

THE BRIDGE

Missouri S&T
Spring 2021 | Vol. 46

Civil, Architectural and Environmental Engineering



Studying ways
to improve
bridge repair
page 6

MISSOURI
S&T
care.mst.edu

FROM THE CHAIR: Joel G. Burken, Ph.D., P.E., BCEE, F.AEESP



As we close out the 2020-21 academic year, so many events could be the lead story in terms of **resilience, perseverance, drive and triumph**. Our graduating class faced great challenges in their final three semesters and stepped up in many ways, along with staff and faculty.

As seating was limited inside the classroom, faculty transitioned courses to online or blended learning. They taught in person, online live and offered recordings of course materials. Faculty and students did not back down from the challenge and wither to “let’s just get through to May.” Rather, they charged on, and would not be denied.

Our student chapter meetings forged ahead too. In some cases 60-100 people were online at 7 p.m. many times to hear alumni presenting on their remarkable work (pgs. 8, 11). Other students took on challenges individually, like **Jessi Schoolcraft**, the first student in the S&T Global Engineering Program (pg. 5) and **Erin Bereyso**, recognized internationally by ASCE — an amazing organization of 170,000 members around the globe — as one of their “10 New Faces of Civil Engineering” (pg. 9).

Our design teams would not be deterred either. Steel Bridge had a “three peat” as regional champs and await results for competing at nationals. The team competed from Rolla in a virtual bridge building competition, shaving 20% off construction time when it mattered most. Solar House earned a second-place finish internationally. They competed among 72 teams from 12 countries. Engineers Without Borders did not rest either, working from Rolla with their in-country partners to initiate projects at four international sites in Guatemala, Ecuador and two in Bolivia. The Paraje Xecaxoj, Guatemala, team completed designs on the

six-classroom school building and started construction!

Praise and accolades continue as we conveyed a remarkable 106 undergraduate degrees and 127 total degrees during May commencement — our highest totals in recent years. Each of these graduates triumphed over challenges to become our newest Miner alumni.

Our faculty did not relax. I was proud to see research output climb and publication rates rise. Our productivity and accomplishments (pg. 12) are reflected in our national and international rankings (pg. 4) and our S&T civil engineering program is the highest-ranked public engineering program in Missouri, in both U.S. and world rankings!

I am incredibly proud of our entire team. The legacy of civil engineering at S&T now spans 150 years and has branched out with successful environmental and architectural programs. Miner alumni have cemented our tradition of accomplishment to truly Change the World. Our new academy members (pg. 18) exemplify that tradition. We also pay tribute to a couple of our most accomplished alumni, with our last surviving initial 1972 Academy of Civil Engineers class member **Bob Bay** (pg. 23) and **Fred Kummer**, who passed just as we went to press. We greatly miss them both and many other alumni who will be covered in the next newsletter.

We are looking forward to gathering again soon. This fall, I invite you to join as we celebrate the greatest MSM/UMR/S&T legacy for our 150th anniversary of civil engineering. We will host a series of events and celebrations (pg. 21) **Oct. 7-9**. Reserve your rooms now!

This academic year was challenging to our whole team. I applaud them all and deeply appreciate their exceptional efforts. I find it humbling and gratifying to see the strength and dedication of our team to live by our motto to **Change the World**. Go Miners!

Follow us on social media



facebook.com/MissouriSandTCARe



twitter.com/SandT_CARe



linkedin.com/school/missouri-s-t-civil-architectural-and-environmental-engineering

DEPARTMENT ADMINISTRATION

Department Chair

Joel Burken, Ph.D., P.E., BCEE, F.AEESP

Assistant Chairs

Civil: **Eric Showalter**, Ph.D., P.E.

Architectural: **Stuart Baur**, Ph.D., A.I.A.

Environmental: **Mark Fitch**, Ph.D.

Graduate Programs: **Cesar Mendoza**, Ph.D.

MINERS REPRESENT



A group of Miner alumni met with Missouri Gov. Mike Parson, senators and state representatives to receive a proclamation for American Public Works Week and discuss the importance of infrastructure funding.

Pictured from left to right are: **Chris Linneman**, CE'97, **Paula (Wuebbels) Hart**, CE'00, **Chris Krueger**, ArchE'09, Missouri Gov. Mike Parson, **Martin Gugel**, CE'96, **Eric Landwehr**, CE'96, and **Kyle Dieckmann**, CE'05.

STRAUSS APPOINTED TO MISSOURI BOARD



Gov. Mike Parson recently made appointments to state boards and commissions. Among those were **Amy Strauss**, CE'90, MS CE'91, of Springfield, Mo. to the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors, and Professional Landscape Architects.

Strauss is retired from city utilities of Springfield, where she managed power generation engineering, among other roles over a 27-year career. She also has chaired Missouri S&T's civil engineering department's advisory council.

TURNER TAKES OATH



Samantha Turner, MS CE'20, re-affirmed her oath of office as senior advisor for gender equality in the U.S. Agency of International Development. A military veteran with more than 14 years of leadership experience, Turner looks forward to fostering inclusive innovation within the U.S. government and partners from around the world.

THE BRIDGE



In this issue

5

First in class of Global Engineering Program

Jessi Schoolcraft is one of the first students to join Missouri S&T's new Global Engineering Program. She is majoring in both environmental engineering and multidisciplinary studies with an emphasis in French.

8

White initiated as honor member of Chi Epsilon

Gary White, CEO and co-founder of Water.org and WaterEquity.org, was recently initiated as the 132nd honor member of Missouri S&T's Chi Epsilon chapter.

9

Bereyso named New Face of Civil Engineering by ASCE

ASCE named **Erin Bereyso** as one of its 2021 New Faces of Civil Engineering – College. Bereyso is a senior in civil engineering with an environmental emphasis in a cooperative engineering program between Missouri S&T and Missouri State University in Springfield, Mo.

14 Distinguished Lecture Series Speakers

18 Academy of Civil Engineers Inductees

21 150-year Celebration

23 Remembering Bob Bay

RISING IN THE RANKINGS

Missouri S&T is again one of the nation's top-ranked institutions for pursuing a graduate degree in engineering, and several specific degree programs are on the rise, according to the latest *U.S. News & World Report* rankings.



Missouri S&T is ranked 50th among public universities and 84th overall in U.S. News' Best Engineering Schools ranking, announced Tuesday, March 30.

In addition, graduate programs in six S&T engineering disciplines climbed in this year's national graduate program rankings:

- **Aerospace engineering** (No. 38 from 47)
- **Chemical engineering** (No. 88 from 98)
- **Electrical engineering** (No. 66 from 75)
- **Mechanical engineering** (No. 63 from 65)
- **Engineering management** (No. 54 from 55 in the industrial engineering category)
- **Environmental engineering** (No. 45 from 48)

S&T's **civil engineering** and **materials science and engineering** graduate programs maintained their rankings of 46 and 54, respectively.

Missouri S&T's online graduate engineering programs are also gaining national recognition. Earlier this year, *U.S. News* ranked S&T's 14 online graduate engineering programs 14th among the nation's best public online programs and 18th overall.

How do CAReE and S&T stack up?

Our vision as a department is to be a destination of choice for talented students and faculty members. Measuring that reputation is often accomplished by rankings. The CAReE department has reached one of the highest rankings of any engineering program in multiple ratings systems and Missouri S&T has been highly rated in terms of being one of the best values in the U.S. — offering a high return on investment.

