

MISSOURI  
**S&T**  
MAGAZINE

SUMMER 2020 VOL. 94 NO. 1

EST. 1870

CELEBRATING

150 YEARS

From hardscrabble, "country academy" roots, how we became a global research university

# TOP 10 things to do

on S&T's 150th anniversary

website 



10

Click the **150@mst.edu** button to ask questions, submit stories and share ideas.

9

Learn why Feb. 24, 1870, and Nov. 6, 1871, are milestones for Miners.

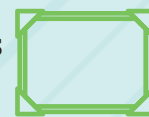


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Watch a video interview with **Larry Gragg**, author of S&T's new history book.

7

Check out classic photos of Miners wearing suits and ties to class.



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See how many 150th anniversary advisory committee members you know.



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Virtually visit the Missouri State Capitol for a replay of S&T Day, marking the 150th anniversary of our charter.

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Discover which projects and programs won 150th anniversary mini-grants.



3

Get the scoop on upcoming events.



2

Figure out what campus looked like WAY before you were born.

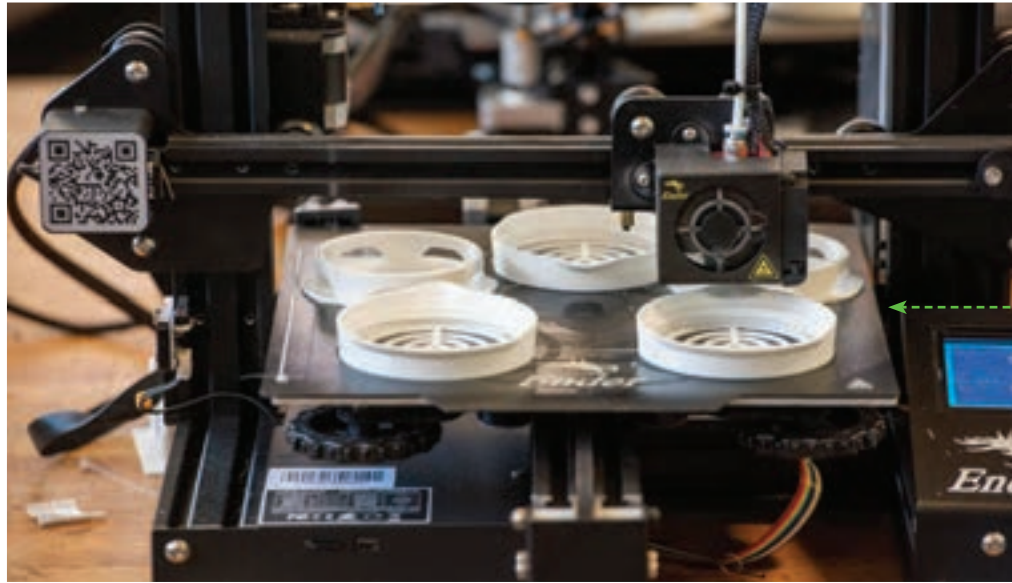


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Order your copy of *Forged in Gold: Missouri S&T's First 150 Years*, scheduled for release in October 2020.

[150.mst.edu](https://150.mst.edu)





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## MISSOURI S&T - BY THE - NUMBERS

# 1,721

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# 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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Top left: Earthbound artist Eduardo Kac partnered with astronaut Thomas Pesquet to create artwork, "Inner Telescope," in space. (Photo: Thomas Pesquet)

Bottom left: M. Stanley Whittingham was one of three people to receive the Nobel Prize in Chemistry in 2019 for their development of the lithium-ion battery.

Below: The St. Pat's tradition at Missouri S&T began in 1908 and has continued ever since.



## S&T PREPARES FOR YEARLONG CELEBRATION

This October, Missouri S&T will kick off a yearlong celebration that honors the university's 150 years. Beyond a jam-packed website and new coffee-table history book, special events are planned throughout the upcoming months to commemorate the milestone.

Ten of these special activities were selected to receive additional financial support from the university, including one led by Alpha Psi Omega, the university's national theater honor society. The group plans to commission a play by Chicago-based playwright Will Coleman to debut as the honor society's 2021 winter production. The play will focus on an important time in the history of computer science in an effort to "bring excitement and knowledge of computer science to the community and fellow undergraduates on campus," says engineering management senior **Maddie Lechner**, Alpha Psi Omega's secretary.

"Alpha Psi Omega wants the student body to feel celebrated and relevant," Lechner adds. "There is definitely a demand to see art created by students that focuses on the experiences and difficulties of people in their own community. Having a play commissioned by a national playwright — that will take in testimony and insight from the current members of the Alpha Psi Omega organization — will combine relevancy and professional dramatic literature to give other students and alumni a chance to see their culture on stage."

Other arts and entertainment activities include a performance by Eduardo Kac, an artist known for his focus on transgenics; a new cantata based on the life of Leonardo da Vinci, written by **Taylor Gruenloh**, assistant teaching professor of theater, with music composed by **Kyle Wernke**, assistant teaching professor of music; and TEDxMissouri S&T.

Some groups are planning family focused activities, including a metallurgical engineering weekend organized by **Greg Hilmas**, chair and Curators' Distinguished Professor, and **Joseph Newkirk**, professor, both in materials science and engineering, and STEM Fest, hosted by faculty in biological sciences and physics.

"STEM Fest will bring together science, technology, engineering and math organizations along with other campus organizations in one location to share how S&T impacts society and to illustrate the value of diverse and inclusive groups," says **Dave Westenberg**, associate professor of biological sciences. "Attendees will obtain 'passports' which will be stamped as they visit each booth."

Additional educational activities include special guest speakers, including Nobel Laureate M. Stanley Whittingham, who will deliver the fifth annual Stoffer Lecture; and a St. Pat's celebration panel discussion led by history and political science faculty **Michael Bruening**, interim chair and associate professor, and **Patrick Huber**, professor.

For more details about these and other events, visit [150.mst.edu](http://150.mst.edu).

# Magazine production suspended



Due to the COVID-19 pandemic's significant impact on the university budget, we are suspending production of *Missouri S&T Magazine*. This will be the final issue of this magazine until we are able to again publish.

This was a difficult decision, and one we postponed for as long as we could. We know that for many of you, this magazine is your lifeline to the university, your source for the latest news about your alma mater and your fellow Miners. We hope you will continue to stay connected through our monthly e-newsletter and through our online community. If you aren't yet signed up for the newsletter or are not yet part of the online community, please visit [mineralumni.com](http://mineralumni.com) to learn how to connect.

Thank you for reading *Missouri S&T Magazine* over the years. Whether you knew it first as the *MSM Alumnus*, *MSM-UMR Alumnus*, *UMR Magazine* or our current name, we hope you were well served by this publication and our efforts to keep you informed and connected.

Visit [mineralumni.com](http://mineralumni.com) to get connected.



Kyleigh Marsh, ME'20

## HONORING OUR GRADUATES ... VIRTUALLY

Because of COVID-19 concerns, regular spring 2020 commencement ceremonies were postponed, but that didn't stop S&T from honoring the accomplishments of our graduates.

They couldn't gather in the Gale Bullman Building, so they gathered on S&T's Facebook page for a live celebration and video presentation. A traditional commencement celebration will be held at a later date. Watch the video at [registrar.mst.edu/virtual-celebration](https://registrar.mst.edu/virtual-celebration).

## WELCOME BACK, WE MISSED YOU

When the COVID-19 outbreak began, Missouri universities — including S&T — moved to online classes, most faculty and staff worked remotely, and most students left campus, all to help contain the spread of the virus. But we will soon see faces on campus again as S&T resumes on-campus classes when the fall semester starts on Aug. 24.

The campus will continue to follow social distancing guidelines and other recommended best-health practices to suppress the spread of COVID-19. For updates, visit [coronavirus.mst.edu](https://coronavirus.mst.edu).



The Miner Resilience Fund helped Abigail Carr, who was studying in Ireland when the pandemic hit.

# HOPE AND A HELPING HAND

**Abigail Carr**, a junior in mechanical engineering, was studying at Ireland's Cork Institute of Technology when the U.S. State Department's Level 4 Travel Advisory ended her semester abroad.

"I had no idea where I was going to live upon my return," says Carr, who faced a 14-day quarantine and couldn't go home to St. Louis because of high-risk family members. "I had already paid rent in Cork, so I had little funds to support myself and no way to get a job."

Carr received help with her airline flight fees and quarantine housing costs in Rolla through the Miner Resilience Fund. "Without this help, I would have been scrambling," she says.

For many S&T students, the struggle between financial stability and insecurity is always present. COVID-19 has pushed the accelerator. In March, S&T established the Miner Resilience Fund to help with student emergency needs, online program development and other challenges triggered by the pandemic.

"The Miner Resilience Fund is a safety net for our students during this troubling time," says Chancellor **Mo Dehghani**. "We are building the resiliency required to weather this storm and recover from it."

A number of donors stepped up to support the fund. University trustee **Joan Woodard**, Math'73, was one of the first. "When we are faced with a global crisis, we need all hands on deck to help," she says.

Trustee **Mike Bytnar**, ME'68, MS EMgt'73, was another.

"The end of this semester has been devastating for students," Bytnar says. "They need encouragement and support."

For Dehghani, the fund is "a bridge between the uncertainties of today and a stronger tomorrow." Trustee **Peggy Montana**, ChE'76, sees that bridge as vital.

"I worked my way through college with scholarships, a residence hall position and summer work," Montana says. "The pandemic has taken away most of those opportunities for our students."

Support the Miner Resilience fund at [give.mst.edu](https://give.mst.edu). For information on the Student Emergency Fund, visit [stuaff.mst.edu/emergency-fund](https://stuaff.mst.edu/emergency-fund). Student need remains high. To contribute to the Miner Resilience Fund, contact Tory Verkamp at [verkampv@mst.edu](mailto:verkampv@mst.edu).





Adam Stumpf at his business, Stumpy's Spirits. Photo courtesy of Farm Futures.

## HAND SANITIZER FROM A WHISKEY STILL

S&T alumnus converts his distillery to help in a crisis

**A**dam Stumpf, ME'10, was focused on making bourbon, whiskey and vodka at his craft distillery when the coronavirus began to sweep across the United States. His wife and business partner, **Laura**, soon noticed that hand sanitizer was gone from store shelves. The Stumpfs had plenty of alcohol available, so why not convert the business from beverages to hand sanitizer? Stumpf says it was a no-brainer.

There were hurdles early on. The Food and Drug Administration regulates hand sanitizer as an over-the-counter drug, and production involved lots of rules and paperwork. But a few days into the COVID-19 crisis, the FDA and the Alcohol and Tobacco Tax and Trade Bureau loosened the restrictions.

"Since then, we've been going 100 miles an hour," says Stumpf. "We got so swamped with orders, we had to use our contacts within the industry to bring in tanker quantities of ethanol to supplement the alcohol supply we make ourselves."

Stumpf says his company, Stumpy's Spirits, has sent about 10,000 gallons of sanitizer to groups in the St. Louis area, from the court system to hospitals and nursing homes to home health care workers. He says sanitizer production helps stabilize his business.

"Sanitizer allows us to keep our entire team employed. But we're not doing this to make a profit."

"When bars and restaurants shut down, we lost about half of our revenue stream," Stumpf says. "Sanitizer allows us to keep our entire team employed. But we're not doing this to make a profit. We're trying to get as much sanitizer as possible to the people who need it."

Stumpf is hoping to return soon to beverage alcohol production at his Columbia, Ill., family farm. He and his team grow the grain used in their products and manage the distilling process completely on site.

"To my knowledge, Stumpy's is one of three single-source distilleries in the country," he says. "We grow every kernel of grain used in our

spirits. It's almost like the Napa Valley of whiskey because we give a regional taste to our product."

Stumpf learned to make his own beer as a student at S&T, and he has used that experience, plus his mechanical engineering degree, to help Stumpy's thrive.

"Pumps, valves, fittings, things that move, thermal processes — those are the things that get mechanical engineers excited, and we have all of that here," Stumpf says. "We designed our own still. It was an experiment in thermal balances and mass flow balances and hydraulic flooding on plates and crazy stuff that I never thought I would use. Sure enough, here I am."



# CAMPUS RALLIES TO 3-D PRINT PROTECTIVE MEDICAL GEAR

When Phelps Health representatives anticipated a shortage of masks due to the coronavirus outbreak and needed help, S&T students, faculty and staff answered using technology and ingenuity.

Campus was abnormally quiet Saturday and Sunday, March 21–22, not only because it was the weekend before spring break, but also because, due to the coronavirus outbreak, most students had moved out for the semester and a majority of faculty and staff were preparing to work remotely. But 3-D printers in a couple of buildings on campus were humming away, fabricating prototype masks and face shield brackets.

Inside the Kummer Student Design Center, where S&T students usually work on rockets, solar cars, Mars rovers and other projects, a few students, faculty and staff outfitted one room with a dozen 3-D printers to produce prototypes

for Phelps Health's physicians, nurses and other medical workers.

Across campus, students at Missouri S&T's Makerspace were using their 3-D printers to fabricate prototypes of the face shield brackets.

## 'PHENOMENAL' PROTOTYPES

The S&T prototypes "are phenomenal," says **Casey Burton**, Chem'13, PhD Chem'17, director of medical research at Phelps Health.

Although there were no confirmed cases of COVID-19 in Rolla at the time, Burton and Shawn Hodges, Phelps Health's director of ancillary and surgical services, foresaw the need to obtain more protective gear for the Rolla-based regional health system.

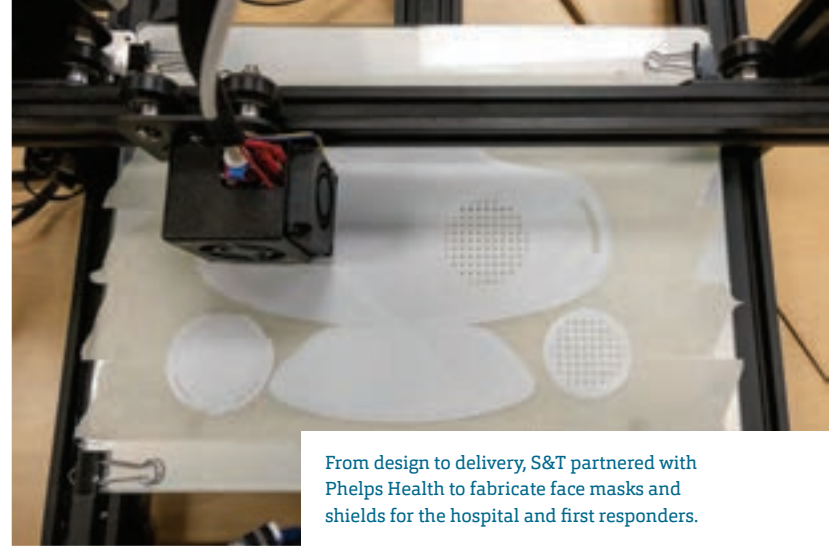
"Shawn had already been experimenting with 3-D printed masks with Rolla High School but realized he needed to drastically scale up production capacity to meet the needs of our community," Burton says. "He reached out to me to rally the university and beyond for their support and to help organize those operations with him on our end."

Burton asked S&T Chancellor **Mo Dehghani** if it was possible to harness the university's 3-D printing capabilities to aid in the effort. Dehghani directed others across campus to do what they could to assist.

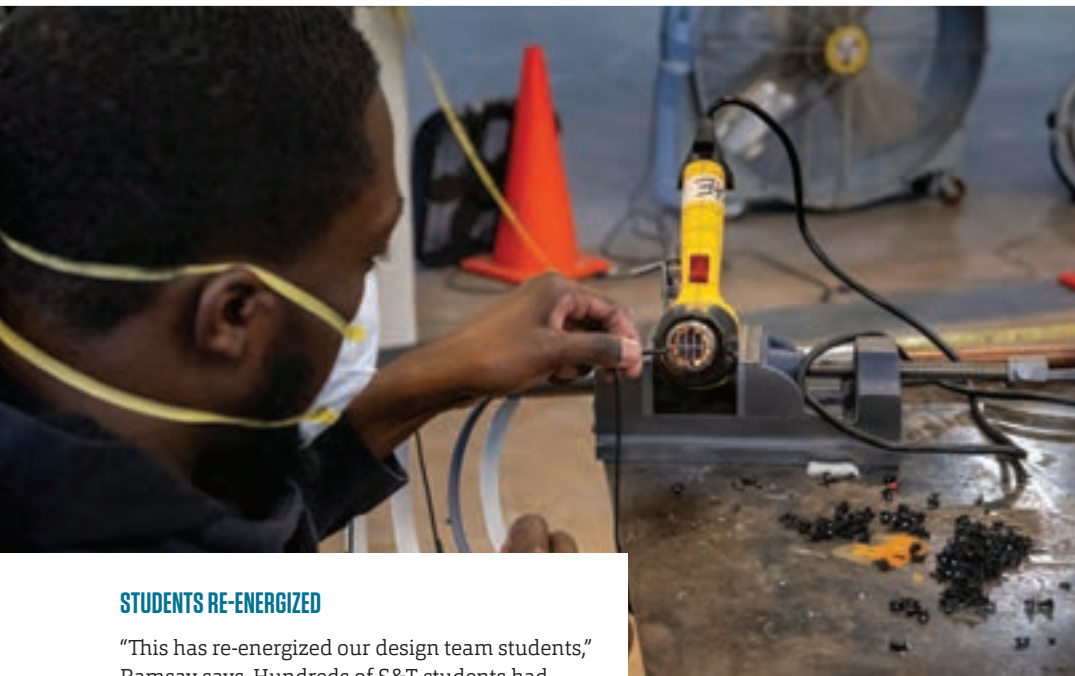
The Kummer Student Design Center staff and students were among the first to respond. **Chris Ramsay**, MetE'83, MS MetE'85, assistant vice provost for student design and director of the center, marshalled the few remaining student members of the center's 19 design teams to set up a 3-D printer farm to run 24 hours a day in the center at 10th Street and Bishop Avenue.

"We started out with five" 3-D printers at the design center, Ramsay says. "I sent a note out to all the design teams, and the students and alumni who were still in town brought their printers in and now we're up to 12."





From design to delivery, S&T partnered with Phelps Health to fabricate face masks and shields for the hospital and first responders.



## STUDENTS RE-ENERGIZED

"This has re-energized our design team students," Ramsay says. Hundreds of S&T students had worked since the fall on projects for spring and summer design competitions that were canceled due to the coronavirus. "This community need fulfills a hunger that they have to do something positive and meaningful in this crisis."

While the design center produced prototype surgical masks, S&T's Makerspace chief executive officer **Daustin Hoelscher**, a senior computer engineering major from Mascoutah, Ill., was printing a prototype bracket for the face shields.

