



31 Dec 2022

2022 Scholarly Productivity Report

Missouri University of Science and Technology

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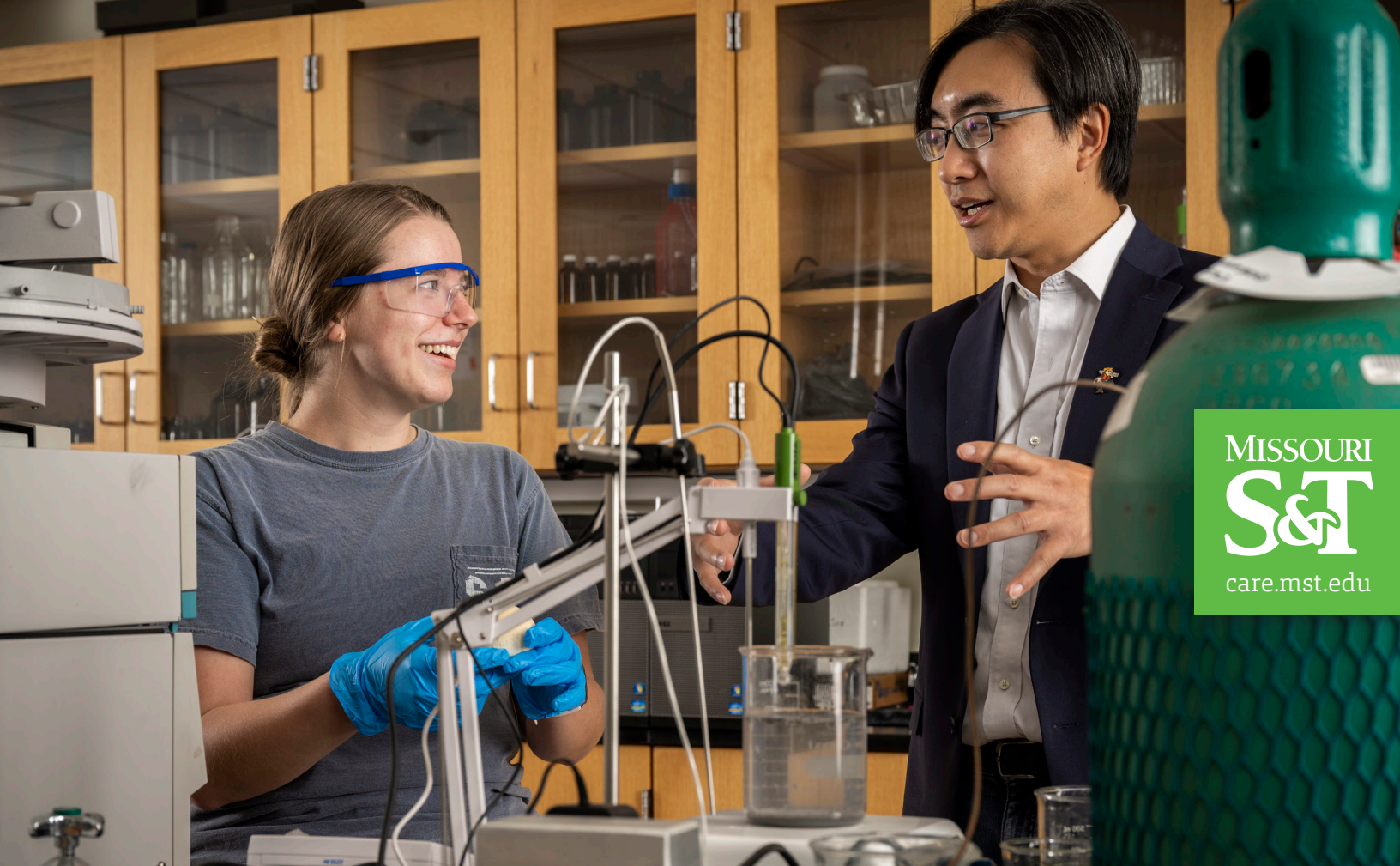


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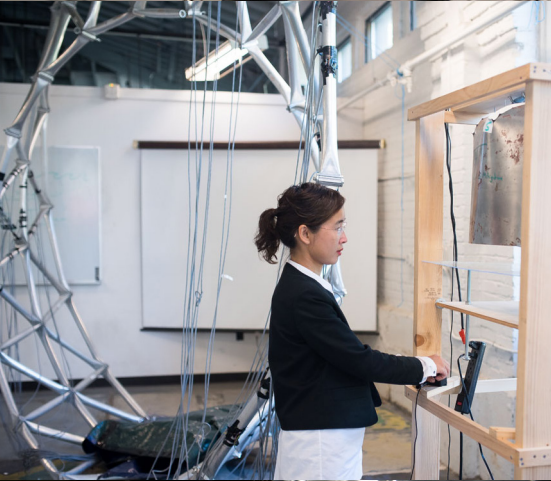
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Missouri University of Science and Technology, "2022 Scholarly Productivity Report" (2022). *Civil, Architectural and Environmental Engineering Scholarly Productivity Reports*. 10.
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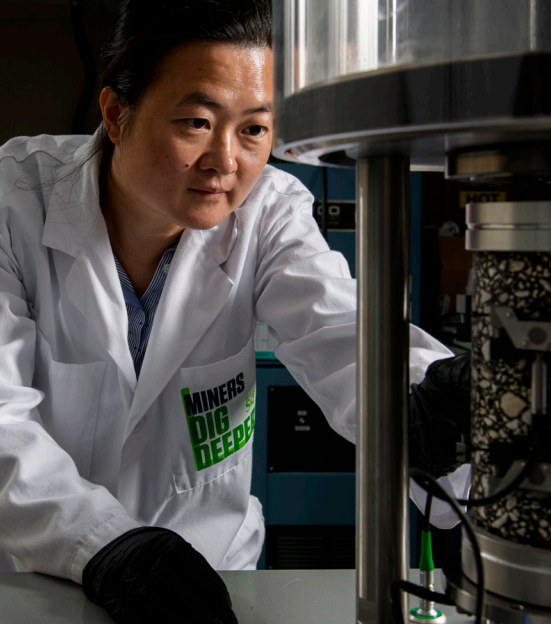


MISSOURI
S&T
care.mst.edu



2022 Scholarly Productivity

Civil, Architectural and Environmental Engineering



Changing the World

Shaping the future of built and natural environments of our global society through creative research and education.

Dear Friends,

The year 2022 had a strong start, with the Civil, Architectural and Environmental Engineering Department wrapping up a stellar year in 2021 and having great anticipation for the future. The 2021-22 academic year was special for us, as we wrapped up the 150th anniversary of the first students at Missouri School of Mines (MSM) following the founding of MSM. The first class had two of three students in civil engineering. For comparison, in 2022, we had an enrollment of 615 students across three programs and spanning two campuses with our cooperative program at Missouri State University in Springfield, Mo.

We celebrate a strong year of scholarly production in 2021-22, averaging over eight articles per tenure track faculty, and new grants and contracts reached just over \$8M in calendar year 2022, up from \$2.7M in 2016. We're quite proud of our team. Our faculty received many national and international awards ranging from notable research breakthroughs to recognition of career for accomplishments in teaching, service, and research (page 6). I'll draw specific attention to efforts that were timely and impactful, like **Dr. Hongyan Ma's** research on decarbonizing the concrete industry (page 5) and our faculty who are solving challenges ranging from tornado resilience by **Dr. Grace Yan** (also page 5) to materials research for application on the moon by **Dr. William Schonberg** (page 7). We look forward to what the future holds!

Our faculty were not alone either, as our students also achieved acclaim for their excellence in advancing our already strong legacy. The combined scholarly output, and our strong reputation showed in our rankings. *U.S. News and World Report* placed the civil graduate program at #48 in the U.S. to be in the top 30%, and the undergraduate civil engineering program at No. 31, the highest ranked graduate and undergraduate engineering programs in Missouri public education. Collectively the online graduate engineering master's degree programs at S&T were ranked in the top 10 in the U.S. as well. Our brand is also well recognized internationally, and the Academic Ranking of World Universities, or "Shanghai Rankings," placed us in the top 50-75 in the world.

Our talented faculty team and our research and educational facilities will undoubtedly create greater opportunities for our graduates to go out and **Change the World** in their career as Missouri S&T alumni. We were also pleased to recognize this excellence with multiple campus faculty awards (page 6), five faculty being named to new scholar and professorship titles (page 24), and multiple faculty members being noted among the Stanford study on the top 2% of scholars in their field (page 7). We look to continue building on this legacy to remain the premier engineering department in Missouri.

If you have any questions about the exciting things ongoing in Rolla and our future vision of Civil, Architectural and Environmental Engineering at Missouri S&T, please contact me and take any opportunity to stay engaged with our CAEE team.