U.S. News and World Report rankings are considered to be the premier rankings in the U.S., and the S&T civil engineering program has climbed from No. 58

to No. 46, tied with Michigan State, University of Iowa and University of Virginia. With more than 150 civil engineering programs in the U.S., this puts our program in the top 30%, which is the highest ranking of any public university engineering program in Missouri. The S&T environmental program rose from No. 48 to No. 45 in 2021 out of 101 programs ranked. The program rankings in *U.S. News* are peer evaluations by all other programs in the U.S. Similarly, the global ranking for the S&T civil engineering program is the highest in Missouri. Also, the Academic Ranking of World Universities (ARWU) conducted by the Shanghai Ranking Consultancy placed our civil engineering program in the top 50-75, along with programs at Texas A&M, Georgia Tech, Penn State, Virginia Tech and Purdue. The ARWU ratings are driven by program and department productivity in scholarly output, such as publications, funded research and authored books.

Missouri S&T ranks high in many value-based rankings as well, being voted among the top nationally by College Factual and Payscale, who look primarily at the average starting salaries compared to tuition and cost of attendance. Recent rankings by Princeton Review, a premier university rankings system, also puts Missouri S&T in the top 25 in the U.S. for overall value and top 10 in the U.S. for career placement and quality internships. These rankings certainly validate the efforts to prepare our Miner alumni to be impactful in their careers and to emphasize experiential learning and professional development.

As we look to the future, we will hold to our mission of shaping our global society's built and natural environments through creative research and education. We have and will continue to elevate the reputation of our programs with employers, peers, future students and alumni that will continue to move forward and **Change the World!**

Websites:

- news.mst.edu/2021/04/princeton-review-rates-missouri-st-high-for-roi-career-placement-internships/
- shanghairanking.com
- mst.edu/about/rankings

Schoolcraft is first in class of Global Engineering Program

by Delia Croessmann



Jessi Schoolcraft, a junior at Missouri S&T from Willard, Mo., discussed the benefits of combining an engineering education with foreign language skills and cross-cultural experiences in an interview on the national “Lead with Languages” campaign website.

The Lead with Languages campaign, sponsored by the American Council on the Teaching of Foreign Languages (ACTFL), aims to create a new generation of Americans who are competent in other languages and cultures and fully equipped to compete and succeed in a global economy.

Schoolcraft is one of the first students to join S&T’s new Global Engineering Program. She is majoring in both environmental engineering and multidisciplinary studies with an emphasis in French and will graduate with a degree in both fields. The program prepares its graduates to work in international settings by adding knowledge of another

language and culture to the highly ranked engineering education students receive at Missouri S&T.

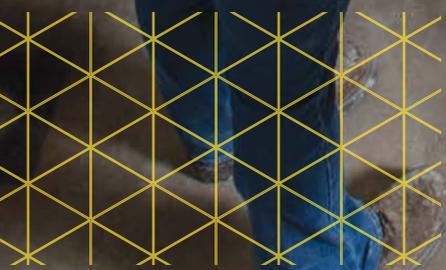
“I think that engineering students should consider learning a language because it helps develop problem-solving skills,” says Schoolcraft. “The same strategies that I use to improve my French can be used in my studies to become an engineer. These skills are vital to be a language learner as well as an engineer.”

During the 2021-22 academic year, Schoolcraft plans to spend one semester studying in France and one semester completing an onsite engineering internship. After that, she plans to come back to the U.S. to finish her degrees. Schoolcraft says she may consider pursuing a graduate degree in France.

“The Global Engineering Program (GEP) is aimed at preparing engineering students for a global workforce by providing the opportunity for them

to spend their 4th year abroad while working toward a 2nd degree in language and culture. In their first semester abroad, GEP students will take courses in the local language and spend the second semester on internships before returning to Rolla for their 5th and final year of study,” according to **Dr. Francisca Oboh-Ikuenobe**, associate dean for academic affairs in the College of Engineering and Computing.

“Engineers who speak more than one language can effectively communicate with peers and clients, navigate diverse work environments, and understand the cultural aspects of their projects,” says Global Engineering Program co-director **Dr. Audra-Merfeld Langston**, chair of arts, languages, and philosophy and an associate professor of French at Missouri S&T. “S&T’s top-notch engineering education complemented with international experience gives our graduates a rich toolbox to use throughout their careers.”



Researchers investigate improved bridge repair after collisions

by Nancy Bowles

Vehicle collisions with bridge supports or girders are the second leading cause of bridge collapse in the United States, with an average of three such collisions per day, according to researchers at Missouri S&T who are studying ways to improve bridge repair and cut costs for cities and states.

A railroad bridge in Kansas City, Mo., is an example. According to news reports, the Independence Avenue Bridge has been struck by trucks multiple times in recent months despite signs warning of height restrictions. Reports indicate the Kansas City Terminal Railway has spent \$100,000 on signage and repairs over the past decade.

The Missouri S&T research project could reduce those types of repair costs for municipal and state governments and enhance bridge safety by finding more efficient repair methods.

“We are looking at two things in this project,” says lead researcher **Dr. Mohamed ElGawady**, Benavides Faculty Scholar and professor of civil, architectural and environmental engineering at Missouri S&T. “First, we examine the remaining strength in a girder after impact. Second, we investigate how to repair the girders to recover their original strength.”

The research will address the lack of design tools that indicate how much load-bearing strength remains after impact, ElGawady says, adding that once repairs made, there is not much current research on the load-bearing capacity of the repairs.

ElGawady says there are two possibilities for repair — splicing together severed strands to repair damaged girders or making repairs using advanced materials

such as fiber-reinforced polymers. ElGawady says the researchers will use materials that are readily available to entities needing to make repairs rather than researching new materials.

“We’re looking at very recent developments in ultra-high-performance concrete — state-of-the-art material that is emerging or on the market that they could use now,” he says.

ElGawady and his team at Missouri S&T are working with researchers at the University of Idaho to conduct numerical simulations that calculate damage from a vehicle hitting a bridge. ElGawady says they hope to secure an outdoor location where they could conduct actual tests with a mass hitting a girder.

The three-year research project is supported through \$755,000 in pooled funding managed by the Missouri Department of Transportation. Other contributing states are Texas, Ohio, Mississippi, Idaho and Alaska, as well as the Federal Highway Administration. ElGawady says Mid-America Transportation Center has provided \$85,000 in supplemental funding.

“During the COVID-19 pandemic and associated budget cuts, it was a really tense time for the states to dedicate money for this research,” says ElGawady. “That they did is another indication that this is a really serious issue.”



White initiated as 132nd honor member of national honor society Chi Epsilon

Gary White, CEO and co-founder of Water.org and WaterEquity.org, was recently initiated as the 132nd honor member of Missouri S&T's Chi Epsilon chapter.

Chi Epsilon, the national honor society for civil engineers, selects individuals who have attained a degree of eminence in the civil engineering profession, exhibited experience and ability worthy of emulation by young civil engineers, and possess a minimum of 10 years' experience in the civil engineering profession as registered professional engineers. The S&T student chapter initiated 23 new current students during the ceremony along with White.

The recent online meeting provided an opportunity for participation by distance education students, including international initiates **Samantha Turner** and **Ricky Estardo**. Turner works for the U.S. Agency for International Development (USAID) in Germany, and Estardo owns his own geotechnical engineering company in the Philippines. Both are master's students in civil engineering at S&T. The transition to online initiation allowed the chapter to include distance education students for the first time, and had initiates spanning 14 time zones.



"Having Gary White there to chat with us as the chapter's newest member showed us just where we could go as professionals and global citizens," says Turner. "I have some experience seeing just that — engineers taking our base education and applying it to solve the world's toughest problems. I'm thankful that Gary was able to share that with us."

For the past 25 years, White's entrepreneurial vision has driven innovations in the way water and sanitation projects are delivered and financed through Water.org, which is based in Kansas City, Mo.