"This was a game changer for us and even the rest of the world, so we appreciate Missouri S&T's efforts," says Dr. Brian Kriete, otolaryngologist and medical director of surgical services at Phelps Health.

"I'm so pleased with how our university community has come together to help in this time of need," says Dehghani. "The rapid response and support for one of our important community partners typifies the true S&T spirit of innovation, ingenuity and community engagement. I am very proud of the way our university has responded to this critical need." ▢







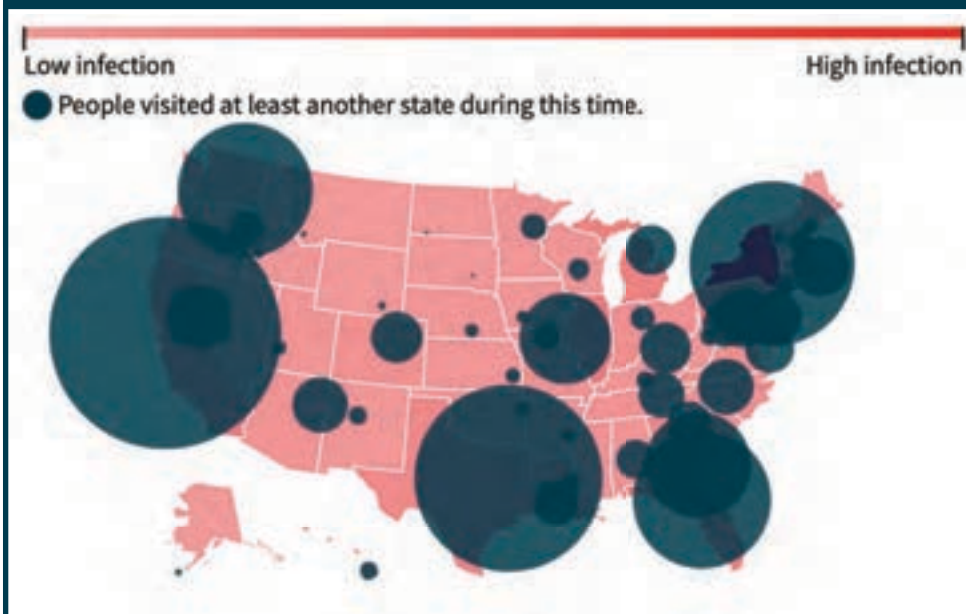
## FOOTBALL, SOCCER, VOLLEYBALL POSTPONED UNTIL SPRING

Because of the COVID-19 pandemic, the Great Lakes Valley Conference (GLVC) announced July 27 that it would postpone regular season competition and championships for the 2020 fall semester for the sports of football, volleyball and soccer. Competition in those sports, as well as GLVC championship events, will be conducted in the 2021 spring semester.

The conference will allow competitions in cross country, golf, swimming, and track and field during the 2020 fall semester, and S&T will move forward with these sports. A decision about the start of basketball — which is scheduled to compete on a conference-only basis in the 2020–21 season — will be made by Oct. 1.

The decision, voted on by the conference's Council of Presidents, was made based on guidance from the athletics directors across the league and an extensive review of the recommended testing and safety measures developed by the NCAA Sport Science Institute.

# WHAT SOCIAL MEDIA CAN TELL US ABOUT COVID-19



People movement vs number of infections since March 6, captured July 14 from Kabir's interactive website detailing the information he has collected from his analysis — [mykabir.github.io](https://mykabir.github.io)

**A**s COVID-19 swept across the U.S. and the world, people took to social media with concerns, questions and opinions. S&T researchers analyzed tens of millions of Twitter posts in real time to show the change in attitudes toward the disease.

**Sanjay Madria**, Curators' Distinguished Professor of computer science, and Ph.D. student **Yasin Kabir** designed machine learning and natural language processing techniques for the study, which measured topics of concern, subjectivity, social distancing and public sentiment rather than predicting the spread of infection.

"We can see how people are reacting to news and officials' briefings about COVID-19. Are they comfortable, or are they more panicked?" Kabir says. "If we can understand that, we can help officials know how to share news in a way that avoids panic."

Kabir studied how public sentiment, trending topics and movement compared with the rate of infection. He learned that attitudes changed as the disease continued to spread.


"Early on, many people were skeptical of reports about the seriousness of the disease, and their sentiment was subjective rather than fact-based," Madria says. "Slowly, they realized this is real, and their outlook became more fact-based."

Geographical information in the analysis was limited to Twitter users who have enabled geotagging, which helped Kabir collect information by state and track movement between and among states.

Other researchers have developed models to predict the spread of COVID-19, Madria says, but this may be the only project that investigated social analytics for COVID-19 study.

"As we analyze trending topics, we can see how thinking and behavior change over time," Kabir says. "That can help decision makers because they know how people are feeling."





Ph.D. student Weixing Hao tests different materials. See more about their process online at [rol.la/31cJh3Q](https://rol.la/31cJh3Q).

# ENVIRONMENTAL ENGINEERS STUDY FACE-MASK MATERIALS

The day before the federal government issued new recommendations that Americans wear cloth face coverings to help slow the spread of the coronavirus, **Yang Wang**, a professor of environmental engineering who studies how fine particles like aerosols are transmitted, decided to test a few common household materials — pillowcases, scarves, furnace filters — “out of curiosity.”

His early results, which he shared on Twitter in April, attracted the interest of do-it-yourselfers, fellow engineers and scientists, and the news media, including *The New York Times* and the *Today Show*.

After seeing posts on Twitter about whether scarves would sufficiently block aerosols, Wang decided to test a variety of household materials — including scarves, bandannas, pillowcases and household air filters — to see how well they might prevent the spread of aerosols.

Wang and his Ph.D. student, **Weixing Hao**, used a scanning mobility particle sizer, which measures particle size and concentration, then compared the “filtration efficiency” of multiple layers of each material against aerosol particles

ranging in size from a few nanometers to over 400 nanometers.

They found that layers of scarves and bandannas did a poor job of filtering out aerosols. Pillowcase fabric fared somewhat better, depending on thread count. The higher the thread count, the better the filter, the researchers determined.

But the best aerosol-blocking material of those Wang tested comes from commercially available household air filters. The multilayered air filters work almost as well as N95 medical masks to block aerosols, especially smaller particles, according to Wang’s initial findings.

As more layers of filter materials are stacked, however, a change in air flow through the materials, or “pressure drop,” becomes larger. This pressure drop increase can make it more difficult to breathe. Wang and his team are also looking for a combination of materials that produces the highest filtration efficiency, but the lowest pressure drop.

This off-the-cuff study was more than just a passing curiosity for Wang, however. He is one of several S&T faculty, students and staff members who came together to help local

physicians and medical staff by 3-D printing masks and face shields.

To protect health care workers adequately, these reusable masks require a filter to block airborne particles that may spread the coronavirus or other diseases. That’s where Wang comes in.

Wang and Hao continue to test different materials for the masks. While a furnace filter may be much more efficient at filtering out aerosols than a bandanna, its components could pose risks.

“There are so many different types of fabric to consider,” says Wang, who recently won an international award for his research on aerosols. “Even for T-shirts, there are different types of materials. We plan to look at different types of pillowcases, bed sheets and other fabrics with different thread counts as part of the testing,” he adds.

“This is not a new field of study,” Wang says. “People in volcanic regions have studied the filtration qualities of various fabrics for years. I have received information about some of these studies. I find it all very helpful.”



## STUDENTS, ALUMNI SHARE VIRTUAL STEM OUTREACH WITH HOUSEBOUND KIDS

When the coronavirus pandemic caused schools to close, S&T students and alumni took the opportunity to share their STEM (science, technology, engineering and math) knowledge in unique ways with housebound kids.

S&T's Mars Rover Design Team members adapted their traditional onsite K-12 outreach visits to virtual learning sessions for curious kids.

"Teaching future engineers and STEM innovators about space exploration is a big part of the Mars Rover Design Team's mission," says **Téa Thomas**, a senior in business and management systems and the team's public relations lead. "We want to help parents and teachers who are homeschooling, and the outreach is a lot of fun for us."

In mid-March, Thomas issued a Facebook invitation offering virtual outreach sessions

and received an overwhelming response from almost 200 parents and teachers across five countries and 12 U.S. states. She set up four presenters from the 75-member team to share their knowledge using various video conferencing platforms.

The sessions drew small groups of inquisitive children, mainly ages 6 to 9, who asked questions about the rover's assemblies, autonomous navigation system, programming languages and wheel construction, as well as its 15 motors.

Leonardo Sent (pictured above), a fourth-grader from Orange County, Calif., attended all the S&T virtual sessions.

"I learned how to use the Mantis suspension and how the many different assemblies you have work inside the body off the Linux operating system," says Sent, who already built a rover

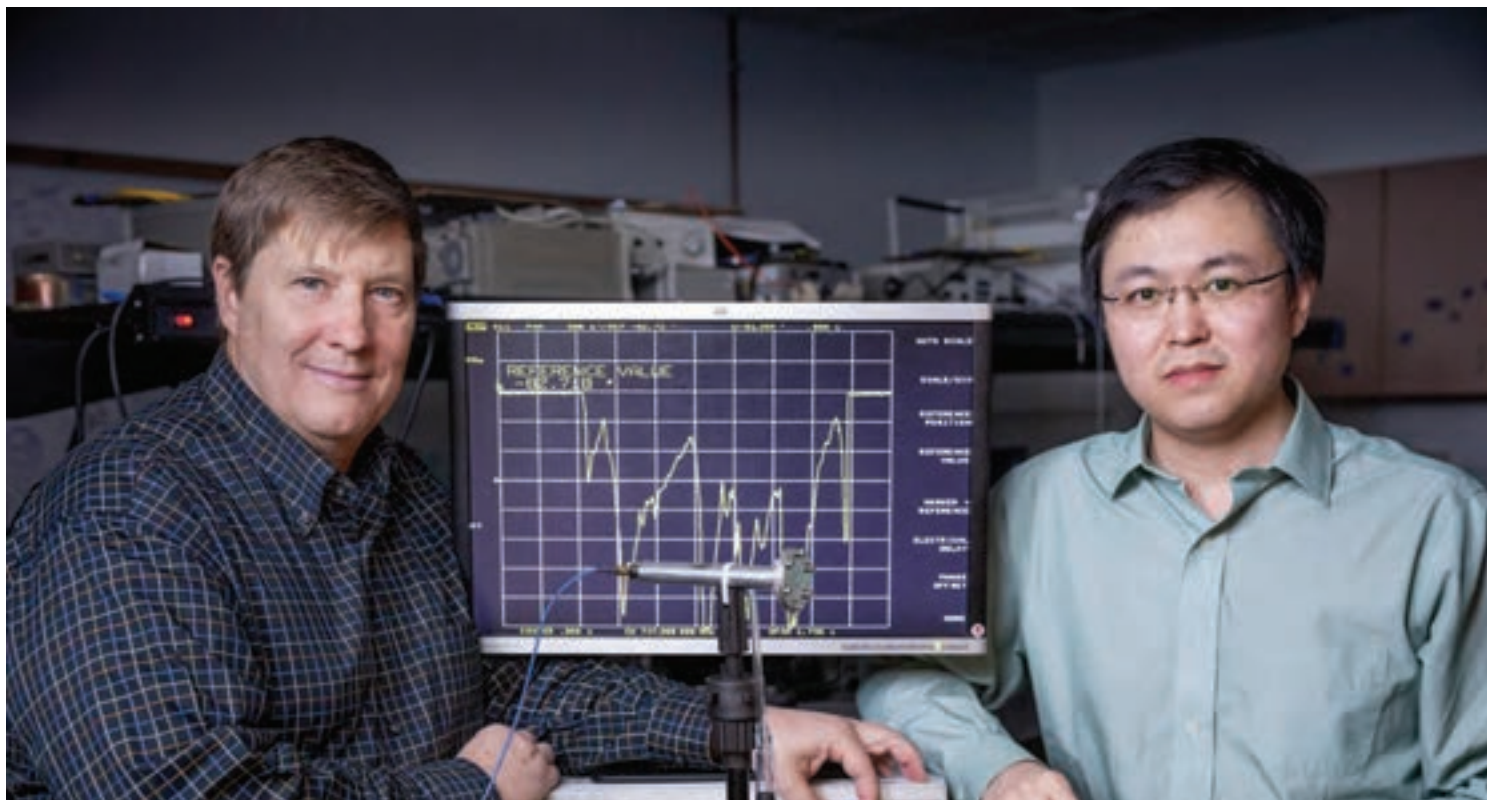
through NASA's Jet Propulsion Laboratory Open-Source Rover Project and created instructional YouTube videos for each assembly.

**Grace Deitzler**, BSci'16, who is working toward a Ph.D. in microbiology at Oregon State University, reached out to Facebook friends with an offer to teach their children anything they wanted to learn about science.

Deitzler spoke on video to a kindergartner and second-grader on the timely subject of the life cycle of germs and customized a session with another second-grader about microorganisms in the ocean and their importance to coral reefs. She advocates scientific representation to children at an early age.

"As a kid, I only knew a few scientists who let me ask questions," Deitzler says. "Kids want to learn ... and I want to show them what the path to becoming a scientist is like."





# BIOHAZARD BREATHALYZER COULD DETECT CORONAVIRUS

S&T electrical and computer engineering researchers are using machine learning to build a system to alert authorities to airborne biohazards such as the coronavirus as travelers pass through airport security checkpoints.

"The mission of this lab is to invent sensors that have ultra-high sensitivity," says assistant professor **Jie Huang**. "We are advancing new frontiers in research."

To trigger the airborne-biohazard alert system, individuals would exhale into a sensor Huang's team is developing to detect viruses in the breath. If a virus is detected, the breath would be chemically tagged for further testing in a spectrometer. The entire process would take less than a minute and could eventually differentiate between a cold, flu or coronavirus.

The researchers hope the system could be made widely available in accessible locations so people could self-test, similar to blood pressure monitors in retail stores.

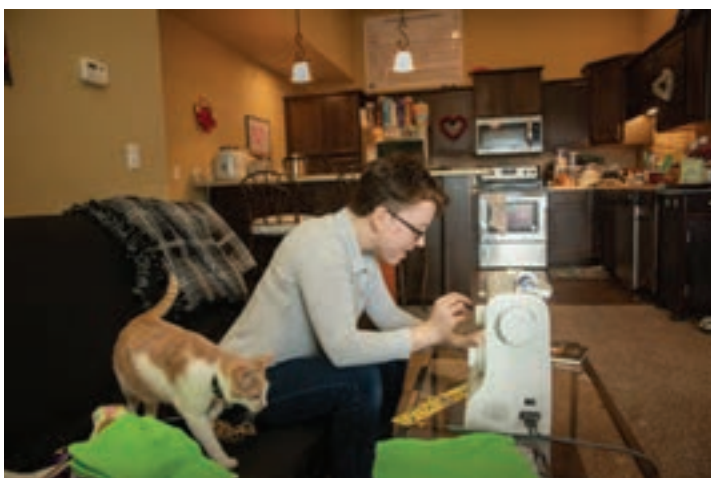
"This could provide valuable information to the individual, done in private of course," says visiting professor **Rex E. Gerald**. "We focused on airports first to try to mitigate the impact of canceled flights in the event of a pandemic, which could cost billions of dollars to the airline industry."

With each iteration of the prototype device, the team provided researchers in biology, chemistry and medicine an opportunity to evaluate the evolving design of the sensor system. The researchers adjust and modify the system based on their feedback.

The front-end sensor, which would indicate whether someone is sick or healthy, could be ready for clinical trials in about a year. The full system with chemical tagging and a spectrometer will take significantly longer to develop.

The biohazard sensor showcases the types of research that complement the University of Missouri System's NextGen Precision Health Initiative, which is expected to accelerate medical breakthroughs by harnessing the research expertise of the four UM System universities.

Working with Huang and Gerald are lead graduate student **Chen Zhu**, assistant research professor **Qingbo Yang** and artificial intelligence expert **Donald Wunsch**, the Mary K. Finley Distinguished Professor of Computer Engineering.



## SEWING TO SAVE THE ORPHANS

When bush fires in 2019 and early 2020 ravaged Australia and killed an estimated 1 billion animals, rescuers kept orphaned kangaroos, wallabies, koalas, bandicoots and other animals comfortable in pouches, wraps and nests handmade by crafters from around the world.

**Laurie Gilson**, a student in mechanical and metallurgical engineering at S&T, joined the effort. She organized an assembly-line approach to sew pouches for animals and wraps for bats and to crochet nests as homes for birds through Relief Crafters of America.

Gilson's outreach to animals isn't limited to those half a world away. She also helps animals close to home, crafting items for Lakeside Nature Center in Kansas City, Mo.

"I sent a big donation to Australia, then thought, 'Wait a minute,'" Gilson says. "They need help right in my backyard."



## 'GREASED LIGHTNING' SCORES BOTH HUMAN-POWERED TITLES

A pandemic couldn't stop an S&T design team in pursuit of success.

S&T's Human Powered Vehicle Design Team is a national champion after taking first place at both of the American Society of Mechanical Engineers' 2020 Human Powered Vehicle Challenge Digital Competitions, ASME E-Fest North and E-Fest South.

Traditionally held in person at different universities, the competitions were moved online because of COVID-19 precautions. Teams were judged on a design report and presentation.

The competitions challenge students to design, build and operate a human-powered vehicle for practical use. Vehicles typically resemble aerodynamic cycles. S&T's vehicle, *Greased Lightning*, features two wheels in the front and one in the back. It has a recumbent-style steel frame designed to allow riders to recline as they pedal. (Pictured: *Leviathan*, S&T's previous human-powered vehicle.)

