

# MISSOURI S&T MAGAZINE

# MINER MADE

Miners have a hand in things we use every day,  
from beauty products to bed springs.

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AEROSPACE TEAM  
ROCKETS TO A WIN

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HOMECOMING  
2013

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SILVER AND GOLD  
DONORS

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## ◀ ON THE COVER

Miners are taught to push beyond theory to tinker with what could be. Many of the everyday items we rely on have a connection to a Missouri S&T graduate. Things like bleach, bed springs, shampoo bottles and trains, to name a few. Our favorites begin on page 22.

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## BRIEFLY { BY THE NUMBERS }

# 7,512

Students enrolled at Missouri S&T during the Spring 2013 semester. This is the highest spring enrollment since 1983.

S&T students who presented their research results to Missouri legislators during Undergraduate Research Day at the Capitol.

# 11

# 100

Missouri S&T freshmen who participated in FIRST robotics programs in high school. S&T will continue to host the FIRST Tech Challenge regional championship for three more years.



# 2

S&T Women's Mucking Team's place in the 35th International Intercollegiate Mining Competition held in Golden, Colo., in March. The Men's A Team placed third. Alumni teams placed first and third in their respective divisions and the Co-ed Team placed 10th out of 13 teams. S&T will host the competition in 2014.

# 530

Individual recruiters at the Spring 2013 Career Fair.

# 81

S&T's rank among the nation's best graduate engineering programs as reported in *U.S. News & World Report's* "America's Best Grad Schools" listing.

# 1

The Advanced Aero Vehicle Group's place in the advanced class at the Society of Automotive Engineers' annual Aero Design East competition held in Fort Worth, Texas, in March. See story on page 12.

## MISSOURI S&T MAGAZINE

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

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### S&T alumni touch everyday life.

This issue features Miners who craft and design the items we depend on every day — from the time you shampoo your hair in the morning until the moment you relax on your bed at night. Your fellow alumni, employed by companies like L'Oreal and Leggett & Platt, are the people who make these everyday items what they are — examples of innovative simplicity. A Missouri S&T education fuels creation and development of the essential goods and services that characterize our daily lives.

Issac Newton said, “If I have seen further it is by standing on the shoulders of giants.” Bearing in mind this apt



sentiment, I invite you to imagine all of the ways you are lifted up by fellow alumni each day. Whether you consider the knowledge and experience gained on campus or the well-known items we use every day, Missouri S&T has allowed you to do more and live better.

### Katie Jackson

associate editor and assistant director,  
alumni and constituent relations

# 5

## FACTS ABOUT KATIE

1. Finished with her coursework, Katie recently began her dissertation for a doctoral degree in education leadership and policy analysis from the University of Missouri-Columbia.
2. She moved to Rolla from Minnesota almost five years ago.
3. Her husband, Joe, works in the registrar's office and is enrolled in S&T's MBA program. Joe and Katie have two cats, Stella and Carl.
4. When Katie's not working or going to school, she's running. She has finished three half-marathons and a handful of 5- and 10-kilometer races.
5. Katie is faculty advisor to Zeta Tau Alpha sorority and is a member of the Chancellor's Retention Committee.

### CORRECTION

The picture that ran with the memorial for **Gary L Reynolds**, ME'73, in the Fall/Winter 2012 issue was actually **Kurt R. Seidinger**, ME'74, who lives in Drury, Mo. Their pictures were reversed in the 1974 *Rollamo*. The memorial notice and correct picture of **Gary L Reynolds** is on page 46 of this issue.

## EDITOR'S TOP FIVE PICKS

- 1 } An S&T microbiologist discovered an extreme microbe that can make biofuel production cheaper and reduce the need for fossil fuels. Learn more about this patented process on page 10.
- 2 } **Dianna Meyers**, CerE'09, donned sneakers and ran daily for 365 days in 2012. Read about her drive and energy — and her job at Accenture — on page 6.
- 3 } S&T senior **Jonathan Sanders** wants to travel to Mars and plans to help design a space vehicle to get him there. Read about his adventures as a SpaceX intern on page 21.
- 4 } Did you know that 3M, the company that makes Post-It Notes, began as a mining engineering company? Read about **Layland Watson**, MinE'96, plant manager in 3M's Decatur, Ala., plant on page 23.
- 5 } **Breenae Washington**, EMgt'12, says MasterCard is more than a payment company. It's a technology company that helps make the payment industry more secure. Read more on page 25.

Q

## What was your best (or worst) summer job?

Maybe it was the coolest job ever or maybe it was so bad you counted the seconds until summer ended. Either way, we asked about your summer jobs and you told us.

Watch for the next question in your Miner Alumni Association eNewsletter.

A

In the summer of 1979, I worked for Fiat-Allis' heavy equipment proving grounds south of Phoenix testing bulldozers, scrapers, loaders, etc., in high-temperature desert conditions. It was just like all those Tonka toys I played with as a kid, but in real life! It was our job to treat the machinery rough to see what we could cause to fail before it was commercialized for clients. The engineering manager seemed happy when I would come back to the shop with broken equipment, but then I would have to write up a failure report before I left for the day. Each morning, the plant manager would come out with the daily list of equipment we would operate that day. I usually got something fun, but one day I was assigned to the FL-1 (Front Loader-1), which I soon found out was a shovel. The full-time operators had a good laugh at the "college boy." It was a great summer job that combined testing and engineering in real-life conditions.

**Jim Marfice**, ME'80  
Gainesville, Texas

My best summer internship was at Microsoft in 1999. Got thrown into the code, learned that I didn't really know anything, and got to ship a feature in Internet Explorer that people revile and ridicule to this day.

**Jeff Davis**, CSci'00  
San Francisco

My best summer job was working at the S&T Rock Mechanics Lab. It was a fun summer and I learned so much, too! I learned how to weld while helping build an experimental waterjet contraption for recycling old tires. I'm thankful for patient instructors. I also learned how to drive a four-speed-on-the-column pickup truck, a diesel flatbed we picked up from Army surplus, and a skid steer loader with manual shift and leaky hydraulics. Good times, LOL!

**Greg Messler**, EMgt'99  
Denver, N.C.

I was a blasting engineering intern at Newmont Mining at the open pit Twin Creeks Mine. That summer I designed pattern, worked with blasters and engineers, and got to photograph the blast every day.

**Maggie Hettinger**, MinE'10  
Elko, Nev.

I worked at Bear River Ranch Science Camp and got to bottle-feed baby wallabies and feed snakes.

**Rexann Whorton**, Psyc'11  
Ava, Mo.

Last summer, I interned at American Geosciences Institute in Washington, D.C., and absolutely loved it! It was a great learning experience on the interactions of science and public policy, which is benefiting me now as I work on my master's degree back here in Rolla.

**Krista Rybacki**, GGph'12  
Nashville, Ill.

Submit your answers to [alumni@mst.edu](mailto:alumni@mst.edu), or respond via Facebook or Twitter, by Nov. 12, 2013.





The Spring 2013 magazine is outstanding. The range of coverage: cataract prevention, Benton art, 40 years of public radio, prostate cancer, personalities and computer science. Referring to the latter, I remember the large air-conditioned room with disks of tapes and the monitors outside. Even then, UMR as we proudly called it, was pioneering computer science courses and advancement. I believe I was the oldest undergraduate on campus at that time — 1972–75. Commencement came far too soon, but I remained connected with the university by coordinating its program at Fort Leonard Wood and with university support, initiating The University of the Third Age, holding classes in senior centers and retirement complexes in surrounding central and southern Missouri. Being a Missouri University of Science and Technology alumna is truly a status symbol.

**Barbara Clayton**, Engl'75  
Port Townsend, Wash.

Dear Editor,  
I would like to take this opportunity to thank you and all of the MSM, UMR and Missouri S&T alumni for so generously responding to the call for slide rules for the University Archives' collection! Since the magazine reached the homes of our thousands of alumni last March, I have received dozens of phone calls and emails, all offering to send us marvelous things! Our alumni sent slide rules (even a 4-foot one), a class ring (a gift to the alumnus from his mom), Rollamo yearbooks, photos of St. Pat's celebrations dating back to 1910, and on and on.

These are TREASURES to our archives! Please keep us in mind for your MSM/UMR/S&T goodies. Before you throw it away, call us at 573-341-4817 or email us at [ahmadd@mst.edu](mailto:ahmadd@mst.edu). And next time you're on campus, stop by Curtis Laws Wilson Library and check out our display case outside Room G-2. We change the display every quarter.

THANK YOU!  
Sincerely,

**Diana L. Ahmad**  
University Archivist



Some of the items that alumni recently donated to the University Archives.



**@Marsha\_gesualdi**

Marissa Gesualdi, senior, business and management systems, Rolla, Mo.

Changing your St. Pat's sweatshirt means it's a new outfit. Right? #105thbestever

**@UMPrez**

Tim Wolfe, president of the University of Missouri System, Columbia, Mo.

What a great weekend it has been celebrating #stpats #bestever @MissouriSandT! Grateful to be a 2013 Honorary Knight.

**@Notleks21**

Joseph Skelton, Bus'13, Potosi, Mo.

Pumped to be going to the Grad Fair today. :) Got my cap and gown, need I say more? Haha #Senioritis

**@DamonGuthrie**

Damon Guthrie, junior, engineering management, St. Louis

Time to go recruit the future of @MissouriSandT!!! #MinerDay

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## DIANNA MEYERS: IN IT FOR THE LONG RUN

*As a consultant for Accenture, Dianna Meyers spends a lot of time on the road. But that hectic pace doesn't keep her from hitting the pavement in her running shoes.*

Meyers, CerE'09, ran daily for 365 days in 2012 — missing only one day due to illness (2012 was a leap year). She jogged along the streets of Paris, on hotel gym treadmills from Peoria, Ill., to Beaverton, Ore., and, when no gym was available, up and down flights of hotel stairs. She even ran in place once in the far stall of a women's restroom in London's Heathrow Airport.

While she loves her work, the demanding travel schedule leaves little time for exercise. Meyers spends more time in hotels, airports and corporate meeting rooms than in her Kansas City, Mo., apartment or Accenture's office in Overland Park, Kan.

"Sleep goes by the wayside, fast food can become the norm, and then there

are client dinners at restaurants," says Meyers, who joined Accenture in October 2009. "Only being home around three days on the weekend doesn't give me much time to run to the grocery store to pick up fresh produce."