White developed Water.org's WaterCredit Initiative, which creates new financing options for poor populations to meet their water supply and sanitation needs. He also developed and now leads WaterEquity, the first-ever impact investment manager dedicated to ending the global water crisis in our lifetime, with an exclusive focus on raising and deploying capital to water and sanitation businesses throughout Asia, Africa and Latin America.

White is an advisor in the water and sanitation space, counseling organizations such as the Skoll Foundation, Bank of America Foundation, PepsiCo Foundation, IKEA Foundation and the Caterpillar Foundation on responses to the global water crisis. He is a founding board member of the Millennium Water Alliance and Water Advocates. He was selected as a Skoll Foundation Social Entrepreneur in 2009 and a Schwab Foundation Social Entrepreneur in 2012. In 2011, he was named to the TIME 100 list of the world's most influential people and was honored as one of Missouri S&T's Alumni of Influence. In 2014, he was named to the World Economic Forum's Global Agenda Council on Water. In 2017, White was awarded the Forbes 400 Lifetime Achievement Award for Social Entrepreneurship.

White earned his bachelor's and master's degrees in civil engineering from S&T in 1985 and 1987, respectively. He also holds a master's degree in environmental engineering from the University of North Carolina at Chapel Hill.

Chi Epsilon has 141 chapters across the country and has initiated more than 132,000 members. The organization's vision recognizes students and graduates for their academic achievements while seeking to foster excellence, connectivity and engagement among those in the civil engineering community to improve the world.

Bereyso recognized as one of 2021 New Faces of Civil Engineering

by Sarah Potter



The American Society of Civil Engineering (ASCE) has named **Erin Bereyso** as one of its 2021 New Faces of Civil Engineering-College. Bereyso is a senior in civil engineering with an environmental emphasis in a cooperative engineering program between Missouri S&T and Missouri State University in Springfield, Mo.

“I am just extremely honored and grateful for all of the unique opportunities ASCE and the Missouri State-Missouri S&T cooperative program have presented me over the last three years,” says Bereyso. “I also feel very thankful and lucky to have such great advisors, mentors and professors to teach and guide me throughout my undergraduate education.”

Bereyso, who is from Wildwood, Mo., was nominated by ASCE student chapter advisor **Dr. Sanjay Tewari**, an assistant teaching professor of civil, architectural and environmental engineering (CArEE) at S&T.

“It is an honor for Erin to be a part of this select group of people from all over the world,” says Tewari.

“Erin is a great role model in many ways. She participated in undergraduate research and is active in her community as a volunteer despite taking a full load of classes and working for an engineering firm. Our students are some of the best in the nation. I am really excited for Erin’s next chapter.”

Bereyso works year-round as an environmental engineering intern for Associated Electric Cooperative Inc. in Springfield. She has served as ASCE student chapter president and attended national ASCE meetings in that role. Bereyso also participated in the 2019 Environmental and Water Resources Institute’s World Environmental and Water Resources Congress where she earned second prize for her research presentation.

“I could not be happier for Erin,” says **Dr. Joel Burken**, Curators’ Distinguished Professor and chair of CArEE. “She has been a real leader in our program with Missouri State and has been active on our campus including participating in our 2020 Leadership Institute hosted by S&T’s Academy

“Erin is a great role model in many ways. She participated in undergraduate research and is active in her community as a volunteer despite taking a full load of classes and working for an engineering firm.”

— **Dr. Sanjay Tewari**
Assistant Teaching Professor

of Civil Engineers. She has helped demonstrate that all of our students can make the most of the opportunities provided to them and endeavor to achieve lofty goals.”

The ASCE says the 10 New Faces honorees represent the best and brightest students from campuses around the world. Bereyso received a \$1,000 scholarship from ASCE and is featured on the 2021 New Faces-College website.

Weighing in on current job market trends

Dr. Joel Burken was recently featured among a panel of experts on Zippia for his advice about starting a career with a degree in engineering. The article gave insights into entering the workforce this year and how it will be different given everything that's happening. Zippia is a resource for job seekers who want to empower their career aspirations with knowledgeable data. The website has been featured in *USA Today*, *Forbes*, *Fortune*, *CNBC* and the *New York Times*, among other leading publications.

Given the change of course in the world, Zippia wanted to provide expert opinions on how aspiring graduates can best start their careers given the uncertain economic climate. They wanted to know what skills will be more important, where the economy is doing relatively well, and if there will be any lasting effects on the job market.

Companies are looking for qualified candidates who can handle the new responsibilities of the job market. Recent graduates have advantages because they are comfortable using newer technologies and have been communicating online their whole lives. They can take what they've learned and apply it immediately.

Zippia spoke to professors and experts from several universities and companies to get their opinions on where the job market for recent graduates is headed, as well as how young graduates can prepare to enter the industry.

Read what the full panel of experts had to say. Visit the website at: zippia.com/environmental-scientist-new-york-jobs/trends/

Joel G. Burken

Ph.D., P.E., BCEE, F.AEESP

Department Chair and Curators' Distinguished Professor, Civil, Architectural and Environmental Engineering



In your opinion, what are the biggest trends we'll see in the job market given the pandemic?

Burken: To this point we've seen little impact for our graduates in getting positions. Graduates from last academic year placed into full-time positions at a reported 96% rate, which is actually up. As a university our placement rate was 90% and starting salaries actually rose 5.7%. We had a few students lose internship positions last summer, but most had a start setback or found another opportunity, while some decided to take summer classes. We opened up to offer additional classes to give more options as well.

If a graduate needs to take a gap year, what skills should you recommend they try to enhance and how should they go about doing it?

Burken: We have recommended to advance their technical and professional training. We have a new BS+MS degree option for high performing students that make our MS engineering degrees very achievable in a few years, in civil, civil-architectural and emphasis, or environmental. We also have certificates in a variety of areas, including collaborative with engineering management to get more project management focus in their background, and also a certificate as a specific credential.

What general advice would you give to graduates beginning their career?

Burken: Get started and pursue your passions! I tell all of our students and graduates to find where their strongest skill sets intersect with their passions. If they are good at what they do (aligning with talents, skills) and they love what they do (passion for their work) in their profession, they will have a fulfilling and successful career in their profession. I specifically don't say they have a "job" or will "work" in their careers. I want them to know they are part of a great and noble profession in engineering, with a higher calling than a "job." If they find their path, that 40- to 45-year career will be a great adventure, and they will look back as a Proud Miner alumni member.

Academy members give special ASCE, AGC lectures

Rich Henry, CE'83 ASCE/AGC Lecture: Leadership in Today's Architecture, Engineering and Construction (AEC) Industry



Henry talked about what it means to be a leader in the construction industry. He explored what is needed beyond technical skills

and book smarts to propel a career. Using examples of what has created and derailed leaders, he discussed finding the right path.

Henry has been with McCarthy his entire 40-plus-year career — starting as a project engineer, and then working his way up as project manager, senior project manager, project director and vice president. He is also a member of the company's board of directors.

Karin Jacoby, CE'85 ASCE Lecture: Regreening the Blue: A 100-year Tale of an Urban Waterway in the Kansas City Region



Jacoby discussed how the Blue River — a 39.8-mile-long stream near the border of Kansas and Missouri — scarcely resembles what

it did 100 years ago. In an effort to re-engineer the stream and preserve some of its natural aspects, the Blue River has gone “green.” Volunteers have worked to create trails, restore native natural areas and revitalize urban neighborhoods

and brownfields in the middle Blue River corridor.

Jacoby is a water resources engineer and environmental lawyer, and a partner with Husch Blackwell in Kansas City. She has spent most of her 35-year career working in the areas of water resources, waterways, flooding and levees.

Jill Erickson, co-founder and current executive director of the Heartland Conservation Alliance, joined Jacoby in the presentation. Erickson has co-led the Middle Blue River Urban Waters Federal Partnership since 2013 and has served as the ambassador since 2016.