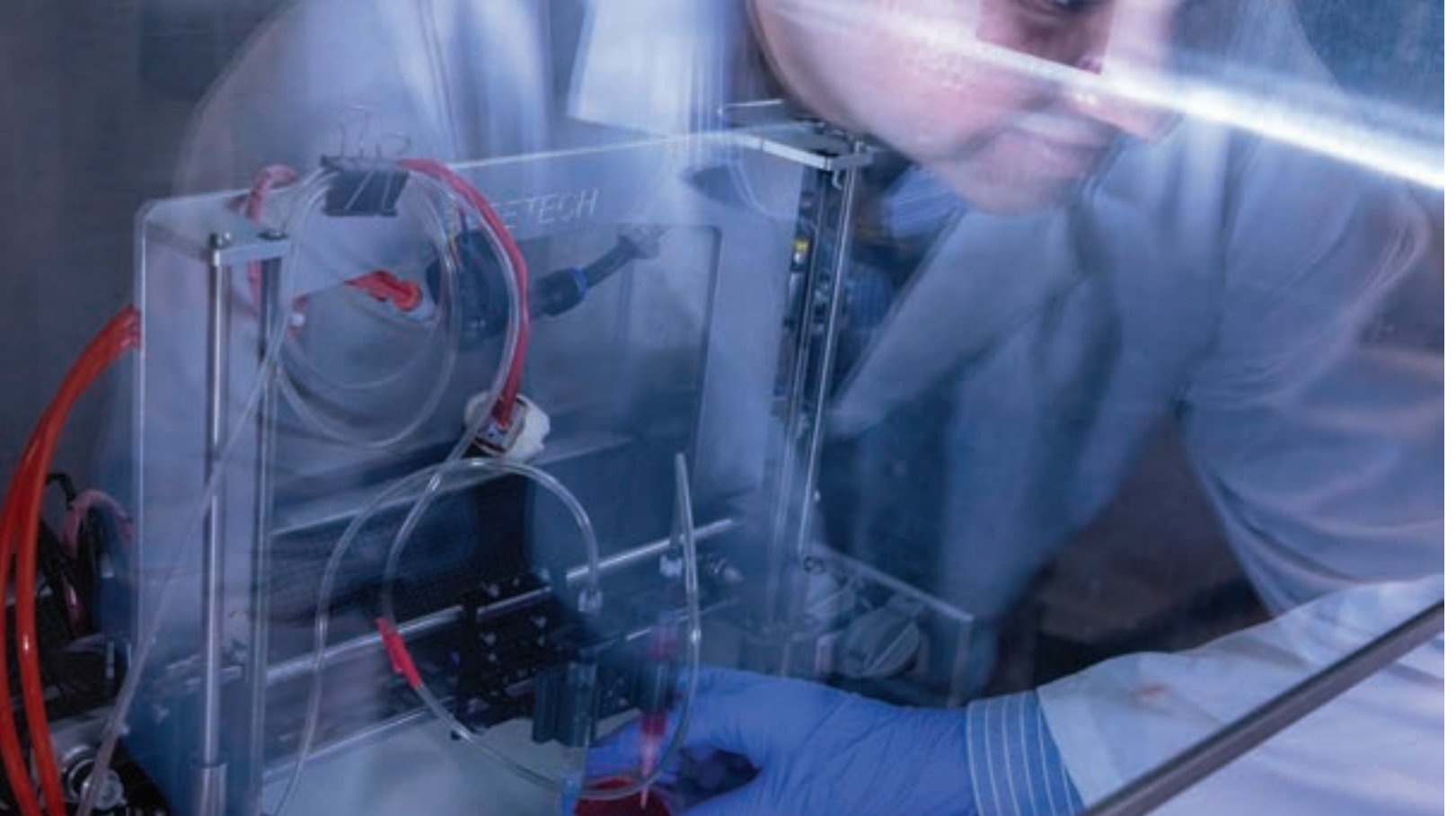


## S&T DEFENSIVE END SIGNS WITH KANSAS CITY CHIEFS

Miner defensive end **Tershawh Wharton**, who studied psychology at S&T, signed a free-agent contract with the NFL's Kansas City Chiefs. Wharton was a record setter at S&T, earning All-America honors and making Great Lakes Valley Conference all-conference three times.

A native of University City, Mo., Wharton was not selected in the NFL Draft, but agreed to a deal with the defending Super Bowl champions a short time after the draft closed.





# RECIPE FOR ORGAN TISSUE CREATION

Using bioactive glass, stem cells and a 3-D printer, Missouri S&T researchers are creating organ tissue samples in hopes of advancing pharmaceutical testing and providing a better understanding of how diseases affect human cells.

The researchers grow stem cells and add them to hydrogels made of alginate, gelatin or similar substances. Then, in a step unique to Missouri S&T, the researchers add bioactive glass to supply needed calcium ions to the hydrogel/cell mixture and load the mixture as “bio-ink” into a 3-D printer. They test the samples after fabrication to assess the stem cell function, the material’s tensile strength, degradation and the best glass type to add.

“Different cells prefer different gels, so we work to find which gel combination suits

our research,” says **Krishna Kolan**, MS ME’11, PhD ME’15, a postdoctoral researcher in mechanical and aerospace engineering. “The challenge is that dissolved glass adds calcium, but it changes the pH, and cells need neutral pH to survive. We figured out which glass and how much to add to maintain neutral pH.”

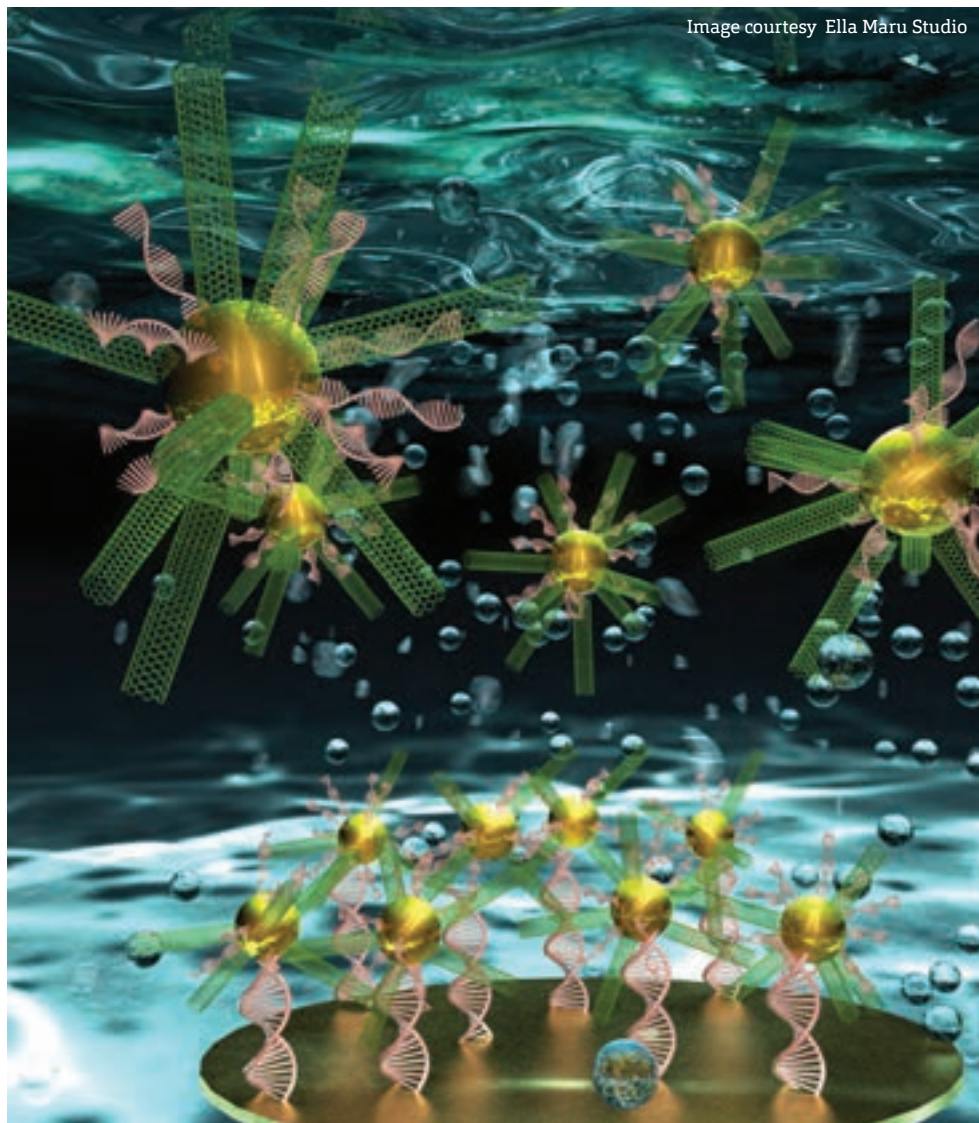
Kolan says researchers are several years away from making a functioning organ, such as a liver or kidney. The challenge is the vascular system and multiple types of cells in those organs, but S&T researchers are working on ways to

develop vascular systems within the bioprinted tissue. Undergraduate students **August Bindbeutel** in mechanical engineering and **Lesia Steen** in materials science and engineering are assisting Kolan.

“Endothelial cells form networks in environments they like, such as glass-infused hydrogel,” Kolan says. “As the network grows, it vascularizes the tissue.”

As researchers work toward someday repairing or replacing organs with engineered organs, they create tissue models for pharmaceutical testing, Kolan says. His team is also working on 3-D-printed bone models. Biology graduate student **Bradley Bromet** is comparing diseased cells with healthy stem cells to see in 3-D how a disease — diabetes, for instance — affects cells.

Kolan is working on the project with **Ming Leu**, the Keith and Pat Bailey Professor in S&T’s mechanical and aerospace engineering department; **Richard Brow**, interim deputy provost and Curators’ Distinguished Professor of materials science and engineering; **Delbert Day**, CerE’58, Curators’ Distinguished Professor emeritus of ceramic engineering, and **Julie Semon**, assistant professor of biology and director of S&T’s Laboratory of Regenerative Medicine.



## DNA BIOSENSOR COULD SPEED DISEASE DETECTION

Combining nanotechnology and biomedical diagnostics into a process called nanodiagnostics is helping scientists detect diseases at an earlier stage.

S&T chemistry researchers **Risheng Wang** and **Wenyan Liu** are creating an ultrasensitive DNA biosensor to detect, transmit and record information about biological substances like DNA and RNA, proteins, antibodies, antigens and other biological components.

Using the sensor to detect biomarkers linked to disease could allow physicians to diagnose cancer and genetic disorders earlier than current testing methods allow. It could also help monitor patient response to therapies.

"Biosensing with nanomaterials has the advantages of greater sensitivity and faster response than traditional analytical methods that require today's medical devices and time-consuming molecular amplification techniques," Wang says.

Made from carbon nanotubes and gold nanoparticles, the biosensor has a 3-D radial shape much like that of a sea urchin. The researchers say the biosensor generated a remarkable electrochemical response.

"This biosensor could detect the ultralow-abundance nucleic acids in complex biological media," says Liu. "It was also highly selective in discriminating single mismatched DNA from fully matched DNA. This type of nanodiagnostic system is a potential candidate for point-of-care medical measurements because of its excellent stability and possibility of miniaturization."

The research, which is funded by the National Science Foundation, was featured on the cover of the April issue of *Analytical Chemistry*.

## DEVELOPING A FASTER, CLEANER, CHEAPER CHEMICAL REACTION

A group of S&T researchers has developed a way for chemists to perform the combined reaction-separation process in chemical reactions without using metals or solvents.

Manufacturers convert substances such as carbon dioxide or biomass into more usable forms through reactive chemistry, often using expensive metal catalysts such as gold or palladium. Reclaiming those catalysts for reuse can be difficult as well as labor- and energy-intensive, especially when the catalyst and reaction agent are homogeneous: both liquids, for example. The expense of precious metals makes catalyst reclamation even more important.

By using hollow composite polymer fibers with organic linkers such as toluene as a binding agent, the researchers immobilized the catalyst on the surface of the fibers while the reaction product flowed through the hollow tube. The process allows chemists to more easily reclaim the catalyst.


The researchers used a continuous operation, adding chemicals at different points along a system. That allows for quicker heating and a faster reaction rate — seconds or minutes as opposed to the hours needed for batch reactions.

"Think of it as making coffee," says **Ali Rownaghi**, an assistant teaching professor of chemical and biochemical engineering at Missouri S&T and a member of the research team. "You can brew a big pot of coffee, but think how much easier it would be to add together water and coffee along a tube and dispense a cup at the end."

The pharmaceutical manufacturing aspect of the research supports the University of Missouri System's investment in research as part of the NextGen Precision Health Initiative and Institute.

Working with Rownaghi at S&T are assistant professor **Fateme Rezaei** and graduate students **Abdo-Alslam Alwakwak**, **Yingxin He**, **Ahmed Almuslem** and **Matthew Senter**, all in chemical and biochemical engineering.





# THE SKY IS NO LIMIT

**D**anielle Gines comes from a musical family in Bunker Hill, Ill., and she is always singing. But it was her interest in science and aviation that drew the Illinois transfer student to Missouri S&T and the Air Force ROTC program.

"I have a passion for anything related to air and space and flight," says Gines, a senior in aerospace engineering.

At 28, Gines is finding success in her major and in the ROTC. In 2019, she earned a spot in the highly competitive Freefall Program at the Air Force Academy in Colorado Springs. The skydiving program only takes 49 students from across the U.S., and Gines trained for four 10- to 12-hour days before making her first solo jump out of a plane.

"I was the first person out of my plane," says Gines, who describes herself as a thrill-seeker and adrenaline junkie. "I jumped out, and I was under my canopy and looking at the beautiful scenery. After my first jump, I was ready for flips and tricks."

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"I have a passion  
for anything  
related to  
air and space  
and flight."

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Gines' ROTC commander praises her emotional intelligence, servant leadership and willingness to take on any challenge.

"Danielle is one of the most mature cadets and phenomenal leaders I have worked with in my entire AFROTC career," says Col. **Brent Unger**, former commander of Air Force ROTC Detachment 442 on the S&T campus. "Danielle aspires to become an astronaut, and she is already well on her way."

The former music major also found a way to keep music in her life, singing with the Missouri S&T Chamber Choir.

"As much as I love science, one specific part of your brain gets overloaded," says Gines. "Pulling back and doing something artistic is a nice release."

When Gines graduates in May 2022, she will commission as a second lieutenant, and she hopes to earn a spot as a pilot in the Air Force and work her way up to becoming an astronaut.

"I love being close to the sky and space," she says. "You have a completely new perspective on the world."

## GLOBAL ENGINEERING PROGRAM LAUNCHES THIS FALL

Missouri S&T will take a purposeful step this fall to prepare engineering graduates for international careers with the inauguration of a new Global Engineering Program (GEP).

The program will equip engineering graduates with the skills and cultural awareness they need to meet complex global career challenges — challenges that could revolve around worldwide food security, medical advancements, energy production, environmental improvements or the expansion of global supply chains, says S&T Chancellor **Mo Dehghani**.

The program allows engineering students to earn two degrees simultaneously in five years while increasing their intercultural competence and proficiency in another language. Upon completion, GEP graduates will hold a bachelor of science degree in an engineering field and a bachelor of arts degree in multidisciplinary studies with an emphasis in language and culture.

The fall 2020 program launch includes French and Spanish language options. The university plans to add German and Russian in the future. In addition to completing the GEP's liberal arts course component, students will study abroad and complete an international engineering internship that combines with their interests.

"A degree from Missouri S&T is widely recognized as an exceptional value," says **Richard Wlezien**, vice provost and dean of S&T's College of Engineering and Computing. "A dual degree with international experience provides them an even greater edge — they will be uniquely positioned to work on global teams and provide leadership on an international scale."

**Audra Merfeld-Langston**, chair of arts, languages and philosophy and associate professor of French, and **Lesley Sneed**, associate professor of civil, architectural and environmental engineering, co-direct the program.



## IS THERE NICKEL IN 'THEM THAR HILLS'?

Major discoveries of metals with scientific and economic significance — metals like nickel, copper and platinum — are becoming few and far between, which seems to suggest that most deposits that are easy to access have already been found.

But with funding from a three-year, \$550,000 NSF Faculty Early Career Development (CAREER) award, **Marek Locmelis** (pictured above, center) plans to dig deeper to find more.

Locmelis, an assistant professor of geosciences and geological and petroleum engineering, studies where these metals come from, how they are transported and where they are most likely to be concentrated in mineable deposits.

"Most known world-class metal deposits formed relatively close to the Earth's surface," he says. "However, a recent decline in major discoveries suggests that most of the easily accessible, near-surface deposits have already been found. To guarantee a steady metal supply in the future, we must look at deeper levels in the Earth, which the CAREER award will help me to do."

The CAREER award supports early career faculty who have the potential to serve as academic role models in research and education and to lead advances in the mission of their department and organization.

Locmelis is an economic geologist with expertise in geochemistry, petrology, planetary evolution and analytical chemistry.

In addition to research on metal deposits, Locmelis also studies supply chain resilience for critical minerals, such as cobalt and rare earth elements. He is the workshop chair for an NSF-supported workshop on supply chain resilience that is tentatively scheduled to be held on the Missouri S&T campus later this year.

He also studies how metals and other contaminants are redistributed during catastrophic flood events and investigates the geochemical evolution of the deep interiors of planets and protoplanets. By studying if, and how, oxygen that is bound in minerals and magmas in the interiors of planetary bodies can affect the composition of oceans and atmospheres, Locmelis can begin to predict whether or not a planet is habitable.





# A CRIME TO REMEMBER

**M**ississippi native **Trent Brown** was born in McComb, a town of 10,000 he calls “a remarkably violent place in the 1960s.” It’s also where a 12-year-old named Tina Andrews was murdered in 1969. After two extensive murder trials that ended in a mistrial in 1971 and resulted in an acquittal in 1972, her case remains unsolved today.

Brown, a professor of English at S&T, chronicles the first comprehensive examination of the case in his book *Murder in McComb: The Tina Andrews Case*. After three years of research and writing, his investigation sheds new light on the impact of the prejudices of whites against whites during and after the tense, uncertain civil rights era.

Brown presents documented evidence and proceedings of the case, as well as recent interviews with people involved. He says the book doesn’t try to solve a cold case, but to explain why the arrests after the murder didn’t result in a conviction.


Andrews and her friend, Billie Jo Lambert, the state’s key witness, were considered “girls of ill repute” and “trashy” children by many people in McComb.

“If they had come from so-called ‘better’ families, I can imagine a different outcome for the case,” he says. “With witnesses reluctant to testify, a skilled and aggressive defense attorney, and some local residents who didn’t wish to see the two arrested law enforcement officers

convicted, the story became one about social class and taking sides.

“I’ve spent a lot of time reflecting on the values of the place where I grew up,” says Brown. “With Tina Andrews’ story, I’ve tried to explore part of the Deep South’s history in the years beyond the civil rights movement, and at the same time, give her short life and the lack of justice that ensued the recognition it deserves.”

“If they had come from so-called ‘better’ families, I can imagine a different outcome for the case.”



# WHAT CAN THE NAKED MOLE-RAT TELL US ABOUT AGING?

Photo by John Trainor/flickr.com

According to widely accepted theories, aging results from accumulated cellular damage caused by the byproducts of oxidative metabolism — the way our bodies burn oxygen to produce energy. Once a certain threshold of oxidative damage is reached, we die.

The theory doesn't seem to apply to naked mole-rats, which can live 10 times longer with higher oxidative damage than mice of comparative weight.

"The long lifespan of the East African naked mole-rats raises one of the most serious paradoxes in the study of aging," says **Chen Hou**, an associate professor of biological sciences at S&T. "And geriatric researchers are asking if the oxidative stress theory is dead."

Hou and his team developed a data-based theoretical model that estimates oxidative damage accumulation with age. It highlights a tradeoff between the metabolic energy costs of growth versus damage repair. If animals expend too much energy on growth, will less be available to repair their oxidative damage, and will it accumulate? It suggests that high metabolism leads to faster damage accumulation.