Sincerely,



Joel G. Burken



Joel G. Burken

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

burken@mst.edu

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

ON THE COVER:

- Dr. Hongyan Ma is developing solutions by turning CO₂ into rock
- Dr. Grace Yan uses a new simulator to model extreme cyclonic wind speeds and study how tornadoes destroy structures
- Dr. Jenny Liu focuses on innovative additives and recycled materials such as waste plastic for asphalt
- CAEE faculty honored for excellence

CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING BY THE NUMBERS

care.mst.edu

RANKED NEAR THE TOP

UNDERGRADUATE CIVIL ENGINEERING #31

GRADUATE CIVIL ENGINEERING #48

ENVIRONMENTAL ENGINEERING #55

U.S. News & World Report (2021-22)

26 Full-time
faculty
members

16,000 ft²

NEW LAB SPACE

CLAYCO ACML

Advancing S&T's leadership in
infrastructure engineering research
(Opened 2021)

610+

CAREE student enrollment

8 GRADUATE CERTIFICATES
Start earning college credit
toward your master's degree.
(Learn more: distance.mst.edu)

#9 IN ONLINE GRADUATE PROGRAMS
U.S. News & World Report Rankings (2022)

32%

CAREE department
undergraduate
female engineers

Peer-reviewed
journal articles
per faculty
member

8.2

\$8M Research
Awards
(CY 2022)

7 DEGREE
PROGRAMS

CIVIL ENGINEERING

Bachelor of Science (B.S.)

Master of Science (M.S.)

Doctor of Philosophy (Ph.D.)

Doctor of Engineering (D.E.)

ARCHITECTURAL ENGINEERING

Bachelor of Science (B.S.)

ENVIRONMENTAL ENGINEERING

Bachelor of Science (B.S.)

Master of Science (M.S.)

\$450K

Annual alumni scholarships
awarded to CAREE students

COLLEGE OF ENGINEERING AND COMPUTING

cec.mst.edu

16 ABET-accredited
engineering
programs

CEC total
engineering
enrollment **5,900**

One of 20

LARGEST ENGINEERING
COLLEGES IN U.S.

\$36M

New research awards

Highlights



Civil engineering noted as top STEM profession

Civil engineering is No. 1! Architectural and environmental engineering are close behind at No. 3 and No. 6.

According to a 2022 *U.S. News & World Report* article, civil engineering was noted as the top STEM profession in the U.S., citing job satisfaction, upward career mobility and job opportunities.

"Civil engineers are involved in all parts of the built environment and in the protection and restoration of the natural environment," says Maria Lehman, 2022-23 president of the American Society of Civil Engineers (ASCE).

Architects and environmental engineers also landed in the top six professions, showing that protecting human health and providing a better world to live in are important in career satisfaction and career opportunities.

Website: money.usnews.com/careers/best-jobs/rankings/best-engineering-jobs

CAREE faculty awarded Kummer Ignition Grants

A dynamic group of CAREE faculty members shared their projects, vision and leadership to help achieve future success toward campuswide initiatives and earned Kummer Ignition Grants for Sustainable Educational Transformation for their efforts. The grants support new and innovative ideas that lead to transformations in education at Missouri S&T.

Faculty team members selected were **Drs. Genda Chen, Jenny Liu, Chenglin "Bob" Wu and Guirong "Grace" Yan**, who received four out of the 12 grants awarded during the inaugural competition. This was the highest number given to any one department on campus.

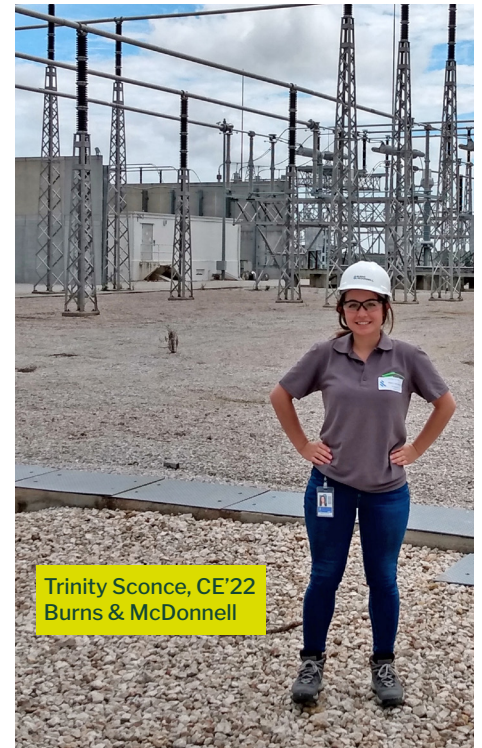
Dr. Nicolas A. Libre, associate teaching professor of structural engineering, followed up with professor of economics, Dr. Bonnie Bachman. The duo was selected among six research teams this spring to receive a grant. Their project is titled "Promoting Entrepreneurial Mindset Learning in Mechanics of Materials."

Each Kummer Ignition Grant initiative represents a significant effort to develop a research team in S&T's strategic areas and pursue large-scale proposal opportunities from externally funded sources.

Energy engineering – degree of the future

Missouri S&T is one of 15 U.S. universities chosen by the science and technology website Gizmodo as schools that offer the best energy engineering programs in a recent "degrees of the future" report.

"One of the most critical problems humans currently have is how to generate power efficiently," Gizmodo's editors wrote in the report, which was released Aug. 11. "We have many ways of generating electric power, but all have their drawbacks – some are devastating for the environment, some are difficult to scale, and some have been sidelined for years due to fears about safety.



"As we move away from fossil fuels, energy engineering will help us find more efficient alternatives and better ways to use existing renewable energy like wind and solar," Gizmodo says. "The field produces innovations in energy production, storage, consumption, and distribution, and will hopefully free us from our destructive reliance on oil and gas."

Missouri S&T is the only university in Missouri to make the list.

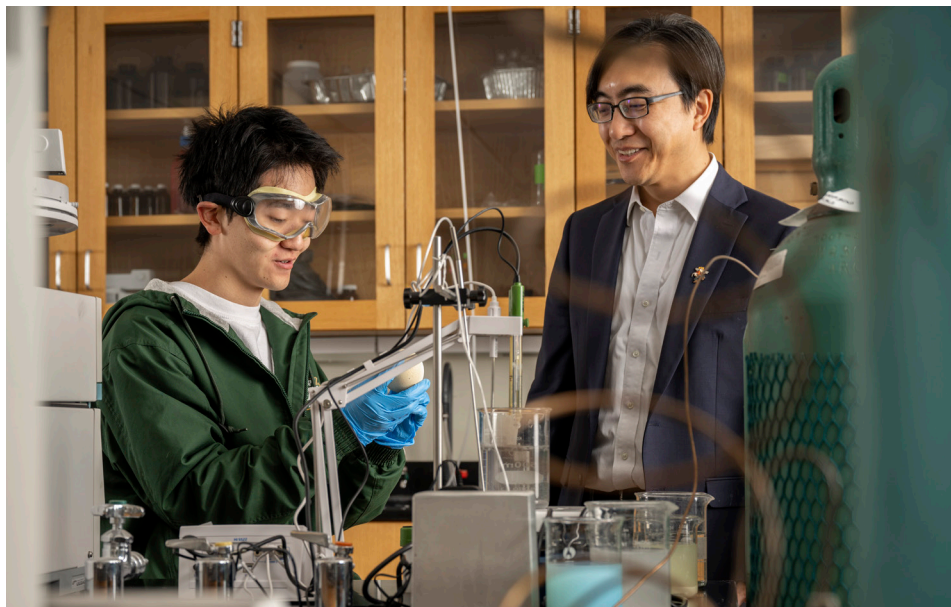
Missouri S&T CO₂ research is rock solid

As climate change accelerates, scientists are investigating ways to lower carbon dioxide in the atmosphere.

At Missouri S&T, researchers are developing solutions by turning CO₂ into rock, including massive rocks for permanent carbon storage, and concrete, the manmade rock that supports modern civilization.

“CO₂ concentration in our atmosphere is now 420 parts per million, the highest in human history,” says **Dr. Hongyan Ma**, associate professor and Benavides faculty scholar of civil engineering. “We need ways to not only reduce CO₂ emission but also to remove CO₂ from the air and utilize or permanently store the removed CO₂ at a scale large enough to combat climate change.”

Ma and a team of researchers in materials science and engineering, chemical engineering, mining and explosives engineering, economics, and other disciplines at S&T are forcing CO₂ to react with silicate rocks and industrial wastes generated from power plants, cement plants, concrete recycling facilities, and steel mills to form carbonate minerals. Such reactions happen in nature over millions of years to create natural limestone and dolomite formations that



stores trillions of tons of carbon, but they are too slow to address the climate change challenge. Ma and his team use innovative technologies to speed up the process. Their manmade rocks are intended for gigaton-scale permanent carbon storage or production of carbon-negative cement materials for making concrete. Traditional cement production emits a metric ton of CO₂ for every metric ton of cement produced, and Ma says the innovations will potentially reduce over 2 billion metric tons of CO₂ every year.