Inspired by a cousin who ran every day of 2011, Meyers decided to follow in her footsteps. "What I learned was that if I made it a priority, it would happen."

For Accenture, Meyers' priority is to help Fortune 500 companies clean up their data and improve the way they manage all their information and databases. She helps corporations tackle "data governance" issues by "pulling people together to discuss who the owners of the data are and what the quality rules are. We ask, 'Does everything need to be

checked? How are they keeping track of customer information and what are the relationships of the data?'"

It may seem like an odd career choice for a ceramic engineering major. Accenture, a global consulting and technology management company, hires many S&T graduates, ranging from information systems and technology and business majors to mechanical and electrical engineers.

But Meyers thinks her choice of major prepared her well for the job. "Ceramic engineering is about solving real-world issues," she says, "and that's what I get to do every day and I love it."

"I'm in it for the long run now until I stop learning," she says. ■





Ilene Morgan (right) with *Jeopardy!* host Alex Trebek. (Photo courtesy of Jeopardy Productions Inc.)

## PROFS ON TV FOR \$1,000, ALEX

*It took three tries, but Ilene Morgan finally succeeded in landing a spot on the game show Jeopardy! in 2012.*

**M**organ, an associate professor of mathematics and statistics, is well-known around campus and in the Rolla community for her expertise at trivia. Members of the Missouri S&T community gathered for a watch party for her *Jeopardy!* debut on March 5. She finished in second place.

Morgan's pursuit of an appearance on the program has been anything but trivial. Her quest began online, where she played the official version of the game all would-be contestants must complete. In 2007 and again in 2009, her score on the 50-question quiz was high enough to qualify her for a tryout.

That in itself is no small feat. According to Morgan, each year about 100,000 people take the online test and 2,000 to 3,000 are selected for an in-person audition. Of those, 300 to 400 will be selected annually as contestants on the show, which is now in its 29th season. Read more about her *Jeopardy!* experience at [rol.la/whatismorgan](http://rol.la/whatismorgan).

## ENGINEERING EDUCATION CENTER RELOCATES

The Engineering Education Center (EEC) has relocated to a new facility at a central location in St. Louis, sharing space with the University of Missouri-St. Louis West County Continuing Education Center. The EEC delivers 20 to 25 courses each semester, serving 400 to 500 students in Missouri and elsewhere.

"The facility can now simultaneously deliver up to four lectures to distance students as well as to the students on the Rolla campus and local students in St. Louis," says **Victor Birman**, professor of mechanical engineering and EEC director. "New equipment makes it possible to pre-record distance classes and archive them for students who can't attend real-time live lectures or who need repeated access to the lectures."

## CHANGING OF THE COACHING GUARD

Two S&T athletic programs announced coaching changes in March.

**Tyler Fenwick**, who served as offensive coordinator at Missouri Western State University for the past six seasons, was named head football coach. He replaces David Brown, who joined the coaching staff at Fresno State University.

**Gabe Hall**, an assistant coach at the University of Dayton for the past two seasons and a former assistant at two schools in the Great Lakes Valley Conference, was named head coach of the men's soccer program. He replaces Joe Ahearn, who is now an assistant coach at Northwestern University.

Read more about them at [minerathletics.com](http://minerathletics.com).

## IN PRINT

**Larry Gragg**, Curators' Teaching Professor and Chair of history and political science, is the author of a book on Las Vegas in popular culture titled *Bright Lights City: Las Vegas in Popular Culture*, published in April.



Model predicts growth of

# ‘SUPER-ORGANISM’ ANT COLONIES

*Assistant professor Chen Hou has developed a mathematical model that can predict the survival, growth and life span of ant colonies. According to Hou, smaller colonies — and the ants that inhabit them — tend to live faster, die younger and burn up more energy than larger colonies.*

A HORSE MAY  
BE 10,000 TIMES  
HEAVIER THAN  
A MOUSE, BUT  
IT DOESN'T  
CONSUME  
10,000 TIMES  
MORE ENERGY.

**H**ou compares the way ants act in a colony to how cells function in the body. He calls the colonies “superorganisms.” His study, in the journal *Biology Letters*, compared the rates of metabolism, growth, reproduction and longevity of individual ants with those same traits for entire colonies. He based his models on Kleiber’s Law, also known as “quarter-power scaling.”

As Hou explains it, a horse may be 10,000 times heavier than a mouse, but it doesn’t consume 10,000 times more energy. Applying quarter-power scaling, researchers can determine that a horse only consumes 1,000 times more energy.

Hou combined data from actual ant colonies with mathematical predictions and found that body mass and metabolic rates increased at a consistent, nearly three-quarter-power scaling rate for

worker ants and queen ants alike, as well as for their colonies.

Based on these findings, Hou and his colleagues then developed a mathematical model to predict colony lifespan by linking it with colony size, or mass.

Quarter-power scaling could also be applied to entire cities to see if they also function as “superorganisms.” Energy usage in a city, for example the number of gas stations or the total length of electrical cables, correlates to the size of the city, Hou says.

Comparing two similar people, the one living in the bigger city is more energy-efficient, Hou says. “As you can imagine, the number of gas stations per capita is smaller in New York than in St. Louis, and smaller in St. Louis than Rolla, which means more people share one gas station in New York than in St. Louis, than in Rolla.” ■

## MAPPING THE ROUTE TO STUDENT SUCCESS

*A group of Missouri S&T students is helping Garmin International Inc. develop new GPS products and technologies through an internship program at a new software engineering facility established on campus last fall.*

The facility supports semester-long part-time internships throughout the school year, says **Robert Buehler**, CSci'05, MS CSci'09, a software engineering team leader with Garmin and manager of the facility.

"The facility first opened in December and we're up to nine undergraduates so far," Buehler says. "They spend their days working on a variety of tasks for our aviation and automotive products, including embedded software, verification testing and internal tools."

Students work side-by-side with Garmin engineers and get hands-on experience developing future GPS products and technologies.

"We are open to providing internships to any qualified S&T students," Buehler says. "The software engineering focus lends itself most easily to computer science and computer engineering majors, but that hasn't stopped us from picking from others as well. These opportunities are going to be filled by the best fit for the company."

Garmin worked closely with S&T's office of technology transfer and economic development (TTED) to open the new facility, which is located in the Technology Development Center, a 22,000-square-foot building in Missouri S&T's Innovation Park.

"Students are given a lot of flexibility in their hours to compensate for the unique schedule of a full-time student, with many needing to work outside of standard business hours," Buehler explains. "We are very impressed with the caliber of students that S&T produces, and seeing how well they work with so little supervision reinforces that."

"We plan to be up to 20 interns by September and continue to expand here at Missouri S&T," Buehler says. ■



Robert Buehler, CSci'05, MS CSci'09, manages the Garmin facility located in Innovation Park.

## UNIVERSITY OF MISSOURI LEGISLATIVE DAY 2013

On April 3, Missouri S&T alumni and friends visited with lawmakers in Jefferson City to garner support for the four-campus University of Missouri System as part of Legislative Day at the Capitol. Attendees included:

**Jim Foil**, CE'74; **Dan O'Sullivan**, Phil'82; **Matt Coco**, CE'66; **Bob Bay**, CE'49; and **Michael McMenu**, LSci'81.

Missouri S&T representatives included: Chancellor **Cheryl B. Schrader**, **Darlene Ramsay**, **Katie Jackson**, **Nancy Zamazanuk**, **Katie Machovsky**, **Steve Tupper**, **Eric Bohannon**, **Edna Grover-Bisker**, **Glenn Morrison**, **Matt Limmer**, **Randy Stoll** and **Mike Bassett**.

## MISSOURI S&T CAREER FAIR

Career opportunities and employer relations hosted its Spring 2013 Career Fair on Feb. 19 with 197 employers in attendance, including 22 new employers. S&T students and alumni visited with 530 recruiters in hopes of landing a full-time job, internship or co-op opportunity.

## STAT HOSTS BREAKFAST FOR ALUMNI

Before the Spring Career Fair began, alumni recruiters were treated to a continental breakfast hosted by the student alumni association, Students Today, Alumni Tomorrow (STAT), and S&T's Engineers Without Borders.



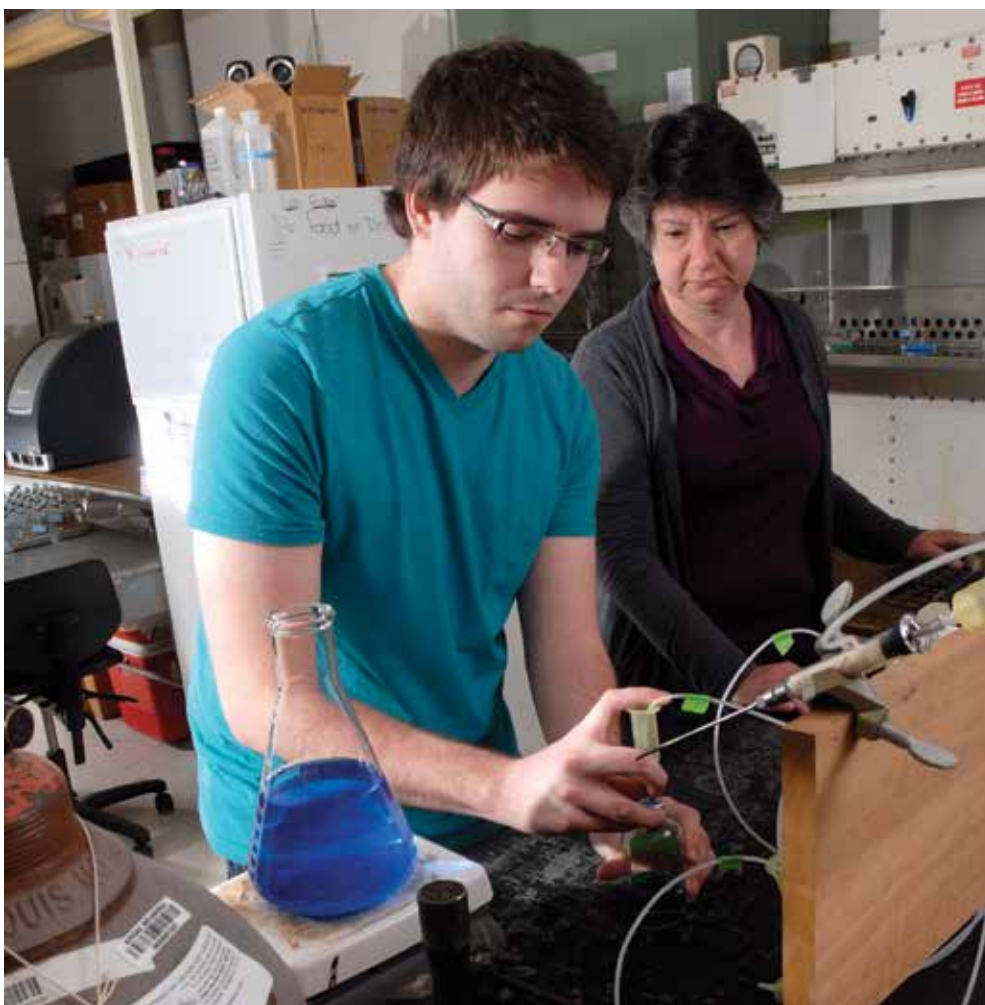
Dylan Courtney, a senior in chemical engineering, helped microbiologist Melanie Mormile patent a process to improve biofuel production using bacteria. ►

