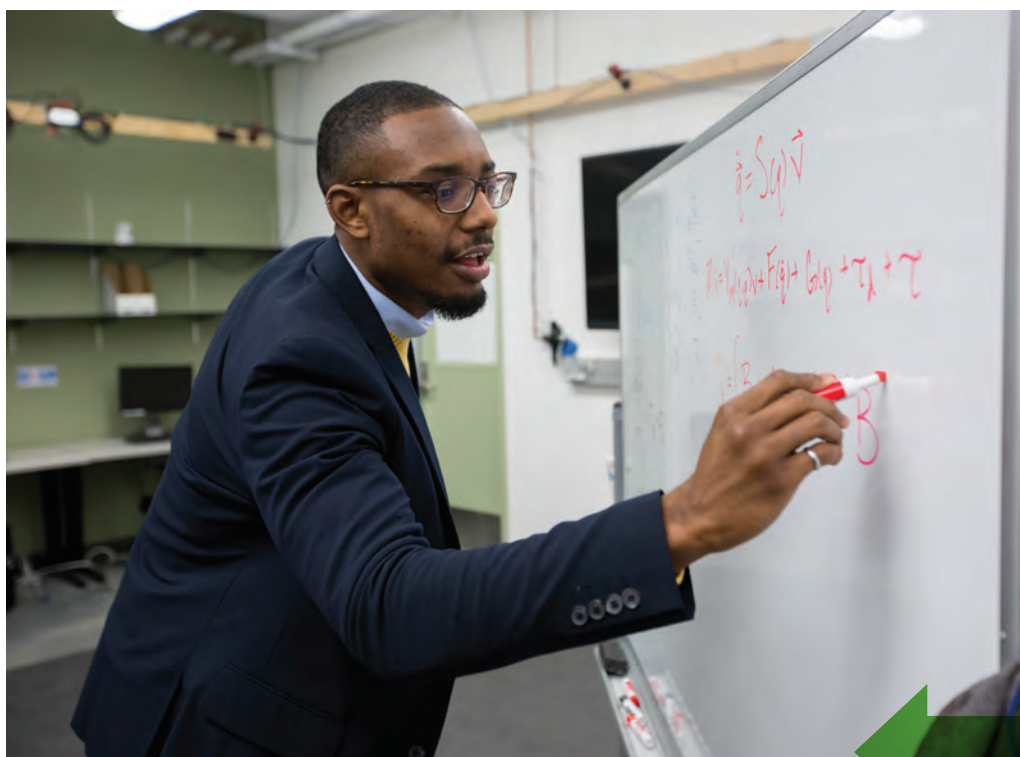
So Holmes and his father made the trip from St. Louis to tour Missouri S&T. As he walked around campus, Holmes told his dad, "I could see myself here."

"George was that rare student who sought a deep understanding of the material and always came to my office hours to discuss the material."

Today, Holmes is still here — and sees new possibilities for his future.

Last summer, he began working toward a Ph.D. in control system engineering, which focuses on the design of robotic systems, among others. He is studying under the direction of **S.N. Balakrishnan**, a Curators' Distinguished Professor of aerospace engineering and a leading authority in the field.

Holmes is one of dozens of GAANN Fellows at Missouri S&T. GAANN (Graduate Assistance in Areas of National Need) is a U.S. Department of Education program designed to get more Ph.D. students into the nation's universities — and to eventually get them to pursue careers in research in academia, national laboratories or the private sector. Holmes applied for the program at the urging of **Robert G. Landers**, a professor of mechanical engineering who taught one of Holmes' favorite undergraduate courses, Modeling and Analysis of Dynamic Systems.



"George was that rare student who sought a deep understanding of the material and always came to my office hours to discuss the material," Landers says. "George is a leader and has the curiosity and intellect to have a stellar career in research; therefore, I knew the GAANN program would be a perfect fit for him."

Holmes also worked as a grader for Landers' course the following semester. "Not only did he grade quizzes and assignments, he reviewed all of my notes and provided feedback on how the

course could be improved to maximize student learning," Landers says.

Improving processes and systems is something of a pastime for Holmes. While he remains undecided on a specific direction for his GAANN research, he hopes his advanced studies will lead to a way to either "decrease inefficiencies or decrease drudgery."

"I'm a tinkerer," Holmes says. "If I can find a way to improve something, I'll do it." ■

FROM TRUCKER TO TEACHER

By Joe McCune, mccunej@mst.edu

Daniel Field was driving a truck when inspiration struck — and that took him from Southern California to Missouri S&T.



Field, MetE'13, is now a doctoral student in metallurgical engineering working through the Graduate Assistance in Areas of National Need (GAANN) program.

But back in the late 2000s, he and a partner drove a mobile document shredding truck from Santa Barbara to Los Angeles to Pasadena. They shredded documents at biopharmaceutical company Amgen, and they shredded *Spider-Man 3* props under the watchful eye of Paramount Studios security. In between stops, Field read Ayn Rand's *Atlas Shrugged*, but it wasn't her objectivism philosophy that brought him to the Missouri Ozarks, it was a character the author created.

"Hank Rearden sparked an interest in metallurgy," Field says.

In the book, Rearden owns the most important steel company in America and makes Rearden Metal, an alloy that's stronger than steel. As part of his graduate studies, Field is working on making high-strength steel lighter and stronger to improve automobile fuel economy and safety, both of which are a concern when you're driving on California's nightmare highways.

Field worked four years for ShredRite, a company owned by his father-in-law, and briefly for its subsidiary, StoreRite. During the day his wife, Melissa, went to college to become a teacher, and when she started working, Field completed four semesters of night classes at Ventura County Community College.

And then he started looking at his full-time college options.

"I chose Missouri S&T because when I called the various other schools that offered a metallurgy degree, I got the most direct help from the S&T secretarial staff in the materials science and engineering department," he says.

He loaded up his growing family — the couple now has three children — and moved to Rolla in 2011.

After earning his undergraduate degree, Field applied for the GAANN fellowship that provides more than \$30,000 a year in assistance from the U.S. Department of Education and Missouri S&T. The program is aimed at training the next generation of researchers or professors.

Before he fulfills the GAANN program's goals, he plans to work in the steel industry to gain practical experience.

"I respect those who went out and worked in the industry to gain that practical knowledge," he says.



By Peter Ehrhard, ehrharp@mst.edu | Photo by Stuart Isett

Long distances may separate Miners from their alma mater, but as the saying goes, absence makes the heart grow fonder. Two thousand miles away from Rolla, **Margaret Bowman**, CE'13, continues to learn at and support the university from which she recently graduated, even though she thought she would never continue her education. Thanks to her employer's education assistance program, she's now pursuing a graduate degree.

"It's awesome how easy the application process is for alumni who have already gone through the system," says Bowman. "Letters of recommendation aside, everything you need to submit, like transcripts and records, is already there."

Despite working a full-time job for Boeing in Seattle, Bowman has earned a graduate certificate in engineering management

and is currently working toward a master's degree in the same field.

"I have learned a lot from my experiences with distance classes," says Bowman. "Scheduling becomes very important, along with maintaining a flexible plan and working out all the time zone differences."

Bowman says it helps that classes are recorded and can be watched at any time. And if she has questions, she can always reach her professors during office hours on the phone.

"I can almost instantly apply something that I learned in class to my work the next day," says Bowman. "I am a liaison engineer, which is basically the 'Mr. Fix-It' side of things at work."

Working and studying don't take up all her time, though. Bowman still finds time to serve as co-chair of the New Alumni Council, which aims to ease the transition for young alumni from the university setting to the world of work.

"I have learned a lot from my experiences with distance classes."

"The group is slowly but steadily increasing its numbers by reaching out to young alumni who are able to be active with Missouri S&T activities despite building a career," says Bowman. "If any of my fellow alumni are interested, I hope they contact the Miner Alumni Association for details and get involved."

To learn more about the New Alumni Council, visit mineralumni.com/nac.



FOR HIS MOTHER

By Greg Katski, katskig@mst.edu

For years, **Jatin Mehta** watched his mother's health degrade as she dealt with the debilitating effects of type 2 diabetes. When she died on March 5, 2016, Mehta dedicated his research to her, and to the millions of others around the world who die from age-associated diseases every year.