Ma’s CO₂ conversion and utilization work has garnered more than \$2 million in grants for Missouri S&T from the

National Science Foundation and other organizations such as the Environmental Research & Education Foundation and the Association for Iron & Steel Technology.

These research projects focus on processing various solid wastes using captured CO₂ or CO₂-rich flue gases to make carbon-negative cement materials and manmade rock for permanent carbon storage.

Ma is seeking follow-up grant funding and investment to scale up these innovations and accelerate commercialization.

S&T tornado simulator helps researchers investigate structure failure

Researchers at Missouri S&T are bringing tornadoes into the lab with a new simulator to model extreme cyclonic wind speeds and study how tornadoes destroy structures. The findings could be used to update existing structures and influence new construction. The S&T simulator was recently featured in the American Society of Civil Engineers’ (ASCE) publication *Civil Engineering Source*.

“Currently, post-storm damage surveys are the primary way to determine a tornado’s strength using the EF scale,” says **Dr. Grace Yan**, associate professor of civil, architectural and environmental engineering at Missouri S&T. “With the simulator, we can reproduce real-world tornadoes in the lab environment to discover the true failure mechanisms in civil structures.”

The S&T tornado simulator has an 84-inch diameter fan that can produce a 139,000-cubic-feet-per-minute flow rate and allows researchers to scale up the wind speed to a high-intensity tornado. The massive metal dome is suspended on a track from the laboratory ceiling and can move along the track to simulate the path of an actual tornado. Yan’s team developed the computational fluid dynamics model for the facility, which is open for testing by researchers, practitioners and stakeholders from other institutions and agencies.

Yan wants to someday take the simulator’s capabilities out of the lab and into the world.

Video: youtu.be/hfjc--Gs8NI



Dr. Grace Yan, center, is director of Missouri S&T’s Wind Hazard Mitigation Laboratory and the Center for Hazard Mitigation and Community Resilience. She also chairs the North American Alliance for Hazards and Disaster Research Institutes (NAAHDRI) board of directors. NAAHDRI is affiliated with 100 hazard and disaster research centers across North America.

Faculty Achievements

Pickerill on track to lead national association



Dr. Heath Pickerill, assistant teaching professor and director of Missouri's Local Technical Assistant Program (LTAP), was elected to the president's track of the National Local Technical Assistance Program Association (NLTAPA) at the group's annual conference held in Seattle. The organization works closely with the Federal Highway Administration, which provides funding to LTAP centers in each state and Puerto Rico.

Pickerill serves as vice president of the association. During his tenure through July 2023, he will serve as co-chair of the partnership workgroup to maintain and cultivate strong working relationships with organizations such as the American Public Works Association and Association of State Highway Transportation Officials. He will become president-elect in July 2023 and lead planning efforts for the 2024 NLTAPA Conference.

Oerther elected chair of hazardous waste management commission

Dr. Daniel Oerther, professor of environmental health engineering, was elected chair of the Missouri Hazardous Waste Management Commission during its September meeting.

Founded in 1977, the commission implements and enforces the Missouri Hazardous Waste Management Law, which includes holding hearings on rules, complaints and permit appeals. The commission also promotes hazardous waste recycling, reuse and reduction. The Missouri Department of Natural Resources assists the commission.

Feys named to ACI executive board



Dr. Dimitri Feys, associate professor of materials engineering, was elected president of the 2022 Missouri Chapter of the American Concrete Institute (ACI) Executive Board. The Missouri Chapter of ACI is dedicated to furthering engineering and technical education; scientific investigation and research; and development of standards for design and construction of concrete structures.

Website: acimissouri.org/board.php

Chen awarded editorial excellence award

Dr. Genda Chen, the Robert W. Abbett Distinguished Professor of Civil Engineering, was honored by the International Society for Structural Health Monitoring of Intelligent Infrastructure with an Editorial Excellence Award for his outstanding contribution to the Journal of Civil Structural Health Monitoring.

CAREE faculty honored for research, service and teaching

Three faculty members were recognized for their achievements and excellence in research, service and teaching.



Pictured from left to right with **Dr. Joel Burken**, chair of the department:

- **Dr. Sanjay Tewari**, Faculty Achievement Award, recognizes non-tenure-track faculty who have demonstrated sustained excellence in at least one of the categories of teaching, research, or service.
- **Dr. Daniel Oerther**, Experiential Learning Award, recognizes faculty who require undergraduate students to go beyond mastering basic skills and knowledge in the application of that material to problem-solving challenges.
- **Dr. Hongyan Ma**, Faculty Research Award, recognizes faculty members who have demonstrated excellence in research and scholarship.

Tewari promoted

Dr. Sanjay Tewari was promoted to associate teaching professor. Tewari teaches environmental and water



resources engineering for our Missouri State University Cooperative Engineering Program in Springfield, Missouri.

Tewari came to MSU from Louisiana Tech University, where his research focused on water quality, desalination and sustainable management of infrastructure in coastal regions. He earned his Ph.D. in civil engineering from Texas A&M.

Schonberg part of \$2 million NASA research project

Researchers at Missouri S&T will develop mineral extraction techniques for lunar construction as part of a NASA project to make it possible for people to live and work on the moon. NASA will provide up to \$2M over two years to support S&T's research.

Dr. William Schonberg, professor of civil, architectural and environmental engineering, will join Dr. Leslie Gertsch, associate professor of geological engineering, and the rest of the team to coordinate S&T's efforts to use electrostatic and magnetic extraction techniques to separate anorthite from lunar soil known as regolith. Anorthite is a type of feldspar – a group of minerals that are found in rocks all over the world and make up more than 50% of the Earth's surface. Anorthite contains calcium and magnesium needed to make parts for manufacturing equipment, which NASA believes is more efficient than launching supplies from Earth.

Missouri S&T is one of three universities selected for different aspects of the project. As S&T's team develops mineral extraction processes, a team from Colorado School of Mines will develop tools and methods that will allow robots to build landing pads and living quarters. A team from Auburn University will create new electronics that maintain reliability despite the lunar environment's extreme cold.

El-adaway talks solar energy

What is the cost of installing residential solar energy systems?

That was the question posed at a roundtable discussion held in February.

Missouri S&T's **Dr. Islam El-adaway**, the Michael and Barbara Hurst-McCarthy

Professor, along with other state experts, discussed how homeowners could make the transition. They discussed the science, benefits and cost of solar energy infrastructure and how it's being used to respond to climate change.

Website: mostpolicyinitiative.org/events/roundtable-discussion-solar-energy-in-missouri/

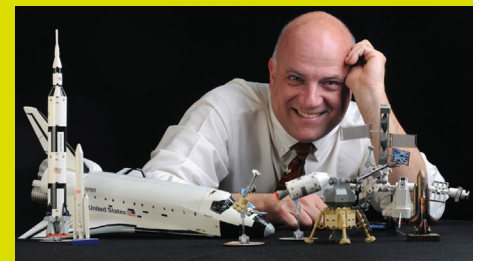
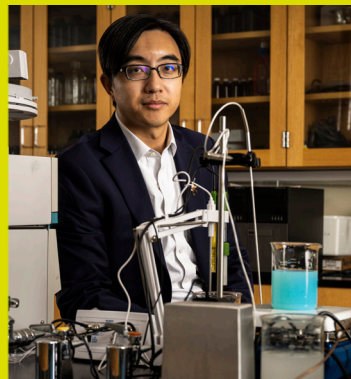
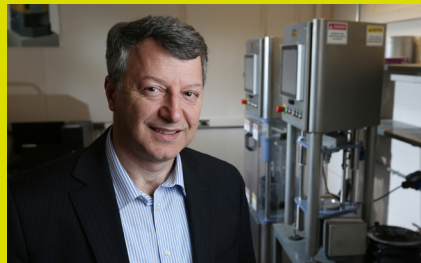


CArEE researchers among top 2% in their fields

Drs. Genda Chen, Kamal Khayat, Hongyan Ma, and William Schonberg were listed among the top 2% of researchers worldwide in their fields for career impact. This collective group of four represents the highest number of faculty in any department on campus that received this honor based on their number of research publications, citations and other measures of research productivity.

Career-long data was updated, and the selection was based on the top 100,000 researchers as determined by a composite citation metric known as a "c-score" (with and without self-citations) or by their percentile rank of 2% or above.

In addition, two other CArEE faculty members — **Dr. Mohamed ElGawady** and **Dr. Dimitri Feys** — were recognized for their single-year impact according to the same analysis.