## EXTREME BUG BOOSTS BIOFUEL PRODUCTION

*Using a microbe that thrives in extreme conditions, Melanie Mormile patented a process that could streamline biofuel production, making it less costly and reducing the reliance on fossil fuels.*

**M**ormile, a professor of biological sciences, discovered a particular bacterium, called *Halanaerobium hydrogeniformans*, that thrives in high-alkaline, high-salt conditions. The bacterium can eliminate the need to neutralize the pH of the biomass, a step required in the alkali treatment of biomass to produce hydrogen fuel and other biofuels. Mormile and her fellow researchers have been awarded two patents for developing a biofuel production process that uses the microbe.

The conventional method of biofuel production involves the steam-blasting of switchgrass and straw to separate lignin, an unnecessary byproduct, from



the cellulose that is needed to create the biofuel. The process requires electricity, usually produced by either coal or natural gas, to generate the steam. That process releases considerable amounts of carbon dioxide while burning fossil fuels. The breakdown of the lignin produces compounds that inhibit fermentation and lead to lower hydrogen yields.

Treating the switchgrass and straw with an alkaline substance removes the lignin with limited formation of the harmful compounds, but the resulting slurry is highly alkaline and very salty. Before the discovery of *Halanaerobium hydrogeniformans*, a neutralization step was required before the fermentation process could begin. Using Mormile's bacterium, that step can be eliminated.

"We realize this isn't going to solve all the transportation fuel problems, but we'd like to see this develop into regionalized solutions," Mormile explains. "Farm communities could take agricultural waste, perform the alkaline pretreatment, feed it to an onsite reactor and produce hydrogen fuel directly for use on the farm."

Mormile studies extremophiles — life forms that exist in extreme conditions. The *Halanaerobium hydrogeniformans* bacterium used in Mormile's hydrogen fuel production study came from Washington's Soap Lake, which is unique in that it has not turned over in more than 2,000 years because of its high salinity. Its water has the same pH as ammonia and is 10 times saltier than seawater. ■



## ◀ BATTLE OF THE BRAINS

Scholarship donors and the students who benefit from their generosity pooled their brain power on April 19 to vie for the title of "Smartest Miners" as part of the Battle of the Brains trivia challenge during MinerFest. The evening, which included a casual picnic dinner, was filled with recognition and fellowship.

## CELEBRATING THE CLASS OF 2013

On May 14, the Miner Alumni Association hosted its biannual Grad Finale celebration for graduating seniors. Students celebrated their graduation with a free barbecue outside the alumni office. The association welcomed about 170 graduates into the Miner alumni family at this event.





## KNIGHTS OF ST. PATRICK

Eight alumni and friends of Missouri S&T were dubbed Honorary Knights of St. Patrick during the 105th Best Ever St. Pat's Celebration in March. Retired Rolla Police Chief **Stan Spadoni** was named Honorary St. Pat and served as marshal of the St. Pat's parade.

### 2013 HONORARY KNIGHTS

- **Roger Dorf**, ME'65, chair of the board of Airwalk Communications and member of the board of the National Chamber Foundation of the U.S. Chamber of Commerce
- **Mark Fitch**, associate professor and assistant chair of environmental engineering at Missouri S&T
- **Steve Hargis**, director of public works for the city of Rolla
- **Shenethia Manuel**, associate vice chancellor of human resource services, affirmative action, diversity and inclusion at Missouri S&T
- **Jason Smith**, 8th District U.S. representative
- **Don Sparlin**, professor emeritus of physics at Missouri S&T
- **Timothy Wolfe**, president of the University of Missouri System
- **Joan Woodard**, Math'73, a consultant and retired executive vice president at Sandia National Laboratories.



Daiki Nuiki (left) and Justin Nichols work on the team's plane. (Photo by Bob Phelan)

## AEROSPACE TEAM ROCKETS TO A WIN

Despite crashing its first plane during testing, Missouri S&T's Advanced Aero Vehicle Group won the Society of Automotive Engineer's 2013 Aero Design East competition. Sponsored by Lockheed Martin, the competition was held in Texas in March at the Fort Worth Thunderbirds Flying Field.

The competition required the students to design and build an 8-pound aircraft capable of carrying a 15-pound static payload and a 3-pound "humanitarian aid package," a sandbag that was to be dropped on a target from 100 feet in the air. Scoring was based on the sandbag's proximity to the specified target.

S&T's team earned first place in the presentation portion of the competition and third place in design. The team was in first place overall at the end of the first day.

No team in S&T's class was able to successfully complete the flight portion of the competition. Teams struggled in the strong Texas winds and even after achieving liftoff, many vehicles crashed or failed to target the designated drop zone. With no points being awarded for the flight aspects, the Miners remained in first place. ■





## OPEN SKIES

- \$90B** Projected global spending on unmanned aircraft by 2023
- 1,428** Number of drone permits FAA has issued since 2007
- 2015** Year U.S. government is expected to begin issuing commercial drone permits

*Global spending data is from Teal Group. Drone permit information is from the Federal Aviation Administration.*

- ◀ Computer engineering sophomore Chris Seto controls this “multicopter,” designed to inspect bridges safely and efficiently by remote control.

# REMOTE-CONTROLLED BRIDGE MONITORING

*The current method of inspecting bridges for structural damage is labor-intensive and, in some instances, dangerous to all involved. But Zhaozheng Yin is developing a safer, more efficient solution dubbed the “multicopter.”*

The system monitors the health of bridges by collecting data autonomously and then detecting patterns that provide clues about the structures' integrity.

The “multicopter” gets its name from its appearance. The radio-controlled mini-helicopter has multiple propellers to lift it into the sky and is loaded with an assortment of cameras, sensors and other technology that help it to maneuver and hover. Yin's group has created several versions of the machine, including a hexacopter (six propellers) and a quadcopter (four propellers).

While the flying machine may not be groundbreaking, it is incredibly practical, says Yin, an assistant professor of computer science at S&T.

“Imagine you need to perform a check-up on a bridge that is over an extremely fast-flowing river, or even spans a section of the ocean,” says Yin. “The standard procedures are extremely labor-intensive and time-consuming. With a multicopter, you have a feasible solution to a dangerous problem.”

Yin's research is funded by Lockheed Martin and sponsored by the Mid-America Transportation Center, a consortium of Midwestern universities based in Lincoln, Neb.; Missouri S&T is a member of the group. The finishing touches of this project are set to be completed by December 2013. **Chris Seto**, a sophomore in computer engineering, and **Yunxiang**

**Mao**, a Ph.D. candidate in computer science, work with Yin.

“These aircraft can be very precisely flown, so even in sensitive environments, such as those with many obstacles, the aircraft can still be successfully maneuvered,” Seto says.

“In the future, besides its initial intentions for bridge structure monitoring, this technology could be incorporated into military or corporate use,” Yin says. “Similar to drone uses, auto-detection and tracking is going to be important. Or even something like farming. If you have 60 acres of corn, you can monitor which areas need attention or irrigation, or find where the cows are on a very large farm.” ■





**SUMMONING ALL  
SUPER MINERS TO  
RETURN!  
REUNITE!  
RECONNECT!  
IN ROLLA!**

LIKE OUR MIRACULOUS MINER METALS, SILVER AND GOLD, THE PECULIAR, PRETERNATURAL POWERS OF MINERS PAST AND PRESENT WERE FORGED IN THE FURNACE OF PERSEVERANCE AND PERSISTENCE. NOW, WE'RE CALLING ON YOU TO JOIN HUNDREDS OF YOUR FELLOW MINERS IN ROLLA THIS FALL TO REDISCOVER THE SOURCE OF YOUR SUPER POWER. THE GREATER OUR NUMBERS, THE STRONGER OUR POWERS. JOIN US FOR A HOMECOMING OF HEROIC PROPORTIONS.



# UNCOVER A HOMECOMING OF HEROIC PROPORTIONS...

## FRIDAY, OCT. 18

### ALUMNI ASSOCIATION MINER LEGENDS LUNCHEON

Noon–1:30 p.m.

Havener Center, St. Pat's Ballroom

Help us honor our Miner superheroes at the Miner Legends Luncheon.

Tickets for event: \$20

### SILVER AND GOLD GATHERING

5–8 p.m.

Alumni Patio, Castleman Hall

Social Time: 5–8 p.m.

Dinner Buffet: 6–7:30 p.m.

Tickets for event

- \$25 for adults
- \$10 for children ages 6 to 12
- Free for children under age 6

Kick back and relax with family and friends for a casual buffet dinner on the patio. Meet the Super Miners, including our 2013 Miner Alumni Association awardees and student design team members.

## SATURDAY, OCT. 19

### SUPER MINER 5K

9 a.m.

Allgood-Bailey Track

Join the Central Ozarks Section for a beautiful run, jog or walk through the S&T campus. All alumni, friends, faculty, staff and students are welcome.

Registration fee

\$15 for students (K–college)

\$20 for alumni

### FOOTBALL GAME, MINERS VS. ST. JOSEPH'S COLLEGE

1 p.m.

Allgood-Bailey Stadium

Tickets for event

- \$8 for adults
- \$6 for students (K–college) and seniors age 65+
- Free for children under age 6 and S&T students with a valid student ID

### KICK-OFF TAILGATE PARTY

11 a.m.–1 p.m.