Mehta is a doctoral candidate and teaching assistant in chemistry. He works with **V. Prakash Reddy**, professor of chemistry, on a project to design and synthesize medicinal compounds that could slow or prevent age-associated diseases like Alzheimer's, cancer, cataracts, dementia and, of course, type 2 diabetes.

Mehta doesn't believe in a mythical Fountain of Youth, but he does think aging doesn't have to be so difficult.

"We get diseases when we get old," he says. "We can't stop aging, but we can make it more pleasant."

Before he came to Missouri S&T, Mehta worked as a research scientist for several major pharmaceutical companies in India

"We get diseases when we get old. We can't stop it but we can make it more pleasant."

for eight years. He holds two Indian patents for drug synthesis.

Mehta, who has both bachelor's and master's degrees from Kurukshetra University in India, noticed that he was often passed over for promotion for candidates with doctoral degrees.

"If you want to do research in the pharmaceutical industry, you should have a Ph.D.," he says.

Mehta applied to a number of universities with organic chemistry research programs, but his first choice was always Missouri S&T, in part because of his desire to work with Reddy, whose research interests include drug design.

At Kurukshetra, Mehta met his wife, **Meenakshi**, who is also an S&T doctoral student in chemistry. They have a 6-year-old son.

"My family is my motivation, especially my wife," Mehta says. "She sacrificed a lot in terms of her career to get me here. I believe this wouldn't be possible for me without her support and motivation."

Mehta, a member of Toastmasters International since 2014, also has a passion for public speaking that led him to participate in S&T's 2016 3-Minute Thesis competition. A presentation about his research garnered him the People's Choice Award.

Mehta is current president of the Ozark Orators #1056 Toastmasters International Club in Rolla.

"I welcome everyone to visit our club to improve public speaking in a fun manner," he says.

MASTERING BUSINESS

By Peter Ehrhard, ehrharp@mst.edu | Photo by Brett Deering

After deciding to pursue a master's degree to open up more career opportunities, **Jeffrey Jenkins**, MBA'16, chose Missouri S&T on the recommendation of his brother, recent Rolla graduate **Jared Jenkins**, BAdm'12, Econ'12.

"I didn't want to sell myself short in the education department, and I wanted to prove it to myself that I could keep going to get an MBA," says Jenkins, who works in accounting for Hertz Corp. in Oklahoma City. "The advanced degree will open up many doors later on in my career and help me pursue my personal and professional interests."

"Educating students about the need for business-minded individuals is key for the industry."

Teaching young people about the business world is one of Jenkins' goals. In the future, he hopes to teach high school-aged students. Jenkins sees a gap when students learn about potential careers.

"Educating students about the need for business-minded individuals is key for the industry," says Jenkins. "High schoolers could really benefit from being exposed to business jobs and management skills. It is sometimes too late to learn about a career at the college level."

Jenkins started out by testing the waters in the business program, earning a graduate certificate in enterprise resource planning in 2014 to make sure he could handle the increased graduate-level workload.

"I wasn't sure about the whole distance education thing, but I quickly realized that the program was flexible and I could continue to work full time while taking classes," says Jenkins. "If I miss the first 15 minutes of class rushing home, I can always watch them later that evening."

Jenkins echoes the sentiments of most distance students, saying that time management and determination are key for those who balance full-time work and full-time studies.

"Sometimes I would just be so drained from it all, it really made me question it, but then I would step back and look at my priorities," Jenkins says. "That would reaffirm my beliefs and push me to keep going on."





LONG ROAD

By Joe McCune, mccunej@mst.edu

Being the best can be as much a curse as a blessing. **Laura Bartlett**, MetE'08, PhD MetE'13, Robert V. Wolf Professor in Metallurgical Engineering at Missouri S&T, is living proof.

Bartlett came to S&T in the fall of 1993 as a mechanical engineering student. But she "was more interested in the social aspects than the courses," she says, and after three years and change she left Rolla without a degree.

After leaving school, Bartlett worked for years in jobs that had nothing to do with mechanical engineering. There were jobs on a print production line, in a dog food factory, cleaning motel rooms and waitressing.

Waiting tables one day in 2005 in her husband's hometown of Ravenden Springs, Ark., she overheard a diner mention the university in Rolla, Mo. She struck up a conversation with the man, **Tom Baird**, MS Math'63, a

"It turned out to be the best thing. I never would have thought 15 years ago that I would fall into this line, to be a professor and a teacher."

former associate professor of computer science at Missouri S&T, and in the course of that talk, she mentioned she wanted to get back to Rolla. Baird encouraged her to contact **Jerry Bayless**, CE'59, MS CE'62, former associate professor of civil, architectural and environmental engineering at S&T.

"That night, I couldn't sleep," Bartlett says. "I was very apprehensive about making the call because, frankly, I didn't know if I could still do well after being out of school for so long."

By that time, it wasn't just her and husband, Chris, she had to think about. Son Christopher, now a 13-year-old middle school student, was in the picture. "I wanted something more for him," Bartlett says.

She made the call. And when her family's tax return came in, she said, "Let's go."

Bartlett returned in 2005 as a mechanical engineering student, but one day she went to Missouri S&T's foundry to watch molten iron being poured.

"That hooked me," she says. "I said, 'I've got to do that.'"

With a bachelor's degree in hand in 2008, she had an offer to work in a steel mill, but she

was worried that she would be out of a job if the economy got worse. Looking around for something more stable, she was encouraged to apply for a Graduate Assistance in Areas of National Need (GAANN) fellowship that focuses on training the next generation of researchers and professors.

"It turned out to be the best thing," Bartlett says. "I never would have thought 15 years ago that I would fall into this line, to be a professor and a teacher."

Then she did what the GAANN program prepared her to do by accepting a job as an

assistant professor at Texas State University. But when the offer came in to be Missouri S&T's Robert V. Wolf Professor in Metallurgical Engineering, it didn't take Bartlett long to decide that Rolla was home. Now she gets a chance to help students at her alma mater, whether it's professionally or just life lessons she learned the hard way.

"If I see a student is struggling and going down the wrong path, I can tell them my story, that they can turn their fortunes around," she says. "I think that's a very powerful message." ▣





By Greg Katski, katskig@mst.edu | Photo by Brian Carlson

Working to rid the world of dangerous bacterial infections and developing less painful ways to take and test blood — it's all in a day's research for **Steve Frey**.

Frey, MS Phys'86, is vice president of engineering and technology for Orlando-based Ocean Optics, which invented the world's first miniature spectrometer.

An optical spectrometer measures properties of light over a specific portion of the electromagnetic spectrum. It is typically used in spectroscopic analysis to identify materials.

Frey is especially excited about two new spectrometer applications under development. One is a rapid-result test for E. coli in food. The other is a painless way to measure blood glucose levels.

The most common way to test blood glucose is by pricking a finger with a lancet to draw blood for a test strip. People with type 1, or juvenile diabetes, often test their blood glucose between four and eight times a day.

"Imagine how valuable (a non-prick test) would be," says Frey, who envisions a handheld device that would replace the lancet with a light source and spectrometer. The device would have to be positioned in the same spot on the individual for every test to get consistent readings, he says.

At the touch of a button, test results could be sent to a smart phone that records the patient's reading in a cloud database that is accessible by a primary care physician. The doctor can download reports to monitor the readings and recommend adjustments.

Frey and his researchers are also developing a way to test food for E. coli on the fly. The process could help pinpoint origins of food contamination.

"Ask any chain restaurant how much they'd pay you for that test," says Frey. "If you had that test, it would improve the world food supply. That's the thing that really excites me."

The company's spectrometers can already test food for characteristics like freshness, sweetness, acidity and firmness.

Ocean Optics recently created a handheld device to allow one of the largest retailers in the country to test the freshness of produce coming into its warehouses and on its store shelves, thus reducing food waste and improving produce freshness and quality.

TEACHING AND LEARNING

By Peter Ehrhard, ehrharp@mst.edu

Many graduate students work at the university as lecturers or graduate teaching assistants. And, most get time to prepare and have a certain mentality or “game face” when heading into their classrooms. For **Mariah Covington**, teaching and learning sometimes blur together.