Pictured clockwise from top left: Khayat, Chen, Schonberg and Ma

Faculty Profiles

Magdy Abdelrahman



**Missouri Asphalt
Pavement Association
Endowed Professor
MATERIALS
ENGINEERING**

Ph.D., civil engineering,
University of Illinois-Urbana

Scholarly Focus, Teaching or Research Areas

Experienced in infrastructure sustainability with applications in pavement engineering; expert in asphalt modifications including the use of recycled modifiers in civil/construction applications

Honors or Awards

- Missouri Asphalt Pavement Association (MAPA) Endowed Professorship in Flexible Pavement, 2017
- CAREER Award, National Science Foundation (NSF), 2009

Selected Academic Activities or Research Projects

- Preparing Interdisciplinary Professional for Rebuilding/Engineering Resilient Infrastructure of the Nation, U.S. Dept. of Education, 2019-23
- Friction Enhancements to Asphalt Pavement Surfaces, Missouri Department of Transportation, Project #00078213, 2022-2024.

Selected Publications and Presentations

Hemida, A., and **Abdelrahman, M.**, "Performance Assessment of Bio-Asphalt Mixtures Containing Guayule Resin as an Innovative Bio-Based Asphalt Alternative," *ASCE Journal of Materials in Civil Engineering*, Vol. 35, No. 04. 2023, DOI: 10.1061/(ASCE)MT.1943-5533.0004682.

Ragab, M., **Abdelrahman, M.**, Attia, M., "Investigation of the Changes in Asphalt Rubber Binder Fractions and their Relation to Performance Enhancement," *Advances in Civil Engineering Materials*, American Society of Testing Materials, Vol. 9, No. 1, pp. 105-116, 2020, DOI: 10.1520/ACEM20190157.

Noureldin, E., **Abdelrahman, M.**, "Parametric Analysis of Resilient Modulus Modeling for Recycled Asphalt Pavement in Base Layer," *Journal of the Transportation Research Board (TRB)*, No. 2401, pp. 30-43, 2014.

Abdelrahman, M., Hardy, A., "Incorporation of Property-Based Testing in Coarse Aggregate Specifications for Pavement Applications," *Journal of ASTM International*, Vol. 7, No. 10, 2010, DOI: 10.1520/JAI102670.

Stuart Baur



**Assistant Chair and
Associate Professor
ARCHITECTURAL
ENGINEERING**

Ph.D., civil engineering,
Missouri University of Science
and Technology

Scholarly Focus, Teaching or Research Areas

Developing sustainable communities through renewable energy technology including various techniques that involve energy efficient lighting design and daylight integration

Honors or Awards

- Experiential Learning Award, S&T
- Outstanding Academic Advising Award, S&T
- Engineers Make a World of Difference Award, American Military Engineers
- Outstanding Solar House Team Advisor Award, S&T

Selected Academic Activities or Research Projects

- 2020 Solar Decathlon – Phase I, Department of Energy, 2019
- Photovoltaic Recycling, Ozark Regional Solid Waste Management District, 2018-19
- 3rd Place Architecture, Innovation and Appliances, 4th place Communications, 4th place Overall, Department of Energy National Design Competition, Solar Decathlon, 2017
- A Climate-Responsive Adaptive Control for a Combination Passive Solar Shading and Natural Ventilation, Environmental Protection Agency (EPA), 2013-14

Selected Publications and Presentations

Baur, S.W., Annis, N.C., Choi, J., Homan, K., "Experimental Comparison of Modular Photovoltaic-Thermal Solar Panels," *International Journal of Smart Grid and Clean Energy*, vol. 11, no. 3, July 2022: pp. 118-126, ISSN: 2315-4462 (Print), ISSN: 2373-3594 (Online), Digital Object Identifier: 10.12720/sgece.11.3.118-126.

Simmons, S.M., **Baur, S.W.**, Gillis, W., Pickerill, H., Burns, D.M., "Optimizing exterior lighting illuminance and spectrum for human, environmental, and economic factors," Light Symposium 2022 – Rethinking Lighting Design in a Sustainable Future, September 21-23, 2022, Copenhagen, Denmark.

Simmons, S.M., **Baur, S.W.**, Gillis, W., "Informing Lighting Designs Through a Comprehensive Review of Light Pollution Impacts," International Virtual Conference on Light Pollution and Urban Lighting, September 23-24, 2022, Vancouver, Canada.

Joel Burken



**Department Chair
and Curators'
Distinguished Professor
CIVIL, ARCHITECTURAL
AND ENVIRONMENTAL
ENGINEERING**

Ph.D., civil and
environmental engineering,
University of Iowa

Scholarly Focus, Teaching or Research Areas

Phytoremediation, plant-chemical interactions,
mine restoration and remote sensing

Honors or Awards

- U.S. EPA Science Advisory Board, 2016-22
- Milton Gordon Award, Lifetime Research Accomplishment in Phytoremediation, International Phytoremediation Society, 2019
- Best Paper Award 2021 – Environmental Science and Technology for Machine Learning: New Ideas and Tools in Environmental Science and Engineering
- American Academy of Environmental Engineers and Scientists (AAEES) Science Award, 2018
- Fellow, AEEESP, Class of 2016

Selected Academic Activities or Research Projects

- Integrated Enhanced Natural Attenuation Approach for Risk-Based Closure of a Toluene Contaminated Site, Natural Sciences and Engineering Research Council of Canada (NSERC), University of Guelph, \$2.35M
- Mitigating Nonpoint Source Pollution Impacts on Nearshore Health in the Great Lakes Basin, USA, Great Lakes Research Institute, U.S. EPA, \$591,139, Collaborative with USFS, 2016-2022
- Excellence in Research: Elucidating Uptake Mechanisms of Silver/Zinc Oxide Nanoparticles into Food Crops and Transport through Soil Ecosystem, \$499,915, NSF, Collaborative with Lincoln University, 2020-23

Selected Publications and Presentations

Al-Lami, M.K., Oustriere, N., Gonzales, E., **Burken, J.G.**, Phytomanagement of Pb/Zn/Cu Tailings Using Biosolids-Biochar or-Humus Combinations: Enhancement of Bioenergy Crop Production, Substrate Functionality, and Ecosystem Services, *Science of The Total Environment*, 836, 155676, 2022.

Zhong, S., Zhang, K., Bagheri, M., **Burken, J.G.**, Gu, A., Li, B., Ma, X., Marrone, B.L., Ren, Z.J., Schrier, J., Shi, W., Machine Learning: New Ideas and Tools in Environmental Science and Engineering, *Environmental Science & Technology*, 17;55(19):12741-54. (Feature, Cover article, Awarded Best Paper, 2021).

Manley, P.V., Fritsche, F., Sagan, V., **Burken, J.G.**, "Remote Sensing of Explosives-Induced Stress in Plants: Hyperspectral Imaging Analysis for Remote Detection of Unexploded Threats, *Remote Sensing*, Vol. 11, No. 15, pp. 1827, 2019.

Genda Chen



**Robert W. Abbett
Distinguished Professor
CIVIL ENGINEERING
Director, Center for
Intelligent Infrastructure**

Ph.D., civil engineering,
State University of New York
at Buffalo

Scholarly Focus, Teaching or Research Areas

Structural health monitoring (SHM), structural control,
structural dynamics, robotic platform dynamics, bridge
preservation, infrastructure resilience to multi-hazards,
computational and experimental mechanics

Honors or Awards

- Editorial Excellence, Civil Structural Health Monitoring, 2022
- SHM Person of the Year, Structural Health Monitoring, 2019
- Certificate of Registration, Adaptive Wavelet Transform, 2019
- U.S. Patent, Strain Sensitive Coax Cable Sensor, 2008

Selected Academic Activities or Research Projects

- Mixed Reality for Beyond Visual Line-of-Sight Bridge Inspection Using Robot-Assisted Nondestructive Evaluation, INSPIRE Center, USDOT
- Traffic Disruption-Free Bridge Inspection Initiative with Robotic Systems, Seven-State Pooled-Fund Study, MoDOT
- Inspecting and Preserving Infrastructure through Robotic Exploration (INSPIRE) – a Tier 1 University Transportation Center, USDOT
- Assistive Intelligence for Cooperative Robot and Inspector Survey of Infrastructure Systems (AI-CRISIS), NSF

Selected Publications and Presentations

Ma, P., Fan, L., **Chen, G.**, "Hyperspectral Reflectance for Determination of Steel Rebar Corrosion and Cl- Concentration," *Construction and Building Materials*, Vol. 368, Paper No. 130506, March 3, 2023.

Mondal, T., **Chen, G.**, "Artificial Intelligence in Civil Infrastructure Health Monitoring - Historical Perspectives, Current Trends, and Future Visions," *Frontiers in Built Environment*, August 31, 2022.

Qu, H., Li, T., Wang, R., Li, J., Guan, Z., **Chen, G.**, "Application of Adaptive Wavelet Transform-based Multiple Analytical Mode Decomposition for Damage Progression Identification of Cable-stayed Bridge via Shake Table Test," *Mechanical Systems and Signal Processing*, February 15, 2021.