Alumni Tent, Gale Bullman

Multi-Purpose Building parking lot

Join us for a tailgate party with grilled hot dogs and hamburgers, \$1 beer and other tailgate goodies.

Tickets for event

- FREE for those who pre-register online or call by Oct. 11, 2013

Tickets purchased at the door:

- \$10 for adults
- \$5 for children ages 6 to 12
- Free for children under age 6

## REGISTER TODAY

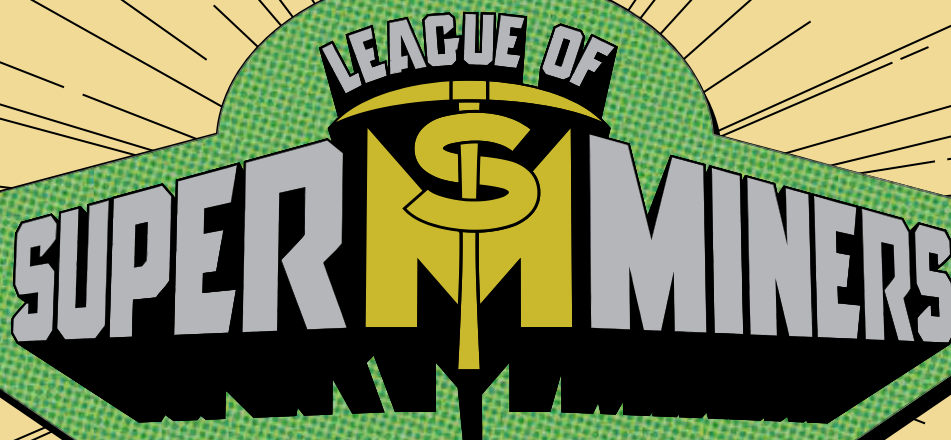
Register online at  
[mineralumni.com/homecoming](http://mineralumni.com/homecoming)  
or call 800-JOMINER

## WHEN YOU ARRIVE ...

All alumni should pick up their registration packets at the Homecoming Welcome Desk:

- 1–7 p.m. Friday, Oct. 18, in Castleman Hall
- 10:30 a.m.–1 p.m. Saturday, Oct. 19, at the Alumni Tent in the Gale Bullman Multi-Purpose Building parking lot





# LEAGUE OF SUPER MINERS

## A HOMECOMING OF HEROIC PROPORTIONS

### THURSDAY, OCT. 17

#### GEOLOGY AND GEOPHYSICS ADVISORY BOARD MEETING

10–11:30 a.m.  
Havener Center, Mark Twain Room

#### ACADEMY OF ENGINEERING MANAGEMENT PICNIC

11:30 a.m.–1 p.m.  
Schuman Park, lower pavilion

#### ACADEMY OF MECHANICAL AND AEROSPACE ENGINEERS BOARD OF DIRECTORS MEETING

12:30–4:30 p.m.  
Havener Center, Silver and Gold Room

#### ACADEMY OF MECHANICAL AND AEROSPACE ENGINEERS INDUCTION DINNER

5–10 p.m.  
Matt's Steakhouse, 12200 Dillon Outer Road, Rolla

#### ACADEMY OF COMPUTER SCIENCE BANQUET

Reception: 6 p.m. Dinner: 7 p.m.  
Matt's Steakhouse, 12200 Dillon Outer Road, Rolla

#### GEOLOGY AND GEOPHYSICS HOMECOMING BANQUET

6–9 p.m.  
Havener Center, Carver-Turner Room  
Cost \$25

RSVP to Patty Robertson at [patty@rmst.edu](mailto:patty@rmst.edu) or call  
573-341-4616 and indicate if vegetarian meal is desired.

### FRIDAY, OCT. 18

#### ACADEMY OF MECHANICAL AND AEROSPACE ENGINEERS ANNUAL MEMBERSHIP MEETING

7:45 a.m.–2 p.m.  
Matt's Steakhouse, 12200 Dillon Outer Road, Rolla

#### ACADEMY OF MECHANICAL AND AEROSPACE ENGINEERS SPOUSE AND GUEST EVENT

8 a.m.–2:30 p.m.  
Location TBD

#### SOUVENIR REPRINTS OF YEARBOOK PHOTOS

8 a.m.–4 p.m.  
Provided by Curtis Laws Wilson Library,  
Havener Center atrium

#### ACADEMY OF COMPUTER SCIENCE MEETING

8:30 a.m.  
Room 327 Computer Science Building

#### ACADEMY OF ENGINEERING MANAGEMENT BUSINESS MEETING

8:30 a.m.–noon  
Engineering Management Conference Room  
Room 226 Engineering Management Building

#### MINER ALUMNI ASSOCIATION COMMITTEE MEETINGS

9 a.m.–4:30 p.m.  
Havener Center

#### ACADEMY OF MINES AND METALLURGY MEETING

9:30 a.m.–3 p.m.  
Havener Center, Silver and Gold Room

#### ORDER OF THE GOLDEN SHILLELAGH EXECUTIVE MEETING

10–11 a.m.  
Room 107 Castleman Hall

#### ALUMNI ASSOCIATION MINER LEGENDS LUNCHEON \*

Noon–1:30 p.m.  
Havener Center, St. Pat's Ballroom

#### ACADEMY OF MINER ATHLETICS COMMITTEE MEETINGS

Noon–4 p.m.  
Hall of Fame Room, Gale Bullman  
Multi-Purpose Building

#### HOMECOMING REGISTRATION

1–7 p.m.  
Castleman Hall

#### BIOLOGICAL SCIENCES DEPARTMENT HOMECOMING PICNIC

2:30–4 p.m.  
Schrenk Hall, front lawn

#### JACKLING JOCKS DINNER

5 p.m.  
Castleman Hall

#### SILVER AND GOLD GATHERING \*

5–8 p.m.  
Alumni Patio, Castleman Hall

#### ACADEMY OF MINER ATHLETICS BANQUET AND INDUCTION CEREMONY

5–8:30 p.m.  
Castleman Hall

### SATURDAY, OCT. 19

#### SUPER MINER 5K \*

9 a.m.  
Allgood-Bailey Track

#### ALUMNI ASSOCIATION BOARD AND ANNUAL MEETING

8–11 a.m.  
Havener Center

#### HOMECOMING PARENT MEETING AND RECEPTION

10 a.m.  
Havener Center, St. Pat's Ballroom A and B

#### HOMECOMING REGISTRATION

10:30 a.m.–1 p.m.  
Alumni Tent, Gale Bullman Multi-Purpose Building  
parking lot

#### MISSOURI SET ATHLETIC HALL OF FAME ROOM OPEN TO VISITORS

11 a.m.–12:30 p.m.  
Gale Bullman Multi-Purpose Building

#### KICK-OFF TAILGATE PARTY \*

11 a.m.–1 p.m.  
Alumni Tent, Gale Bullman Multi-Purpose Building  
parking lot

#### FOOTBALL GAME, MINERS VS. ST. JOSEPH'S COLLEGE \*

1 p.m.  
Allgood-Bailey Stadium

\* SEE PAGE 15 FOR DETAILS.

# REGISTRATION:

## FRIDAY

1-7 P.M.

UNIVERSITY ADVANCEMENT OFFICE  
IN CASTLEMAN HALL

## SATURDAY

10:30 A.M.-1 P.M.

ALUMNI TENT AT GALE BULLMAN  
PARKING LOT

### REUNION OF ELECTRICAL ENGINEERING GRADUATES OF '62, '63 AND '64

2-5 p.m.

Faculty Lounge, Emerson Hall

RSVP to Tom VanDoren at vandoren@mst.edu

### JACKLING JOCKS ANNUAL BANQUET AND BUSINESS MEETING

6-9 p.m.

Location TBD

### SUPER MINER ALUMNI SOCIAL

7-10 p.m.

Public House Brewing Company  
600 N. Rolla St., Ste. B

Drop in for a pint and enjoy some local music. Come  
and go as you please. Payment may be made directly  
to the brewery.

## SUNDAY, OCT. 20

### CHANCELLOR'S ADVISORY COMMITTEE ON AFRICAN AMERICAN RECRUITMENT AND RETENTION MEETING

1-3 p.m.

Location TBD

## SPECIAL CELEBRATIONS

### SIGMA NU 110TH ANNIVERSARY

For more information contact Darren Peeler at  
darrendpeeler@gmail.com

### JACKLING JOCKS 16TH ANNUAL REUNION

For more information contact Delbert Day at  
573-364-5569 or day@mst.edu, or Newton Wells  
at 979-690-3650 or mnwells1@verizon.net.

### ROLLA CATHOLIC NEWMAN CENTER 60TH ANNIVERSARY

Time TBD, Sunday, Oct. 20

For more information contact Don Bagat at  
573-364-2133 or campusminister@rollanewman.org.

### DEPARTMENT OPEN HOUSES

3-4 p.m. Friday, Oct. 18

To find out if your department is hosting an open house,  
visit [mineralumni.com/homecoming](http://mineralumni.com/homecoming)

Those planning to host to date are:

- Business and Information Technology
- Chemical and Biochemical Engineering
- Economics and Finance
- Electrical and Computer Engineering
- Mechanical and Aerospace Engineering
- Mining and Nuclear Engineering

# MEET OUR HEROES!

Illustrations by Dave Bryant

### ALUMNI ACHIEVEMENT

- Col. John Pierre Powell, AE'87, president, PAMCO Investments Corp.
- LeRoy E. Thompson, CE'56, MS CE'65, retired principal and vice president, C3TS, and emeritus professor, Florida International University

### ALUMNI MERIT

- Kathryn A. Walker, MS EMgt'82, managing director, OPENAIR Ventures

### ROBERT V. WOLF ALUMNI SERVICE

- Bradley H. Hornburg, CE'69, CEO, Landmark Contract Management Inc.

### DISTINGUISHED YOUNG ALUMNI

- Daniel P. Ellis, CE'99, vice president, Crafton Tull and Associates
- Karlynn Sievers, Engl'96, LSci'96, physician and clinical assistant professor, University of Wyoming

### FRANK H. MACKAMAN ALUMNI VOLUNTEER SERVICE

- Jerry D. Parsons, CE'70, retired materials engineer, Illinois Department of Transportation

### CLASS OF 1942 EXCELLENCE IN TEACHING

- Jennifer Pattershall, assistant professor of psychological science at Missouri S&T



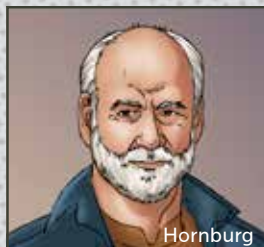
Powell



Thompson



Walker



Hornburg



Ellis



Sievers



Parsons



Pattershall

SEE THEIR SECRET IDENTITIES AT [MINERALUMNI.COM](http://MINERALUMNI.COM) ...