“I teach a morning class and go straight from there to my classes where I am a student, so it is always like a splash of cold water,” says Covington, a graduate student in technical communication. “Splitting time between teaching and being taught is sometimes a challenge, and a 10-minute break is not really enough some days.”

“Seeing the students I teach change and improve is such a big motivator.”

She doesn’t mind the contrast between the two, though. She spends her office hours talking to students or meeting with faculty about departmental information rather than studying.

“It seems like a cliché, but seeing the students I teach change and improve is such a big motivator to put up with any difficulties and keep doing what I do,” says Covington. “Though it is strange to be called ‘Ms. Covington’ by students who are only a year or two younger than I am!”

Covington is not writing a traditional research thesis for her master’s, but she continues hands-on learning as a research assistant on campus. She helps **Katie Grantham**, AE’01, MS AE’03, PhD ME’05, associate professor of engineering management and systems engineering, to document information and help migrate data as the campus changes learning management systems.

Covington hopes her degree and current documentation work will prepare her for future employment in whatever country or situation she ends up in.

“My husband is a part of the U.S. Army at Fort Leonard Wood, Mo., but he could be relocated at any time, so my hope is this degree will give me a lot of flexibility wherever we end up. But we will hopefully stay in the Rolla area for a few more years,” Covington says. “My undergraduate degree is in biochemistry, but by earning a writing-intensive degree, I hope to find a career in science documentation or writing.”





LEARNING FOR LIFE

By Alan Scher Zagier, zagiera@mst.edu

"The trouble with retirement is you never get a day off."

Former University of Texas men's basketball coach Abe Lemons popularized that one-liner in a long-ago interview. Missouri S&T doctoral student **Ken Boyko** embraces that sentiment to a degree few can hope to match.

At 65, Boyko is preparing to complete a Ph.D. in geological engineering, perhaps as soon as this fall. His research focuses on how LIDAR (light detection and ranging) scanners can be used to "see through" vegetation that might otherwise prevent detection of potential falling rock — research that could enhance safety along highways and bridges and that also involved a project for the U.S. Navy, which wants to use the technology as a navigational aid for self-driving off-road vehicles.

Boyko's academic mentor is **Norbert Maerz**, a professor of geological engineering and director of the Rock Mechanics and Explosives Research Center. The pair first met when Boyko came to campus for graduate school after retiring from a 30-year career with the U.S. Geological Survey in Rolla. At the USGS, he helped guide the federal agency's shift from its analog roots to digital cartography and 3-D maps — "GIS before it was called GIS," as Boyko says.

Boyko didn't come to S&T to study rocks. An inveterate tinkerer, he initially pursued a master's degree in computer science. His involvement with the campus robotics team eventually led him to Maerz, who was in need of a savvy programmer to handle the sophisticated data produced by LIDAR scanners. The scanners create 3-D images of the environment with distance measurement resolution as precise as 0.3 millimeters — a level of detail that Boyko has managed to achieve from scanners with a stated precision of 8 millimeters.

"I didn't know anything about geological engineering," Boyko says. "It turned out to be a good match."

The collaboration has caught the attention of the federal Centers for Disease Control and Prevention, which in August awarded the pair a nearly \$300,000 grant to develop a low-cost LIDAR hazard detection network for use in underground mines, where roof falls and pillar failures can often be anticipated by otherwise imperceptible geological shifts.

"In many cases these types of failures can be predicted," Maerz says. "We can use these inexpensive sensors for environmental monitoring and potentially build nodes that could be worn by workers whose

“On the farm, there’s always problem-solving, just like engineering.”

exposure to high temperature, dust and other possible hazards could be monitored above ground in real time.

“We are solving two problems at once,” he adds. “First, how to make these measurements. And second, how to get the information out of the mine using a peer-to-peer radio network.”

When not immersed in his research or teaching undergraduate labs, the Detroit native and his wife, Marsha Hughes, operate a 240-acre sheep farm near Little Piney Creek beside the Mark Twain National Forest south of Rolla. The sprawling property includes a 450-million-year-old geological formation known as the Devil’s Punchbowl, a cone-shaped outcropping that offers sweeping views of the surrounding forest.

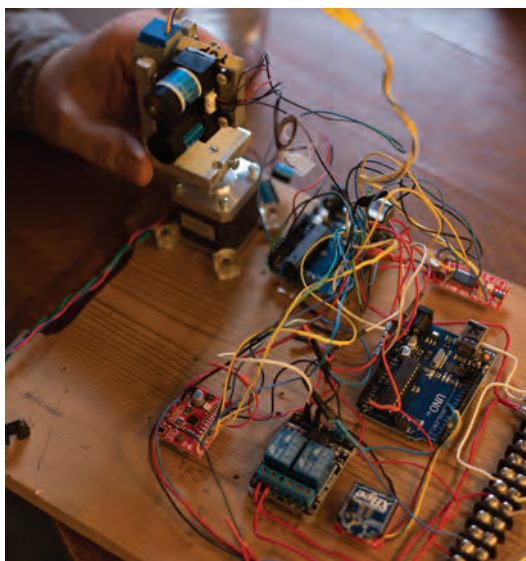
Boyko and Hughes raise the sheep for meat, not wool, and have developed a loyal customer base among observant Muslim S&T students who prepare their food under halal dietary laws.

The nontraditional Ph.D. student, who grew up in the city and left the military as an “early-out” as the Vietnam War ended, considers the farm his sanctuary, a space as far removed from the office as possible. Yet the parallels between his two worlds are unmistakable.

“On the farm, there’s always problem-solving, just like engineering,” he says.

Boyko expects to remain in Rolla and at S&T after graduation, hoping to teach as an adjunct professor.

“I’m not in a big hurry,” he says. “I don’t have any plans to start another career. But I do get a lot of energy being around young people. I just like being connected with the university.” ■



COME TOGETHER

With over 50 sections across the country, the Miner Alumni Association offers an abundance of opportunities for you to expand your professional and social circle. From sporting events to St. Pat's festivities, Miners like you get together year-round to connect and play. Don't miss out on the fun. Check out the events calendar at mineralumni.com/events.



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Your opinion matters to the Miner Alumni Association, which represents nearly 60,000 alumni. If you have comments, questions or ideas, please share them with your elected representatives listed below.

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CLASS NOTES

SHARE A CLASS NOTE

Let your classmates know what you've been doing. Send us information about your professional and personal accomplishments — career changes or promotions, weddings, births and other news — and we will publish it in an upcoming issue. Email your update and a high-resolution photo (if available) to alumni@mst.edu.
Deadline:
Fall/Winter issue — July 15

PUBLICATION POLICY

We publish information submitted by alumni, news submitted by employers of alumni, and selected news stories that mention alumni and their affiliation with Missouri S&T. We are happy to announce weddings, births, promotions and other special occasions after they have occurred. We will print addresses if specifically requested to do so by the alumnus/alumna submitting the note and will mention a spouse's name if it is specifically included in the submission. We reserve the right to edit alumni notes and will use submitted print-quality photos as space permits. Due to the production time required for each issue, submissions may take up to six months to appear. Your patience is appreciated.

1955

Joseph Kolasch, ChE, "I obtained a law degree from the University of Missouri in 1960 and am a member of the Virginia Bar. I am a founding partner of Birch, Stewart, Kolasch and Birch, a patent trademark and copyright law firm in Falls Church, Va. I am still practicing patent law at the age of 83."

1956

Bruce R. Doe, GGph, "I remain in independent living at Penick Village, a continuing care facility, though I am quite bent over from arthritis. I received a powered wheelchair that has revitalized my life and allowed me to explore places on campus I never could walk, such as a little pond with water lilies, goldfish and two tiny waterfalls. I still am able to walk around my apartment. I still operate my blog Reunite Gondwanaland and have now passed 42,000 page views."

1957

Charles A. Wentz Jr., ChE, MS ChE'59, and the

Edwardsville (Illinois) High School class of 1953 held their reunion party at the home of Wentz and his wife, Joan, in September. The event raised more than \$1,000 for the Dirty Dozen Scholarship Fund for Edwardsville High School.