Chen, G., Keynote Speaker, "Robotic Platform for Autonomous Bridge Inspection and Maintenance," First International Conference on Unmanned Aerial Vehicles, Remote Control Vehicles and Remotely Operated Vehicles for Onshore, Offshore and Subsea Asset and System Integrity: DRONES & ROVS, London, UK, February 25-26, 2021.

Islam El-adaway



**Hurst/McCarthy
Professor and
Founding Director,
Missouri Consortium of
Construction Innovation
CONSTRUCTION
ENGINEERING**

Ph.D., civil engineering,
Iowa State University

Scholarly Focus, Teaching or Research Areas

Modeling and simulation, sustainable infrastructure management, resilient hazard management, energy management, contractual and dispute management, decision and risk management

Honors or Awards

- Thomas Fitch Rowland Prize, ASCE, 2020
- Editor's Choice Peer-Reviewed Journal Paper, (4 times), ASCE
- Best Peer-Reviewed Journal Paper, ASCE, 2017
- Outstanding Reviewer (7 times), ASCE

Selected Academic Activities or Research Projects

- Alleviating Electric Grid Congestion – Understanding Consumer and Utilities Response to Infrastructure Investment in Distributed Solar Generation, National Science Foundation (NSF)
- The Impact of Offsite Construction on the Workforce, Construction Industry Institute
- Using the Transmission Network, Consumer Behavior, and Market Structure to Maximize the Value of Solar Generation, Sloan Foundation
- A Multidisciplinary Fellowship Program in Engineering Management and Systems Engineering for Rebuilding Infrastructure, U.S. Department of Education

Selected Publications and Presentations

El-adaway, I., Jennings, M., "Professional and Organizational Leadership Role in Ethics Management: Mitigating Ethical Codification and Supporting Ethical Culture," *Science and Engineering Ethics*, Springer, Vol. 28, Article 33, <https://doi.org/10.1007/s11948-022-00385-2>, pp. 1-30, 2022.

Rayan, A., **El-adaway, I.**, Hastak, M., Needy, K., "The COVID-19 Pandemic: A Catalyst and Accelerator for Offsite Technologies," *Journal of Management in Engineering*, American Society of Civil Engineers, Vol. 38, No. 6, 1943-5479.0001091, pp. 1-18, 2022.

Muaz, A., **El-adaway, I.**, "An Integrated Game-Theoretic and Reinforcement Learning Modeling for Multi-Stage Construction and infrastructure Bidding," *Journal of Construction Management and Economics*, Taylor and Francis, <http://dx.doi.org/10.1080/01446193.2022.2124528>, 2022.

Mohamed ElGawady



**Alard and Sheri Kaplan
Faculty Scholar and
Professor
CIVIL ENGINEERING**

Ph.D., structural engineering,
Swiss Federal Institute of
Technology (EPFL)
Lausanne, Switzerland

Scholarly Focus, Teaching or Research Areas

Resilient infrastructure, earthquake engineering, extreme loads, impact loads, infrastructure repair, metamaterial, sustainable material, tire derived aggregate, geopolymer concrete, 3D printing

Honors or Awards

- Recognized as a Top 2% Scientist by Stanford University rankings of global scientists and engineers, 2019-21
- Missouri S&T Faculty Excellence Award, 2017, 2020
- Missouri S&T Outstanding Teaching Commendation, 2020
- Scientist Award and Medal, International Association of Advanced Materials (IAAM), Sweden-Based, 2020
- American Society of Civil Engineers (ASCE) Innovation Award with Ph.D. student, Yasser Darwish, 2019
- Missouri S&T Faculty Research Award, 2018

Selected Academic Activities or Research Projects

- Assessment and Repair of Over-Height Truck Impact with Prestressed Concrete Bridge Girders, 2021-23
- Pooled Funding Assessment of Bridge Girders Subjected to Vehicle Impact, Mid-America Transportation Center (MATIC), 2021-22
- Using Tire Derived Aggregates for Bridge, Masonry, Concrete, and Chip Seal Applications, MoDOT and MoDNR
- Behavior of Corroded Steel H-Piles Before and After Repair Using FRP, Geopolymer Concrete, UHPC, Polymer Modified Concrete, MoDOT and MATC
- CrunchPillow: Meta-Material Impact Protection Units, NSF
- Recycled Paint for More Durable Concrete Structure, MoDNR
- Evaluating and Relaxing the Limits on Flexural Reinforcement Ratio of Masonry Shear Walls, National Concrete Masonry Association

Selected Publications and Presentations

Sheta, A., Ma, X., Zhuge, Y., **ElGawady, M.A.**, Mills, J., and Abd-Elaal, E., "Shear behavior of thin-walled composite cold-formed steel/PE-ECC beams" *Steel and Composite Structures*, 46(1), 75-92, 2023.

Pourhassan, A., Ghenia, A., **ElGawady, M.A.**, "Raveling performance of conventional and rubberized chip seal under field and laboratory traffic loading" *Construction and Building Materials*, 370, 130674, 2023.

Abudawaba, F., Gomaa, E., Ghenia, A., **ElGawady, M.A.**, "Developing mix proportions of class C fly ash based geopolymer mixtures for 3D-printed concrete" *Transportation Research Record*, September 2021, doi.org/10.1177/03611981211039167.

Dimitri Feys



Associate Professor MATERIALS ENGINEERING

Ph.D., civil engineering,
Ghent University,
Ghent, Belgium

Scholarly Focus, Teaching or Research Areas

Rheology of cement-based materials and complex suspensions; mix design, workability and placement of concrete

Selected Academic Activities or Research Projects

- Minimizing the Effect of Pumping on SCC Workability and Freeze-Thaw Durability, ACI-CRC
- Influence of Casting Conditions on Durability and Structural Performance of HPC-ARL: Changes in Workability and Air-Void System of Concrete due to Pumping, RE-CAST
- Understanding Early Age Behavior of Cement: Rheology and Hydration Kinetics of Pure C_3S and C_3A , UMRB
- How much consolidation energy is really required to create concrete specimens?, ACI CRC
- Cost-Effective and Ecological 3D Printing of Reinforced Concrete Structures through Vibration Dynamics and Granular Physics, Missouri S&T Ignition Grant

Selected Publications and Presentations

Feys, D., Schutter, G., Fataei, S., Martys, N., Mechtcherine, V., "Pumping of concrete: Understanding a common placement method with lots of challenges," *Cement and Concrete Research*, 154 (2022): 106720.

Feys, D., M&S Highlight: De Larrard et al.(1998), Fresh Concrete: A Herschel-Bulkley Material, *Materials and Structures*, 55-2 (2022), 1-4.

Kosacki, J., **Feys, D.**, Dogan, F., "The Effect of Sodium Polymethacrylate on the Rheology of the Positive Paste and Performance of the Lead-acid Battery," *International Journal of Applied Ceramic Technology*, 19 (2022), 2029-35.

Sonebi, M., **Feys, D.**, "An Overview of the Achievements of RILEM TC-266: Measuring the Rheological Properties of Concrete (MRP)," 76th Annual RILEM Week, Kyoto, Japan, September 2022.

Feys, D., Schutter, G., Fataei, S., Martys, N., Mechtcherine, V., "Pumping of Concrete: Understanding a Common Placement Method with a Lot of Challenges, 15th International Conference on Recent Advances in Concrete Technology and Sustainability Issues," Milan, Italy, July 2022.

Mark Fitch



Assistant Chair and Associate Professor ENVIRONMENTAL ENGINEERING

Ph.D., chemical engineering,
University of Texas at Austin

Scholarly Focus, Teaching or Research Areas

Constructed wetlands/biochemical reactors for metals removal, biofiltration/membrane biofiltration, nutrient uptake in streams

Honors or Awards

- UM System President's Award for University Citizenship – Service, 2019

Selected Academic Activities or Research Projects

- Nonpoint Source Pollution Mitigation in an Urban Watershed: Examining floating treatment wetlands to mitigate nutrient pollution in urban watersheds with application to eutrophic urban ponds. The project is determining uptake by various native plants and by algae in floating treatment wetlands, where aquatic vegetation is suspended in the water column of streams and lakes to take up nutrients with plant growth.
- Biochemical Reactors for treatment of mine-impacted water: Passive bioreactors generate sulfide as wood is degraded, and that sulfide reacts with metals to form precipitates. The lifespan of such reactors is practically unknown and change in precipitation efficiency over time is entirely unknown. This long-term project involves operating thirty small reactors and evaluating performance and extent of wood decay over a decade.