## A NEW OLD TRADITION

St. Pat's arrival in downtown Rolla aboard a railroad handcar on March 13 marked the revival of an old tradition. In the early days, St. Pat arrived in Rolla by rail, but that tradition was derailed in 1996 because of safety concerns. In recent years, he arrived on a custom manure spreader. **Robert Hribar**, a senior lab mechanic in mechanical and aerospace engineering and a 2012 Honorary Knight of St. Patrick, worked with St. Pat's Board members to modify the handcar for street travel.



## HONORING A GEOLOGY LEGEND

The late **A.C. Spreng** was passionate about rocks and passed that enthusiasm on to generations of S&T geology and geophysics students. In January, local artist Lynn Grannemann donated her mixed-media painting "Exploring Missouri's Past" to Missouri S&T in Spreng's memory. "I contacted Dr. Spreng when I needed fossils and rocks for this piece," says Grannemann. "He was so helpful and kind. I continually needed more and more samples and he graciously allowed me to borrow them."

Pictured with Grannemann (right) are **Ralph Flori**, PetE'79, MS PetE'81, PhD PetE'87, associate professor and chair of geological sciences and engineering, and **Francisca Oboh-Ikuenobe**, professor of geological sciences and engineering.







Jie Gao (left) and Xiaodong Yang report that a new class of nanoscale slot waveguides pack 100 to 1,000 times more transverse optical force than conventional silicon slot waveguides.

## GIANT FORCES IN SUPER-STRONG NANOMATERIALS

*In a study that could lead to advances in the emerging fields of optical computing and nanomaterials, Jie Gao and Xiaodong Yang, both assistant professors of mechanical engineering, report that a new class of nanoscale slot waveguides pack 100 to 1,000 times more transverse optical force than conventional silicon slot waveguides.*

The findings, which were published in the Sept. 24 issue of the journal *Optics Express*, could lead to advances in developing optical computers, sensors or lasers.

Gao and Yang describe the unusual optical and mechanical properties of nanometer-scale metal-dielectric structures called metamaterials. Using computers, they simulated nanometer-scale models of metamaterial slot waveguides, which are structures designed to channel beams of light from one area to another. Waveguides function like tiny filaments or the wires of an integrated circuit, but on a much smaller scale.

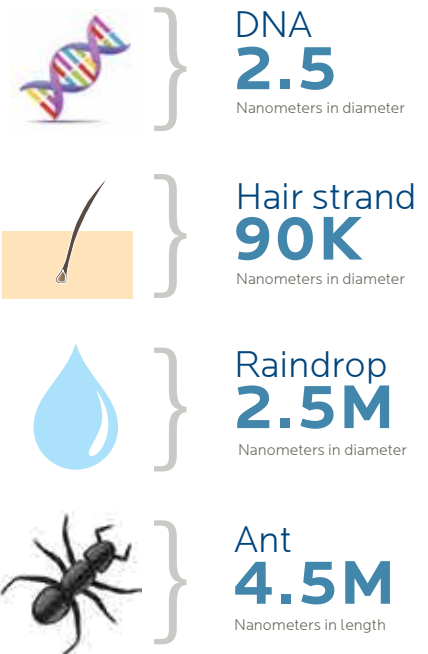
For their study, the Missouri S&T researchers simulated slot waveguides made of layered structures of silver and a dielectric material arranged like the alternating bread and meat in a club sandwich. A nanometer — visible only with the aid of a high-power electron microscope — is one billionth of a meter, and some nanomaterials are only a few atoms in size.

Gao and Yang simulated what would happen with modeled identical waveguides stacked with a tiny air gap between them. They then measured the transverse optical force between the waveguides. Optical force refers to the way beams of light can be made to attract or repel each other, as magnets do.

They found that “the transverse optical forces in slot waveguides of hyperbolic metamaterials can be more than two orders of magnitude stronger than that in conventional dielectric slot waveguides.” For this reason, Gao and Yang describe the magnitude as “giant” in the title of their *Optics Express* article, “Giant transverse optical forces in nanoscale slot waveguides of hyperbolic metamaterials.” ■

## JUST HOW SMALL IS NANO?

One nanometer is one-billionth of a meter. It's difficult to imagine just how small that is, so here are some examples according to the National Nanotechnology Initiative:



## RESEARCH UPDATE

In a process comparable to squeezing an elephant through a pinhole, **Jie Gao** and **Xiaodong Yang** have designed a way to engineer atoms capable of funneling light through ultra-small channels. Their research is the first to demonstrate that the material — a specially designed “meta-atom” of gold and silicon oxide — can transmit light through a wide bandwidth and at a speed approaching infinity.

# SPORTS BY THE NUMBERS

Total points scored by **Mary Ann Bradshaw** in the indoor pentathlon at a February 2013 Illinois Wesleyan meet. This is a new school record.

3,224

7

Consecutive New South Intercollegiate Swimming Championships titles Missouri S&T has won. Next year, the Miner swimming team will compete in the Great Lakes Valley Conference.

Total career pitching wins by starters **Kyle Robertson**, **Chris Bowe** and **John Auble** heading into the 2013 season.

25

139

**Toni Knar**'s career three-point total, second on Missouri S&T's all-time list.

5

Capital One Academic All-America selections at Missouri S&T for the 2012–2013 season as of the end of May. They are **Adam Stensland**, NucE'13, and **Caleb Collier** in men's soccer, **Brian Peterson**, ChE'11, in football, **Jennifer Costello**, ChE'13, in volleyball and **Kaylea Smith** in softball.

24

**Kaylea Smith**'s career home runs — the fifth most in school history. Smith was named to the Capital One Academic All-American second team for Division II Softball.

169

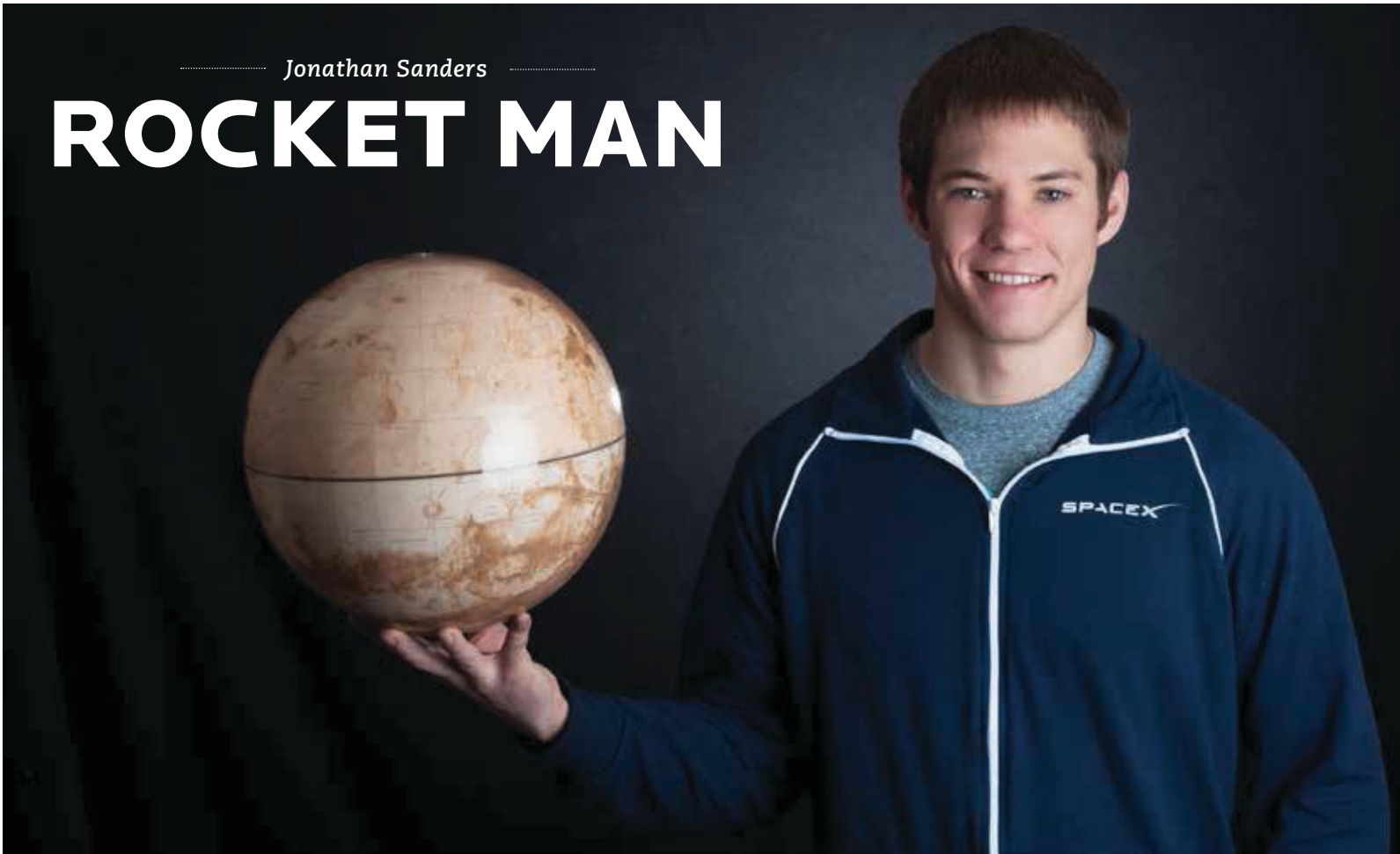
Hits in **Will Morrison**'s baseball career — a total that ranks sixth on S&T's all-time best list.

7.9

Rebounding average for Miner basketball player **Mudi Eruteya**, who ranked fourth in the Great Lakes Valley Conference.

Jonathan Sanders

# ROCKET MAN



*Jonathan Sanders wants to be involved in the next great space race — and not just as an engineer helping design future space vehicles. He also wants to fly to Mars.*

“Duct-tape me to a rocket — I’m ready,” says Sanders, a senior aerospace engineering major from Webb City, Mo.