Brent Massey, CE'95 ASCE Lecture: Invisible Engineering – Solving Complex Problems You Can't See: Crystal Bridges Museum of American Art



Massey discussed some of the challenges he encountered as the Engineer of Record for the Walton family's Crystal Bridges Museum of

American Art in Bentonville, Ark. The building is a 210,000-square-foot museum on steep, rocky terrain at the bottom of a ravine in a floodway in the middle of a natural forest.

Massey is principal and vice president of operations for CEI Engineering Associates Inc., a 100-person firm. He joined CEI after graduation and has worked on engineering designs for development projects throughout the county.

Chi Epsilon hosts notable alumni



Two guest speakers with Crawford, Murphy & Tilly Inc. in St. Louis gave a presentation to Chi Epsilon titled “Who Needs Pavement when you have Ice?” about an airport system building project in Antarctica.

Ty Sander, CE'98, (pictured front left) has unparalleled knowledge of what it takes to plan, program, design and construct airfields. He works closely with airport sponsors to coordinate programs with the FAA and keeps a close watch on the ever-changing trends and priorities. He has worked for the company since 1999 and serves as vice president and aviation group manager. He is also a member of the S&T Academy of Civil Engineers.

Andrew Bodine, CE'11, (middle front) is a “jack of all trades.” His nature suits projects requiring close coordination across disciplines. He serves as a senior engineer in design engineering and construction oversight. He has been with the company since 2015.

Night to Network held via Zoom

The spring 2021 Night to Network event, held via Zoom, was a success. There were five breakout rooms, with close to 60 employers and students in attendance. Thank you to those who were able to attend. Here are a few of the companies represented: ARCO, Apex, Arkansas Department of Transportation, CDG Engineering, Clayco, Evergy, GEO Consultants, George Butler Associates, KPFF Consultants, McCarthy, Missouri Department of Transportation, Robinson Construction, and RTM Engineering Consultants.

Faculty accolades, appointments and talks

Hu receives outstanding editor award and appointed to TRB Leadership Council



Dr. Xianbiao Hu, assistant professor of transportation engineering, received the Outstanding Associate Editor Award from the

International Journal of Transportation Science and Technology (IJTST). This journal received a CiteScore of 5.4 in 2020. IJTST is an outlet for researchers to disseminate innovative research that enhances the efficiency, reliability, resilience, safety and sustainability of person and freight transportation.

Hu was also appointed an at-large member of the Transportation Research Board (TRB) Committee Research Coordinator (CRC) Leadership Council (CRCC) during the 100th annual meeting held in January 2021. CRCC provides guidance and training to the CRCs, and acts as the liaison between TRB and the CRCs. CRCC and CRC help committees identify, formulate, prioritize, and promote research needs and the conduct of research, turning research needs into results.

International Journal of Transportation Science and Technology Website:

journals.elsevier.com/international-journal-of-transportation-science-and-technology

Oerther elected to national EWB board



Dr. Daniel B. Oerther, professor of environmental engineering, was elected to the board of directors of Engineers Without Borders-USA. Oerther will

serve a three-year term beginning January 2021.

Founded in 2002, the mission of Engineers Without Borders-USA is building a better world through engineering projects that empower communities to meet basic needs and equip leaders to solve the world's most pressing challenges. In 2019, more than 9,500 volunteers contributed to nearly 500 projects in 39 countries and 26 states and territories. This engineering work affects more than a million people worldwide.

Schonberg appointed associate editor of international journal



Dr. William Schonberg, professor of civil, architectural and environmental engineering, has been appointed associate editor of the

International Journal of Impact Engineering, the world's leading peer-reviewed journal in the general area of impact engineering. Established in 1983, the journal publishes original research findings related to the response of structures, components and materials subjected to impact, blast and high-rate loading.

Yan talks living in harmony with natural disasters



Dr. Grace Yan, associate professor of structural engineering, was part of the Global Learning Speaker Series. She talked about how to live in harmony

with natural disasters by preparing the public psychologically, preparing the city physically, and preparing the government financially through interdisciplinary research.

Website: global.mst.edu/speakers-series/graceyan

Zhang invited to serve as associate editor of ASCE journal



Dr. Xiong Zhang was invited to serve as associate editor of the *ASCE Journal of Cold Regions Engineering*, a leading peer-reviewed scientific

journal in the general area of cold regions engineering. The journal is published by the American Society of Civil Engineers (ASCE).

Established in 1987, the topics of this journal include ice engineering, ice force, construction on permafrost and seasonal frost, cold weather construction, environmental quality and engineering in cold regions, snow and ice control, cold regions materials, and surveying and planning in cold regions.

Journal of Cold Regions Engineering Website: ascelibrary.org/journal/jcrgei



Engineering sustainability into the next century and beyond

by Nancy Bowles

For the past 150 years, Missouri S&T (AKA Missouri School of Mines and Metallurgy and the University of Missouri-Rolla) has produced world-changing engineers. At the intersection of S&T's 150th anniversary and National Engineers Week, we're looking ahead at how engineering can lead the way for the next 150 years.

Leaders in the College of Engineering and Computing shared their thoughts about the most important focus for their disciplines, and a trend quickly emerged — sustainability. From carbon capture and advanced materials to water and soil use, engineering can play a big role in careful stewardship of resources, both now and in the future, as outlined by the heads of some of S&T's engineering departments.

Dr. Kwame Awuah-Offei, mining and explosives engineering – The need for mined materials is going to grow for two reasons: increasing urbanization in the developing world and transition to green energy. If we don't find ways to increase our production in a sustainable way, the environmental and societal impacts of mining will be a significant drawback to our quest to develop and use green energy to combat climate change.

Dr. David Bayless, mechanical and aerospace engineering – Looking to the next 150 years, I think artificial intelligence will have the greatest impact, and the way we enable machine learning and its integration into our world will be as important as the technological advancements themselves. We could wind up in a world where we have even more free time to pursue our interests (education,

art, research) or we could wind up fostering more inequality where those who have resources and ability to use and control AI integration will have more economic and political power than those who do not.

Dr. David Borrok, geosciences and geological and petroleum engineering – Over the next 150 years, geological engineering is poised to leverage ongoing improvements in unmanned aerial surveying, satellite-based data and advanced computing to gather and apply high-resolution data about the Earth's surface and subsurface at all scales to solve problems related to water and soil sustainability, predict and mitigate natural hazards, and provide clean and renewable energy sources.

Meanwhile, petroleum companies are evolving to take a broader view of energy. Although we will still need substantial amounts of oil and gas for the foreseeable future, these companies are developing new technologies in areas such as geothermal energy and CO₂ sequestration. You can expect petroleum engineers to be leaders in building a sustainable energy portfolio.

Dr. Joel Burken, civil, architectural and environmental engineering – Civil engineers will revolutionize our infrastructure from the molecular properties of building materials to integrating infrastructure systems on a grand scale and will improve our urban centers into more efficient, healthy, livable mega cities.

(continued on page 21)

DISTINGUISHED LECTURE SERIES

HURST-MCCARTHY LECTURE **Dr. Aminah Robinson Fayek** University of Alberta - NAC

Canadian researcher speaks on artificial intelligence in construction engineering



Known for her 30-year career in artificial intelligence (AI) and developing advance decision support systems for the

construction industry by combining fuzzy logic with AI and other simulation techniques, **Dr. Aminah Robinson Fayek**, delivered the 2021 Hurst-McCarthy Lecture at Missouri S&T on Tuesday, March 16, via Zoom.

In her lecture, titled “Artificial Intelligence Solutions in Construction Engineering and Management,” Fayek shared her background and inspiration for using AI to improve construction industry performance, competitiveness and innovation. She illustrated the unique challenges presented by construction problems and how AI could be used to overcome those challenges. She also shared her vision for future research and discussed the importance and relevance of working closely with

industry to advance both research and practice in construction.