Selected Publications and Presentations

Locmelis, M., Clark, S., Lueking, A., Moats, M., Awuah-Offei, K., Alagha, L., **Fitch, M.**, & Krolikowski, A. (2022): Summary Report: 2nd Annual Workshop on Resilient Supply of Critical Minerals, 4-5 August 2022, Missouri University of Science and Technology, Rolla, Missouri, USA, 27 pages.

Deef-Allah, E., Abdelrahman, M., **Fitch, M.**, Ragab, M., Bose, M., He, X., "Balancing the Performance and Environmental Concerns of Used Motor Oil as Rejuvenator in Asphalt Mixes," *Recycling*, Vol. 4, No. 1, pp. 11, 2019, DOI: 10.3390/recycling4010011.

Sochacki, A., Yadav, A.K., Srivastava, P., Kumar, N., **Fitch, M.**, Mohanty A., "Constructed Wetlands for Metals: Removal Mechanism and Analytical Challenges," Chapter 11 in *Constructed Wetlands for Industrial Wastewater Treatment*, Alexandros Stefanakis (Ede.), John Wiley & Sons, 2018, ISBN 978-1-119-26834-5.

William Gillis



Associate Teaching Professor CIVIL AND ARCHITECTURAL ENGINEERING

Ph.D., engineering management, Missouri University of Science and Technology

Scholarly Focus, Teaching or Research Areas

Heating, ventilation, and air-conditioning systems; building electrical systems; architectural materials and construction methods; LEED certification; commissioning of new-building construction, the building envelope, and existing buildings; project management for quality building systems design; project management and construction management for quality constructed buildings through commissioning

Honors or Awards

- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T, 2020
- Outstanding Professional Engineer in Higher Education, Missouri Society of Professional Engineers, St. Louis Chapter, 2015

Selected Publications and Presentations

Cudney, E., **Gillis, W.**, "Quality Function Deployment Implementation in Construction: A Systematic Literature Review," *Frontiers of Engineering Management*, Vol. 3, No. 3, pp. 224-230, 2016.

Gillis, W., Cudney, E., "A Methodology for Applying Quality Function Deployment to the Commissioning Process," *Engineering Management Journal*, Vol. 27, No. 4, pp. 177-187, 2015.

Gillis, W., Cudney, E., "A Standard for the Commissioning Process," *Frontiers of Engineering Management*, Vol. 2, No. 1, pp. 39-51, 2015.

Gillis, W., Cudney, E., "A New Methodology for Eco-Friendly Construction: Utilizing Quality Function Deployment to Meet LEED Requirements," Azevedo, S., Brandenburg, M., Carvalho, H., Cruz-Machado, V., Editors, *Eco-Innovation and the Development of Business Models: Lessons from Experience and New Frontiers in Theory and Practice*, Springer, 2014.

Gillis, W., Cudney, E., "Applying the House of Quality to the New-Building Construction Commissioning Process," Freund, L., Cellary, W., Editors, *Advances in the Human Side of Service Engineering*, AHFE Conference, 2014.

Kamal Khayat



Interim Vice Chancellor S&T RESEARCH AND INNOVATION Vernon and Maralee Jones Professor CIVIL ENGINEERING

Ph.D., civil engineering, University of California, Berkeley

Scholarly Focus, Teaching or Research Areas

High-performance cement-based materials for structural applications and rehabilitation; self-consolidating concrete; high-performance concrete with adapted rheology; ultra high-performance concrete; fiber-reinforced composites; materials for 3D printing; sustainable hydraulic binders; recycled materials for concrete

Honors or Awards

- President's Award for Sustained Career Excellence, University of Missouri System, 2020
- Robert E. Philleo Award, ACI Concrete Research Council, 2020 "For outstanding contributions to research, teaching, innovation, and leadership targeting the advancement of high-performance concrete with adapted rheology and self-consolidating concrete (SCC), and the relentless pursuit of knowledge transfer regarding the science, performance, design, and testing standards of SCC"
- Listed in 2% Top Scholars in the World published by Stanford University (ranking #24 in Building and Construction category out of 30,244 scholars), 2021
- Fellow: RILEM, 2015; ACI, 2004

Selected Academic Activities or Research Projects

- Development of 3D Printable Fiber-Reinforced Materials Using Locally Available/Indigenous Materials, U.S. Army Corp of Engineers, ERDC
- Center for Novel Carbon-Efficient Binders for Sustainable Infrastructure, UM System
- Superabsorbent Polymers in Concrete to Improve Durability, University of Illinois, Urbana Champaign
- Enhanced Performance of Fiber-Reinforced Concrete for Construction and Repair, Euclid Chemical

Selected Publications and Presentations

Khayat, K.H., Meng, W., Innovation and Eco-Efficiency of Nanostructured Cement-Based Materials, Elsevier, p. 216, Jan. 2023, ISBN: 978-0-12-817832-4.

Khayat, K.H. and Kawashima S., Editors, *Advances in Concrete Rheology and Additive Manufacturing in Construction*, Special Issue, ACI Materials Jr., Nov.-Dec., 2021 (37 papers).

Khayat, K.H., Co-Chair, Gordon Research Conference, *Advanced Materials for Sustainable Infrastructure Development*, Ventura Beach, CA, February 23-28, 2020.

Nicolas Ali Libre



Associate Teaching Professor STRUCTURAL ENGINEERING

Ph.D., civil engineering,
University of Tehran, Iran

Scholarly Focus, Teaching or Research Areas

Teaching innovations and educational technologies;
computational mechanics and applied mathematics;
advanced composite materials

Honors or Awards

- Provost's eFellows Grant Program Recipient, S&T
- Educational Research Grant Recipient, Center for Advancing Faculty Excellence, S&T
- UM System President's Award for Innovative Teaching
- FTTC Teaching with Technology Award, UMSL
- Faculty Achievement Award, S&T
- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T

Selected Academic Activities or Research Projects

- Development and Evaluation of an Early Alert System to Identify Academically At-Risk Students," Educational Research Grant, S&T Center for Advancing Faculty Excellence
- Develop, Implement, Assess, and Disseminate Entrepreneurially Minded Modules in Mechanics of Materials," Awarded by Lawrence Technological University and KEEN Partners
- Roller Compacted Concrete for Rapid Pavement Construction, Co-PI, MoDOT

Selected Publications and Presentations

Abolhasani, A., Samali, B., Dehestani, M., **Libre, N.A.**, "Effect of Rice Husk Ash on Mechanical Properties, Fracture Energy, Brittleness, and Aging of Calcium Aluminate Cement Concrete," *Structure*, 36, pp. 140-152, 2022.

Libre, N.A., "Grade Prediction Model Using Regression Analysis: An Implementation in Engineering Mechanics," ASEE Annual Conference and Exhibition, 2022.

Sabbaghi A., Sadeghi-Nik, A., **Libre, N.A.**, Nasrollahpour, S., "Characterizing Fiber Reinforced Concrete Incorporating Zeolite and Metakaolin as Natural Pot Loans," *Structures*, 34, pp. 2617-2627, 2021.

Jenny Liu



James A. Heidman Professor MATERIALS AND PAVEMENT ENGINEERING

Ph.D., civil engineering,
Texas A&M University

Scholarly Focus, Teaching or Research Areas

Engineering characterization and modeling of infrastructure materials; pavement design, testing, preservation, and condition assessment; sustainable materials and resilient infrastructure adapting to climate change/extreme events

Honors or Awards

- Keynote Speaker, Transportation Research Congress, 2021
- Faculty Research Award, S&T, 2019
- Best Paper Award (3 times), 2014, 2016, 2017
- Outstanding Reviewer (2 times), ASCE
- Engineer of the Year, Alaska Society of Professional Engineers, Fairbanks Chapter, 2016

Selected Academic Activities or Research Projects

- Associate Editor, *ASCE Journal of Materials in Civil Engineering*
- Associate Editor, *ASCE Journal of Transportation Engineering Part B: Pavements*
- Associate Editor, *ASCE Journal of Cold Regions Engineering*
- Chair, ASCE Bituminous Materials Committee
- Analysis of Asphalt Mixtures Using Alternative Aggregate in SMA and Superpave, MoDOT
- Impact of RAP Material on Cracking Resistance of Alaskan Asphalt Mixes, AKDOT&PF
- Fellowship Program in Civil Engineering for Infrastructure Preservation and Resilience with Emerging Technologies, DOEd GAANN
- National Center for Transportation Infrastructure and Life-Extension (TriDurLE), S&T Program, USDOT

Selected Publications and Presentations

Song, Y., Wang, D., Hu, X., **Liu, J.**, "An Efficient and Explainable Ensemble Learning Model for Asphalt Pavement Condition Prediction Based on LTPP Dataset," *IEEE Transactions on Intelligent Transportation Systems*, 23(11), 22084-22093, 2022.