"The long lifespan of the East African naked mole-rats raises one of the most serious paradoxes in the study of aging."

The study shows that during growth, naked mole-rats expend more energy than mice, and by the end of their growth, have accumulated greater oxidative damage. It also shows that the low metabolism of adult naked mole-rats significantly slows the speed of damage accumulation to less than that of mice.

Hou says this observation led to his hypothesis that mice have lower oxidative damage than naked mole-rats for a large portion of their life, but the oxidative damage of mice will reach the threshold sooner, which causes them to die sooner. He calls it "the simple answer to the paradox."

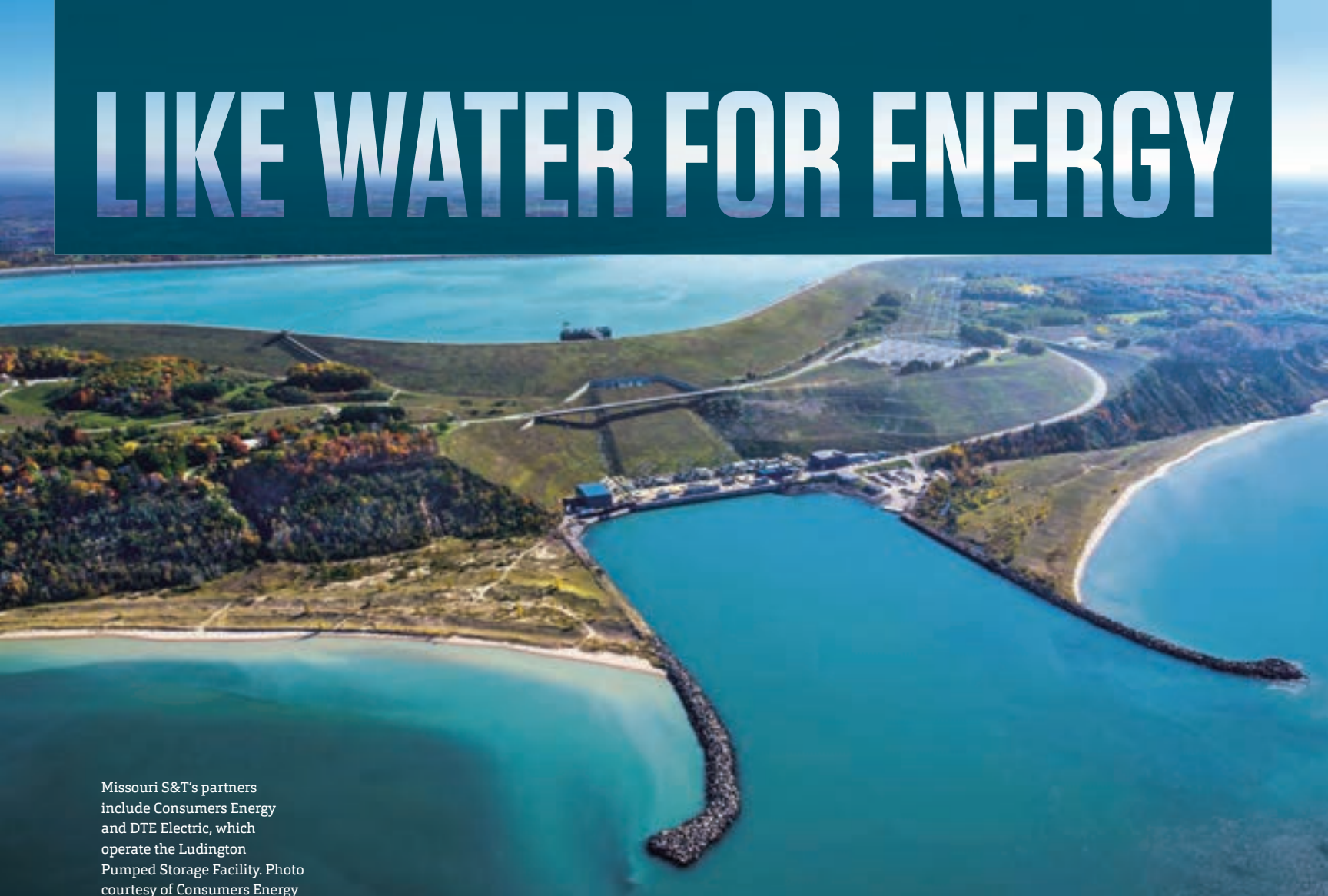
Hou says the discovery that a large portion of lifetime oxidative damage accumulates during growth is especially important for large species, including humans, due to their long growth periods.

"If our hypothesis is proven, the model can become a theoretical framework to learn how differences in children's developmental traits — such as growth rate, birth-to-adult weight ratio, and the energetic cost of biosynthesis — will affect their adult health and lifespan," says Hou.

The research was published in the journal *Advances in Geriatric Medicine and Research*.



# LIKE WATER FOR ENERGY



Missouri S&T's partners include Consumers Energy and DTE Electric, which operate the Ludington Pumped Storage Facility. Photo courtesy of Consumers Energy

About 10% of electricity in the U.S. is created by moving water, or hydropower, according to the U.S. Department of Energy's *Hydropower Vision* report, which also found great potential in improving hydropower systems to meet more U.S. energy needs. Now the DOE is investing about \$7.5 million into research projects to improve hydropower and reduce electricity costs for consumers.

Part of that investment includes a \$999,554 grant to a Missouri S&T research team to improve and evaluate better models for pumped storage hydropower (PSH) — a subset of hydropower that uses water storage in reservoirs to generate energy.

"A pumped storage hydro plant is a special plant that can both generate electricity and consume electricity," says **Rui Bo**, the principal investigator on the grant and an assistant professor of electrical and computer engineering.

A PSH plant uses two water reservoirs at different elevations to generate power as the water descends through a turbine. To generate energy continuously, the plant pumps

water from the lower reservoir to the upper reservoir and the cycle starts again. The Taum Sauk Energy Center near Lesterville, Mo., is one example of a PSH plant. It is operated by St. Louis-based Ameren, one of the industry partners on this project.

"It may sound odd to use energy to pump the water up and then you're using the water to generate energy again," says Bo. "But the reservoirs serve different purposes at different times."

The process works like a rechargeable battery — storing and expending power when needed, Bo says.

"You want to generate power when the system is in need of more energy and the price is higher," Bo explains. "When you pump water, you choose the time when the energy demand or load is low and the price is low."

Bo says when operated efficiently, the cycle makes sense economically.

"Hydro plants are also very flexible," he says. "They can adjust the amount of electricity they generate really quickly. In contrast, a coal-fired

power plant involves a complex thermal process that is not as fast."

Other renewable energies, such as wind and solar, are intermittent resources that depend on the weather to generate energy. The result is that other conventional electricity generation must adjust up and down accordingly to compensate.

PSH plants can help the system deal with this issue to integrate renewables.

"The PSH plants don't emit air pollutants when generating power, and they can enable the use of more renewable energy. That makes it possible to reduce emissions. It can also defer investment in generation and transmission," says Bo. "If we don't operate PSH plants efficiently, we would need other generators to compensate for that."

Missouri S&T is joining with system operators, research institutions and industry leaders to test new PSH models in real-world conditions.

"We will use real data to generate real benefits to consumers. If this project is successful, it has the potential to be applied in energy markets across the U.S.," says Bo.





# CELEBRATE MINER-STYLE

*Missouri S&T's 150th Anniversary  
Celebration kicks off during  
Homecoming 2020, Oct. 16–17.*

MISSOURI S&T | 150



## COVID-19 has affected Missouri S&T — and our world — in ways that were unimaginable a year ago.

The pandemic has also affected our planning for Homecoming 2020 and the official kickoff for our 150th anniversary celebration. We still plan to celebrate in true Miner fashion, but exactly how we celebrate — whether face-to-face, virtually or in some combination of the two — has yet to be determined. We are working closely with S&T leadership and local public health officials to determine the right approach for our Homecoming events as well as the special events commemorating our 150th anniversary.

While we hope to move forward with many of our planned events, some of them are likely to be affected because of COVID-19, social distancing requirements and other public health considerations that will be in place this fall. Some events may move to virtual experiences, while others may be postponed. And while we can't predict what precautions may be in place for Homecoming Weekend, we will work on ways we can connect all Miners everywhere to celebrate.

Please visit [mineralumni.com](http://mineralumni.com) or [150.mst.edu](http://150.mst.edu) for the latest updates and information.

# MINER ALUMNI ASSOCIATION AWARDS

## Alumni Achievement

1: **Frederick Baganoff**, Phys'85, research scientist at Kavli Institute for Astrophysics and Space Research at Massachusetts Institute of Technology

2: **John Asher Johnson**, Phys'99, professor of astronomy at the Harvard-Smithsonian Center for Astrophysics at Harvard University



## Alumni Merit

3: **Robert Berry**, CE'72, adjunct professor at Missouri S&T, vice president of Burns & McDonnell and manager of the St. Louis Region (retired)

4: **Charles Copeland**, ME'62, president and CEO of Goldman Copeland Associates P.C.



## Robert V. Wolf Alumni Service

5: **Robert H. Brockhaus**, ME'62, managing partner at Brockhaus Group LLC

## Distinguished Young Alumni

6: **Casey Burton**, Chem'13, PhD Chem'17, director of medical research at Phelps Health

7: **Kyle Lampe**, ChE'04, assistant professor of chemical engineering at the University of Virginia

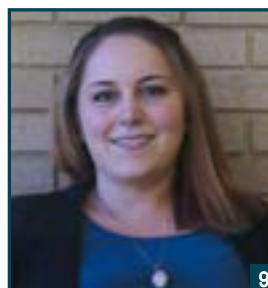
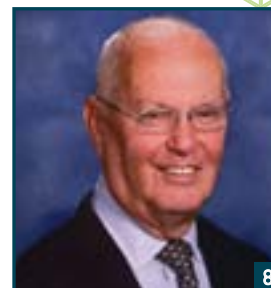
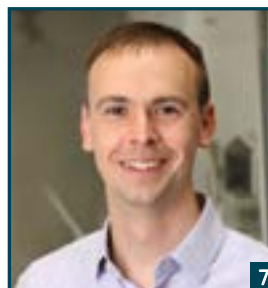


## Frank H. Mackaman Alumni Volunteer Service

8: **John Donnelly**, MinE'70, vice president of Spectrum Commercial Services (retired)

## Class of '42 Excellence in Teaching

9: **Carleigh Davis**, assistant professor of technical communication at Missouri S&T



1870

# CELEBRATING 150 YEARS

From hardscrabble, “country academy” roots, how we became a global research university

By Andrew Careaga, [acareaga@mst.edu](mailto:acareaga@mst.edu)

Rolla in 1871 was a rough-hewn, hardscrabble town. It had more taverns than churches, no paved streets, and seemingly “as many dogs, hogs, horses, ducks and geese as humans walking the dusty streets,” writes **Larry Gragg**, Curators’ Distinguished Teaching Professor emeritus of history and political science.

The town of 1,400 had been a line of defense for the Union Army during the Civil War, which had ended six years earlier. The ravaged nation was still recovering from that conflict.

The Rolla of 1871 seemed an unlikely setting for what would become a major research university by the 21st century. Yet it was here, on the site of Fort Dette, the former Union outpost, that the Missouri School of Mines and Metallurgy (MSM) took root.

The early years were difficult. Derided by one college president as a “country academy,” MSM was poorly funded, struggling to enroll students, and even opposed at times by the very board that governed it. One early leader of MSM described it as “a forlorn foundling ... despised by the mother institution,” the University of Missouri based 90 miles to the north, in Columbia.

Nevertheless, MSM persisted.





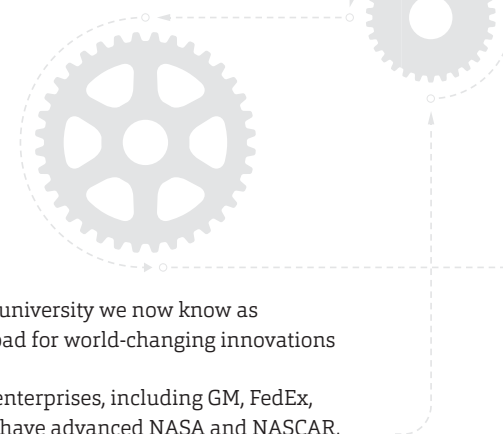
# ROLLA, MO

Above: Rolla, Mo., circa 1919. Norwood Hall and the MSM campus are in the background.

Right: The Missouri School of Mines was built on the site of Fort Dette, a Union outpost during the Civil War.







From these ignoble roots, the university we now know as Missouri S&T became a launchpad for world-changing innovations (see story on page 26).

Its graduates have led major enterprises, including GM, FedEx, Sprint and Bell Labs. Its alumni have advanced NASA and NASCAR, established global humanitarian efforts, and founded countless small businesses. Alumni are known the world over for their problem-solving and can-do spirit. Employers take pride in hiring a “Rolla grad” from MSM, UMR or S&T.



S&T has been able to endure because every generation of faculty and administrators has embraced the land-grant mission of providing access to higher education for qualified Missourians. Whatever challenges faced them, faculty members and campus leaders understood the significance of striving to achieve that compelling mission.”

How has this university persevered — even thrived — through all these years? According to Gragg, whose new history book *Forged In Gold* chronicles the campus’s first 150 years, “S&T has been able to endure because every generation of faculty and administrators has embraced the land-grant mission of providing access to higher education for qualified Missourians. Whatever challenges faced them, faculty members and campus leaders understood the significance of striving to achieve that compelling mission.”

In many ways, the history of S&T parallels that of other land-grant institutions. As Stanford University’s David F. Labaree explains in his 2017 book *A Perfect Mess: The Unlikely Ascendancy of American Higher Education*, by the time of MSM’s founding, the “remarkably humble” U.S. college system was emerging as a rag-tag collection of “lean, adaptable, autonomous ... and radically decentralized” institutions. MSM fit right in.

Land-grant universities like S&T offer “a practical education in vocationally useful skills that will prepare students to be adept practitioners in professional roles,” Labaree writes. S&T has taken that pragmatic approach to heart. That’s why many graduates have found success in business and in major national initiatives — notably NASA’s Apollo space program in the 1960s.

There’s also a “do-it-yourself” ethos that runs through the institution and its students. One of our earliest graduates — **L.R. Grabill**, class of 1878 — described this attitude well when he wrote that our students “work not only with their heads, but with their hands.” They get stuff done.

Students hard at work in Mechanical Hall, circa 1902.



**Nuran Ercal**, the Richard K. Vitek/Foundation for Chemical Research Endowed Chair in Biochemistry, works with lab student **Kaysi Lee** in 2019.



“[Our students] work not only with their heads, but with their hands.”

In Grabbill’s day, that approach was essential to a nation recovering from the Civil War and expanding its industrial capacity. In the years since, students and graduates have responded to other national and worldwide needs, from world wars to the space race to the global need for clean water.

As Gragg points out, MSM in the 1870s was one of only a handful of schools nationwide that offered mining engineering instruction, “so there were few models” for MSM’s first director, **Charles P. Williams**, to go by as he developed the curriculum for the new institution.

But Williams had this charge from University of Missouri President **Daniel Read**: To make MSM “a school both of science and of its applications: its purpose is to teach knowledge and art — first to know and then to do, and to do in the best manner.”

That was enough. And since those hardscrabble early days, students and alumni of MSM, UMR and S&T have forged ahead, armed with their Rolla education, to know and to do, all in the best manner. As this university endures all current and future difficulties, its alumni will continue to do so well into the future. □

## NEW BOOK CHRONICLES UNIVERSITY’S HISTORY

**Larry Gragg**, Curators’ Distinguished Teaching Professor emeritus of history and political science, tells the Missouri S&T story from its founding in 1870 to today in a commemorative history book that will be available by Homecoming 2020.

*Forged in Gold: Missouri S&T’s First 150 Years*, available for pre-order now at [forged.thesandtstore.com](http://forged.thesandtstore.com), is fundamentally the story of the campus’s commitment to its land-grant mission. Most of the students were Missourians of modest means. They were the young people who U.S. Rep. Justin S. Morrill of Vermont had in mind when he promoted the Land Grant College Act of 1862. Morrill was a passionate advocate of providing access to higher education for the “working classes,” specifically in the study of “agriculture and the mechanic arts.” The book’s title honors a lyric from the university’s alma mater.

Want to hear more about the process and journey behind creating the book? Sign up online at [150.mst.edu/forged-in-gold](http://150.mst.edu/forged-in-gold) for updates about upcoming book signing opportunities where Gragg will talk about the work, read selected passages, and of course, sign your copy.



# INNOVATION,

## THE ROLLA WAY

Since our founding, S&T and innovation have been tightly connected. From advances in materials, movies and microloans to wound-healing glass and the Hula-Hoop, Miners have created some of the world's most significant innovations. Here are some notable achievements of our alumni and faculty.



### An early "expert bacteriologist"

The first female scientist in the U.S. Public Health Service, **Ida Bengtson** came to Rolla in the 1920s to study the bacterial infection trachoma. MSM Director **Charles Fulton**, delighted to have an "expert bacteriologist" in town, added her to the faculty. In Rolla through 1931, she also worked on a treatment for Rocky Mountain spotted fever.



### Revolutionary copper mining

Copper wire made electrification of the U.S. possible in the early 20th century, but it was **Daniel C. Jackling**, MetE 1892, who made the copper wire possible. Jackling developed a way to recover copper "so cheaply," notes the Mining Hall of Fame, "it was hailed throughout the industry as a revolutionary achievement."

# 1870

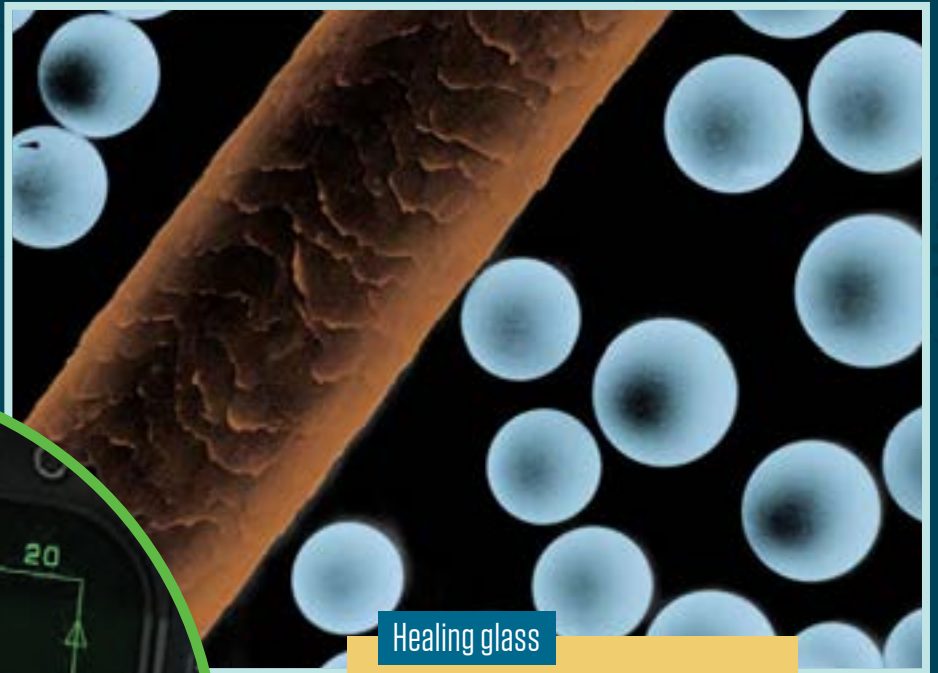
University of Missouri School of Mines and Metallurgy is founded.