Fayek has gained international recognition and helped shape the construction industry’s best practices in applications related to workforce development, productivity, project performance, risk analysis and organizational competencies. She also serves as an editor of two leading academic journals in construction engineering and management.

ABBETT LECTURE **Dr. John van de Lindt** Colorado State University

Talking applications and systems for earthquakes, floods, tornadoes and more



Dr. John W. van de Lindt, the Harold H. Short Endowed Chair Professor in civil and environmental engineering and co-director for the National Institute of Standards and Technology-funded Center of Excellence (COE) for Risk-Based Community Resilience Planning at Colorado State University, spoke Monday, April 19, via Zoom.

His lecture titled “Resilience-Informed Guidance through Modeling and Interdisciplinary Field Studies,” gave an overview of the Center for Risk-Based Community Resilience Planning’s approach to merge engineering, social science, planning, and economics to form the Interdependent Networked Community Resilience Modeling Environment (IN-CORE). This included learning from an interdisciplinary longitudinal field study from 2016 to present for flooding in Lumberton, N.C., including challenges posed by a second hurricane and the pandemic on data collection and interpretation. His presentation closed with an illustrative example application of a community planning for tornado hazard and an example of resilience-informed policy guidance.

Over the last two decades, van de Lindt’s research program has focused on performance-based engineering and test-bed applications of building and other systems for earthquakes, hurricanes, tsunamis, tornadoes and floods. He has published more than 400 technical articles and reports including more than 200 journal papers, and currently serves as the editor-in-chief for the ASCE *Journal of Structural Engineering*.

(More distinguished lectures continued on page 16.)

Ali Al-Khafaji, CE'21, a Ph.D. student in civil engineering and GAANN fellow, recently passed the project management professional (PMP) exam and his professional engineer (PE) exam.

"I have studied at several well-known universities, but Missouri S&T has been the best due to its top-notch education, research opportunities and location," Al-Khafaji says. "As a graduate student, I've experienced tremendous support and encouragement from my advisor, **Dr. John J. Myers**, as well as others in the CArEE department and across the S&T campus. Dr. Myers' teaching and advising style is exceptional and inspiring. He is very respectful, caring and encourages his students to work on projects that interest them. He gives us space and time to think outside the box and to be creative. I am very lucky to have worked for someone like him."

Al-Khafaji, who was born in Iraq, graduated with honors from Baghdad University with a bachelor's degree in civil engineering. He earned his first master's degree in



Ali Al-Khafaji

Civil engineering graduate student passes two professional certification exams

civil engineering from Kansas University and his second master's degree in engineering management from Ohio University. He recently graduated from Missouri S&T in spring 2021. His research interests include advanced and sustainable concrete and composites for structural engineering purposes.

Al-Khafaji is definitely ahead of the game — becoming registered in his field of expertise and already passing his professional engineer license (PE) exam in 2019. He has been active in the American Concrete Institute (ACI) at the

national level, serving as a committee voting member on ACI 440L and he is also an associate member of ACI 440. Plus he has had 17 papers published with three now under review and two under development.

Myers, professor of civil, architectural and environmental engineering, has made a particular effort to encourage his graduate students to pursue their certifications. The PMP certification requires not only the education, but three years of professional experience.

"From day one of arriving in Rolla, Mo., Ali was well prepared as a new Ph.D. U.S. Department of Education GAANN Fellow and Chancellor's Distinguished Fellowship recipient to take a leadership role on the first major U.S. field-based durability study to investigate the field performance of 15- to 20-year-old fiber reinforced polymer (FRP) bars in highway bridges," says Myers. "It has been a major undertaking and a collaborative effort along with the University of Miami, Penn State University, and Owens Corning Infrastructure Solutions LLC, with funding from both the ACI-Strategic Development Council and the Re-Cast University Transportation Center at Missouri S&T. What has impressed me the most has been Ali's ability to balance excellence in his research, classroom education, teaching contributions, society contributions, while also seeking his professional certifications. In over two decades at S&T, I do not recall another student that has become both a PE and PMP as a graduate student and I am extremely proud of all Ali has accomplished," says Myers.



JONES LECTURE **Paulo Monteiro**

University of California,
Berkeley - NAE

**Speaker talks about
unlocking secrets of
ancient Roman concrete**



Extraordinary, high-performance composites like the ones used to build Trajan's Market and other ancient Rome monuments, as well as the massive piers, breakwaters and fishponds along the central Italian coast, are now helping provide a unique window into studying the long-term performance of cementitious systems.

Dr. Paulo J.M. Monteiro, the Roy W. Carlson Distinguished Professor in Civil and Environmental Engineering at the University of California, Berkeley, and his research team secured permission to collect a large number of 2,000-year-old concrete samples from Rome to study.

As the 2021 Jones Lecturer, Monteiro described his comprehensive experimental program using synchrotron radiation and neutron scattering to characterize and optimize the nano and microstructure of these advanced construction materials. His presentation discussed how 3-D tomographic images can

provide fresh new insights into the complex nature of composite materials and how this information can be used in the design of improved materials. His talk, titled "Unlocking the secrets of ancient Roman concrete using synchrotron radiation and neutron scattering," was held Thursday, April 22 via Zoom.

Monteiro earned engineering degrees from Escola Politécnica da Universidade de São Paulo, Brazil and University of California, Berkeley. He has published more than 280 papers on topics that include micro and nanostructure of concrete, poromechanics of concrete durability, development of green concrete and sustainable construction, incorporation of carbon sequestration materials into the civil infrastructure, and advanced soft and hard synchrotron techniques to characterize materials and fluid flow in shales.

PRAKASH LECTURE **J. David Frost** Georgia Tech

**Talking reconstructing
infrastructure systems
after disastrous events**



efforts are made to replace impacted infrastructure systems.

Aside from ensuring functional systems are built, other things like resilience and sustainability often drive reconstruction decisions. With these extreme events becoming more frequent, new challenges emerge that bring about approaches and decisions used in reconstruction.

Students learned about some of these new approaches when **Dr. J. David Frost** gave the 2021 Prakash Lecture, presenting "Considering Nature in Addressing Resilience and Sustainability During Reconstruction" on Wednesday, May 12, via Zoom.

Frost is the Higginbotham Professor of Civil Engineering at Georgia Tech. Throughout his career he has focused on the study and analysis of natural and man-made disasters and their impact on infrastructure. His research centers on the development and implementation of digital data collection systems for studying infrastructure problems related to disasters at multiple scales. For more than 25 years, Frost has led NSF-supported post-disaster study teams following earthquakes in Chile, China, India, Japan, Turkey and the U.S., as well as at the World Trade Center.

MAPA Lecture (Fall 2021) **Kevin Hall** University of Arkansas

Stueck Lecture (Oct. 8, 2021)
Paul O'Callaghan
Founder of BlueTech Research



Three S&T graduate students honored with TriDurLE awards

Three Missouri S&T civil engineering graduate students, **Hanli Wu**, **Jun Liu** and **Beshoy Riad**, were presented Waheed Uddin Outstanding Graduate Student Awards by the National Center for Transportation Infrastructure Durability and Life-Extension (TriDurLE) for their outstanding academic performance.

TriDurLE is one of seven National University Transportation Centers (UTCs) led by Washington State University and sponsored by the U.S. Department of Transportation (DOT) and serves as the only National UTC with a focus on the USDOT strategic priority of improving the durability and extending the life of transportation infrastructure.

Students were nominated by site directors and ranked by an advisory board. Wu and Liu received \$1,000 for first place and Riad received \$500 for second place.