Wu, H., Wang, D., Zhang, X., **Liu, J.**, "Impacts of Lightweight Aggregates Interlayers for Air Convection Embankment on Pavement Thermal Profile and Pavement Performance in Alaskan Permafrost Regions," *Transportation Research Record*, Vol. 2676 (12), 760-774, <https://doi.org/10.1177/03611981221097401>, 2022.

Murph, D., Liu, J., **Liu, J.**, "Mix Designs of Abrasion Resistant and Durable Concrete Made with SCMs for Cold Climates," *ASCE Journal of Transportation Engineering Part B: Pavements*, 148(2), 04022017, 2022.

Hongyan Ma



**Francisco Benavides
Faculty Scholar and
Associate Professor
MATERIALS
ENGINEERING**

Ph.D. civil engineering,
Hong Kong University of
Science and Technology

Scholarly Focus, Teaching or Research Areas

Carbon-negative cements and carbon-neutral concrete; solid waste upcycling; large-scale carbon utilization and storage; critical mineral recovery; smart materials and systems; biotechnology in construction; multi-scale modeling; durability of concrete structures; thermal energy storage; mechanics of materials

Honors or Awards

- Faculty Research Award, S&T, 2022
- Game Changer Academies Panel Fellow, CMMI, NSF, 2022
- Outstanding Teaching Award, S&T, 2021
- Faculty Excellence Award, S&T, 2020
- Faculty Research Award, S&T, 2019

Selected Academic Activities or Research Projects

- Concrete Assisted by Particles Sealed Under Large-scale Encapsulation (CAPSULE), DARPA, 2023-27
- Reduce Comminution Energy and Improve Energy Relevant Mineral Yield using Carbon-Negative Reactions, ARPA-E, 2023-26
- ECO-CBET: GOALI: CAS-Climate: Expediting Decarbonization of Cement Industry through Integration of CO₂ Capture and Conversion, NSF, 2022-26
- NSF Convergence Accelerator Track I: Revolutionizing the manufacture of Portland cement concretes towards a circular and carbon-negative future (Phase 1), NSF, 2022-23
- PFI-TT: Decarbonizing concrete using carbon-negatively processed solid waste, NSF, 2022-24
- Hyperspectral Imaging and Analysis for Steel Paint Condition Assessment, USDOT vis INSPIRE UTC, 2022-23
- Converting Off-Specification Coal Ash and Incinerator Ash into High-Value Blended Cementitious Materials through Enhanced CO₂ Uptake, EREF, 2022-24

Selected Publications and Presentations

Li, Z., Zhou, X., **Ma, H.**, Hou, D., "Advanced Concrete Technology, 2nd Edition," Hoboken: Wiley, 2022. ISBN: 978-1-119-80625-7 (print); 978-1-119-80619-6 (e-book).

Lu, H., Sun, X., **Ma, H.**, "Anti-washout Concrete: An Overview," *Construction and Building Materials*, Vol. 344, 128151, 2022, DOI: 10.1016/j.conbuildmat.2022.128151.

Sun, X., Liao, W., Kumar, A., Khayat, K., Tian, Z., **Ma, H.**, "Multi-level Modeling of Thermal Behavior of Phase Change Material Incorporated Lightweight Aggregate and Concrete," *Cement and Concrete Composites*, 2022, Vol. 122, 104131, DOI: 10.1016/j.cemconcomp.2021.104131.

Cesar Mendoza



**Associate Professor
WATER RESOURCES
ENGINEERING
Associate Chair
GRADUATE PROGRAM**

Ph.D., civil engineering,
Colorado State University

Scholarly Focus, Teaching or Research Areas

Environmental fluid mechanics, hydraulics, sediment transport and mathematical modeling; teaches undergraduate and graduate-level courses in the areas of fluid mechanics, hydraulics, rheology and environmental fluid mechanics

Honors or Awards

- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Teaching and Service Achievement Award, S&T, 2008
- Outstanding Student Advisor Award, Miner Alumni Association, 2007
- Excellence in Teaching Award, S&T School of Engineering, 2005, 2006

Selected Academic Activities or Research Projects

- Board of Editors, *Mechanics Research Communications*, ELSEVIER; Review Board, *International Journal of Sediment Research*, WASER
- Erosion Potential of the Osage River Downstream from Bagnell Dam, AMEREN UE
- Transport Processes of Mining Related Metals in the Black River of Missouri's New Lead Belt, EPA
- USSES – Expert System for Urban Streams, MSD
- Cell-Enabled Water Citizen Science for Data and Knowledge Generation: WatCitSci, NSF

Selected Publications and Presentations

Mohammed-Ali, W., **Mendoza, C.**, Holmes, Jr., R., "Influence of Hydropower Outflow Characteristics on Riverbank Stability: Case of the Lower Osage River (Missouri, USA)," *Hydrological Sciences Journal*, 2020, DOI: 10.1080/02626667.2020.1772974.

Mohammed-Ali, W., **Mendoza, C.**, Holmes, Jr., R., "Riverbank Stability Assessment during Hydro-Peak Flow Events: The Lower Osage River Case (Missouri, USA)," *International Journal of River Basin Management*, 2020, DOI: 10.1080/15715124.2020.1738446.

Zhou, D., **Mendoza, C.**, "Growth Model for Sand-Wavelets," *Journal of Hydraulic Engineering*, ASCE, Vol. 131, No. 10, pp. 866-876, 2005.

El-Habel, F., **Mendoza, C.**, Bagtzoglou, A.C., "Solute Transport in Open Channel Flows and Porous Streambeds," *Advances in Water Resources*, Vol. 25, No. 4, pp. 455-469, 2002.

John J. Myers



Professor
STRUCTURAL
ENGINEERING
Director, Missouri Center
for Transportation
Innovation

Ph.D., civil engineering,
University of Texas at Austin

Scholarly Focus, Teaching or Research Areas

Structures/high-performance concrete (HPC) behavior and durability performance; fiber-reinforced polymers (FRP) in structural repair and strengthening applications with an emphasis related to concrete and masonry structures and durability performance; development of environmentally sensitive construction materials; hybrid materials and enhanced systems for blast resistant structures

Honors or Awards

- Society Fellow, ACI, ASCE, IAAM, IIFC, TMS and VEST
- National Outstanding Educator Award, AEI
- Professional Recognition Award, ASCE
- Honorary Member, S&T Academy of Civil Engineers
- Faculty Excellence Award (9 times), Faculty Research Award (2 times), Faculty Teaching Award and Commendation (8 times), S&T

Selected Academic Activities or Research Projects

- Durability of GFRP Bar Reinforcement Extracted from In-service Concrete Structures, ACI-SDC, USDOT
- GFRP Reinforced Bridge Barriers Phase I and II, MoDOT
- GAANN Program for Doctoral Training in Civil Infrastructure Condition Assessment, Sustainability, and Resiliency, U.S. Dept. of Education

Selected Publications and Presentations

Al-Khafaji, A.F., **Myers, J.J.**, Alghazali, H.H., "Evaluation of Bond Performance of Glass Fiber Rebars Embedded in Sustainable Concrete," *Elsevier's Journal of Cleaner Production*, Vol. 282, 124516, pp. 16, Feb. 2021.

Al-Khafaji, A.F., Haluza, R.T., Benzecry, V., **Myers, J.J.**, Bakis, C.E., Nanni, A., "Durability Assessment of 15-20 Years Old GFRP Bars Extracted from Bridges in the USA – Part II: GFRP Bar Assessment," *American Society of Civil Engineering – Journal of Composites for Construction*, Vol. 25, Issue 2, April 2021.

Al-Khafaji, A.F., **Myers, J.J.**, Wang, W., "Bond Assessment of Two Types of Steel Reinforced Polymer (SRP) Strengthening Systems Subjected to Severe Conditions," *Elsevier's Construction and Building Materials*, March 2021, Vol. 273.

Zhang, F., **Myers, J.J.**, Liao, W., Hui, C., Ma, H., "Investigation of Corrosion Mechanism of Ribbed Mild Steel Bars Coated with Magnesium Potassium Phosphate Cement Paste," *Elsevier's Construction and Building Materials*, Available Online Feb. 2023.

Daniel Oerther



Professor
ENVIRONMENTAL
HEALTH ENGINEERING

Ph.D., environmental
engineering, University of Illinois,
Urbana-Champaign

Scholarly Focus, Teaching or Research Areas

Renowned for interprofessional education and community based participatory research improving access to clean water and nutritious food worldwide

Honors or Awards

- Fellow, Association of Environmental Engineering and Science Professors, 2020
- University of Missouri Presidential Engagement Fellow, 2021
- Experiential Learning Award, Missouri S&T, 2022

Selected Academic Activities or Research Projects

- Executive Director, American Academy of Environmental Engineers and Scientists, Annapolis
- Treasurer, Engineers Without Borders-USA, Denver
- Chair, Chartered Institute of Environmental Health, London, England

Selected Publications and Presentations

Oerther, D.B., Gautham, L., and Folbre, N., "Environmental Engineering as Care for Human Welfare and Planetary Health," *Journal of Environmental Engineering*, Vol. 148 No. 04022029, 2022.