### Telecommunications and transistors

Research by **Mervin J. Kelly**, Chem 1914, at AT&T Bell Laboratories led to the world's first trans-oceanic phone call in 1927. Kelly later served as president of Bell Labs, where his research group invented the transistor.







### Healing glass

**Delbert Day**, CerE'58, co-invented a process to treat inoperable liver cancer with radioactive glass microspheres, each one about one-third the diameter of a human hair. The treatment is used at hundreds of medical sites worldwide.



### Hand-held GPS

Until the 1980s, global positioning systems had no commercial applications. Along came **Ed Tuck**, EE'53, who developed the first hand-held GPS receiver for general use, the Magellan NAV 1000.

### Perfecting plastics

While studying catalysts to convert petroleum into liquid gasoline, **Robert L. Banks**, ChE'44, stumbled upon an idea in 1951 to create high-density polyethylene (HDPE), a material used for plastic milk jugs, baby bottles, laundry baskets and the Hula-Hoop.

### Pulse-Doppler radar

As an engineer for Westinghouse in 1953, **Harry Smith**, EE'42, discovered pulse-Doppler radar, now commonly used for weather forecasters everywhere.

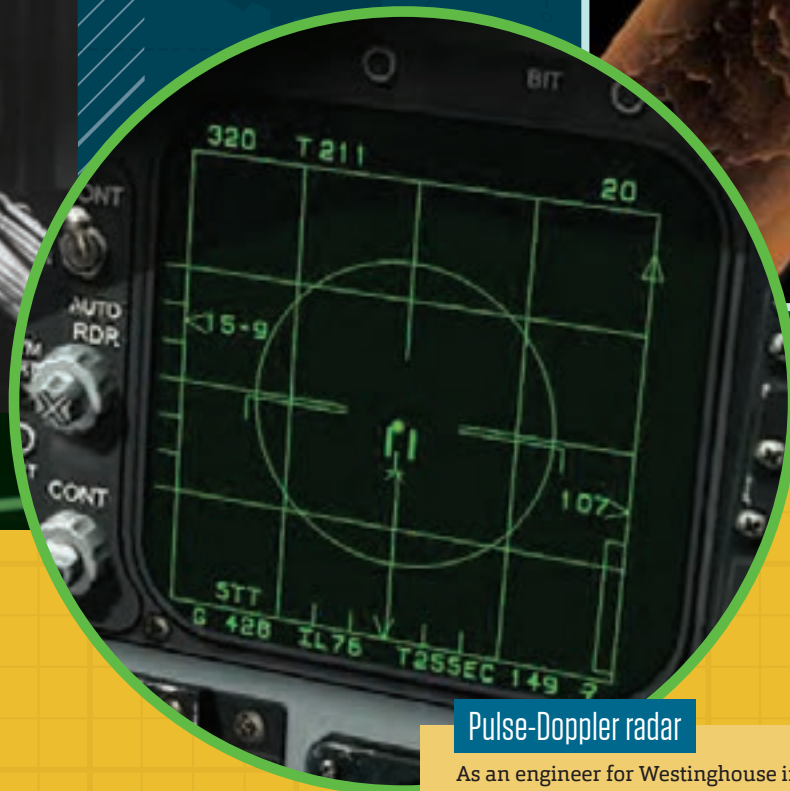


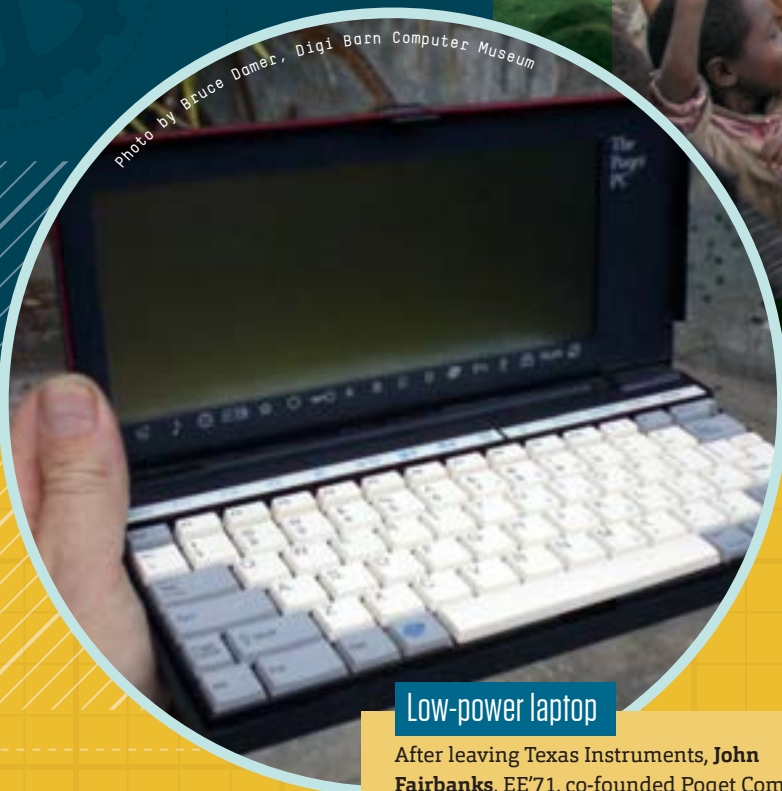
Photo by Water.org



### Water everywhere

Joining forces with actor Matt Damon, **Gary White**, CE'85, MS CE'87, is bringing clean water and sanitation to millions worldwide through the non-profit, **water.org**, and the WaterCredit microloan program.

Photo by Bruce Damer, Digi Barn Computer Museum



### Low-power laptop

After leaving Texas Instruments, **John Fairbanks**, EE'71, co-founded Poqet Computer and created the first sub-notebook style computer. It was powered by two AA batteries.

### Rare-earth innovator

He started out as a florist, but **Robert Herchenroeder**, MetE'59, is better known for creating Haynes Alloy 188, which was used in engines for the F-15 Eagle and other military aircraft. He earned 36 U.S. patents in his lifetime.

### Movie magic

The winner of three Academy Awards for technical achievement, **Steve Sullivan**, EE'89, developed special effects systems used in dozens of movies, including *Pirates of the Caribbean*, *Avatar* and *Iron Man*.



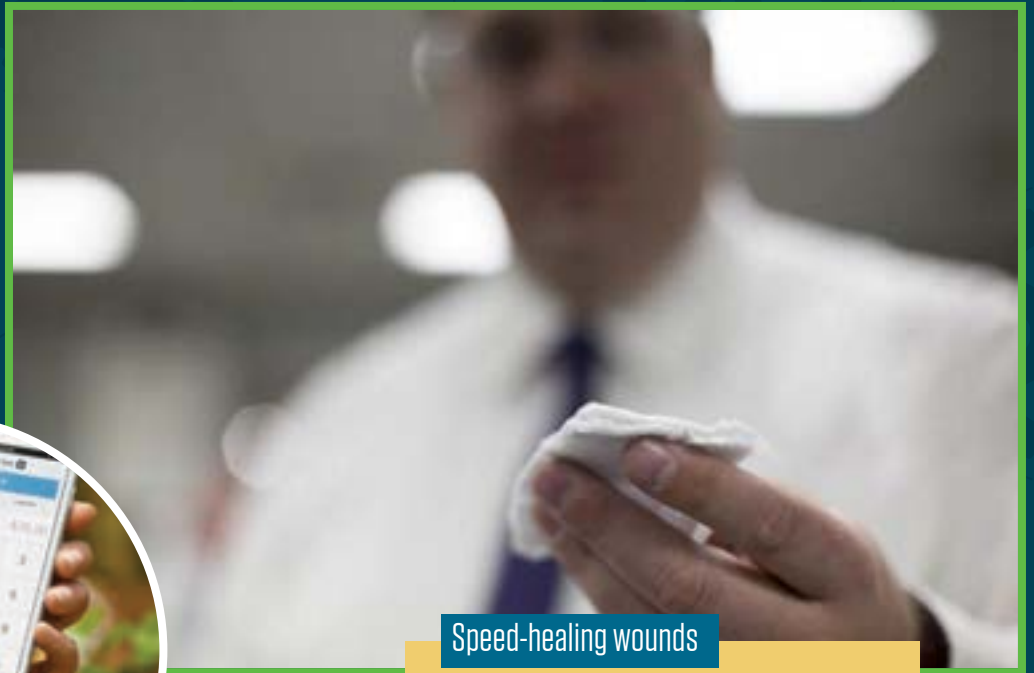
Photo by Steve Jennings Photography





### Creating connections

**Jack Dorsey**, NDD'98, co-founded two of the 21st century's most influential digital developments: the social network Twitter and the mobile payment platform Square. This year, he set aside \$1 billion to battle coronavirus, support girls' health and education, and promote universal basic income.



### Speed-healing wounds

**Steven Jung**, CerE'05, MS CerE'07, PhD MSE'10, developed a cotton candy-like glass fiber matrix called Mirragen that speeds the healing of open wounds.



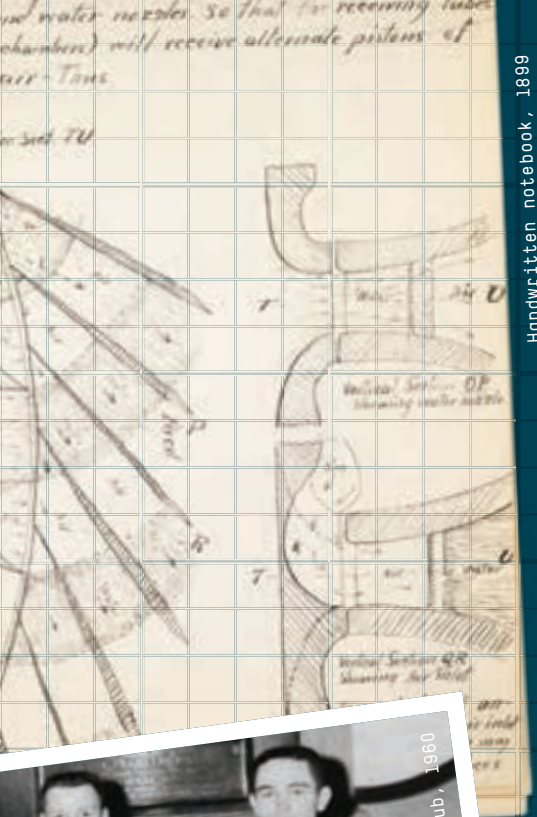
Photo by Nick Romanenko

### Securing the cloud

A security researcher at AT&T, **Cristina Serban**, MS CSci'93, PhD CSci'96, holds patents for content security systems and now studies ways to make mobile and cloud computing more secure.

# 2020

Missouri S&T celebrates its 150th anniversary.



Handwritten notebook, 1899



M Club, 1960



Victory Bell, circa 1940

# KEEPING HISTORY ALIVE

By Rudi Starek, [news@mst.edu](mailto:news@mst.edu)

Several authors have written history books about S&T, but no tome can contain all the information researched or preserve any physical items.

**Debra Griffith**, archives librarian at S&T, says the university maintains a physical archive to preserve its history and to keep records of a variety of campus functions.

"We continue to maintain the physical materials — the originals — because the digital world can be fragile despite our best efforts," she says.

Established in 1978 to house the university's historical, legal and cultural records, the archives collects departmental, professional and alumni materials like photographs, campus artifacts and day-to-day records. The archives staff also works closely with faculty, staff, students and the public on research projects related to the university's history.

## Deciding what to keep

Many day-to-day documents, including bills and vacation requests, are shredded after their usefulness has passed, but the archives staff tries to keep most "first-time" documents, Griffith says. A receipt for the first hook-up of electricity or a telephone to the university would be kept, for example, if it could be found. Some items like chancellors' correspondence, committee meeting minutes and organizational by-laws are kept permanently, but they can't be used in research until a designated amount of time has passed.

*Rollamo* yearbooks and *Missouri Miner* student newspapers are retained permanently, and are both available online through the university's institutional repository, Scholar's Mine ([scholarsmine.mst.edu](http://scholarsmine.mst.edu)). The yearbook collection is complete, and the digitization of the newspaper is ongoing. The archives keeps five physical copies of each yearbook in addition to digitizing them.



# DEAR MINERS OF 2071 ...

By Peter Ehrhard, [ehrharp@mst.edu](mailto:ehrharp@mst.edu)

To help give Miners of the 22nd century — and archaeologists, historians and anthropologists — a glimpse of life way back in 2020, S&T officials are preparing a time capsule. It will be sealed in fall 2021 with instructions to be opened during S&T's bicentennial.

So, what goes in the capsule, you ask? An iPhone, a St. Pat's sweatshirt, campus photos, letters from students — the possibilities are nearly endless. Regardless of what the contents are, they'll be safe from the elements.

The water-tight, stainless steel capsule is 31 inches wide, 23 inches long and 11 inches deep. It has a foam gasket seal and can withstand temperature fluctuations from minus 40 degrees to 250 degrees Fahrenheit.

The time capsule will be placed on campus at a location to be determined, to mark the close of the 150th celebration in fall 2021.

## What do you think should be placed in the capsule?

What do people of 2071 need to know about life at S&T today? Submit your suggestion at [150.mst.edu/capsule](https://150.mst.edu/capsule) and check back throughout the year to see the final list.

# "I think for some collectors the 'hunt' is part of the fun."



Joe Miner figures, 1951

## In search of

Some seemingly important items have been lost. Griffith says she would love to learn what happened to the Victory Bell, which was rung whenever Miners won sporting events.

"The Victory Bell hung on the Rolla Building," Griffith says. "It was donated by Joseph Campbell, a patron of the university, but was taken off the roof in the 1940s to prevent students from falling."

The Victory Bell, given to S&T in the late 1800s, was broken in the 1950s and seems to have mysteriously disappeared, Griffith says. A new bell, donated by the Frisco Railroad in the 1950s to replace the Victory Bell, remains in the Curtis Laws Wilson Library on campus.

On a slightly smaller scale, Griffith says the archives can always benefit from additional photo albums from 1915 through the 1960s.

## Why do people collect?

**Amy Belfi**, assistant professor of psychology at S&T, believes she knows why people enjoy collecting and keeping their own "archive."

"I think for some collectors the 'hunt' is part of the fun," she says. "But I would say when the collecting stops being a positive experience, then it's probably gone too far."

Belfi says that people may also create collections of things that remind them of specific events or periods in their lives, to display for aesthetic reasons, or even to wear, like St. Pat's sweatshirts. Some collections provide happy memories of loved ones who have died.

**Denise Baker**, assistant professor of psychology at S&T, says people collect things because they think they might need those items one day. Others may collect simply for the feeling of achievement when they complete a collection.

"Perhaps it reassures us that we did indeed live in the past, that we are not merely works of our own fiction," Baker says. □



THE NEXT

# CHAPTER

What lies ahead for S&T's next 150 years?

By Sarah Potter, [sarah.potter@mst.edu](mailto:sarah.potter@mst.edu)

**A**s Missouri S&T launches its 150th anniversary celebration, the world continues to recover from a devastating pandemic and the economic downturn that followed. Despite this environment, S&T leaders are optimistic about the university's ability to deliver excellent instruction and become a world-class science and technology university.

## Learning from crisis

Because of the growing coronavirus threat, Missouri S&T put courses entirely online just before spring break last March and continued to deliver courses online through the summer. University leaders say last spring's hasty transition to online teaching and learning has brought with it important lessons.

"This period taught us that we need multimodal delivery of educational programs," says S&T Chancellor **Mo Deghani**. "We cannot rely exclusively on in-person learning."

Deghani is energized by the prospect of delivering an S&T education to anyone, anywhere.

"We can now take the university to the world," he says. "As was proven in this crisis, no matter where you are, we can deliver the content of our programs."

Even so, Deghani doesn't foresee a complete move to fully online teaching anytime soon.

"This situation also showed us just how much our students value the in-person experience," Deghani says. "They told us that they miss their friends and classmates, they miss the campus, they miss their professors."

**Richard Wlezien**, vice provost and dean of the College of Engineering and Computing, agrees.

"I don't believe students will migrate to online learning as the primary choice for an engineering education," he says. "If anything, being away from campus for a significant time is going to help students better appreciate their on-campus experiences."



**“This situation also showed us just how much our students value the in-person experience.”**

### Preparing students for the future

Part of the university’s history of success is due to its ability to adapt to changing educational needs.

“We have to evolve,” says Wlezien. “We started as a mining school because that was what was needed at the time of our founding. We then became an engineering school.”

Today’s Missouri S&T offers 99 degree programs in 40 areas of study, many of them beyond engineering. Wlezien predicts that S&T will maintain its strength in engineering but notes that computer science will grow rapidly as the needs for data analytics and artificial intelligence increase. Some things will stay the same, though, he says.

“What we really train our students to do is to think like an engineer; that’s the biggest gift that we give to our students and the common denominator that all engineers share,” says Wlezien.

**Kate Drowne**, interim vice provost and dean of the College of Arts, Sciences, and Business, says technology platforms come and go. What matters most, she says, is not the learning platform or delivery method, but empowering students with the skills needed to be successful in their careers and lives.

“The way to help graduates become invaluable to their employers is to teach them not only content, but also how to work together, problem solve, synthesize complicated information, communicate well and evaluate information,” says Drowne.

Dehghani agrees that preparing students involves more than a transfer of knowledge.

“The great majority of people in the future will be working in jobs that don’t yet exist,” says Dehghani. “We need to teach them how to learn in order to produce future-proof graduates.”

Toward that end, university leaders have been exploring new academic offerings that either build on existing strengths, such as the new global engineering program (see page 16), or envision entirely new and customized approaches to education. Expect to see growth in the number of graduate certificates S&T will offer in the future to prepare students for the evolving needs of society, and expect to see more focused, single-course “medallion” programs that provide the expertise needed for emerging fields.

Top: **Sahra Sedigh Sarvestani**, associate professor of electrical and computer engineering and associate chair for distance, teaches students online.