1958

Robert W. Sucher, ChE, "I retired from Anheuser-Busch in 1994 and from private consulting in 1998. I'm living in Sunrise Beach, Mo., and enjoying the quiet life. I still follow Miner swimming as well as my granddaughter at Rock Bridge High School in Columbia, Mo. Old swimmers never die, they just float away."

1960

Johnnie Hall, CE, and his wife, Peggy, are enjoying retirement and "a precious new great-grandson."

Roger Meadows, ME, recently published his third novel, *Devil's Lane*. The historical novel is set in 1880 in Taney County, Mo. (where Branson is now located), recovering

after the Civil War. "It's been a great retirement journey, along with my wife, Wanda, who worked in the military department of what was then the Missouri School of Mines and Metallurgy," Meadows says. The book can be found on Amazon.com.

1962

Henry Duvall, Math, and his wife, Catherine, celebrated their 50th wedding anniversary in Chelan, Wash., with their three children, two sons-in-law, one daughter-in-law and six grandchildren.

1964

Ratilal S. Patel, ME, "Academic excellence is the key to make America great again. It is when we are most lost that we sometimes find and look where we started."

1966

Clifton A. Schwach, EE, "Thanks for a wonderful 50-year celebration." Schwach works for Rockwell Collins Inc.

1970

Robert J. Webb, EE, "I am enjoying retirement in Houston, and have always benefited from my degree. I still exercise regularly, still like to work math and engineering problems for fun, still growing and progressing in life. I enjoy my kids and grandkids. Susan and I are well."

Thomas F. Wolff, CE, was elected national president of the 119,000-member civil engineering honor society, Chi Epsilon. Wolff is an associate professor of civil and environmental engineering at Michigan State University.

1972

Joseph Rupp, MetE, president of the Missouri S&T Board of Trustees, was appointed to the board of directors of Cass Information Systems Inc., provider of transportation, energy, telecom and environmental invoice payment and information

Continued on page 40

DAY NAMED ACADEMY OF INVENTORS FELLOW



Delbert E. Day, CerE'58, a prolific inventor whose work with specialty glasses has led to treatments for cancer, bone tissue regeneration and wound care, has been named a National Academy of Inventors (NAI) Fellow.

His selection is in recognition of his "highly prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development and the welfare of society."

Day, Curators' Distinguished Professor emeritus of ceramic engineering at Missouri S&T, was inducted into the NAI during an April 6, 2017, ceremony at the John F. Kennedy Presidential Library and Museum in Boston as part of the academy's Sixth Annual Conference.

FIX-IT FIXATION



As Missouri S&T undergraduates a decade ago, **Brandt, CE'07** and **Nicole, EMgr'07 MS SysE'10, Genz** never envisioned careers as small-business owners flourishing amid the 21st century version of the arts and crafts movement.

But after earning engineering degrees in Rolla, the St. Louis couple is now carving out an unexpected expertise in the home design market as the creative and managerial forces behind Rescued Furnishings and Designs. Their business began as a basement hobby and now consists of a workshop, new retail showroom and thriving do-it-yourself space occupying 6,600 square feet in a historic building near Lafayette Square.

What began as a diversion from their full-time engineering jobs is now a no-two-days-are-the-same gig that also pays the bills. Nicole, a former systems engineer at Boeing and logistics manager at Anheuser-Busch, made the career switch on Labor Day, 2014. Brandt, a civil engineer who focused on municipal public works and infrastructure as a project manager with CDG Engineers, followed a year later.

"We were doing this on the side for fun," says Nicole. "And slowly it started becoming that challenge I was looking for."

Their paths to S&T were distinct. Brandt grew up in Warrenton, Mo., a town of 8,000 located 60 miles west of St. Louis. Nicole, whose father is also an S&T graduate, hails from the southern California tourist town of Temecula, sandwiched between Los Angeles and San Diego.

"My goal my whole life was to never be an engineer and never go to Rolla," she says. "I grew up with a dad who was an engineer (**Steven Fischer, ME'80**), and we fought all the time because we're very alike and hard-headed. I just didn't want to be like him.

"So then I went to Rolla and became an engineer," she says. "I am my father's daughter."

Despite the change in occupational direction when each had barely turned 30, both are quick to attribute the burgeoning success of Rescued Furnishings and Designs to their engineering background.

"You learn how to learn," says Brandt, who maintains his professional engineering license. "That's what an engineering degree did for me — it just set me up for life."

The fix-it fixation began when the couple, who married in 2008, salvaged antique and neglected furniture in their own home, a habit cultivated via Brandt's antiques-shopping parents. The venture moved from their basement to a 500-square-foot rented space in someone else's warehouse before the September 2014 move to their current location. The retail showroom and DIY center was unveiled in October 2016, tripling their space. And the initial focus on furniture restoration has broadened to include kitchen cabinet painting, carpentry, and home and kitchen designs.

"Being engineers has made us crazy about quality and durability and doing things right," says Nicole, now a regular guest on the *Show-Me St. Louis* morning television show on KSDK-TV. "This is where the nerdy engineers in us come out. We were always looking to make things better. I'd read spec sheets, he would draw plans. People like that attention to detail."

The growth of their business has allowed the Genzes to hire two other full-time employees as well as two part-timers. They hope to bring in \$1 million in sales by 2018, a growth rate that could easily land Rescued Furnishings as a case study in the engineering management textbooks Nicole pored over not that long ago.

Their advice to other young graduates?

"Getting your degree sets you up for so many other things," she says. "So even if you venture off your path and go into a different field than engineering, you now have that background to carry on with." ▣



HERNANDEZ WINS IEEE-HKN AWARD



The IEEE-Eta Kappa Nu (IEEE-HKN) board of governors awarded The Alton B. Zerby and Carl T. Koerner Outstanding Student Award to **Emily Hernandez, EE'16**, of the IEEE-HKN Gamma Theta Chapter at Missouri S&T.

At S&T, Hernandez was active in Eta Kappa Nu, the Robotics Design Team and the Missouri S&T Chapter of the Society of Hispanic Professional Engineers. She held a research position in the Electromagnetic Compatibility Laboratory and was an Opportunities for Undergraduate Research Experience Fellow in the Applied Computational Intelligence Laboratory.

Hernandez's paper "Graphical Trust Models for Agent-Based Systems" is pending publication in *IEEE Potentials Magazine*, and "High Speed Serial Link Challenges using Multi-level Signaling," which she co-authored, was accepted for the Electrical Performance of Electronic Packaging and Systems (EPEPS) Conference in October 2015.

Hernandez is currently pursuing a Ph.D. in electrical engineering at Stanford University.

ALUMNA HONORED AT WOMEN OF COLOR STEM CONFERENCE

Raquel P. Cundiff, ME'93, received the Community Service-Industry Award at the 2016 Women of Color STEM Conference, held in October in Detroit. Cundiff is a customer engineering manager with Boeing.

The conference was sponsored by Consumers Energy and Career Communications Group's *Women of Color Magazine*.

The development of science, technology, engineering and math (STEM) careers is integral to America's advancement, according to the Career Communications Group.

The magazines and award winners offer a blueprint for growth and success in STEM fields by highlighting progress and people at all stages of the STEM pathway, from college students to a senior executive managing the projects that will change the ways people live.

services. Rupp recently announced his retirement as chairman of Olin Corp.'s board of directors, a position he held since 2005.

1973

Patrick Byrne, CE, retired from Massman Construction Co. after 43 years. He now resides in Olathe, Kan., and is enjoying spending time with his grandson in the Kansas City area and two granddaughters in the Phoenix area.

Steven H. Wunning, MetE, was appointed director of Summit Materials Inc., a vertically integrated construction materials company. Wunning has more than 40 years of combined operating and board experience across the industrial and building products industries. Wunning served as group president and executive office member for Caterpillar Inc. from January 2004 until his retirement in February 2015.

1974

James "Jim" Frey, CE, won the Construction Forum Education Foundation's Board of Advisors' Award in October in St. Louis. He was recognized for his career of reaching across lines to promote fairness. Frey retired from Alberici Constructors in 2016. Part of his legacy is Alberici's "Fairness Doctrine," which is designed to ensure fair business and honesty in the company's dealings with its contractors and suppliers.