Sanders got a head start on his dream last summer as an intern for SpaceX, the California-based rocket manufacturer. Working in the company’s manufacturing and engineering area, a division of the structures department, Sanders helped develop the heat shield for SpaceX’s Dragon spacecraft. Last August, the Dragon successfully attached and delivered cargo to the International Space Station, becoming the first commercial spacecraft to do so.

Being a part of that historic achievement fueled Sanders’ desire to pursue space

exploration. He is again interning this summer at SpaceX (Space Exploration Technologies Corp.). “My contributions were relatively small,” he says, “but I’ve always wanted to work with something that goes into space.”

His plans for the future are much more ambitious.

“I would like to put people on Mars,” says Sanders. “Putting people on another planet and extending as far as we can — that’s science fiction becoming reality. What could be cooler?”

Sanders took an unconventional route to his internship. After speaking at S&T’s Alumni of Influence event in November

2011, he met one of the evening’s honorees, **Brian Matthews**, ME’81, founder of River City Internet Group in St. Louis. Intrigued by Sanders’ interest in SpaceX, Matthews contacted some of his connections at the company. From there, Sanders “got a call from a recruiter, and after that I got a call for an interview.”

So launched Sanders’ career as a SpaceX intern.

“We’re involved in a space race again,” he says. “It’s a different kind of space race because it’s based on private competition, which drives the price to go into space. It’s very exciting.” ■

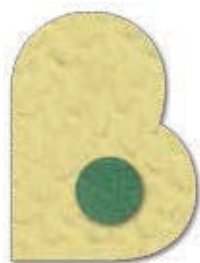


Nine different alumni — and the companies that employ them — are represented in this issue. Their stories illustrate just a few of the ways that Miners touch our everyday lives. We may not know what tomorrow's great must-have will be. But we know our grads will be involved in making it.

BEYOND

# MINING

by Mindy Limback | limbackm@mst.edu



y the time **Layland Watson** left Rolla in 1996, he knew how to drive a haul truck, design a mine, and work in open pit copper mines

and underground coal mines — tasks a mining engineer would normally expect to have acquired after some time on the job.

“I truly believe the co-op opportunities in Rolla prepare you to go to work,” Watson says. “You work a regular schedule and it prepares you for real life. It gives you instant credibility with prospective employers.”

With four co-ops under his belt, Watson, MinE’96, joined 3M as a process engineer for an open-pit quarry in Little Rock, Ark. The facility produced roofing granules — the small, coated pieces of rock found on roofing shingles.

People don’t always associate 3M with mining, but the company was founded in 1902 as the Minnesota Mining and Manufacturing Co., Watson says.

Mining has been part of Watson’s whole life. He was born in a gold-mining town in Western Australia and grew up in Rolla under the watchful eye of his father, former metallurgical engineering chair **John Watson**.

After leaving Arkansas, Watson worked at a number of 3M facilities across the United States. While working as a product manager at a multi-technology plant in Cumberland, Wis., he was asked to help lead the micro-finishing film business. He enrolled in the University of Minnesota’s Carlson School of Management and spent every Friday and Saturday night in class for two straight years to earn his MBA.

“I was in Cumberland for three years before I left to work at the headquarters in St. Paul,” Watson says. “It was a project management assignment, known within the company as a black belt position that let me lead projects for Scotch Brite products and window films. I then went on to a plant manager role in Northern California at an optical film manufacturing facility.”

Today, Watson is the plant manager at a facility in Decatur, Ala. The plant manufactures specialty resins and films that serve as the base for many finished products.

“The great thing about 3M is we’re so diverse that even a guy in mining engineering can advance,” Watson says. “You aren’t pigeonholed. You can progress to be what you want to be.”



Photo by Lauren Tomasella Photography

“I TRULY BELIEVE THE CO-OP OPPORTUNITIES IN ROLLA PREPARE YOU TO GO TO WORK.”



IT'S ABOUT

# quality

by Mindy Limback | limbackm@mst.edu



**Brad Lind**, EMgt'96, is a quality guy. To him, quality — the continuous improvement of products and services — is a key driver in improving consumers' lives.

A member of The Clorox Co.'s corporate quality assurance team, Lind focuses on reducing risks and increasing consumer value with new and existing products.

A 16-year veteran of the company, Lind and other members of his team do that by examining the several different data streams available from all the business units — from its namesake bleach and cleaning products unit to Kingsford charcoal. He takes a systematic approach to driving out waste at the plant.

"We are the guardians for the consumer," he says of his team. "We have the right processes, tools and systems to build great brands for customers and consumers."

After graduation, Lind joined First Brands Corp. in Rogers, Ark., as a production supervisor at a Glad manufacturing plant. It was a typical entry-level position for an engineer with the company.

"During the interview process, I went on site to the plant," he says. "If you had told me before I went that it would have been a good fit, I would never have believed it. But it truly was a great fit for me personally and professionally."

Lind liked that Clorox Co. is a true manufacturing facility and over time, he says, he got to see it move from manual processes to automation. The company now embraces technology, Lind says.

Lind had the opportunity to take on different roles after Clorox acquired First Brands in 1999.

"After the acquisition, Clorox was nearly twice the size of the former First Brands Corp.," he says. "It's been great."

Photo by Michael's Photography







After leaving Arkansas, Lind joined the leadership teams at a Glad manufacturing plant in Amherst, Va., and then later at Forest Park, Ga. At that time, due to supply chain needs, the company closed a couple of plants and shifted its operation to the Atlanta area.

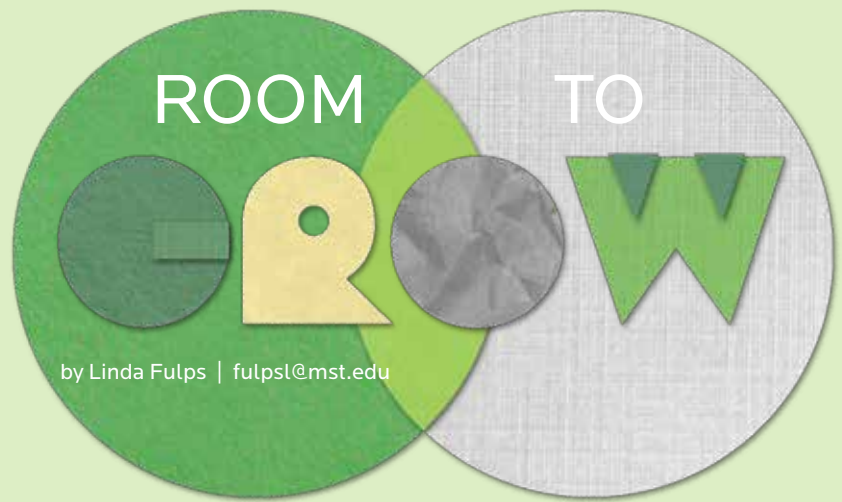
For the last three years, Lind has worked in a satellite office in Kennesaw, Ga., where operation services and R&D teams are housed.

"If you've been around manufacturing long enough, and doing enough, you develop an invaluable lens," he says. "Getting experiences in the plant is a great place to get started for anyone who's going to get in the world of manufacturing. You understand how critical people, processes and technology are to drive out waste and achieve your goals."

Outside of work, Lind enjoys spending quality time with his family. He and his wife, Angela, have a 10-year-old son and an 8-year-old daughter. A former Miner football player, Lind now finds himself on the sidelines, coaching his son's football and basketball teams or cheering on his daughter's competitive gymnastics team.

As Clorox celebrates its 100th anniversary this year, Lind credits the company's success to its emphasis on finding the right people.

"We're relatively small and competing with giants, but we're boxing above our weight," he says. "We have great people who work together, understand business and consumer needs, and understand how to get product to market quickly."



## Breenae Washington, EMgt'12, didn't know what to expect when she started her first job after graduation.

"I thought I'd be treated like an intern, but I'm not," she says of her project management position with MasterCard in O'Fallon, Mo. "Although there's a steep learning curve, I'm learning as I go."

Washington says she's discovered there's a big misperception about the company. "We're not a payments company — we're actually a technology company that works on solutions to make the payment industry more safe and secure," she says. "We don't issue cards or control interest rates."

As a member of the global project management office, Washington helps manage the financial aspects, plans and team schedules for projects.

"I get a lot of exposure to different things here," she says. "I worked on the environment testing phase of Priceless Cities, a unique program that gives holders one-of-a-kind experiences around the world, including fine dining, world-class sporting events and indulgent shopping experiences. It started in New York and has expanded to 20 cities around the globe."

She's also part of a team that is working to help MasterCard better market itself to top talent.

"It's easy to find the positives about working here," she says. "MasterCard cares about its employees' development and job satisfaction, and it promotes from within. I can set my own path here."



Photo by Tim Parker Photography

# IT STARTED WITH A

by Mary Helen Stoltz | mhstoltz@mst.edu



arthage, Mo.-based Leggett & Platt manufactures a broad array of products, so it's only fitting that one of the company's staff vice presidents has an equally broad resume of experience.

**Randall Wood**, ME'85, MS ME'87, began work at Leggett & Platt as a director of operations optimization nine years ago. He moved into a leadership role and then took his current position. Today, a typical workday begins before 6:30 a.m. Wood says the early hour

gives him time to prepare for the day's meetings and planning sessions.

Wood credits his broad experience prior to joining Leggett & Platt with his career success.

After graduation he began work for General Electric analyzing heat

transfer in the engines of F-16 aircraft. He left GE to pursue a Ph.D. from the University of Missouri-Columbia to "get closer to manufacturing," he says.

While finishing his Ph.D. dissertation, Wood took a job at Joplin, Mo., based Able Body Corp., designing sleeper cabs for the heavy truck industry. After a product launch, he took on a lean manufacturing role in the company that expanded his business expertise.

Wood then took a job managing a Vermeer plant in Iowa that made stump grinders, brush chippers and large tub grinders. After a short stint as a stay-at-home dad, Wood joined Simpler Consulting to provide lean manufacturing solutions to companies like Lockheed Martin and Snap On Tool.





Randall Wood, ME'85, MS ME'87 right, a staff vice president, leads Leggett and Platt's business system office. The photos on page 26 show some of the company's 130-year history. The photos below show some of Leggett and Platt's current operations.

"My broad experience both prior to Leggett & Platt, and with L&P, has prepared me for this career," Wood says. "I have seen a variety of businesses and manufacturing processes and been involved in virtually every aspect of manufacturing."