Middle: **Kelvin Erickson**, EE’78, MS EE’79, Curator’s Distinguished Professor of electrical and computer engineering, interacts with lab students virtually.

Bottom: **Jossalyn Larson**, assistant teaching professor of English and technical communication, teaches remotely from her home.





## Changing footprint

The principles of delivering a high-quality Missouri S&T education aren't changing. But the campus footprint will soon look different.

The Classroom Learning Center will expand the Computer Science Building's west side to add one 300-seat auditorium and four 100-seat classrooms this fall. Originally envisioned to provide more space for larger classes, this fall the rooms will help S&T comply with social distancing requirements designed to minimize the spread of COVID-19.

The Clayco Advanced Materials and Construction Laboratory is also adding 18,000 square feet on the north side of Butler-Carlton Civil Engineering Hall along Pine Street. Plus, the Kummer Student Design Center has doubled in size with an 8,000-square-foot expansion to provide design teams more space for their projects, and room for whatever future design teams may emerge.

By 2022, the Transportation Development District — a partnership among the City of Rolla, Phelps Health and the university — will realign University Drive along 12th Street to connect to campus and improve access to Bishop Avenue from U.S. Interstate 44. The roadways will better usher visitors into a new university arrival district — a more visually defined entrance point for campus. S&T master planners have long hoped to create a clear path for visitors to enter the university.

"We want to build that sense of excitement as prospective students, faculty or industry partners step onto campus," says **Fred Stone**, MetE'07, MBA'16, director of design, construction and space management. "Coming to campus should be intuitive and easy to navigate, and right now it's not."

Stone says demonstrating the Miner experience for prospective students is challenging because elements such as the student design center and athletics facilities are not part of the campus tour. He says the feedback gathered while developing the preliminary 2021 Missouri S&T Master Plan led to a proposed new welcome center, student experience center and a research facility. Architectural drawings of the plan show a new entrance archway with the university name, added pedestrian walkways and expanded greenspace.



Top: Architectural rendering for S&T's new arrival district.

Middle: The Clayco Advanced Construction and Materials Laboratory, an 18,000-square-foot expansion to Butler-Carlton Hall.

Bottom: Inside the Kummer Student Design Center's 8,000-square-foot expansion.



## Vision for the future

The welcoming new spaces will help the university achieve Dehghani's vision of S&T as a world-class science and technology university for workforce development, research breakthroughs and economic development. Dehghani says the university must be a "destination of choice" for the caliber of faculty, students, researchers and practitioners who will ensure S&T's excellence for the next 50 years.

"I've served at some of the nation's leading universities, and based on my experience, I can tell you that the quality of a Missouri S&T education is second to none," Dehghani said during his inaugural State of the University address. "The entire state of Missouri should be proud of our excellence."

Dehghani's focus is on the three R's and one E — retention, research, reputation and enrollment. He called on the university community to improve S&T's retention and graduation rates, elevate research activity, and enhance the university's reputation. He emphasized the need to increase enrollment at undergraduate and graduate levels and to achieve a top-100 ranking in the *U.S. News & World Report's* annual list of the nation's best universities. Dehghani hopes to see total student enrollment reach 12,000 and to achieve a Carnegie "Research 1" classification through increased research funding.

That focus is starting to pay dividends as university rankings and enrollment show signs of improvement. Missouri S&T's graduate engineering ranking has risen from 106th to No. 83 in 2020 in the highly competitive *U.S. News & World Report* rankings. Projected fall enrollment is up slightly at a time when higher education researchers are predicting a loss of up to 20% in fall 2020 enrollment, according to research by SimpsonScarborough. Classes are scheduled to resume in-person on campus Aug. 24.

## Optimism about the future

Drowne is especially excited about the next generation of students heading to S&T this fall.

"We have a generation of students that wants to do good in the world," she says. "We need to keep them empowered and excited. That's going to be the future of higher education."

Dehghani says the university will continue to attract the best and brightest minds. He holds fast to his vision, even as the university reinvents itself for what many are calling the "post-pandemic" world.

"I am absolutely optimistic about our future," says Dehghani. "These are stressful times right now, but we will reemerge and we will reemerge stronger." □



Chancellor Mo Dehghani delivers the State of the University address on the S&T campus.

# TEST YOUR S&T KNOWLEDGE

1. In what year did the Missouri School of Mines (MSM) begin offering classes?
  - (a) 1870
  - (b) 1871
  - (c) 1874
2. Which star pitcher of the 1920s faculty baseball team was the namesake of a campus building?
  - (a) Walter Schrenk
  - (b) Luman Frank Parker
  - (c) J.G. Norwood
3. In the library, you will find a sculpture by local artist Louis Smart of what famous scientist?
  - (a) Thomas Edison
  - (b) Albert Einstein
  - (c) Nikola Tesla
4. The university was built on what former Civil War site?
  - (a) The Battle of Wilson's Creek
  - (b) Fort Wyman
  - (c) Fort Dette
5. Who was MSM's first director?
  - (a) Elmo Golightly Harris
  - (b) Charles P. Williams
  - (c) George Ladd

## How did you do?

Visit [150.mst.edu/trivia](https://150.mst.edu/trivia) and take the full quiz to find out if you are an S&T trivia expert!

Answers: b, a, b, c, b

# 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 circles. In response to the challenges of the COVID-19 pandemic, these opportunities have expanded in new ways with our "Inside the Miner's Studio" web events, online book club and virtual happy hours. To learn more about how you can connect with Miners nationwide, check out the events calendar at [mineralumni.com/events](http://mineralumni.com/events).



Bay Area Section Oktoberfest



Houston Section Holiday Party



Houston Section St. Pat's



Tulsa Section St. Pat's



St. Louis Section St. Pat's



Dallas Section St. Pat's

# LET YOUR VOICE BE HEARD

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.

## PRESIDENT

Stephen W. Rector '72

## PRESIDENT-ELECT

Michael McEvilly '80

## VICE PRESIDENTS

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Ernest K. Banks '81

Kurt Haslag '07

Delores Hinkle '75

Ronald W. Jagels '86

Christopher Ramsay '83

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## TREASURER

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## DIRECTORS-AT-LARGE

Robert "R.J." Agee '03

Tessa C. Baughman '04

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Jeremy Bylo '14

Daniel Dziedzic '83

Michael Emanuel '87

## AREA DIRECTORS

Area 1: Rhonda Pautler '87

Area 2: Joshua Hoffman '07

Area 3: Kathryn Crinnian '13

Area 4: John Burgess '85

Area 5: John Stutsman '77

Area 6: Gary Hines '95

Area 7: Tamra Scheibhofer '95

Area 8: Richard Berning '69

Area 9: Richard Szevery '02

## Areas 10-18:

Kenneth Bandelier '97

Julie Hawkins '06

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Area 20: Michael Party '78

Area 21: Hugh Cole '72

Area 22: Ian Lee '14

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Area 24: David W. Heineck '79

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James E. Bertelsmeyer '66

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Perrin R. Roller '80

Susan Hadley Rothschild '74

Gerald L. Stevenson '59

To contact your  
representatives, go to  
[mineralumni.com](http://mineralumni.com).



# CLASS NOTES

## YOU CAN STILL KEEP IN TOUCH

Send information and a about your personal updates — weddings, births and other special occasions, and professional accomplishments — career changes or promotions and other news — to [alumni@mst.edu](mailto:alumni@mst.edu), and they will be shared online at [mineralumni.com](http://mineralumni.com).

### 1957

**Al Matz, ME:** "My wife, Margaret (Peggy), passed away on July 19, 2019, after a fall in Florida on Feb. 25. We were married for over 60 years, and she will be greatly missed by me and our family."

### 1961

The International Astronomical Union named a newly discovered asteroid after Egyptian scientist **Farouk El-Baz**, MS GGph, PhD GGph'64, in honor of his scientific contributions to NASA space projects.

**Michael Kearney, EE:** "I have just returned from our SigEp conclave in Houston, where our chapter did indeed win the Buchanan Cup. This is the highest chapter award in the organization. Conclave is held every two years, so the application for the Buch' Cup must cover two years of documenting accomplishments. Our chapter was rated Exceptional in 16 of the 18 judged categories."

### 1962

**Charles Copeland, ME,** was the 2019 recipient of the *Engineering News-Record* New York Legacy Award for outstanding contribution to engineering in the New York region. Copeland is CEO of Goldman Copeland Associates in New York City.

**Robert Erdmann, ME:** "I founded Trinity Equipment Co. in 1986 and retired in 2012. We live in North Carolina with all our children and grandchildren around. I had a wonderful BSME career."

**Norman Larason, CE:** "I retired from the FAA in 1994 after 31 years. I opened Winston Salem Antiques in 1995. Sold our building and closed the store in 2018. Now we are enjoying lake life at Lake Viking, Mo."

**Murray "Mike" McCrary, CE:** "I retired from my public works construction company in the San Francisco Bay Area after 42 years in 2015. Arlene, who worked in the registrar's office, and I celebrated our 60th anniversary. Our son didn't attend

MSM, but one grandson did. We have visited S&T several times over the years ... amazing changes!"

### 1963

**Edward Benn, ME:** "I made it to 80. I am retired in the Rockies."

**Fred Brost, MinE:** "My wife, Gretchen, and I are retired and living in Tucson. I have written a book titled *A Mining Saga: People, Places and Adventures Along the Way*, which contains a few stories about our years at Rolla as well as stories from South Africa, Papua New Guinea, Brazil, Yemen, India and others. It is available on Amazon in paperback or as an e-book."

### 1964

**Alan E. Stricker, CerE:** "I still operate my rare coin business, the Nickel Trader Co., in McMurray, Penn."

### 1965

**Alfred Thiede, CE,** MS EMgt'72, MS CE'72: "As of July 10, I officially beat colon cancer and have been declared 'free for life.'"

### 1969

**Edward C. Gentzler III, GGph:** "Lost my partner of 27 years five years ago to leukemia just as we were moving into a retirement complex, Bethesda Gardens in the St. Louis suburb of Kirkwood, Mo. I have finally regained my bearings and life is good here again."

**Charles W. Myles, Phys,** retired in January after 41 years as a professor of physics at Texas Tech University.

### 1972

**Joseph D. Rupp, MetE,** was named to the Nucor board of directors. He previously served as director of Olin Corp.

### 1973

**John Keating, MetE,** received the Hero of the Industry Award from the Florida Section of the Society for Mining, Metallurgy and Exploration during the 34th Florida SME Regional Mining Conference in Lakeland, Fla. The award is given annually to individuals the



## RED FEATHER PUBLISHES BOOK

**Stephanie Red Feather, AMth'92,** published a book titled *The Evolutionary Empath* in November 2019. The metaphysical book focuses on what Red Feather describes as "heart-centered consciousness." After serving 10 years in the U.S. Air Force, she earned master's and doctoral degrees in shamanic studies.

Today she is a metaphysical author, teacher, healer, non-traditional/non-denominational minister, and founder and director of Blue Star Temple. Her book focuses on Peruvian shamanic traditions and how empaths can better understand their nature and embrace their role in humanity.



## YEUNG STARTS NEW POSITION AT S&T

**San Yeung**, PhD CSci'19, joined the S&T faculty as an assistant teaching professor of computer science. He was formerly a graduate research assistant at S&T. Yeung's research interests include personalized learning, smart computing with artificial intelligence and data science, and green computing.

## O'KEEFE NAMED DEAN AT KANSAS STATE

**Matthew J. O'Keefe**, MetE'85, was named dean of the Carl R. Ice College of Engineering at Kansas State University. As part of the appointment, O'Keefe will hold the LeRoy C. and Aileen H. Paslay Chair in Engineering.

He joined Kansas State from the University of Mississippi, where he was executive director of the Haley Barbour Center for Manufacturing Excellence and professor of chemical engineering.

Before joining the University of Mississippi, O'Keefe was at S&T from 1999 to 2017. He also served as director and senior investigator for Missouri S&T's Graduate Center for Materials Research and interim assistant vice chancellor of global learning. He earned a Ph.D. in metallurgical engineering from the University of Illinois.



Delbert Day, left, and his son, Ted Day, at the symposium in honor of Delbert Day. Photo by the American Ceramic Society.

# SYMPOSIUM HONORS DELBERT DAY

**Delbert E. Day**, CerE'58, was honored during a symposium named for him in July 2019 in Toronto. Researchers discussed work similar or related to Day's research, and talked about how their personal relationships with Day have influenced them.

The symposium was held in conjunction with two global ceramics conferences: the Second Global Forum on Advanced Materials and Technologies for Sustainable Development and the Fourth International Conference on Innovations in Biomaterials, Biomanufacturing and Biotechnologies.

Speakers from around the world discussed Day's contributions to the field, including development of Theraspheres for treating cancer and his work with **Steve Jung**, CerE'05, MS CerE'07, PhD MSE'10, to develop wound-healing borate glass fibers. He was recognized as a teacher and mentor by many.

**Mohamed Rahaman**, professor emeritus of ceramic engineering, and **Richard Brow**, interim deputy provost for academic excellence and Curators' Distinguished Professor of materials science and engineering, organized the symposium.



section considers to have made significant contributions to the continuing vitality of the mining industry.

# 1974

**Gerry Howser**, Phys, MS CSci'12, PhD CSci'14, an associate teaching professor of computer science at Missouri S&T, published a textbook titled *Computer Networks and the Internet*, which offers a hands-on approach to networking.

**Ali A. Selim**, MS CE, PhD CE'76: "After retirement in 2008, I received an offer in 2013 from the secretary of transportation in the Egyptian government to be his assistant. I accepted the offer, moved to Egypt and served in that position for 18 months, then returned to the U.S."

# 1975



**Dean B. Jones**, NucE, MS NucE'76, president and CEO of TransWare Enterprises Inc., earned an Award of Professional Distinction from Missouri S&T during the university's December 2019 commencement ceremonies.

**Alan Sullivan**, ME, who worked for Ameren Missouri at the Bagnall Dam Power Plant, was chosen to be grand marshal of the Lake Ozark, Mo., St. Pat's Parade.

**Steve Lang**, MinE, MS MinE'80, was appointed chair of the board of base metals miner Hudbay. He is former CEO of Centerra.

# 1977



**R. Tim Bradley**, PetE, retired president of Kinder Morgan CO<sub>2</sub> Co., returned to campus in December 2019 as S&T's commencement speaker.

# 1980



**Barry Fehl**, CE, joined Freese and Nichols Inc. as a senior water resource design engineer. After Hurricane Katrina, Fehl worked to restore levees, floodwalls and pump stations in New Orleans. He spent the first half of his career as an engineer with the U.S. Army Corps of Engineers and continues to help write their guidance documents.

**Mike McEvilly**, ChE, MS EMgt'81, was named an at-large member of the Grand Council of Tau Kappa Epsilon.

# 1981

**John Anderson**, MinE, was appointed president of RMR

Industries Inc. He previously served as vice president of operations for the Quikrete Companies.

**Steven Harrison**, LSci, was appointed by Missouri Gov. Mike Parson to the Missouri Conservation Commission.

# 1983

**Mark Grossenbacher**, CE, joined HNTB Corp.'s St. Louis office as a practice leader. He previously served as a senior project manager and practice leader at the company's Arlington, Va., office.

**Paul A. Lang**, MinE, was named CEO of Arch Coal Inc. He previously served as president and chief operating officer.

**Don Taylor**, MS GGph, received an Alumni Merit Award from the Southeast Alumni Association during Southeast Missouri State University's Homecoming celebration. Taylor earned a bachelor's degree in geology from Southeast in 1970.

# 1985



**Samuel "Bo" Mahaney**, Hist, an Air Force major general, shared rapid-response leadership strategies used during the coronavirus pandemic and critical missions of 21st century wars during a live webinar hosted by S&T in May. Watch it at [rol.la/Mahaneytalk](http://rol.la/Mahaneytalk).



## ENGINEERING A GLIDER

**Bruce Wundrack**, CE'82, recently shared this photo of his grandfather, **Aaron J. Miles**, ME'30, MS ME'31, former S&T faculty member and first dean of the School of Engineering, flying a homemade glider in Rolla in the 1930s. The story passed down to Wundrack details a doomed flight that started when a group of students used a car to get the glider, piloted by Miles, up to speed before releasing it. The glider crashed soon after. Miles broke a few bones, but the experience gave him a story to pass down to generations of Miners, including his son, **John Bruce Miles**, ME'55, MS ME'57, and Wundrack's father, **William Wundrack**, EE'49, and Bruce Wundrack's son, **Aaron Wundrack**, MinE'14, MS MinE'16.

**Tom Newman**, ME, MS EMgt'95, was appointed director of the Rotorcraft Business Unit at Donaldson Aerospace and Defense. He previously served as an engineering director.

**Norman D. Pumphrey Jr.**, MS CE, associate professor emeritus of civil engineering and construction engineering technology at Louisiana Tech University, was commencement speaker during the university's summer ceremony in August 2019.

**Cindy Tang**, Econ'85, was named Platteville, Wis., Citizen of the Year. Considered by community officials

one of Platteville's most productive civic leaders, she runs Inspiring Community, a group that helps connect people with ideas with funding options and expertise.

# 1986

**Sandra Magnus**, Phys, MS EE'90, a former NASA astronaut and deputy director for engineering in the Office of the Under Secretary of Defense for Research and Engineering, shared her coping mechanisms, encouragement and advice dealing with challenges during the coronavirus pandemic during a live webinar hosted by S&T in

April. Watch at [rol.la/Magnustalk](http://rol.la/Magnustalk).



**Terrence T. Palisch**, PetE, global engineering advisor with CARBO Ceramics, received an Award of Professional Distinction from Missouri S&T during the December 2019 commencement ceremonies.

# 1987

**Rad Ganesh**, PhD ME, received a Distinguished Service

# FUTURE MINERS

(A–K)



1



2



3



4



5

1. **Matt Dennis**, NucE'05, MS NucE'08, and his wife, **Suzi (Schroer)**, NucE'09, had a daughter, Eleanor Christine, on June 20, 2019. She joins sister Margaret Elizabeth, 2.
2. **Ryan Eisenbath**, PetE'10, and his wife, **Jen (Qualls)**, BSci'10, had a daughter, Charlotte Ryan, on Nov. 11, 2019, in Brunei. She joins sisters Margaret and Jacqueline.
3. **Cory Hunsley**, ME'97, and his wife, Emily, had a son, Parke Miner, on June 18, 2018. He joins brother Demry, 6, and sister Ruby, 8.
4. **Katie (Bryant) King**, Bus'08, and her husband, Adam, had a son, Charles, on Feb. 15. Adam studied civil engineering at S&T and was the 2008 St. Pat's Herald.
5. **Kate (Baygents) Kolett**, ChE'08, and her husband, Josh, had a son, Max Howard, on July 22, 2019. He joins sister Nadia Avigail Kathleen, 3. The family lives in Houston.