IACIP awards

Jun Liu, a Ph.D. student in civil engineering, was recently awarded a first place IACIP Outstanding Graduate Student Award by the International Association of Chinese Infrastructure Professionals (IACIP) for his academic performance. The IACIP Outstanding Graduate Student Award is funded by the International Association for Chinese Infrastructure Professionals with the purpose of encouraging graduate students to participate in research activities and pursue a future career in the general area of transportation infrastructure.

Two Ph.D. students, **Anyou Zhu** and **Hanli Wu** were awarded second place and third place IACIP Best Poster Awards, respectively, during the IACIP Student Poster Contest at the 11th Annual IACIP Workshop held online Jan. 9 and 16, 2021.

Miners building partnerships that literally Change the World

Jack Dorsey, NDD'98, Twitter and Square CEO, donated \$4,720,000 to Water.org to change lives with safe water and sanitation as part of his #StartSmall initiative to fund COVID-19 relief. Support will make an impact today while building resiliency to future pandemics. #StartSmall is Dorsey's philanthropic initiative to fund global COVID-19 relief, girls' health and education, and efforts toward Universal Basic Income.

Water.org, co-founded by alumnus **Gary White**, CE'85, MS CE'87, and actor Matt Damon, has positively transformed more than 33 million lives around the world by providing access to safe water and sanitation. Water.org pioneers market-driven financial solutions to the global water crisis. For 30 years, their work has given women hope, children health, and families a bright future.



Pedestrian bridge construction

The city of Rolla, in partnership with Missouri S&T, constructed a pedestrian bridge on Route E (University Drive) over U.S. Interstate 44, near Exit 185 in Rolla. This project was identified as a priority by the Move Rolla TDD Program, and its purpose is to provide pedestrians a multi-use path that meets ADA standards and offers a safer route to campus.

Academy of Civil Engineers

Nine professionals with ties to Missouri S&T will be inducted into the S&T Academy of Civil Engineers during an official ceremony, which will be held Thursday, Oct. 7, during Homecoming Weekend. The academy recognizes outstanding alumni for their professional achievement and success, and it provides support and experience to help the civil, architectural and environmental engineering department at S&T to reach its collective mission and vision.

Here are the 2021 inductees:

David Bufalo

Retired, Department of Public Works
Denver, Colo.



David Bufalo of Denver, Colo., who retired from the city and county of Denver public works department, earned a bachelor of science degree from Missouri S&T in 1966. Over a 40-year career, Bufalo has been involved in virtually every aspect of the management of the design and construction of buildings, highways, heavy construction, and information

management systems. He has been employed by Fortune 500 corporations, private consultants, federal, state and local governments, and Engineering News Record top 400 construction contractors. He has managed projects in Missouri, Arizona, California, Montana, Alaska, Canada and Colorado. Prominent projects in Denver include the Denver Central Library, the Denver Art Museum Expansion, the expansion of the Colorado Convention Center, the Red Rocks Visitor's Center, the Wellington E. Webb Municipal Office Building and the Ellie Caulkins Opera House. He is also a past director of the Denver building department. Bufalo's responsibilities with the city of Denver also included managing the final construction effort, except for the baggage handling system, to open Denver International Airport in February 1995. He was primarily responsible for creating a materials recycling program at the former Stapleton International Airport, which saved the City approximately \$95 million in demolition costs. This project won the Colorado Recycling Project of the Year in approximately 1999. He also managed the city's Y2K remediation program. While on active duty with the U.S. Army he performed engineering facilities surveys on temporary duty in Germany, South Korea, Taiwan, Okinawa, the Eastern seaboard and Hawaii.

His interests revolve around classic cars and car shows. He owns a 1978 Triumph Spitfire, which mostly sits in his garage, and a 1966 Pontiac GTO, which he bought new in 1966 in Rolla, Mo. In 2012, his GTO won Concourse Best of Show for Factory Original at the GTO Nationals in Loveland, Colo. Bufalo has been active in NSPE, Engineer's Club in St. Louis, ASCE and especially the Miner Alumni Association, where he served in active roles and was awarded the Alumni Ambassador, Little Mack, Phoenix and Century Club Awards.

Gary W. Creason

Retired, Affinis Corp.
Overland Park, Kan.



Gary Creason of Overland Park, Kan., who retired from Affinis Corp. in Overland Park, Kan., in 2015, earned a bachelor of science degree in civil engineering from Missouri S&T in 1971, and an MBA from Rockhurst University in 1984. Creason started his career as a construction engineer for a heavy-highway contractor in Illinois. After returning to Kansas City,

he had an outstanding career with the U.S. Army Corps and with Burns & McDonnell. He rose through the ranks, overseeing large projects as lead project manager. After retiring from Burns & McDonnell, Creason founded his own consulting firm to provide oversight of the new Riverside-Quindaro Bend Levee L-385 construction project in the Kansas City area. After the levee project was completed, he finished his engineering career at Affinis Corp., the engineer of record for L-385.

Creason has been an active alumnus, returning to Rolla to speak in person to future Miners and share his wealth of experience. He is also active in keeping in touch with fellow Miner alumni and served as an admissions ambassador at S&T. He has also been active in the National Society of

inducts nine new members

Professional Engineers, Missouri Society of Professional Engineers and American Society of Civil Engineers and has served as elected precinct committeeman and elected ward chair for the Kansas Republican Party. Creason currently serves on the College of the Ozarks Board of Trustees and is an elder in his church.

He and his wife, Janet, spend summers in Overland Park and winters in Arizona. They are avid golfers and Creason enjoys woodworking on projects like high-end boxes and writing pens. He isn't much of a fisherman, but on a trip to the Snake River in Idaho, he landed an 8-foot 230-pound sturgeon. It helped that his fishing partner was Idaho's director of fish and game.

Judge David Flanagan

Retired, Reserve Judge
Madison, Wis.



Judge David Flanagan earned a bachelor of science degree in civil engineering from Missouri S&T in 1967 and a juris doctor degree from the University of Wisconsin Law School in 1974. He is a professional engineer registered in Wisconsin. In 1968 Flanagan earned a commission as an officer in the U.S. Navy Civil Engineer Corps. After completing the Navy's Deep

Sea Diving program he served three years active duty as the diving officer designing and supervising underwater construction for a Seabee battalion on various projects including deployment to South Vietnam. After law school, he spent 24 years trying jury trials as an assistant attorney general. His work included criminal prosecution, construction and product liability matters as well as professional negligence cases. Flanagan was elected circuit court judge three times and served from 1999 to 2016, with responsibility for criminal, civil and juvenile cases. He continues to serve as a reserve judge. While on the bench, Flanagan was invited to be a guest lecturer at the High Court, Shanghai, China, and was selected to participate in the International Judicial Academy, Den Haag, Netherlands. He founded the Veterans Treatment Court in Dane County, Wis., and continues to serve as a mentor in that program.

Since leaving the bench he has acted as a volunteer attorney for Veterans in VA disability claims and has facilitated resolution of pending lawsuits by providing mediation and arbitration assistance. Flanagan currently serves as a

faculty member with legal education programs in Kenya, Tanzania and the Czech Republic. He is a member of the Wisconsin and National Society of Professional Engineers and has spoken on legal issues at their annual conventions.

James Kreher

President, Kreher Engineering
Columbia, Ill.



James Kreher of Waterloo, Ill., has been president of structural design firm Kreher Engineering for 18 years. The firm specializes in low-rise structures. He earned a bachelor of science in civil engineering from Missouri S&T in 1987 and is a licensed professional engineer in nine states and a licensed structural engineer in Illinois and Utah.

Kreher has been active in several professional societies including American Society of Civil Engineers, American Institute of Steel Construction, American Concrete Institute, American Welding Society, American Wood Council and National Council for Examiners for Engineering and Surveying. He also participates in reviews for the Capital Development Board for the State of Illinois.