Richard L. "Dick" Elgin, CE'74, MS CE'76, was named Surveyor of the Year by the Missouri Society of Professional Surveyors. Elgin is semi-retired from Archer-Elgin Engineering, Surveying and Architecture, and is an adjunct professor at Missouri S&T, where he teaches the civil engineering department's required surveying course. He authored *The U.S. Public Land Survey System for Missouri* among other books.

1975

Duane Bequette, CerE, EMgt'76, "Retired in spring 2016. We are living in the Minneapolis area after living in Texas twice, Wisconsin three times and Washington twice," he says. "We're enjoying being near grandkids, hobbies, volunteering and traveling."

1976

Mike Watkins, Psyc, retired April 1, 2016, after a 38-year career with the Boy Scouts of America working in local chapters in Carbondale, Ill., Lincoln, Neb., Des Moines, Iowa, and Chattanooga, Tenn. Other assignments included working in the Atlanta regional office and national office in Irving, Texas. "My wife Tonya and I plan to downsize and move to the Florida panhandle," he says.

1982

Jim Coll, MS CE, joined Burns & McDonnell in St. Louis, where he will develop and oversee programs and projects for a range of clients focused on public water and wastewater infrastructure upgrades. Before joining Burns & McDonnell, he served as project manager over the Combined Sewer Overflow and Sanitary Sewer Overflow Control Plan projects for the St. Louis Metropolitan Sewer District.

1983

Brad Pettijohn, ME, MS EMgt'94, joined the Kansas City District of the U.S. Army Corps of Engineers as a project manager with responsibilities for civil works, including flood risk management.

1985

Ray Shea, EE, lives in St. Charles, Mo.,

and is vice president of engineering and product development at Motor Appliance Corp. in Washington, Mo.

1991

Eric Haynes, Hist, was selected for the inaugural cohort of the two-year Kansas City Teacher Residency program to become certified and trained to teach middle school English and language arts in a high-needs urban Kansas City school. He was placed at the KIPP Endeavor Academy as a co-teacher for eighth grade writing for the 2016–17 school year.

1994

Ken Owens, EE, MS EE'01, is the chief technical officer for cloud infrastructure services at Cisco Systems. He is responsible for creating and communicating technical and scientific vision and strategy for cloud infrastructure services (CIS) technical vision and strategy.

2001

Ryan Cross, EE, was one of seven Burns & McDonnell employees promoted to the

principal leadership level in regional offices throughout the country. Principals are selected for outstanding performance, future leadership potential and technical excellence.

As manager of a team of more than 50 employee-owners in St. Louis, Cross oversees substation and transmission and distribution line design to utilities and industrial clients across America.

Kurt Voss, ME, was promoted to vice president of engineering at Integrated Facility Services in St. Louis. He is responsible for overall management and strategic direction of the engineering and design team. Voss joined the company in 2008 as sales engineer and most recently was director of engineering.

2002

Darcey Schumacher, CE, was promoted to principal of Wallace Engineering in Kansas City, Mo., where she has worked for more than 13 years.

2003

Nathan Turner, EE, was promoted to the position of principal

at Burns & McDonnell in Kansas City, Mo. In his 12 years with the firm, Turner has managed projects and relationships with many of the company's largest electrical transmission and distribution clients and has become an effective advocate of the benefits of regional office coordination among all Burns & McDonnell office locations. His promotion recognizes his contributions to the company's largest and fastest-growing division and his ability to cross-sell projects that have been managed by other divisions within the company.

2006

Melanie Wulff, Hist, MBA'12, student services coordinator in student diversity, outreach and women's programs at Missouri S&T, received the 2016 Alumna of the Year Silver Award from Missouri S&T. The award recognizes alumnae who are dedicated to advancing the lives of women and committed to diversity.

2007

Ryan A. Elam, CE, was hired as director

of the Lee's Summit (Mo.) Development Center — a one-stop shop for community development activity.

2009

Kyle Griffin, CE, works with the residential design team for Civil Site Design Group in Nashville, Tenn., where he creates site development plans of all types.

Tyler Johnson, Hist, BSci, and his wife, Rachel, vacationed in summer 2016 in Europe. While there, they visited Munich and Frankfurt, Germany; Paris; and Dublin. Johnson was born in Frankfurt, but this trip was the first time he had been back. He works as an admissions counselor at Missouri S&T.

Tara L. Stone, TCom, MS TCom'12, a user interface designer specialist in marketing and communications at Missouri S&T, received the 2016 Alumna of the Year Gold Award from Missouri S&T. The award recognizes alumnae who are dedicated to advancing the lives of women and committed to diversity.

Continued on page 43



FUTURE MINERS

Robert Nagel, ME'06, and his wife, **Jacquelyn (Stroble) Nagel**, EE'05, MS MfgE'07, had a girl, Karen Angeline, on June 30, 2016.

WATKINS TO LEAD IEEE-HKN

Steve E. Watkins, EE'83, MS EE'85, professor of electrical and computer engineering at Missouri S&T, is the 2017 president-elect of IEEE-Eta Kappa Nu, the honor society of the Institute of Electrical and Electronics Engineers. He will serve as president January–December 2018.

Watkins, who is a co-advisor for the S&T student chapter of IEEE-HKN, is editor-in-chief of *THE BRIDGE* magazine of IEEE-HKN.

CONTROLLED CHAOS CREATES COMPELLING RUBRIC

Raz Kerwin, TCom'12, an instructional developer in educational technology at S&T, published an article in October issue of *The Teaching Professor*.

Kerwin, who has been teaching Technical Communication 2540 Layout and Design at Missouri S&T on a regular basis, wrote an article titled "Involving Students in Rubric Creation and Using Google Docs to Make It Happen." In it, Kerwin says that using Google Docs "can quickly become chaos" when students collaborate on creating a rubric. But if the chaos is controlled, the students usually come up with the "best" version of work — in real time.

"I regularly end up with a student-created rubric much like the ones I've created — but with a key difference: students are full stakeholders in the rubric," writes Kerwin. "They know exactly what a rubric is, what it's good for and how to use it."

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'MR. S&T' HANGS UP HIS SLIDE RULE



No matter whether you call it MSM, UMR or Missouri S&T, **Jerry Bayless** has called it home.

Bayless, CE'59, MS CE62, an associate professor of civil, architectural and environmental engineering at Missouri S&T, first came to Rolla in 1955. He joined the faculty in 1959.

Now, after more than 50 years, Bayless retired. His last day was Feb. 28.

Known as "Mr. UMR" for many years and as "Mr. S&T" for several more, Bayless influenced thousands of students during his time at the school.

"There's nobody who has made such an impact on our students in our almost 150 years of civil engineering education in Rolla," says **Joel Burken**, Curators' Distinguished Professor and chair of civil, architectural and environmental engineering. "He has influenced many, many students, helping those who are struggling to stay in school and see it through. That's day to day, not just a special occasion. That's who he is."

In 2011, Bayless was asked what course was his favorite to teach.

"I can narrow it down to three," he said. "Fluid Mechanics, Reinforced Concrete Design, and Structural Analysis. Slide Rule would rank high, also, but I haven't taught that in 35 years!"

Bayless has served as an assistant to the chair of civil engineering and as the assistant dean of engineering. In 1990, he became associate dean, and in 2004 he received the Chancellor Medal. Bayless is a recipient of the Alumni Merit Award, was an honorary St. Pat and parade marshal, and in 2011 he was named one of Missouri S&T's inaugural class of Alumni of Influence.

Bayless was active in the Miner Alumni Association for decades, first serving as a section leader and later as a member of the board of directors. Bayless served as the board's treasurer for 20 years. He is an honorary member of the Academy of Miner Athletics and was inducted into the Academy of Civil Engineers in 1986.

"He stands for what S&T stands for," Burken says. "Excellence in preparing students."

2010

Mark Jordan, NDD IST, was named senior vice president and chief information officer at Bunzl North America, a leading nonperishable supply chain specialist. Jordan is responsible for leading the Bunzl North America information technology department and aligning technology and business strategies.

Adam Strein, ME, was promoted to engineering manager at Beckwood Press Co. of Fenton, Mo., a manufacturer of custom hydraulic presses and automation systems and the Triform line of sheet hydroforming equipment.