Leggett & Platt itself has a broad manufacturing footprint. The company began 130 years ago with a partnership of ideas and know-how that produced the first commercially viable bed spring. The company has come a long way since J.P. Leggett and C.B. Platt first shook hands.

"Our bedding components are found in most sleep products in the United States, including fasteners, fabrics, bed frames, foundations, sheets and pillows," Wood says. The company then expanded into home and office furniture and carpet padding and underlay.

The company also diversified into automotive seating, retail fixtures, and steel wire and tubing industries. It manufactures wire and tubing for its own components as well as those produced by other companies. It also provides lumbar support in automotive

vehicle seats and engineered tubing components for the aerospace industry.

Today Leggett & Platt has grown to more than 130 manufacturing operations in 20 countries with 19,000 employees.

"I help our partners around the globe achieve success in their business and in their careers," Wood says. "I enjoy developing the strategy for our business process development and the supporting technology, and then executing that strategy."

Wood has a longstanding connection to S&T and the Rolla community. While he was in college, his father, **Richard Wood**, ME'64, and his mother, Betty, lived in Rolla. Betty worked at the old Foster's Bakery. Today, Wood's son, **Ryan**, is studying computer science and computer engineering at S&T.


"I thoroughly enjoyed my time at Missouri S&T and certainly gained a great education that has propelled my career," Wood says.



Photo by Greg Hall/Leggett & Platt







Dambach returned to P&G for two additional internships, both times to the manufacturing site in Cape Girardeau, Mo., the same plant where she currently works. She and her husband, Travis, live in their nearby hometown of Jackson, Mo., with their toddler, Birkley.



Dambach says her daughter gives her an invaluable perspective on her career.

"Not only am I a producer, I'm a consumer. Therefore, I really understand the need for the quality checks and all that goes into producing the diapers," she says. "They have to be perfect because they are going on our most prized possessions — our babies."

The amount of pride and dedication Dambach puts into her work is a direct reflection of what P&G puts into their employees.

"Our employees are our number one asset," says Dambach. "Without them, there is nothing. P&G

builds leaders and invests in their employees — they really care."

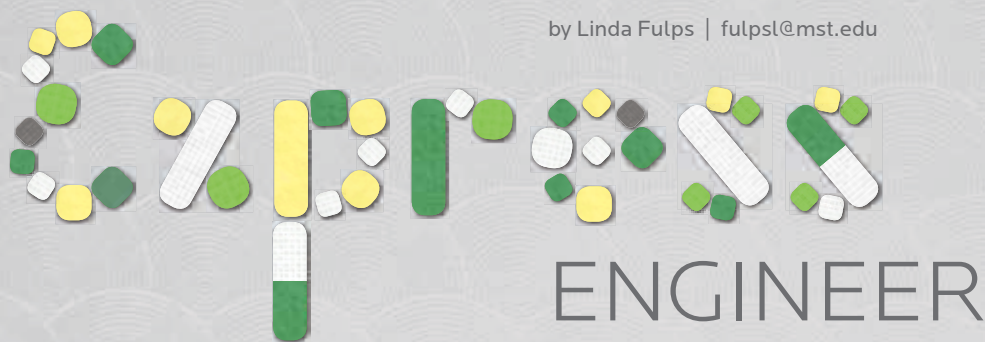
For example, Dambach recalls running into the plant manager who hired her seven years earlier. He had since become a vice president, working in Cincinnati. "He came up to me and said, 'Hi, Katie! How are you doing? How's Travis?'"

P&G strives to maintain the family-friendly feel it was built upon more than 175 years ago. Headquartered in Cincinnati, P&G has production plants in more than 80 countries and consumers in more than 180 countries. The company now manufactures more

## "P&G BUILDS LEADERS AND INVESTS IN THEIR EMPLOYEES — THEY REALLY CARE."

than 300 products, from Crest to Tide, and at least one product is found in nearly every American household, according to a recent *Wall Street Journal* report.

"I love knowing that what we make improves our consumer's lives every day," says Dambach. "It's pretty cool to be part of that."



by Linda Fulps | fulpsl@mst.edu

"I thrive under pressure," says **Patrick Dippel**, EMgt'04. "I was looking for a company that was aggressive in improving itself, and I found it. I have never seen such strong passion and alignment across all segments of a business and through the efforts of every individual employee."

Dippel is talking about Express Scripts Inc. in St. Louis, where he is senior manager of operations. His group manages the order intake channels for the company's home delivery operations.

"We're involved in the entire home delivery process, so we interact with all areas — from the home delivery technicians, the pharmacists who communicate with both the patient and the doctor's offices, and the people who fill the orders and send them out," he says.

Dippel is also a member of the strategy and continuous improvement group, which helps shape the vision for home delivery operations and looks for ways to drive out waste.

The company recently acquired another large prescription benefit management company, Medco Health Solutions. Dippel has had a large role in helping the companies integrate.

"Merging two different business models is pretty challenging," he says. "But both sides are committed to being flexible and transparent. We're working together to get the merger done successfully so all of our patients and clients benefit."

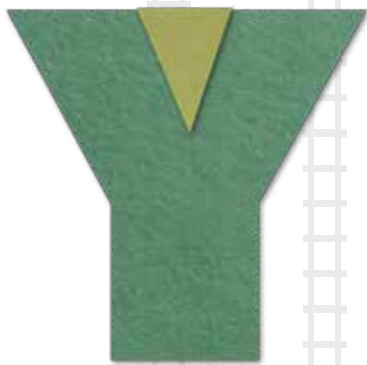


Photo by B.A. Rupert/Missouri S&T



## ON THE RIGHT

# Trail



es, it's an old company. It's been a fixture in the transportation industry since Abraham Lincoln signed the Pacific Railway Act of 1862 to create a transcontinental railroad. But that doesn't mean Union Pacific is out-of-date.

"Most people look at us and think, 'You're a railroad, you must use a lot of old technology,'" says **Travis Duncan**, BAdm'08, IST'08. "And while it's true that Union Pacific has been around for 150 years, we are a leader in developing and applying cutting-edge technology in transportation."

The nation's largest railroad covers 23 states across the western two-thirds of the United States and employs about 45,000 people.

Based in Omaha, Neb., Duncan is manager of "MyUP," Union Pacific's internal company portal. "It's a place where our various departments (operations, marketing, sales, etc.) have access to the information and applications they need to do their jobs. Our goal is to be a one-stop shop that brings together what they need on a daily basis," he says.

"Because MyUP touches all departments, I get to interact with a lot of people throughout the company and learn about all the different pieces of the business," he says.

Duncan says he was initially drawn to UP because of its technology aspect, not from a fascination with trains as many other employees have. But he's a fan now. "I've developed a real appreciation for trains since I've been with Union Pacific," he says. "We get things from one place to another in ways trucks just can't. A single train can carry as much as 300 trucks can. And we're really efficient too, with less impact to the environment."

Union Pacific moves freight, not people, but Duncan plans to get out in the field soon and take a ride on one of the trains himself.

He encourages new graduates and others to consider Union Pacific for a career. "A lot of baby boomers will be retiring in the next few years, creating tremendous career opportunities for younger employees," he says.

"It's the diversity in both the technology and people that makes Union Pacific a fun, challenging and rewarding place to work," he says.

**"WE ARE A LEADER  
IN DEVELOPING AND  
APPLYING CUTTING-  
EDGE TECHNOLOGY IN  
TRANSPORTATION."**





Photo by Bob Ervin/Ervin Photography. Photos courtesy Union Pacific







Photo by Timothy Hughes Photographics

## MAKING TALL GRASS

# SHORT

by Mary Helen Stoltz | mhstoltz@mst.edu

**am Patterson** is one of the voices of John Deere.

A design engineer in John Deere's rotary mower group, Patterson, ME'06, is passionate about his work — making lawn mowing easy — and it shows in the company's latest "How We Run John Deere" video, which features Patterson.

Patterson designed the two new high-capacity mower decks on John Deere's updated X700 tractor. He followed the project all the way through production, working on everything from computer modeling to performance and reliability testing. That breadth of knowledge made him a natural fit for the video.

"Aside from making tall grass short, my main job is to make it very easy for the customer to attach the mower deck to the tractor," Patterson says.

There is one latch to flip in the front of the tractor, but the majority





Find out what Sam thinks about the X700 mower deck. Scan the QR code with your smart phone or visit [rol.la/samx700](http://rol.la/samx700). Scroll down or click on the Deck link to watch the video.



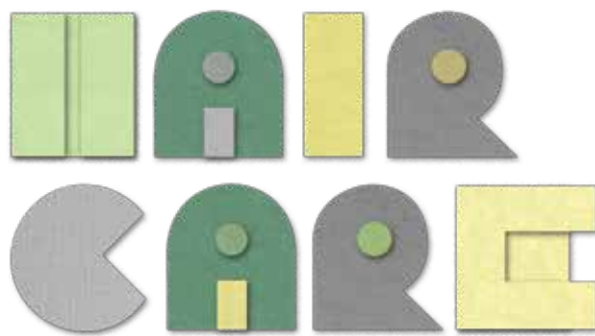
of the connection to the vehicle is automatic, which makes maintenance and cleaning simple. Patterson says the technology was first developed for large commercial tractors.

"John Deere first developed this feature for our commercial customers on larger tractors, but it is very exciting to give this flexibility to residential customers," Patterson says. "It allows customers to mow very tall and thick grass while still leaving a manicured look, and gives them tremendous mulching capability."

Patterson is now working on Deere's new EZtrack mowers. When he isn't fine-tuning a mower deck, he travels with his wife, **Amy (Edwards) Patterson**, Engl'07, and plays guitar in a garage band near their Beaver Dam, Wis., home. He says the problem-solving skills he developed at Missouri S&T were the foundation of his success.

"Missouri S&T gave me the skills, attitude and discipline necessary to work at an innovative company like John Deere," Patterson says. "The faculty understand exactly what it takes to be an engineer in today's rapidly changing workplace, and they provided me with the tools I needed to succeed."

## OUTSIDE-THE-BOX



by Mary Helen Stoltz | [mhstoltz@mst.edu](mailto:mhstoltz@mst.edu)

### Anita Heinzke, ChE'10, thinks outside the shampoo bottle.

That creative thinking earned Heinzke, a project engineer in L'Oreal's Florence, Ky., hair care facility, a \$5,000 Beauty Shakers award from the company. Her suggestion — to use corn plastic in L'Oreal shampoo packaging — took third place out of more than 900 submissions in the company's annual ideas competition.