His active community services include providing pro-bono engineering services for Habitat for Humanity, Boy Scouts and local church community projects in the metropolitan St. Louis area. Kreher is an active member of the Saints Peter and Paul Catholic Church community and a member of the Holy Name Society and the Knights of Columbus. He has chaired the facilities management committee for Saints Peter and Paul Catholic Church for the expansion of the existing grade school and the future campus relocation. Kreher Engineering also is the dinner sponsor for Gibault Catholic High School for its major annual fundraiser.

Kreher and his wife of 34 years, Colleen, have two children. Katherine, a married mother of two children, works as a parochial elementary school teacher. Erin is a social worker at SSM Hospital in St. Louis. In his free time, Kreher enjoys golf, softball and spending time with his family.

(continued on the next page)

Ken Morgan

President, KCM Consulting Services LLC
Keller, Texas



Ken Morgan of Keller, Texas, president of KCM Consulting Services LLC, earned a bachelor of science degree in civil engineering from Missouri S&T in 1983. He is a licensed professional engineer in Arizona, Colorado, Missouri and soon to be Texas. He also holds water distribution operator certifications in Arizona and Texas. Morgan spent

15 years with the Denver water department, followed by a distinguished career with utilities and local city governments including St. Louis Metro Sewer District, Charlotte Mecklenburg Utilities, and the cities of O'Fallon, Mo., Phoenix, Ariz., and Gilbert, Ariz. He has had a strong career as a leading expert in water distribution and wastewater collection systems and operations, recognized nationally within American Water Works Association (AWWA). He has worked in multiple large-scale municipalities as a leader in design, construction management, and operations, including the \$1.7 billion T-REX project in Denver, Colo.

Within AWWA, Morgan is a member of the Standards Council, a trustee of the Distribution Plant and Operations Division, and serves on several committees with a focus on system operations. He was instrumental in writing the AWWA's standard on the effective removal of lead water service lines, and he has been sought as a national expert in the areas of wastewater collection and water distribution systems, including holding training workshops at a national level. He authored the book "Managing Water Main Breaks Field Guide," and co-authored the book "Wastewater Operator Certification Exam Prep," both published by AWWA. He is in the process of publishing "Developing Effective Standard Operating Procedures for Water Utilities."

Morgan has offered his expertise to S&T students as well, offering online talks in his area of expertise and nationally recognized leadership. He was an active leader in chartering the alumni chapter of the National Society of Black Engineers in Denver, Colo., and was a member of the Association of Black Engineers at S&T as well as charter member of the Iota Omega chapter of Kappa Alpha Psi Fraternity Inc. at S&T in the early '80s. Morgan is also active in his community, particularly serving his church as a Sunday school teacher and new member orientation presenter. He is divorced with three grown daughters and three grandchildren.

Robert Riess Sr.

Vice President and Division Manager
Pipeline Division, Henkels & McCoy Inc.
The Woodlands, Texas



Robert Riess Sr. of The Woodlands, Texas, vice president and division manager of Henkels & McCoy Inc. pipeline division, earned a bachelor of science degree in civil engineering from S&T in 1979. He began his career at Texas Eastern Transmission Corp., then moved through other positions at Sheehan Pipe Line Construction Co. and ARB Inc. before moving to Henkels &

McCoy. He has been active in multiple roles within the Pipe Line Contractors Association (PLCA) and the Interstate Natural Gas Association of America (INGAA) Foundation including board of directors and chair positions. Riess has regularly been a featured speaker at numerous pipeline industry events. He founded the Riess Family Endowment for scholarship awards, and in 2007 received the Robert V. Wolf Alumni Service Award from the Miner Alumni Association for his service and contributions.

Riess enjoys golfing, sporting events, handyman projects, landscaping and gardening. He has been active over the years in his homeowner associations, co-chaired the Martini International Golf Tournament for 23 years, and spent 10 years serving as a recruiter for the alumni ambassador program. He and his wife, Becky, enjoy entertaining family and guests at their Grand Lake, Okla., lake house. Riess supported two successful S&T civil engineering graduates, his sons Ryan and Robert Jr., who have launched successful careers since graduation.

Tracy Thomas

Managing Director, U.S. Department of State's
Bureau of Overseas Buildings Operations (OBO)
Arlington, Va.



Tracy Thomas, managing director of the U.S. Department of State's Bureau of Overseas Buildings Operations (OBO) Arlington, Va., earned a bachelor of science degree in civil engineering in 1985 and a master of science degree in civil engineering in 1987, both from Missouri S&T. She has had a long and distinguished career as a member of the

Senior Foreign Service where she presently directs construction management, facility management, and security management programs for the U.S. Department of State's robust real

(continued on page 22)

Engineering sustainability into the next century and beyond

(continued from page 13)

Architectural engineers will integrate new technologies into smart cities to allow sustainable buildings of the future to incorporate energy generation and storage and to be more connected to the people living in those spaces.

Environmental engineers will take on chemical and biological threats that cause loss of life and address social barriers to implement lifesaving technical solutions to protect global public health through clean water, sanitation and clean air.

Dr. Gregory Hilmas, materials science and engineering – I see big changes in biomaterials that will live inside the human body to provide biosensing and biofeedback with respect to the health of the body. I think they will be able to cure certain conditions by responding to issues in the human body and then adapting and resolving those issues.

Dr. Suzanna Long, engineering management and systems engineering – Engineering managers and systems engineers consider complexity and rapid change as part of engineering design. In the years to come, EMSE graduates will design mechanisms to address challenges with our critical infrastructure. Examples include real-time databases and data mining tools to connect organ donors to recipients, locations for charging infrastructure to support wide-scale electric vehicle adoption, transportation design for safe, secure transport of energy materials, and more.

Dr. Hu Yang, chemical and biochemical engineering – Chemical and biochemical engineering can contribute a lot to make the world better. If I had to pick a single innovation, I would say carbon capture and storage technology to prevent global warming.



St. Pat's

Benjamin Sitzes, a senior in environmental engineering, was selected 1st Guard of St. Pat's Court!

The following Miners from our department were selected as 2021 student Knights of St. Patrick:

- **Megan Baris**, a junior in civil and architectural engineering
- **Delaney Durbin**, a senior in civil engineering
- **Ben Dyhouse**, a senior in civil and architectural engineering
- **Cole Phinney**, a senior in civil engineering
- **Dana Schath**, a senior in civil and architectural engineering.

Celebrating 150 years of civil, architectural and environmental engineering at Missouri S&T

HOMECOMING WEEKEND 2021 | OCT. 7-9

Reconnect in person with your classmates, visit the new Clayco Advanced Construction and Materials Laboratory (ACML), look at civil engineering memorabilia, pick up your new department history book written by S&T historian **Larry Gragg** and tour S&T's 150th traveling museum.

We are still in the process of gathering collectibles and planning activities. Send old photos by email to **Dick Elgin** at elgin@rollanet.org.

The Neil and Maurita Stueck Distinguished Lecture will be held on Friday, Oct. 8, at Leach Theatre. Hear Paul O'Callaghan, founding CEO of BlueTech Research and main protagonist for the documentary "Brave Blue World," talk about his expertise in market analysis and success in providing business development support to venture-backed water companies.

And be sure to check out our department Facebook and LinkedIn pages as time draws near. You don't want to miss out on the fun!

 facebook.com/MissouriSandTCaRE

 linkedin.com/school/missouri-s-t-civil-architectural-and-environmental-engineering

Academy of Civil Engineers

property portfolio, which comprises nearly 300 assets valued at over \$90 billion that includes many culturally significant properties. Thomas has served as project director for new diplomatic construction in Suva, Fiji; Sana'a, Yemen; and Islamabad, Pakistan, and was previously the construction operations branch chief with responsibility for all diplomatic construction in Europe. She has over 30 years of federal and private sector experience and has been recognized with numerous awards for superior performance and leadership. She had the opportunity to serve on Capitol Hill as a congressional fellow from 2016 to 2017.