Award from the Air Movement and Control Association International Inc. He is director of product applications for Twin City Fan Companies.

**Martin Murray**, ME, was appointed chief technology officer at Mahindra Electric. He previously served as an executive at General Motors.

**Bob Valbracht**, ME, received a Distinguished Service Award from the Air Movement and Control Association International Inc. He is vice president for engineering at Loren Cook Co.

## 1988

**Cary Dunston**, EMgt, was a keynote speaker at Shenandoah University's 12th annual Business Symposium. Dunston is president and CEO of American Woodmark.

**Pietro Fiocchi**, AE, was elected in 2019 to the European Parliament on the Brothers of Italy list. He is a member of the European conservatives and reformists group.

**Ramona Tumblin-Rucker**, PetE, received the Private Sector Executive of the Year award from MOKAN Construction Contractors Assistance Center. She is director of construction management at M Property Services.

## 1989

**James A. "Tony" Hair**, ME, was appointed to the board of directors of QEP Co. Inc. Hair is president of the global residential business

division of Masonite International Corp.

## 1990

**Winston F. Erevelles**, MS EMgt, PhD EMgt'92, was installed as 2020 secretary of SME. He is a professor of engineering and dean of the School of Science, Engineering and Technology at St. Mary's University.

**Eric Haynes**, Hist: "After 28 years in Kansas City, Mo., **Lynne**, ChE'90, and I moved to the St. Louis area. I teach middle school writing at KIPP: Triumph Academy, and Lynn has taken a role with Annie's Hope, a non-profit that supports grieving children who have lost a loved one."

## 1992

**Karen L. Albert**, GeoE, MS GeoE'94, was named county engineer for Montgomery County, Mo.



**Philip Ling**, ChE, general manager executing acquisitions and divestments for Shell Pipeline Co.'s midstream Master limited Partnership, received an Award of Professional Distinction from Missouri S&T during the December 2019 commencement ceremonies.

## 1993

**Steve Campbell**, CE, was named district engineer for the Missouri Department

of Transportation's Southwest District. The district covers 21 counties and includes the cities of Springfield and Joplin.

**James E. Koch**, PhD EMgt, a senior vice president and regional director for Michael Baker International's Mid-Atlantic Region, was named an American Society of Civil Engineers Fellow.

## 1994

**Lisa (Smith) Kirby**, CE, was named city engineer in the city of Greenville, N.C.'s newly created engineering department. Kirby has worked with the city of Greenville since 2003 and served as senior engineer since 2010.

## 1995

**Chance Allen**, MinE, was named general manager for the mountain region of Lafarge-Holcim's U.S. Aggregates and Construction Materials organization.



**Neil S. Brady**, CE, joined Bartlett and West in the company's Springfield, Mo., office.

**Deepa Soni**, MS EE, was appointed chief information officer (CIO) for The Hartford. She previously served as CIO at BMO Financial Group.



# MINER UNIONS

1. **John Schaefer**, AE'14, MS AE'15, married his high school sweetheart, **Emily Dierkes**, ME'15, on Sept. 3, 2018, in Paris. The couple lives in Rock Hill, Mo., and Emily is pursuing a master's degree in systems engineering from S&T. Both work for Boeing in St. Louis.
2. **Henning Schoene**, EMgt'16, and **Chelsea Ehret**, BSci'15, were married in a small town in Bavaria, Germany, on Oct. 22, 2018.



**Kevin Reed**, MetE'83, photographed a group of Miners from his family who were gathered for his daughter's June 14, 2019, wedding in Corinth, Texas. Pictured from left are **Clint Galaske**, ME'09; **Lauren Easterly Galaske**, Bus'09; **Reed**; **Rhonda Reed Galaske**, MetE'79; **Colette Galaske Lozier**, ChE'06; and **Andy Lozier**, ME'06.

in Teaching Award, which recognizes the achievements of St. Louis-area educators.

**Sheila Tabanli**, MS Phys, PhD Phys'02, a Muslim immigrant from Turkey, spoke about her experiences as part of a cross-cultural conversation panel called Community Café in Metuchen, N.J.

## 1999

**Jeff Rieker**, CE, was named manager of the U.S. Bureau of Reclamation's Eastern Colorado Office.

## 2000

**Jerica Holtsclaw**, CE, was named director of the Missouri Department of Transportation's Motor Carrier Services division.

## 2001

**Chad Cole**, CpE, published a book titled *My 93-Year-Old Roommate*, a memoir about the two years Cole lived with his grandfather as his mind slowly succumbed to dementia.

**Chris Edrington**, MS EE, PhD EE'04, was named the Warren H. Owen Distinguished Professor in Electrical and Computer Engineering at Clemson University. He previously served as a research associate in the Center for Advanced Power Systems and a professor of electrical and computer engineering at Florida State University.

## 2004

**Mohammad Tayeb Al Qaseer**, MS EE, PhD EE'09, joined the Iowa State University faculty as a research associate professor

in electrical and computer engineering.

**Nathan Branham**, CE, MS CE'06, was promoted to program and department manager for Burns & McDonnell's Global Facilities Group in Kansas City, Mo. The position is part of the company's Principal Group, a senior level of leadership that marks distinguished performance.

**Laura Ely**, MetE, Barnes Group Advisor, was featured in a question-and-answer article about additive manufacturing in *Quality Digest*.

**Kyle Lampe**, ChE: "In my role as an assistant professor at the University of Virginia, I won the National Institutes of Health 'Trailblazer' grant award for our proposal to develop better methods of drug delivery after ischemic stroke. Last summer, I was recognized as one

## 1996

**Craig Magerkurth**, MS EMgt, joined Sensory Interactive as a senior associate on the company's project management team.

**Sherri Murrish**, MetE, was appointed to the board of directors of the Missouri Association of Manufacturers. She is regional director

of engineering for GKN Aerospace.

## 1997

**Bill Borrenpohl**, ME: "I completed a systems engineering program through Caltech in 2019 as I also reached 20 years employment at John Deere. I am a senior engineer in vehicle performance in the forestry division. My

wife, four children and I also operate a small farm with pastured beef, hogs and meat goats, and we direct-market meat within the local foods community."

**Bill Siever**, CSci, MS CSci'00, PhD CpE'07, a principal lecturer in computer science and engineering at Washington University in St. Louis, received an Emerson's Excellence

## COLLINS WINS TWO AWARDS FOR HIGH-IMPACT PAPER

**Pete Collins**, MetE'99, the Alan and Julie Renken Professor of Materials Science and Engineering at Iowa State University, received the Henry Marion Howe Medal from the American Society for Metals and the Champion H. Mathewson Award from AIME for a paper he published in *Metallurgical and Materials Transactions*. The paper is titled "Understanding the Interdependencies Between Composition, Microstructure, and Continuum Variables and Their Influence on the Fracture Toughness of a/B-Processed Ti-6Al-4V."

Collins earned master of science and Ph.D. degrees in materials science and engineering from Ohio State University. Before joining the Iowa State faculty, he was a faculty member and undergraduate coordinator at the University of North Texas.

## REIDMEYER RECEIVES ACS AWARD

**Mary Reidmeyer**, CerE'78, MS CerE'84, PhD CerE'89, teaching professor emeritus of ceramic engineering at S&T, received the Greaves-Walker Lifetime Service Award from the American Ceramic Society. She received the award at the organization's 121st annual meeting at Materials Science & Technology 2019 in Portland, Ore.

Reidmeyer received the award for outstanding service to the ceramic engineering profession and exemplifying the aims, ideals and purpose of the newly formed Education and Professional Development Council.

During her S&T tenure, Reidmeyer organized and oversaw S&T's Hot Glass Shop. Her research focused on processing, product development, glasses, heat- and corrosion-resistant coatings, deposition methods, high-temperature lubricants, and consumables for the metal casting industry.

of *PRISM* magazine's 20 Under 40 by the American Society of Engineering Education for mentoring, research and teaching efforts."

### 2006

**Brian Stone**, MS EMgt, a family medicine physician specializing in sports medicine at Indiana Regional Medical Center in Indiana, Penn., and a U.S. Army major, recently returned from a tour of duty in Kuwait.

**Bob Swacil**, CE, was promoted to senior project manager with Brinkmann Constructors.

### 2008

**Beth Matthews**, MS CE, vice president of operations for Illinois American Water, was named to the board of directors of the Illinois Manufacturers' Association.

**John Osterhage**, CE, chief of the emergency management branch of the U.S. Army Corps of Engineers, gave a presentation about the 2019 flood response for the St. Louis chapter of the Society of American Military Engineers.

### 2009

**Jonathan Leek**, Psyc, the regional data architect with the University of Missouri-St. Louis' Community Innovation and Action Center, took part in an invitation-only accelerator program organized by DataKind and Microsoft to advance his work to quantify the vacant properties in St. Louis.

### 2011

**Stevie Patterson**, Psyc, was re-elected to serve on the Central District University of Missouri Extension

Council. She is a human resources specialist with Town and Country Bank in Salem, Mo.

### 2012

**Devan Scroggins**, EMgt, was elected to serve as a stockholder in the Cassville (Mo.) Industrial Development Corp. He is an application engineer at Regal Beloit.

### 2013

**Caleb Hull**, Chem, PhD Chem'18, works in research and development for Catalytic Innovations, a Missouri company founded by **Scott Volner**, MetE'83, MS MetE'84, PhD GeoE'94. The company is the first to create an economically friendly recycling technique for household batteries — using them to fertilize vegetables, trees and grass. The company

was featured in a Feb. 6 article in the *Rolla Daily News*.

### 2014

**Andrew Ehlmann**, EMgt, was promoted to vice president of Foreman Fabricators Inc., where he has worked since 2015.

**Marisa Zelip**, ME, was chosen for the 2019 class of Ford's Thirty Under 30, a philanthropic leadership course for Ford Motor Co. employees who work to address challenging social issues. The fellows will work with community development corporations to develop potential solutions for neighborhood concerns such as affordable housing, economic development, beautification and basic resident services.

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# 2015

**Ruwindy Dalpadado**, Psyc, earned a master of science degree in clinical and health psychology from the University of West London and is a health psychologist at Asiri Surgical Hospital in Colombo, Sri Lanka.

**Chelsea Ehret**, BSci: "On Oct. 22, 2018, **Henning Schoene**, EMgt'16, and I got married in a small town in Bavaria, Germany. We've since moved to Colorado, where Henning works at Universal Forest Products as a production supervisor trainee. After finishing my master's degree in Germany, I accepted a yearlong fellowship with Eagle Rock School in the Rocky Mountains near Estes Park. It is a non-profit that provides alternative education on a full scholarship to high-school-aged students who haven't found success in conventional learning environments. I am an instructional science fellow."

**Barbara Rutter**, MS MinE, PhD MinE'19, returned to her undergraduate alma mater, Southern Arkansas University, to speak to engineering freshmen about making explosives.

**Beau Wasson**, MS EMgt, a project manager in the New Orleans District of the U.S. Army Corps of Engineers, wrote an article on instilling discipline in soldiers in a blog post for the Company Command and Platoon Leader Forums, which focuses on growing and leading combat-effective teams.

# 2017

**Katie Bartels**, EnvE, MS EnvE'20, was featured with her cat, Hank, in a story about emotional support animals on public radio station KBIA. Bartels was also chosen as a student speaker for S&T's spring 2020 commencement.

**Tyler Curtis**, Econ, a lender at a community bank in Missouri, reviewed the movie *1917* for [WallStreetWindow.com](http://WallStreetWindow.com).

**Rachel Gordon**, ME MfgE, a production engineer and quality manager for Unico Inc., was featured in a February 2020 article titled "20 to Watch: Women in HVAC" in *Engineered Systems*.

**Jackson Wilhite**, GGph, began service with the Peace Corps in Zambia. "I am in a sector called LIFE — linking income, food and environment," Wilhite said in a January 2020 article in the *Dubois County Herald*. "My position combines agriculture and conservation farming techniques to preserve the environment and improve yield. This position is particularly important because Zambia relies on a consistent rainy season, so the rural farmers are vulnerable to the effects of climate change, such as pushing the rainy season later and more erratic rainfall."

**Dajae "Moe" Williams**, EMgt, was featured in a story on NPR about using hip hop to build diversity in math and science fields. Williams is a quality engineer at NASA's Jet Propulsion Lab.

# 2019

**Mullin Evans**, Psyc, was named the CASA Rising Star of the Year for her work with Court Appointed Special Advocates. She was the featured speaker at the organization's Justice is Served event, where she shared her experiences as a child and teenager in foster homes.

**Rachel Hultz**, Chem, was named water quality coordinator for the city of Moberly, Mo.

**Anna Ramirez**, PetE, provided a millennial's perspective in a panel session about how industry can better attract, develop and retain a next-generation workforce during the IADC World Drilling Conference in 2019.

**Tyler Westerfeld**, ME, joined St. Louis-based Wiegmann Associates as a project engineer. He will design and engineer HVAC systems for the company's projects.



**Alan Scher Zagier**, MBA, joined the St. Louis office of Tightline Public Affairs, working in strategic communications, public policy and community engagement. □

# FUTURE MINERS

(L-Z)



1. **Jeff Lentz**, MS ME'08, and his wife, Ashleigh, had a son, River Zane, on June 18, 2018. He joins brothers Theo, 5, and Sullivan, 3. The family lives in Powder Springs, Ga.
2. **Justin Levy**, GGph'15, and his wife, Cady, had a son, Joel Parker, on Nov. 15, 2019.
3. **Drew Taylor**, MinE'10, and his wife, **Ashley (Smith)**, Bus'11, had a daughter, Katie Ann, on Jan. 29, 2020.
4. **Donald Trice Jr.**, EMgt'12, and his wife, **Kyla (Jackson)**, ME'11, had a daughter, MaKenzie R., on March 3, 2018.
5. **Logan Wesley**, ME'12, and his wife, **Samantha (Mollet)**, EE'13, had a son, Arthur Samuel, on June 26. His uncle is **Jonathon Mollet**, ME'15, and his grandfather is **Samuel Mollet**, EE'88.

# MINERS REMEMBERED



## Let us know

Please let the Miner Alumni Association know of any alumni deaths. Email information to [alumni@mst.edu](mailto:alumni@mst.edu).

## 1953

**John R. Ford**, CerE  
(Oct. 30, 2019)

## 1954

**Richard W. Gotsch**,  
CerE (Jan. 16, 2019)

**Bernard R. Juskie**,  
CE (Sept. 16, 2019)

## 1955

**James E. Thomas**,  
Phys (July 27, 2019)

**M.J. Turnipseed**,  
MinE (Dec. 5, 2018)

## 1945

**James M. McKelvey Sr.**,  
ChE, taught at Johns  
Hopkins University and  
Washington University  
in St. Louis, where he  
served as dean of the  
School of Engineering  
for 27 years. James M.  
McKelvey Sr. Hall and  
the McKelvey School  
of Engineering, both at  
Washington University,  
were named in his  
honor. (Nov. 13, 2019)



**Edmond P. Hyatt**,  
CerE, MS CerE'50,  
was a member of Phi  
Kappa Phi, Tau Beta Pi  
and AIMME and was  
the Keramos Honor  
Graduate. He was a  
geology instructor at  
Brigham Young  
University, general  
manager at Electro  
Ceramics Inc. in Salt  
Lake City, technical  
ceramics product  
manager at Centralab  
in Milwaukee, Wis., and  
president and founder  
of EPH Engineering  
Associates Inc. in Orem,  
Utah. (Oct. 21, 2019)



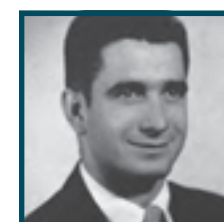
**Sidney Eugene  
Duerr Jr.**, PetE, served  
in the U.S. Navy and  
was on the first ship  
to arrive in Nagasaki,  
Japan, after the end  
of hostilities. Upon  
his return, he played  
football on the Miners'  
championship team  
and was inducted into  
the S&T Athletic Hall  
of Fame. A lifelong  
petroleum engineer,  
Mr. Duerr participated  
in the construction  
of one of the first  
offshore drilling rigs in  
Texas. (July 14, 2019)



**Jack Albert Steuterman**,  
ChE, was in the U.S.  
Navy before enrolling  
at S&T. He worked as  
an estimator, design  
engineer and vice  
president of business  
development for  
Mississippi Valley  
Structural Steel,  
then worked for  
steel companies in  
Evansville, Ind., and  
Williamsport, Penn.,  
before retiring from  
Steward Steel Co.  
(Nov. 17, 2019)



**Theodore J.  
Oldenburg Sr.**, GGph,  
worked for the U.S.  
Geological Survey in  
Rolla after serving in  
World War II. In 1962,  
he moved to Denver,  
where he continued  
government work.  
He retired at age 55.  
(March 8, 2019)



**Charles A. "Pete"  
Weitzel**, ME, played  
three S&T sports and  
was an officer in the  
U.S. Army and the  
Reserves. He worked  
in engineering,  
construction and real  
estate development,  
and was a member  
of the school board  
and city board.  
(Oct. 31, 2019)

## 1946

**Howard Fowler**, MinE  
(April 22, 2019)

## 1947

**James D. Sullivan**,  
MetE (June 18, 2019)

## 1948

**John Griessen**, ChE  
(Aug. 27, 2019)

## 1949

**Paul K. Edwards**,  
MinE (Sept. 4, 2019)

**William L. Griffith**,  
ChE (June 16, 2019)

## 1950

**Joseph A. Albaugh**,  
NDD (Sept. 15, 2019)

**Charles H. Church**,  
Phys (July 8, 2019)

**Ralph E. Coffee**,  
ChE (May 8, 2019)

**Robert V. Faith**, CE  
(July 31, 2019)

**Donald D. Hockett**,  
ME (March 19, 2019)

**Theodore J. Oldenburg**,  
GGph (March 8, 2019)

**Shirley K. Spindle**,  
Chem (June 20, 2019)

## 1951

**Louis A. Gibbs**, MinE  
(Nov. 2, 2019)

**Charles R. Hamm**,  
PetE (June 27, 2019)

## 1952

**Junius L. Johnson**,  
ChE (April 18, 2019)

**H. Chalmers Kerr**,  
EE (July 17, 2018)

**John O. Steele**, EE  
(July 15, 2019)

## 1957

**Donald J. Ferguson**,  
ME (July 27, 2019)

**Ben Johnson**, CerE  
(July 10, 2019)

## 1958

**Robert L. Bono**, ME,  
studied math and  
physics in graduate  
school at the University  
of Washington-Seattle,  
then began work at  
Boeing. His work  
contributed to the  
Apollo Moon Landing



Program and Space Shuttle mission planning. He retired from Wilson Tool and Die. (Oct. 23, 2019)