"Corn plastic is a 100 percent biodegradable material that has a lot of environmental benefits," says Heinzke, who works with the lines that fill bottles with shampoo. "Most plastic is made from oil, but this type is made from corn. It could potentially save hundreds of thousands of barrels of oil annually by switching our products alone to this material."

Heinzke is helping the company with its recent launch of the new restage of the L'Oreal shampoo line, Advanced Haircare. It required the purchase of \$6 million in new equipment and the installation of four packaging lines that were modified to handle the capacity.

"L'Oreal is a company that gives its employees a lot of opportunity and freedom to be creative," Heinzke says. "The company has a strong passion for promoting women in science. Every day there is something new and challenging."



Photo by Brad Smith/Photosmith

**"L'OREAL IS A COMPANY THAT GIVES ITS EMPLOYEES A LOT OF OPPORTUNITY AND FREEDOM TO BE CREATIVE."**



## MISSION, GOALS AND BENEFITS

### MISSION

The association proactively strives to create an environment — embodying communication with and participation by Miner alumni and friends — to foster strong loyalty to the university and growth of the association. The association increases its financial strength and provides aid and support to deserving students, faculty and alumni.

### GOALS

- Increase alumni pride in their association with Missouri S&T and the Miner Alumni Association
- Increase alumni involvement, especially that of young alumni
- Increase alumni contributions, both in the number of alumni making a financial commitment and in the dollars raised to benefit Missouri S&T and the Miner Alumni Association
- Strengthen relationships with faculty, staff and students on behalf of the alumni association.

The officers and other members of the association's board of directors provide leadership and personal participation to achieve these goals and fulfill this mission. For their efforts to be a success, they need YOUR active participation as well, in whatever alumni activities you choose.

### BENEFITS

#### CAREER ASSISTANCE

Missouri S&T's career opportunities and employer relations will help you in your job search. For information, call 573-341-4343.

#### SERVICES

##### Online Community

including searchable directory at [mineralumni.com](http://mineralumni.com)

##### Access to alumni office

via email ([alumni@mst.edu](mailto:alumni@mst.edu))

##### Address update service

so you don't miss your Missouri S&T mail

##### Insurance discounts

##### Travel opportunities

#### MINER MERCHANDISE

Chairs, license plates (for Missouri residents) and the official Missouri S&T ring.

## GET MORE INFORMATION

Want to know who else is planning to attend a section event in your area? Need more details about an upcoming event? Register online at [mineralumni.com](http://mineralumni.com), click on the events tab, select the events you want to attend then click registration.



## MINER ALUMNI ASSOCIATION

Representing more than 50,000 alumni worldwide



For more information about your representatives, go to [alumni.mst.edu/groups/boardofdirectors](http://alumni.mst.edu/groups/boardofdirectors).

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## CELEBRATE OKTOBERFEST WITH THE BAY AREA SECTION

San Francisco Bay area Miners will connect with their fellow alumni as they celebrate fall and enjoy fine German dining at the Bay Area Section's Oktoberfest event.

The group will meet for beer and cocktails at 5 p.m. Saturday, Oct. 26, at Teske's Germania Restaurant and Beer Garden. Dinner will follow at 6:30 p.m.

To register online for this event or to see who is attending, go to **mineralumni.com**. Click on the "Events" tab, select Oct. 26 from the calendar on the right, select the Oktoberfest event listing, and click the "Registration" button. If you do not have access to register online, please RSVP to **Dennis Leitnerman**, EE'76, MS EE'77, at 408-249-6959

Last year, more than 30 alumni and friends celebrated Oktoberfest with the Bay Area Section at this annual event.



Teske's Germania Restaurant and Beer Garden  
255 N. First Street and Devine  
San Jose, Calif.  
408-292-0291  
teskes-germania.com

## UPCOMING SECTION EVENTS

### Central Ozarks

*Shrimp Feed*  
Saturday, Aug. 24  
5 p.m. Social Hour  
6 p.m. Dinner

Lions Club Park  
Highway 63 South, Rolla  
Pavilion 5

### Coastal SC-GA

*Homecoming Celebration*  
Saturday, Oct. 19  
Time TBD

Golf outing followed by dinner at the home of Craig Gordon, EMgt'76  
201 Summerton Drive  
Bluffton, S.C.

### Bay Area

*Oktoberfest*  
Saturday, Oct. 26  
5 p.m. Beer and Cocktails  
6:30 p.m. Dinner

Teske's Germania Restaurant  
and Beer Garden  
255 N. First St.  
San Jose, Calif.

### Falls of the Ohio

*Bowling night*  
6:45 p.m. Friday, Aug. 16

Vernon Lanes  
1575 Story Ave.  
Louisville, Ky.

*Bluegrass and Burgoo*  
5-11 p.m. Sunday, Sept. 1

The Watertower  
Intersection of River Road  
and Zorn Avenue  
Louisville, Ky.  
Kentuckybluegrassfestival.com

*Day at the Races*  
Noon Friday, Oct. 4

Keeneland  
4201 Versailles Road  
Lexington, Ky.

*Dinner at Captain's Quarters*  
7 p.m. Friday, Nov. 1

Captains Quarters  
5700 Captain Quarters Road  
Harrods Creek, Ky.

### Houston

*Oktoberfest*  
Saturday, Sept. 28  
Time TBD

Rudi Lechner Restaurant and Bar  
2503 S. Gessner Road  
Houston  
Hosted by Lori Crocker, AE'88  
loricrocker@sbcglobal.net

*Alumni Road Trip to Missouri*  
S&T Homecoming  
Friday, Oct. 18-20

Contact Lori Crocker, AE'88  
loricrocker@sbcglobal.net

### Lincolndland

*Student Send-Off*  
3-8 p.m. Sunday, Aug. 4

The home of Rich CE'69  
and Carolyn Berning  
10 Beach View Lane  
Springfield, Ill.

*Fall Dinner*  
Wednesday, Oct. 30  
Time TBD

Springfield Motor Boat Club  
17 W. Club Area  
Springfield, Ill.

### Motor City

*Student Send-Off*  
6-8 p.m. Saturday, July 27

The home of Andrew, EE'04, and  
Tessa, ME'04, MS ME'06, Baughman  
37845 Meadowhill Drive  
Northville, Mich.

### Society of Petroleum Engineers

*Alumni Reception*  
5:30-7 p.m. Monday, Sept. 30

Hilton Hotel Riverside,  
Oak Alley Room  
2 Poydras St.  
New Orleans

## SECTION WRAP-UP: ST. LOUIS SHOWS OFF ITS GREEN



A steady stream of alumni and their families joined the St. Louis Section for its annual St. Pat's celebration on March 23 at Bruno's American Grill. The gathering began at noon and continued into the night.

During the celebration, awards were presented for the oldest St. Pat's jacket that still fits, the oldest garter, the oldest button, the newest sweatshirt, the organization with the most members represented, the newest and oldest alumnus, and the youngest future Miner, among others.

The St. Louis section holds informal gatherings at Bruno's throughout the year. For more information about these events, please contact **Bob Buechel** at [sanibel1985@hotmail.com](mailto:sanibel1985@hotmail.com) and ask to be added to his mailing list.



## HUGH AND LINDA COLE: SILVER AND GOLD DONORS



Photo by Chis Diset/Chris Diset Photography

*Six months after graduating from high school in Hazelwood, Mo., Hugh Cole, EMgt'72, enrolled at Missouri S&T, determined to become the first engineer in his family (and first in his family to receive a college degree).*

"With the exception of that first summer, when I worked at the Chevy plant in St. Louis, I went to school year-round," says Cole, now managing partner of AGI-Goldratt Institute, an organization he's been with since 1993.

His four years at Rolla weren't easy, he recalls. Like most students at the time, the Vietnam War, pressure about the draft and a severe U.S. recession weighed heavily on his mind. To supplement their income,

he and six other students formed a horn-driven, pop-rock band known as Miller's Cave. They played music in the style of Chicago and Blood, Sweat and Tears for dances and parties in Rolla, Columbia, St. Louis and, often, at Fort Leonard Wood.

"We're all still in touch," he says. "Everyone has been successful — probably more than what we thought would be possible. When we were in Rolla, we basically had nothing. Sometimes I

wonder how I got through. It was hard to come up with the \$395 a semester for tuition, much less living expenses!"

Despite the struggles, Cole graduated and joined Unidynamics, a division of Universal Match Corp., for 18 months before being hired by another Rolla grad to work for the Linde Division of Union Carbide Corp.

"Linda and I were newlyweds for a week before I had to leave for an engineering training program in Pueblo, Colo.," Hugh recalls. Linda, who was attending the University of Missouri-St. Louis, would go on to join Hugh in Colorado after she completed her last semester at UMSL.

The job took the couple around the country. They lived in nine houses in 18 years while raising their two children, Doug and Lindsay. Hugh held both line and staff positions in production, engineering and marketing, while Linda worked as an elementary school teacher.

"I wouldn't change any of those experiences," says Cole, who chairs the executive committee of Missouri S&T's donor recognition society, the Order of the Golden Shillelagh. "I think that's what gives you an appreciation for making things better."

The Coles' desire to help others led to their decision to give back to Missouri S&T. The couple recently created the Hugh and Linda Cole Silver and Gold Scholarship. The scholarship will benefit engineering management students who have significant financial obstacles that threaten their ability to stay enrolled. In addition to the award, students with remaining unmet financial need may also qualify for university loans that are interest-free while they are in school as well as campus work-study opportunities.

"I do understand that many students in Rolla are first-time college students," he says. "I can totally appreciate it. If you can somehow afford to help, why wouldn't you do that? We know the kids' lives will be better because of it. What's a better thing to do than to give someone else an opportunity?" ■

## ► DOING OUR PART

Calista LaBrell's entry in a Trash Art contest sponsored by the Ozark Rivers Solid Waste Management District at the 2013 Missouri S&T Earth Day Celebration held on campus on April 22. LaBrell was a seventh-grade student at St. George School in Hermann, Mo. Just one example of S&T's community outreach, the event featured Solar Village tours, contests and hands-on activities for hundreds of area youth, as well as our own S&T students. (Photo by B.A. Rupert)







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