Prior to joining the Foreign Service as a construction engineer, Thomas worked as a civil engineering consultant for multiple companies that include McClelland Engineers in St. Louis; GAI Consultants in Raleigh, N.C.; and Law Engineering in Tulsa, Okla., where she served as office manager and principal engineer.

She is single, loves to travel and strives to make a difference in the communities where she has had the opportunity to live. She has participated in numerous choirs and musical presentations on four continents, and she is an avid genealogy researcher.

HONORARY MEMBERS

Chris Nisbet

Project Director, McCarthy Building Companies, Inc.
Des Peres, Mo.



Chris Nisbet of Des Peres, Mo., project director at McCarthy Building Companies Inc., earned a bachelor of science degree in engineering management with a civil focus in 1984. He started his career with McCarthy as a project engineer. He joined Druco Development as a project manager in 1993, returning to McCarthy as a superintendent in 1996. As project director with McCarthy, he holds the overall responsibility for McCarthy Preconstruction and Construction Services on his projects. His experience includes the \$100 million Edward Jones Training Center, \$90 million Cross County Metrolink Extension, 45,000 cy of concrete at Bissell Point Final Clarifiers and Ranken Jordan Pediatric Bridge Hospital Addition. Nisbet served as the leader for the setup/takedown of the Go! Marathon for 13 years and has completed five marathons. He is a trustee for the Construction Training and Advancement Foundation, and has been active in the Associated General Contractors. He worked with S&T to advance the Hurst-McCarthy Professorship in 2018-19 and helped facilitate the advancement of the Missouri Consortium for Construction Innovation (MO-CCI) at S&T.

Nisbet was quarterback and co-captain for the 1983 S&T football team and catcher and co-captain for the 1984 S&T baseball team. He is a member of the Academy of Miner Athletics and has been active in the Catholic Youth Council as a coach for baseball and basketball. Chris and his wife, Lynne, have four grown children. When he can find time, he enjoys hiking, fly fishing, golf and do-it-yourself house maintenance and projects.

Eric Showalter

Teaching Professor, Department of Civil,
Architectural and Environmental Engineering
Missouri S&T, Rolla, Mo.



Dr. Eric Showalter, teaching professor of civil engineering at Missouri S&T, earned bachelor of science and master of science degrees in civil engineering from Michigan Tech, and a Ph.D. in civil engineering from Purdue. He is a registered engineer in Minnesota and has worked for a county road commission, a general contractor, a curtainwall contractor and Los Alamos

National Lab. He joined the faculty at Missouri S&T in 2000 and currently serves as the assistant chair of the civil engineering program and the director of undergraduate advising for the department. Showalter has taught 13 different classes at S&T including the capstone senior design course, which he has taught to more than 2,000 civil, architectural and environmental engineering students. In 2010, he was awarded a Fulbright scholarship and took his family to Tallinn, Estonia, where he taught at the Tallinn University of Technology.

Showalter has received numerous awards including an Academy of Civil Engineer's Joe Senne Award in 2011 and 2018, Faculty Achievement Awards in 2009, 2013, 2015 and 2019, the S&T Dean's Teaching Scholar in 2018, a St. Louis ASCE Professional Recognition Award in 2019, and an Associated General Contractors National Educator of the Year Award in 2020. He spent four years as associate director of freshman engineering, was the first faculty advisor to the Solar Decathlon Team, and currently advises the Concrete Canoe Team, the AGC student chapter and the Blacksmithing Club.

He has been married for 33 years to **Polly Scott-Showalter**, Geo'83, and they have two children. Nathan is a musician in Kansas City and **Lucas**, Cer'15, is a ceramic engineer in Iowa. Showalter has coached Optimist basketball, been an assistant scoutmaster, and is currently secretary of the Rolla Board of Public Works.

Remembering Bob Bay

Civil Engineering and St. Louis Icon



Bay, pictured right, in front of Twin Tower One.

St. Louis engineering and civil engineering overall lost an icon in 2020.

Bob Bay passed away peacefully Sunday evening, Nov. 15, at home, at the age of 94. Bay was a consummate engineer, decorated soldier, dedicated husband, father and leader in all he accomplished.



A World War II veteran in the Pacific theater, Bay rose to Major General, Corps of Engineers in the U.S. Army Reserve. His military service and engineering were always intertwined.

He started at the Missouri School of Mines (MSM) in the freshman class of fall 1943. He then registered for the draft on his birthday (Sept. 15, 1944) and served in the Philippines. Bay served with distinction, receiving the Distinguished Service Medal, the second highest military honor. He returned to MSM, graduating in 1949 with a bachelor of science degree in civil engineering. As a student, he was active in American Society of Civil Engineers (ASCE), the Baptist Student Union and Kappa Sigma fraternity.

He had a long and storied career as a civil engineer in St. Louis with Laclede Steel. He was jointly responsible for a number of patented technologies, including the design and implementation of the composite floor joist system for the New York World Trade Center, the development of load transfer devices, and for deformed wire fabric used in continuous highway pavements. Bay was then a principal of Black and Veatch, managing large projects across the U.S. and internationally.

Bay was a life-long contributor to ASCE. He served as chapter president and in many other roles including ASCE national president in 1986. As ASCE president, Bay was one of the first presidents to visit China and was active internationally to advance ASCE on the global stage. His challenge to civil engineers was to do their best professionally at all times. As part of that, he championed a program of "Commitment to Excellence." A highlight among the many honors throughout his career was being the keynote speaker during the 100th anniversary of engineering in Sydney, Australia. Bay was also honored as the 58th Chi Epsilon National Honor Member in recognition of his broad commitment and service to the profession of civil engineering.

While Bay had a global influence, he was a steadfast servant to his local community and his alma mater. Many of his career accomplishments were unique across 150 years of civil engineering in Rolla, Mo., as Bay's influence spanned from Missouri School of Mines, to University of Missouri-Rolla, to Missouri S&T. He was awarded the S&T Chancellor Medal; he was a commencement speaker; and he was in the inaugural class of the 2011 Missouri S&T Alumni of Influence. Bay was also among the first class of our Academy of Civil Engineers in 1972, and helped found the fledgling organization, serving as the first president. Until recently, Bay rarely missed a Miner Alumni Association meeting, and was active and contributing until the last meeting he attended in spring 2020.

"I was fortunate to count Bob and his late wife, Peggy, as my friends," says **Dr. Joel Burken**, Curators' Distinguished Professor and chair of civil, architectural and environmental engineering. "Bob was simply a wonderful human being in every way possible. He enriched a profession he loved dearly and was a positive force to all that had the honor of knowing him."

Read Bay's full obituary at: [schrader.com/obituary/robert-bay](https://www.schrader.com/obituary/robert-bay)

Connect with us.

Email your news to: care@mst.edu

Join us as we celebrate 150 years of civil engineering.

Come back to campus for Homecoming 2021 as we celebrate the founding of the university and our civil engineering program.

Oct. 7-8

Join your fellow alumni, students, staff, faculty and community members for a weekend of celebrations and Homecoming traditions. Don't miss this chance to show off your Miner pride!

Friday, Oct. 8

Paul O'Callaghan, founding CEO of BlueTech Research and main protagonist for the documentary "Brave Blue World," will give The Neil and Maurita Stueck Distinguished Lecture at Leach Theatre. Following the lecture, join us for an anniversary celebration.

150 
YEARS AT MISSOURI S&T