2012

Derek Welty, EE, was named a 2016 Honeywell Aerospace Outstanding Engineer.

2013

Reza Ahmadi, PhD EE, joined Kansas University's faculty as an assistant professor of electrical engineering and computer science. His research interests include power systems and renewable energy harvesting.

Kyle Brinks, EMgt, a U.S. Army captain, joined Dewberry, a privately held professional services firm, as part of the Army's engineer regiment training with industry (TWI) rotational program. The TWI program was designed to develop soldiers who are experienced in high-level managerial techniques and understand the

relationship of their industry to the functions of specific Army branches.

Sam Smithey, Econ, was hired as project accountant with Black & Veatch, water division, in Overland Park, Kan., in June 2016.

2014

Tim Arrington, Engl, joined *The Packer* newspaper in Lenexa, Kan., as a staff writer. He reports on a wide range of fresh produce industry news. After a graduate teaching assistant position at Missouri S&T, he went to Shanghai to teach and advise high school students. Arrington served as editor-in-chief of the *Missouri Miner*.

Bryant Watrous, MS EMgt, joined Lease Crutcher Lewis' preconstruction group in the Seattle area. He holds a bachelor of science degree in systems engineering from West Point.

2015

David Zdvorak, CE, joined Milwaukee-based Sigma Group Inc. as a staff engineer.

2016

Chris Brenner, ArchE, joined Holland as a project engineer after serving as an intern in the summer of 2016. He completed his internship at the end of August and was hired on full time.

Carol Williams, BSci, is one of four interns selected to work this summer with St. Louis-based Doe Run Co. ■



MINER UNIONS

1. **Ryan T. Semar**, ArchE'09, married **Barbara Wheelden**, ChE'10, on June 13, 2015. The couple lives in Oak Park, Ill.
2. **Joshua Warner**, Phil'14, married **Katherine Reid**, NucE'14, on July 3, 2016, in Kemblesville, Pa. The couple lives in Conshohocken, Pa.



RUSO TOUTS IT AS AN EXCITING, ATTAINABLE CAREER

Last October, **Sophie Russo**, Psyc'11, participated in a panel at the University of Missouri-St. Louis highlighting perspectives on the challenges women and minorities face when considering technology for study and employment. Russo earned a master of science degree in management information systems from UMSL in 2016.

"You can work in whatever industry you would like to work in as a computer professional," Russo says. "If you're interested in fashion ... you don't have to be in the fashion industry as a designer; you can be in the fashion industry as a programmer if that's what interests you."

Russo also talked about the importance of introducing technology-related fields to kids before they get to college. "By the time you get to college, you have an idea of where your life is going to go, so if you can make that impression earlier, I think that that's really where it lacks," Russo says. "You don't really aspire to be something you can't see or picture yourself being."

MINERS REMEMBERED

Missouri S&T Magazine will announce deaths when information is submitted by an immediate family member or published in a newspaper obituary. Notification of deaths that have occurred more than two years before the date of publication will not be published unless a special request is made by a family member. Yearbook photos, if available, will be included for alumni when families submit obituary information. Due to the production time required for each issue, submissions may take up to six months to appear. Your patience is appreciated.

1947



Warren H. Bell, ME, was a member of Triangle fraternity and worked on the *Rollamo*. He spent 35 years in sales at National Steel Co. and played golf, making a hole-in-one at age 81. (July 24, 2016)

1948



John Den Boer, MetE, was a member of the Miner band. He worked at Reynolds Metals Co. as the director

of quality assurance and retired as a self-employed consultant. (April 6, 2016)

Edwin S. Westmoreland, EE (Oct. 20, 2015)

1949

George O. Boeckman, CE (Aug. 10, 2016)

Elmer Cecil Hill, ME (Sept. 10, 2016)

Forrest G. Robinson, CE (Aug. 4, 2016)

Paul Rudoff, EE (April 1, 2016)

1950



John C. Blaine, EE, was a U.S. Army veteran. He retired in 1992 from Ormet, where he worked

as a corporate staff engineer. (Aug. 3, 2016)



George M. Deutman, MinE, had a career that took him to South America, North America and Mexico, where he mined copper, nickel, zinc and uranium. He surveyed the oil shale fields of Colorado and the Dakotas and prospected for gold in Chile and Bolivia. (March 12, 2016)

Richard J. Frautschi, ME (July 24, 2016)

Wesley B. Koenig, MinE (Sept. 9, 2016)

Norman A. Niederstadt, ChE (Dec. 24, 2015)

1951

Joseph A. Beatty, CE (Nov. 17, 2015)

David E. Glenn, ME (Sept. 27, 2016)

Raymond M. Kline, Phys (May 31, 2015)

William H. Roberts, CE (June 30, 2016)

Donald E. Wiseman, PetE (Aug. 21, 2016)

1952

Glenn L. Audsley, GGph (July 2, 2016)

Randall L. Garten, CE (Oct. 16, 2016)

Charles T. Mahoney, PetE (Oct. 3, 2016)

1953

Robert E. Bay, GGph (Oct. 2, 2016)



Ralph B. Weiss, GGph, was a member of Alpha Epsilon Pi fraternity and Sigma Gamma Epsilon and served in the U.S. Army. He lived in New York City and worked many years as a teacher of photography at Manhattanville College in Westchester County, N.Y. A nature photographer, he had photos in many exhibitions, including four in the collection of the Metropolitan Museum of Art in New York. (Dec. 8, 2015)

1954

Richard S. Anderson, NDD (Sept. 1, 2016)

Carlos Herschel Tiernon, MetE, was a member of Sigma Nu fraternity, Army ROTC and was a member

of the Miner football, track and field, and swimming teams. He served in the U.S. Army, was president of Diester Concentrator Co. and was executive vice president of Carroll International Corp. (July 17, 2016)

1955

Charles E. Gockel, GGph (Oct. 21, 2014)

1956

Harry D. Hays, MetE (June 29, 2016)



Robert M. Owen, PetE, was a member of Tau Kappa Epsilon fraternity and Geeks for God. He worked for Tenneco, Arkla Exploration Co., Seagull Energy, Citation Oil and Gas Corp. and Southwestern Energy Co. (April 26, 2016)

1957



Donald F. Snook, EE, was a member of Tau Beta Pi. He worked as a project engineer for the Navy Air Systems Command in Crystal City, Va., for 36 years, retiring 15 years ago. (Aug. 11, 2016)

1958



Donald Gene Guetersloh, ME, was a member of Pi Kappa Alpha fraternity and Blue Key and worked on the *Rollamo*. After graduation, he joined the Delco Remy division of General Motors in Anderson, Ind., designing automotive ignitions, alternators and starting motors. He was a principal engineer designing the first ignition distributors using integrated circuits in the early 1970s. After an early retirement, Mr. Guetersloh joined his father at the family automotive repair shop, D&H Motors, in St. Louis. He became the business owner at his father's passing, until he sold it and finally retired in 2004. (Sept. 12, 2016)

William R. Montgomery, CE, joined the Missouri S&T Order of the Golden Shillelagh in 1991, was an Honored Founder in 1994 and was inducted into the Academy of Civil Engineers in 1998. He was a veteran of the Korean War as a second lieutenant in the U.S. Army in K Company, 32nd Infantry Regiment, 7th Infantry Division. Mr. Montgomery was vice president of J.S. Alberici Construction Co. and then formed his own construction company in 1974 — William R. Montgomery & Associates, specializing in industrial contracting. He was a member of the Associated General Contractors

of St. Louis, where he served as president in 1992. (Oct. 14, 2016)

James N. Sturdy, ME
(Sept. 14, 2016)

1959

William D. Auberry,
MinE (Aug. 13, 2016)

James D. Jackson,
CE, was a member of the Kappa Alpha Order, Independents (GDI) and Army ROTC. He worked for the Missouri Department of Transportation for over 41 years before retiring in 1999 and was a life member of the Missouri Society of Professional Engineers and the Academy of Civil Engineers. (July 14, 2016)

Ronald D. Mouser,
EE (Sept. 10, 2016)

Raymond E. Phillips,
ME (Oct. 6, 2016)



Walter A. Rinehart,
ME, was a member of Tau Beta Pi, the Baptist Student Union and Pi Tau Sigma. He was a chief technology officer at Boeing, retiring in 2003. (April 22, 2015).