**Donald J. Herforth**, ME (Oct. 29, 2019)

**William J. Hill**, EE (Aug. 18, 2019)

**Joseph A. Shewski**, CE (July 21, 2019)

**D. Warren Williams**, PetE (Oct. 4, 2019)

## 1959

**Andrew J. Gazda**, CE (Aug. 13, 2019)

**Frank E. Janes**, ME (Sept. 22, 2019)

**Paul E. Minton**, ChE (Nov. 7, 2019)

**Paul H. Slinkerd**, CE (Nov. 12, 2019)



**Ronald E. Volker**, CE, was a member of Chi Epsilon, Tau Beta Pi and the Newman Center. He retired from McDonnell Douglas Corp. in 1994 as branch chief of structural dynamics and loads. (Sept. 19, 2019)

## 1960



**Howard L. Blevins**, CE, earned his PE license in 1963. He retired in 1997 after 37 years



Photo by Pam Ramirez



1. **Jonas Bereisa Jr.**, EE'67, MS EE'70, former president and CEO of Auto Electrification, died May 11, 2019, at age 73. During a 35-year career with General Motors, Mr. Bereisa created the concept of the Chevrolet Volt electric vehicle and served as chief engineer of propulsion systems for GM's EV1 and S-10 electric pickup, and director of advanced engineering and technology strategy to develop hydrogen fuel cell technology. He also pioneered GM's early control systems, microcomputer chip set architectures and mass production of microcomputer chip technology. A member of the Academy of Electrical and Computer Engineering, he was a 2011 Alumni of Influence honoree.
2. Dr. **Margie Viola Boston**, professor emeritus of music and drama, died Jan. 5, 2020, at age 93. A retired department chair, Dr. Boston was an accomplished vocalist, having performed in several opera and musical productions. Throughout her career, she directed and produced many musical performances and was recognized for her individual approach. She earned a bachelor of arts degree from the University of Tulsa and a Ph.D. in musical arts from the University of Iowa.
3. **Robert Marshall "Bob" Brackbill**, MinE'42, a pioneer in the oil and gas industry, died May 15, 2020, at age 100. During World War II, Mr. Brackbill joined the U.S. Army Air Corps, earning the rank of major, and was awarded the Bronze Star Medal. After the war, he began a 23-year career with Shell Oil Co., where he became a pioneer

in the development of wellsite analysis and testing to determine reservoir production capabilities. In 1965, he joined Texas Pacific Oil Co. and worked 18 years before retiring as chairman of the board. In retirement, he co-founded Robertson Onshore Drilling as chair. An emeritus member of the S&T Board of Trustees, Mr. Brackbill was past president of the Miner Alumni Association and a member of the Academy of Mines and Metallurgy and Sigma Nu fraternity. In 1983, Missouri S&T honored him with an honorary Doctor of Engineering and he delivered the commencement address. In 1999, S&T presented him with the Chancellor Medal, and in 2016, he was named one of Missouri S&T's Alumni of Influence. Among other projects, he and his wife, Cay, helped found the Class of '42 Scholarship and funded a state-of-the-art classroom in McNutt Hall with his daughter, **Mary Hargis**, GeoE'84, and her husband, **Mark Hargis**, GeoE'84.

4. Dr. **Wayne Cogell**, professor emeritus of philosophy and former associate dean of S&T's College of Arts and Sciences, died Feb. 16, 2020, at age 80. Dr. Cogell earned a Ph.D. in philosophy from the University of Missouri-Columbia in 1969. He joined the S&T faculty in 1967 as a philosophy instructor, was named professor in 1983 and retired in 2000. Dr. Cogell held many leadership roles at S&T, including chair of philosophy and liberal arts; director of the Missouri London Program and the General Honors Program; and assistant dean, interim dean and associate dean, in the former College of Arts and Sciences.



1. Dr. **Patricia Julian Morrow**, professor emeritus of English, died Oct. 30, 2019, at age 86. Dr. Morrow taught English literature at S&T from 1969 until her retirement in 1984. After retirement, she continued to edit dissertations and professional journal articles, as well as articles in Braille for *The Blind Missourian* magazine. She volunteered with the National Federation of the Blind of Missouri and served as chair of its scholarship committee. Dr. Morrow earned a bachelor of arts degree in the humanities from the University of Denver, a master of arts in English literature from the University of Colorado, and a Ph.D. in English from the University of Missouri-Columbia. She was a Fulbright scholar and studied in Belgium.
2. Dr. **E. Keith Stanek**, professor emeritus of electrical and computer engineering and S&T's first Finley Distinguished Professor in electrical and computer engineering, died Sept. 30, 2019, at age 77. Dr. Stanek began his career as a part of the electrical engineering faculty at the Illinois Institute of Technology, then held faculty positions at West Virginia University and Michigan Technological University before joining the S&T faculty in 1990. He served as chair of electrical and computer engineering from 1995 to 2002 and retired in 2006. Dr. Stanek was inducted into the Academy of Electrical and Computer Engineering in 2003. Among many honors, he was an IEEE Fellow and a member of the National Society of Professional Engineers, serving on the board of directors of its educational foundation. He earned a Ph.D. in electrical engineering from the Illinois Institute of Technology.
3. **Maurita Stueck**, who helped establish a lecture series and endowed a scholarship at S&T, died March 24, 2020, at age 97. Mrs. Stueck earned a degree from Washington University in St. Louis and valued the importance of higher education. She established the Stueck Distinguished Lecture Series for civil, architectural and environmental engineering at S&T and an endowed scholarship in the name of her husband, Cornelius Frederick Peter "Neil" Stueck, CE'43. Mrs. Stueck served on the Board of the St. Paul Theological Seminary in Kansas City, as well as the Girl Scouts of Greater St. Louis and the American Association of University Women branches in St. Louis and she was active in the Wednesday Club of St. Louis and the St. Louis chapter of Phi Beta Phi.

as chief of design for the department of the president of the Board of Public Service in the city of St. Louis. (May 13, 2019)



**Donald G. Cooper**, MetE, was a U.S. Air Force veteran who worked for Bay State Abrasives as a senior research engineer. An investigator and an entrepreneur, Mr. Cooper co-founded Wel-Co Metallurgical Inc., and founded Phoenix Metallurgical Inc. and Laser Services. He retired in 2005 and spent several years touring the country in an RV. (Aug. 7, 2019)

**George R. Gustafson**, ChE (Jan. 5, 2019)

**Kenneth T. Klebba**, CE (Aug. 2, 2019)

**Allen H. Schwartzburt**, CE (Feb. 3, 2018)

**Roy E. Vied**, ME (July 19, 2019)

1961

**John B. Kinder**, EE (Oct. 1, 2018)



**Jack D. Nelson**, CE, retired from the U.S. Army Corps of Engineers in 1989 after 30 years as a hydraulic engineer. (Aug. 12, 2019)

**Dennis O'Neill**, MetE (March 19, 2019)

1962

**George F. Berry**, NDD (Sept. 13, 2019)



**David C. Girardot**, ME, was a combat engineer in the U.S. Army Corps of Engineers, serving in Vietnam, Korea, Libya, Ecuador and the U.S. After 23 years, he retired as a lieutenant colonel and became director of the physical plant at Ohio Northern University, assistant vice president for facilities management at Old Dominion University and assistant vice chancellor for business services at the University of North Carolina Wilmington, then began a small business consulting firm. (July 2, 2019)

**Darroll S. McCormack**, EE (July 21, 2019)

**Edwin W. Steffen**, ME (July 17, 2019)

1963

**Gerald F.P. Baluha**, MetE (Oct. 5, 2019)

**Gary F. Gronemeyer**, CE (Nov. 27, 2019)

**James D. Haffner**, CerE (Oct. 21, 2018)

**Clarence D. Mayer**, Chem (July 11, 2019)

**James B. Robison**, MinE (Nov. 29, 2018)



## 1964

**Jerry A. Gillette**, CE  
(July 27, 2019)

**Krishna K. Misra**,  
GGph (Aug. 14, 2019)

## 1965

**James W. Crafton**,  
PetE (Oct. 17, 2019)

**Michael J. Jersa**, CE  
(Aug. 10, 2019)

**N. Eugene Lynn**,  
Math (Jan. 23, 2019)

**Charles R. Martin**,  
CE (Sept. 15, 2019)

**Charles A. Myers**,  
Phys (Nov. 4, 2019)

**James F. Wade**, CSci  
(Aug. 15, 2019)

## 1966

**Terrell L. Carlson**,  
CSci (Nov. 6, 2019)

## 1967

**Robert R. Callen**, EE  
(June 27, 2019)

**Milton C. Cissell**,  
Chem (June 18, 2019)

**Douglas G. Shepard**,  
EE (Aug. 25, 2019)

## 1968

**Thomas J. Griffeth Jr.**,  
ME (Oct. 18, 2019)

## 1969

**Kenneth G. Johnson**,  
Math (June 8, 2019)

**Juan J. Mariani-  
Bezegh**, ME  
(Sept. 30, 2019)

**John W. McGuire**,  
Phys (Oct. 18, 2019)

**James Boyd Robison**,  
MinE, MS GeoE'65  
(Nov. 29, 2018)

**Richard L. Walker**,  
ME (July 26, 2019)

**David H. Zimmerman**,  
CE (Sept. 27, 2019)

## 1970

**Michael J. Rooney**,  
ME (Aug. 28, 2019)

## 1971

**Jack D. Dippold**, ME  
(July 23, 2019)

**John D. Huff**, EMgt  
(Sept. 11, 2019)

**John E. Meece**, EMgt  
(Nov. 24, 2018)

**James R. Williams**,  
ME (Sept. 13, 2018)

## 1972

**Ronald L. Schalk**,  
ChE (June 19, 2019)

## 1973

**James H. Herbold**,  
ME (Nov. 9, 2019)

## 1975

**Claude W. Bagby**,  
CE (Aug. 25, 2019)

**Arthur F. Lampe**,  
CE (Nov. 17, 2019)

## 1976

**Thomas J. Domagalski**,  
CE (Sept. 12, 2019)

**Ronald L. Entwistle**,  
CE (Sept. 25, 2019)

**John P. Warne Jr.**,  
ME (Sept. 4, 2019)

## 1978

**Donald R. Brown**,  
EE (June 18, 2019)

**Andrew S. Drake**,  
ME (Oct. 29, 2019)

**Oliver A. Onyewuenyi**,  
MetE (Oct. 24, 2019)

**Larry H. Welch**, EMch  
(Sept. 10, 2019)

## 1980

**Charence Edward  
Hodge**, ME  
(June 10, 2019)

## 1981

**Lisa J. Mueller**, MetE  
(Nov. 4, 2019)

## 1982

**David Lewis Thompson**,  
EE (Dec. 4, 2018)

## 1983

**James. J. Sappington**,  
ChE (Nov. 6, 2019)

**Robert V. Williams**,  
EMgt (July 15, 2019)

## 1985

**Barbara J. Kniepkamp**,  
EE (Sept. 24, 2019)

## 1990

**David Donald Burt**,  
CerE (Nov. 1, 2019)

## 1991

**Bonnie Mathis**, Psyc  
(Nov. 18, 2019)

## 1995

**Leslie L. Lahndt**,  
EMgt (Aug. 4, 2019)

## 1997

**John Eric Cierpiot**,  
ME (Sept. 29, 2019)

## 2000

**Amanda S.  
Whitcotton**, ChE  
(Sept. 21, 2019)

## 2004

**Nicholas Kane  
Barnhart**, EE  
(July 16, 2018)

## 2005

**Joel Aaron Lamson**,  
ME (Sept. 14, 2019)

## 2007

**Gloria Maxine Hutson**,  
Hist (July 19, 2019)

## 2017

**Brennan J. Kristek**,  
CpE (Oct. 12, 2019)

## 2018

**Robert John Bogen**,  
CE (May 5, 2018)

## FRIENDS

**Don Baker** (July 7, 2019)

**Doris Jean Barnds**,  
wife of Campbell  
C. Barnds III, EE'85  
(July 7, 2019)

**Mary Louis Bellis**, wife  
of Gerald. B. Bellis,  
CE'51 (July 25, 2019)

**Darrel Bradford**  
(Oct. 11, 2019)

**Kay Frances Cottrell**,  
wife of Wilbert C.  
Cottrell, PetE'59  
(July 24, 2019)

**Nancy Cummins**, wife  
of James L. Cummins,  
ME'67 (Aug. 2, 2019)

**Laura Rosen-De  
Riemer**, wife of Dan  
L. De Riemer, EMgt'72  
(Sept. 23, 2019)

**Gail Sue Drallmeier**,  
wife of James  
A. Drallmeier  
(July 15, 2019)

**Ann Buckner  
Edwards**, wife of the  
late Gene Edwards,  
CE'53 (June 3, 2019)

**Jolene Feeler**  
(June 25, 2019)

**Heinrich Grohe**  
(Aug. 5, 2019)

**Michael W. Grotha**,  
former Missouri S&T  
maintenance staff  
member (Aug. 5, 2019)

**William A. Henning**  
(July 30, 2019)

**Christine Huff**, wife  
of Fred V. Huff, CE'61  
(July 30, 2019)

**Vera Johnson**, wife  
of the late James  
Winston Johnson,  
ChE'57 (Nov. 8, 2019)

**Jackie Judah**, wife  
of Russell Judah,  
PetE'50 (Oct. 7, 2019)

**Gloria Kerns**, wife of  
Wayne L. Kerns, CE'69  
(Sept. 30, 2019)

**Walter D. Klingenberg**  
(Nov. 17, 2019)

**Glendon Klossner**  
(Oct. 20, 2019)

**Gus J. Kodros III**, former  
video production  
specialist at  
Missouri S&T  
(Aug. 31, 2019)

**Phillip D. Lampert**  
(Nov. 12, 2019)

**Clay S. Landoll**,  
former metallurgical  
engineering student  
(Oct. 20, 2019)

**Mary Lou Lester**, wife  
of James L. Lester,  
ME'61 (July 30, 2019)

**Marilyn Martin**, wife  
of Wade A. Martin,  
CE'63 (Nov. 4, 2019)

**Beverly Ann Masnica**,  
wife of Joseph J.  
Masnica, PetE'59  
(Aug. 2, 2019)

**Eleana McCoy**, wife  
of the late Charles  
"Jerry" McCoy, ChE'59  
(Nov. 25, 2018)

**Ann McDaniel**  
(Sept. 10, 2019)

**Betty Metcalf**, wife of  
Thomas C. Metcalf Jr.,  
ME'58 (Nov. 1, 2019)

**Gale H. Papen**, former  
senior lab technician

at Missouri S&T  
(Oct. 15, 2019)

**Barbara Redline**, wife  
of Richard H. Redline,  
MetE'61 (Aug. 13, 2019)

**Arlyne Roller**  
(Aug. 26, 2019)

**Matthew Dale Romine**,  
former Missouri S&T  
student (Nov. 12, 2019)

**Harold Edward  
Rowden** (Nov. 7, 2019)

**Logan Thomas Runyon**,  
former Missouri S&T  
student (Oct. 7, 2019)

**Lela Russell**  
(Aug. 7, 2019)

**Donna Schmidt**, wife  
of the late Norbert  
Otto Schmidt, a former  
S&T faculty member  
(July 14, 2019)

**Charles A. Scott**,  
(Aug. 28, 2019)

**LaVerne Spears**, wife of  
Andre Spears, ChE'87,  
MS ChE'95 (Nov. 6, 2019)

**William A. Spencer**  
(July 7, 2019)

**Gary Stevens**  
(Aug. 29, 2019)

**Lorraine Swinfard**,  
former S&T staff  
member (Oct. 1, 2019)

**Robert Ann "Bennie  
Ann" Taylor**, wife  
of Harold F. Taylor,  
Phys'61 (July 24, 2019)

**Harvie G. Thomas**,  
a laborer at  
Missouri S&T for 16  
years (Oct. 7, 2019)

**Naomi Vance**, wife of  
the late Joseph E. Vance,  
former S&T faculty  
member (Sept. 6, 2019)

**Betty Ann Williams**  
(Oct. 17, 2019)

**James Dale Williams**,  
who retired from  
Missouri S&T after 30  
years in the computer  
center (Oct. 16, 2019) ■



## FROM CLASSROOM TO COLLABORATORY: AN S&T HISTORY PROFESSOR GIVES BACK

**P**etra DeWitt's journey from Germany to Missouri, student to faculty member and immigrant to scholar of migration embodies the mission of the S&T Collaboratory: encouraging humanities-based research with the potential to challenge traditional ways of thinking.

DeWitt, Hist'96, an S&T associate professor of history, immigrated to the United States from Germany in 1985 with her husband, an American soldier. She became a Missouri resident and soon discovered the state's German-American culture, a legacy reaching back to the early 1800s with the influx of German immigrants who established communities along the Missouri River valley and in the St. Louis area.

DeWitt eventually turned her experience into scholarship as a specialist in immigration and

ethnic history. Her book, *Degrees of Allegiance: Harassment and Loyalty in Missouri's German-American Community during World War I*, won the 2012 Missouri Book Award.

Now DeWitt is giving back to future generations of scholars through an endowment in support of the S&T Collaboratory, a new digital humanities lab in the College of Arts, Sciences, and Business. Her endowment established the DeWitt Collaboratory Undergraduate Student Assistantship.

"My goal in creating the endowment was to fund a permanent position dedicated to encouraging humanities students to exchange ideas, solve problems and create innovative projects," says DeWitt, who joined the S&T faculty in 2003 after earning a Ph.D. in history from the University of Missouri-Columbia and

a master's degree in history from Truman State University. "The Collaboratory assistantship will encourage the growth of significant, original research in the humanities."

DeWitt writes and speaks frequently about social issues and ethnicity during World War I. She spoke at the National World War I Museum and Memorial in Kansas City on the 100th anniversary of the war's end. Her S&T courses include the Making of Modern Germany, European Migration and Nationalism Formation, and Historiography.

"Dr. DeWitt's historiography class really stood out to me," says **James Trusler**, Hist'16, who teaches social studies at Rolla Junior High School. "Her dedication inspired me to become the best history teacher I can be."



## S&T DAY KICKS OFF 150TH CELEBRATIONS

On Feb. 25, 2020, 150 years and one day after former Missouri Gov. Joseph W. McClurg signed the legislation that created Missouri S&T, university officials, students, alumni and supporters celebrated the university's founding at the State Capitol Building in Jefferson City, Mo. Speakers talked about what S&T means locally and globally. Following the ceremony, attendees participated in hands-on activities with Makerspace students and **Dave Westenberg**; toured an S&T pop-up museum and archival display; and signed a six-foot-wide proclamation. See more at [150.mst.edu/capitol-day](https://150.mst.edu/capitol-day).







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Rolla, MO 65409-0650

*Parents: If this issue of Missouri S&T Magazine is addressed to your son or daughter who has established a separate permanent address, please notify us of the new address: 800-JO-MINER or alumni@mst.edu.*

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