Carmen Eugene Ruggeri, ChE, was a member of the Newman Center and retired as an environmental specialist with the Tulsa

health department.
(Dec. 24, 2015)

1960

Thomas R. Halbrook,
CE (July 17, 2016)

1961

William D. Hardin,
ME (Sept. 12, 2016)



Edwin D. Weddington,
ME, was a member of the American Society of Mechanical Engineers and the Society of Automotive Engineers. He worked at the Engineering Development Center at Arnold Air Force Base in Tennessee until retirement in 1999. Married for 58½ years, he was a woodworker, furniture builder and all-around handyman. He loved to travel with his wife, Janice, especially to Frisco, Colo. (Oct. 28, 2014)

1962

Marvin O. Camp,
EE (July 23, 2016)

Daryl C. Hatfield,
Phys (Aug. 17, 2016)

Richard G. Murray,
ME, was a member of Pi Tau Sigma and was the owner and founder of Richard Murray and Associates. (May 29, 2016)

1963

Michael Price Smith,
MetE, was a member of Triangle fraternity and the Newman Center and worked on the



DR. JOSEPH H. SENNE JR.



Dr. **Joseph H. Senne Jr.**, MS CE'51, professor emeritus and former chair of civil engineering at Missouri S&T, died Dec. 20, 2016. Dr. Senne joined the S&T faculty as an instructor in civil engineering in 1948 and was named assistant professor in 1951. He spent eight years at Iowa State University, then returned to Missouri S&T as professor of civil engineering in 1963. He served as the chair of civil engineering from 1965 to 1985.

Dr. Senne was an avid astronomer who made the astronomical calculations for the Missouri S&T Stonehenge replica that was unveiled in 1984. "The stones had to be placed precisely to be aligned for observing equinoctial and summer and winter solstice sunrises and sunsets, by which ancient Britons kept track of the seasons with the original Stonehenge," he said in 1985.

Working in his spare time, it took Dr. Senne two years to make the calculations by computer. "This makes the construction of the original Stonehenge some 3,000 years ago seem even more remarkable," he said.

In collaboration with the Independent Tracking Coordination Program, Dr. Senne

predicted the time of satellite crossings over Missouri and made them available to news media. He avidly tracked Skylab from its launch in 1973 to its reentry to Earth in 1979.

Dr. Senne served in World War II as a Navy Seabee and was stationed on Okinawa when the peace treaty with Japan was signed in 1945.

He was a fellow and life member of the American Society of Civil Engineers (ASCE), the American Society for Engineering Education and the Missouri Society of Professional Engineers, and was the chair of the ASCE Advanced Technology Committee and the ASCE Space Shuttle Task Committee. Dr. Senne also was involved in establishing the Missouri S&T Academy of Civil Engineers and served as secretary-treasurer for 12 years.

A member of the Society of Sigma Xi, Chi Epsilon, Tau Beta Pi, Phi Kappa Phi and Outstanding Educators of America, Dr. Senne held a bachelor of science degree from Washington University in St. Louis and a Ph.D. from Iowa State University, both in civil engineering.

Rollamo. He worked for three years in nuclear weapons research at Monsanto Research Corp. for the Atomic Energy Commission. In 1966, he joined Pratt & Whitney Aircraft Co. (now United Technologies) of East Hartford, Conn., as a materials engineer and earned a master's degree from Rensselaer Polytechnic Institute in 1973. He specialized in the study, development and application of titanium alloys and was the inventor or co-inventor of numerous patents in this field. (July 26, 2016)

1965



Jay W. Alford, MetE with a nuclear option, was a member of Kappa Alpha fraternity and served on the Interfraternity Council. He played quarterback for the Miners football team, earning second-team all-conference honors in 1962. Mr. Alford ranked ninth in passing and 14th in total offense by the NCAA national small-college rankings, ending his career with 1,676 yards passing and 1,915 yards of total offense. He also was a two-time conference outdoor high jump champion, and in 2013 he was inducted into the Miner Athletics Hall of Fame. He was president of Columbus Foundries and retired as vice president of Internet Corp. and president of Mathews Industries, LLC. (Sept. 15, 2016)

Ronald Dawbarn, Phys (Oct. 17, 2016)



David Eugene "Gene" Smith, ME, was a member of Tau Beta Pi, Pi Tau Sigma, the American Society of Mechanical Engineers and the Society of Automotive Engineers. He served in the Air Force 1952–56. Mr. Smith worked for International Harvester, was a crop-dusting pilot for 21 years and developed a patented charcoal machine. Opening Valley Engineering LLC with his son, Larry, led to the creation of Back Yard Flyer Ultralight, wooden propellers and an engine re-drive system that has been used in movies and sold throughout the world. He received an engineering award from the Experimental Aircraft Association for his innovations in the ultralight aircraft division. (Dec. 7, 2016)

1966



Arthur W. Handshy III, ME, was a member of Sigma Nu fraternity, the Society of Automotive Engineers, the American Society of Mechanical Engineers and M-Club and was a Miners football and intramural rugby player. He played semi-pro football in St. Louis and rugby for

the St. Louis Bombers rugby club. In 1976, Mr. Handshy took a job with Lazarus Department Stores, where he worked his way up from facilities engineer to president. In 1988, he bought VICART Precision Fabrication. Never retiring, he was an inventor with multiple patents and continued to run his company daily for 28 years. (July 27, 2016)

1967

John W. Gass, ME (July 9, 2016)



Robert H. Winn, CE, was a member of Independents (GDI), Student Council, Residence Hall Association, Tech Engine Club, the American Society of Civil Engineers, the National Society of Professional Engineers and the Rugby Club. He worked for URS Dames & Moore, an engineering, design and construction company. (Feb. 3, 2016)

1968

James C. Huang, CE (Sept. 25, 2016)

John T. Jackson, ME (Sept. 27, 2015)



Mark Allen Martin Sr., CerE, was a member

of Kappa Sigma fraternity, Blue Key, the Student Union Board, Student Council and the American Ceramic Society. He worked many years in the steel and glass industry and retired from the Illinois Environmental Protection Agency, where he worked as an environmental engineer and an energy project leader. (Aug. 8, 2016)

1969

George Kirk Janes, EE (July 12, 2016)

Dennis C. Martin, EE (Sept. 10, 2016)

Jerry Ronald Sellers, ME, was a member of the Kappa Alpha Order, the Interfraternity Council and Army ROTC. He served in the Army from 1969–71, was a pipeline engineer at Conoco, formed the telecommunications company Houston Network Inc., was president of Wil-Tel Inc., a managing partner of InvenSys Ltd. and Orillion, and was president and CEO of Orillion. In 2004, Mr. Sellers also started the mosquito control company MosquitoZone to combat malaria in Africa and Southeast Asia. He was featured in the Winter 2011 "Everyday Heroes" issue of *Missouri S&T Magazine*. (July 2, 2016)

Thomas J. Tate, Chem (Sept. 13, 2016)

1970

Pedro J. Aragon, Chem (Aug. 8, 2016)

Ronald L. Griesenauer, ME, was a member of Sigma Phi Epsilon

fraternity. He worked in the aluminum industry and medical instrument manufacturing, was a member of the Academy of Mechanical and Aerospace Engineers, and was a professor of management at Lindenwood University in St. Charles, Mo. (June 16, 2016)

William C. Kruckemeyer, ME (Sept. 15, 2016)

Fredrick N. Mendell, CE (July 9, 2016)



Dale Leslie Ricks, CE, was a member of Delta Tau Delta fraternity and Student Council. He worked many years for the Missouri Department of Transportation, retiring in 2008 as the district engineer in Springfield, Mo. He also worked for Olsson Associated, retiring in 2010. (Aug. 21, 2015)

William L. Tolle, ChE (Aug. 22, 2016)

1971

Joseph M. Ingram, EMgt (Sept. 6, 2016)

Lenn J. Scheibal, CerE (Sept. 18, 2016)

1974

Dennis M. Watermann, PetE (Sept. 25, 2016)

1975

Rick E. Larson, CE (Aug. 1, 2015)

1976

Kenneth L. Woods, CE (Sept. 11, 2016)

1978

Victor L. Kerns, ME (Sept. 4, 2016)

1980

Lori J. Herman, GeoE (Aug. 28, 2016)

James L. Thurman, CSci (June 30, 2016)

1983

Jack Preston Taylor, ME (June 30, 2016)

1985

Reyhan Sengül Washington, Econ, was a member of Independents (GDI), the International Students Club and the Turkish Students Association. (Sept. 25, 2016)

1986

Donna Ruth Peacock, Engl (July 5, 2016)

1988

William Richard Mehrer, CE (Sept. 26, 2016)

1994

Nancy Jo Wood, Psyc (Aug. 12, 2016)

2014

Zachary Nicholas Strass, EMgt (March 7, 2016)

FRIENDS

Josette Allgood, wife of the late Dewey Allgood, coach and administrator in Missouri S&T's athletics department (Aug. 24, 2016)

Joyce Ashton, wife of Harlan R. Ashton, CE'80, MS CE'87 (March 28, 2008)

Jean Boyett, wife of Dick Boyett, CE'58 (Aug. 11, 2016)

Michael Brake (Sept. 22, 2016)

Diane Brown, grants and contracts administrator in sponsored programs at Missouri S&T (Aug. 6, 2016)

Max Edward Colvin (Oct. 1, 2016)

Opal Gates, wife of the late Robert W. Gates, ME'50 (Aug. 12, 2016)

Fernanda Gebhardt, wife of the late Adolph A. Gebhardt, ME'41 (May 28, 2015)

Holger Gossmann (May 13, 2016)

Kim Haffer, wife of Randy Haffer in IT research support services at Missouri S&T (Aug. 6, 2016)

James A. Hatchett, retired security guard at Missouri S&T (Sept. 14, 2016)

James I. Huskey, retired electrician at Missouri S&T (Sept. 26, 2016)

Kenneth L. Kaunley, retired athletic equipment supervisor at Missouri S&T (Sept. 22, 2016)

Margaret Lemay (July 3, 2016)

Gloria Marsinkavage, former wife of Donald

M. Marsinkavage, EE'62 (June 26, 2016)

John R. Metzner (July 8, 2016)

Sam Mikel (July 22, 2016)

Jonita Gayle Miller, retired cashiers supervisor at Missouri S&T (July 10, 2016)

Carlos Nava, husband of Robin Nava, GeoE'85 (Aug. 25, 2015)

Lauren Alex Peterson, former associate registrar at Missouri S&T (Oct. 11, 2016)

Doris A. Pohl, wife of the late Robert A. Pohl, ChE'42 (April 16, 2016)

Royal Ranney (June 26, 2016)

Lawrence H. Rehagen (March 28, 2016)

Lucille L. Schendel (July 19, 2016)

Ruth Shank, wife of the late Earl M. Shank, ChE'45 (Sept. 26, 2016)

Julia Stoffer, wife of Jim Stoffer, Curators' Distinguished Professor emeritus of chemistry (Sept. 27, 2016)

Barbara Summers, wife of David A. Summers, Curators' Distinguished Professor emeritus of mining engineering (July 1, 2016)

Leila H. Thomas (Sept. 4, 2016)

Joyce Trimble, wife of Selden Trimble, professor emeritus of mathematics and statistics (Sept. 28, 2016)

Richard E. Wagoner (Sept. 14, 2016)

Kevin Wiginton, husband of Michelle Wiginton, coordinator in distance and continuing education at Missouri S&T (July 22, 2016) □



1. Dr. **Roman J. Dwilewicz**, professor of mathematics and statistics at S&T, died July 29, 2016. A native of Poland, he earned master of science and Ph.D. degrees in mathematics from the University of Warsaw in 1971 and 1976, respectively. He joined the S&T faculty in 2001 as associate professor of mathematics and statistics and was promoted to full professor in 2006. In 2012, he received the Missouri S&T Research Award. In 2008, the president of Poland awarded him the title Professor of Mathematical Sciences, which represents the apex of an academic career in Poland. Dr. Dwilewicz gave lectures at more than 250 universities and conferences on four continents. He published over 60 research papers and books in complex and geometric analysis, analytic number theory, partial differential equations, and algebraic and differential geometry. His work has been published in *Mathematische Annalen* and *Annali Scuola Normale Superiore Pisa*. He received three Excellence in Teaching awards.
2. **Daniel Paul Rice**, EE'49, died July 29, 2016. He flew 26 combat missions for the U.S. Army Air Corps as a B-24 pilot in World War II and spent 17 months as a prisoner of war. After graduation from Missouri S&T, he designed electrical transmission and distribution systems for Missouri utilities and Ameren/Union Electric. He spent most of his career and all of his retirement years in Cape Girardeau, Mo. His three sons and one daughter-in-law also graduated from S&T.
3. **Marquia Lewis**, CSci'16, died in a traffic accident Sept. 16, 2016. She participated in Campus Crusade for Christ, Voices of Inspiration, the National Society of Black Engineers, Delta Sigma Theta and served on the African American Recruitment and Retention Committee.
4. **Valencia McKinney**, a senior in engineering management, died in a traffic accident Sept. 16, 2016. She participated in the National Society of Black Engineers, the Association of Black Students and Delta Sigma Theta.

A photograph of an older couple, Richard and Barbara Jaquay, smiling and standing in a home. Barbara, on the left, has short grey hair and is wearing a grey and black striped sweater with a black cat graphic. Richard, on the right, is balding with a grey beard and is wearing a pink shirt under a black blazer. They are in a room with a wooden cabinet and a fireplace in the background.

RICHARD AND BARBARA JAQUAY:

GIVING THANKS FOR A LIFE OF GOOD FORTUNE AND GLOBAL ADVENTURE

Photo by Brandon Sullivan

Richard Jaquay, CE'63, was building a wastewater treatment plant near Tucson, Ariz., when he met his future wife. They made their first overseas trip together, to China, two years after they were married.

Richard and **Barbara Jaquay** have been on the move ever since, either relocating for work or pursuing their passion for world travel.

Now retired in the Phoenix area, they are planning their next trip to the Basque Country. But that will have to wait until Barbara launches her new book, a history of sheep herding and ranching in Arizona. A geography scholar with a master's degree from Arizona State University and a Ph.D. from Texas A&M University, Barbara has taught in six states — a nomadic career necessitated by Richard's frequent moves.

"My dad was in the contracting business, so I always wanted to be a builder," says Richard, who grew up in upstate New York near Cornell University and Rensselaer Polytechnic Institute. "Private tuition was not something my family could afford, so a math teacher encouraged me to apply to a school of mines. That's how I came to Rolla."

While frequent moves were a fact of life throughout Richard's 39-plus year career with Black & Veatch, the Jaquays didn't put their feet up when they had time off. Across 40

countries and every continent, they pursued their passion for adventure. Along the way, they also gave back to Missouri S&T as supporters of the Miner Alumni Association and civil engineering program.

Now, through their planned gift establishing the Richard and Barbara Jaquay Rolla Rising Scholarship, they have chosen to make a difference for generations to come.

"There were 48 students in my high school graduating class," says Richard, whose brothers, **Francis Jaquay, ME'77**, and **Steven Jaquay, ChE'76**, are also Miner alumni. "It was a big leap to get to Rolla and be one of 3,000 students. It's tough enough without the added burden of worrying about how to pay for school. Barbara and I were lucky. Now we want to help others in the hope that they will do the same one day."

PHOTO FINISH: ST. PATRICK

The moon rises in the sky behind the bronzed St. Patrick statue outside of Curtis Laws Wilson Library on the Missouri S&T campus.





Miner Alumni Association
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Rolla, MO 65409-0650

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A PUBLICATION OF THE
MINER ALUMNI ASSOCIATION
REPRESENTING AND SERVING
ALUMNI OF MSM, UMR AND
MISSOURI S&T

**GRAD SCHOOL
AND BEYOND**

SPRING 2017
VOL. 91 NO. 1
MAGAZINE.MST.EDU

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