Oerther, D.B., and M.E. Glasgow, "The Nurse+Engineer as the Prototype V-Shaped Professional," *Nursing Outlook*, Vol. 70, pp. 280-291, 2022.

Oerther, D.B., "Using modified mastery learning to teach sustainability and life-cycle principles as part of modeling and design," *Environmental Engineering Science*, Vol. 39, pp. 784-795, 2022

Guney Olgun



Assistant Professor GEOTECHNICAL ENGINEERING

Ph.D., civil and environmental engineering, Virginia Polytechnic Institute and State University

Scholarly Focus, Teaching or Research Areas

Energy geotechnology, energy geostorage, geothermal foundations and shallow geothermal systems, geotechnical earthquake engineering, deep foundations, soil improvement, liquefaction, granular geomechanics, fluvial erosion, disaster resilience

Honors or Awards

- ASCE ExCEEed Fellow, 2020

Selected Academic Activities or Research Projects

- Disaster Resilience and Risk Management (DRRM) – Creating Quantitative Decision Making Frameworks for Multi-Dimensional and Multi-Scale Analysis of Hazard Impact, NSF
- Performance-Based Decision Support System for Resilient and Sustainable Multi-Hazard Building Design, NSF
- Reduction of Seismic Shaking Intensity on Soft Soil Sites Using Stiff Ground Reinforcement, NSF
- Long Term Performance and Group Effect Considerations of Energy Piles, NSF

Selected Publications and Presentations

Khosravi, M., Boulanger, R.W., Wilson, D.W., **Olgun, C.G.**, Tamura, S., Shao, L., "Stress Transfer from Rocking Shallow Foundations on Soil-Cement Reinforced Clay," *Soils and Foundations*, 2019, DOI: 10.1016/j.sandf.2019.04.003.

Akinola, A.I., Wynn-Thompson, T., **Olgun, C.G.**, Mostaghimi, S., Eick, M.J., "Fluvial Erosion Rate of Cohesive Streambanks is Directly Related to the Difference in Soil and Water Temperatures," *Journal of Environmental Quality*, 2019, DOI: 10.2134/jeq2018.10.0385.

Sutman, M. **Olgun, C.G.**, Laloui, L., "Cyclic Load – Transfer Approach for the Analysis of Energy Piles," *ASCE Journal of Geotechnical and Geoenvironmental Engineering*, Vol. 145, No. 1, January 2019, doi.org/10.1061/(ASCE)GT.1943-5606.0001992.

Sutman, M., Brettmann, T., **Olgun, C.G.**, "Full-Scale In-Situ Tests on Energy Piles: Head and Base-Restraining Effects on the Structural Behaviour of Three Energy Piles," *Geomechanics for Energy and the Environment*, Vol. 18, June 2019, pp. 56-68, doi.org/10.1016/j.gete.2018.08.002.

Heath Pickerill



Assistant Teaching Professor ARCHITECTURAL ENGINEERING

Ph.D., human environmental science, with an emphasis in architectural studies, University of Missouri-Columbia

Scholarly Focus, Teaching or Research Areas

Teaches architectural design courses, helping students understand the fundamental principles of architectural analysis and how to apply these concepts to the successful solution of contemporary building designs. Also teaches engineering communications and computing courses, increasing students' written, oral and technical communications skills as they apply to the professional civil and architectural engineering practice.

Director of Missouri's Local Technical Assistance Program and Rural Transit Assistance Programs

Manages the operations and administration of Missouri LTAP and RTAP located on Missouri S&T's campus. These public service programs provide training, information, technology transfer and technical assistance to Missouri's local governments and rural transit agencies through Missouri Department of Transportation, Federal Highway Administration and Federal Transit Administration funding.

Honors or Awards

- Missouri's State Transportation Innovation Council
- Traffic Engineering Association of Missouri, Governing Board Member
- Missouri Roadway Safety Coalition – Infrastructure Subcommittee, Member
- Missouri Association of County Transportation Officials Conference, Planning Board Member
- National Local Technical Assistance Program Association 3-year president's track, 2022-23 vice president, 2023-24 president-elect, 2024-25 president
- Missouri Concrete Conference co-director
- Missouri Asphalt Conference co-director
- Kauffman Foundation Project PI, focus in workforce and entrepreneurial training in area of community resilience
- Missouri Safety Circuit Rider Program under my direction and funded through State Transportation Innovation Council (STIC) & Highway Safety Improvement Program (HSIP) grants – focus on providing engineering advice to local agencies in the state to improve rural road safer and implement low cost safety improvements

Selected Publications and Presentations

Pickerill, H., Keynote Speaker, Missouri Association of County Transportation Officials Conference, October 2019.

William Schonberg



**Professor and Assistant Chair, Distance Education and Remote Programs
CIVIL, ARCHITECTURAL AND ENVIRONMENTAL ENGINEERING**

Ph.D., civil engineering,
Northwestern University

Scholarly Focus, Teaching or Research Areas

Armor/anti-armor, penetration mechanics, spacecraft shielding against meteoroid and orbital debris impacts, hypervelocity impact phenomena, building failure and collapse, design and construction of moon and Mars habitats, professionalism and engineering ethics

Honors or Awards

- Associate Editor, *International Journal of Impact Engineering*
- Fulbright Specialist Program Award
- Fulbright Distinguished Chair, Advanced Science and Technology, U.S. State Department
- Distinguished Scientist Award, Hypervelocity Impact Society
- Honor Award, NASA Engineering and Safety Center
- Fraunhofer Bessel Research Award, Humboldt Foundation
- Manuel T. Pacheco Academic Leadership Award, University of Missouri System
- Fellow, ASME, ASCE

Selected Academic Activities or Research Projects

- Assessment of Spacecraft Passivation Requirements, NASA
- Improved Prediction of Terminal Ballistic Events Using Advanced Penetration Algorithms, DST Group, Melbourne, Australia
- Rupture of Composite Overwrapped Pressure Vessels, NASA
- Lightweight Installable Micrometeoroid and Orbital Debris Shield Concepts for International Space Station (ISS) Modules, NASA

Selected Publications and Presentations

Schonberg, W.P., "Notes from Down Under: Some Thoughts from a Fulbright Distinguished Chair in Australia," *Fulbright Chronicles*, Vol. 1, No. 2, 2022.

Schonberg, W.P., "A Comment on the Prediction of Metallic Plate Penetration by Fragment-Simulating Projectiles," *Human Factors and Mechanical Engineering for Defense and Safety*, Vol. 6, 2022, Article No. 7.

Schonberg, W.P., and Ryan, S.J., "Predicting Metallic Armour Performance When Impacted by Fragment-Simulating Projectiles – Model Adjustments & Improvements," *International Journal of Impact Engineering*, Vol. 161, 2022, Article No. 104090.

Eric Showalter



**Assistant Chair and Teaching Professor
CIVIL ENGINEERING**

Ph.D., civil engineering,
Purdue University

Scholarly Focus, Teaching or Research Areas

Teaches introductory courses in construction and the capstone design course, along with construction cost estimating, construction methods and project delivery

Honors or Awards

- Associated General Contractors of America (AGC) National Outstanding Educator, 2020
- St. Louis Section ASCE Professional Recognition Award, 2019
- Faculty Achievement Award, Missouri S&T, 2019

Selected Academic Activities or Research Projects

- Advisor to the S&T AGC Student Chapter, EWB and Concrete Canoe Student Design Teams and the Blacksmith Club

Sanjay Tewari



Associate Teaching Professor MSU PROGRAM AND WATER RESOURCES ENGINEERING

Ph.D., civil engineering,
Texas A&M University

Scholarly Focus, Teaching or Research Areas

Teaching undergraduate/graduate courses on wastewater/ water treatment, fluid mechanics and water-resources; research interests are electro-chemical processes such as capacitive deionization, electrokinetics, electro-coagulation and desalination

Honors or Awards

- Faculty Achievement Award, Missouri S&T, 2022
- Joseph H. Senne Jr. Faculty Teaching and Service Achievement Award, Missouri S&T, 2021
- Crying Towel Award, Louisiana Tech University, 2016 and 2013

Selected Academic Activities or Research Projects

- Pollution Prevention (P2) Grant, Pollution Prevention Technical Assistance and Training, U.S. EPA, 2020-22
- Combined Effect of Sea-Level Rise and Coastal Land Subsidence – Identification of Critical Transportation
- Infrastructure At-Risk in Coastal SPTC Region, Southern Plains Transportation Center, U.S. Department of Transportation Region 6 Regional University Transportation Center, 2017-18
- Coastal Protection and Restoration Authority through the RESTORE Act Center of Excellence for Louisiana, Protecting Subsurface Freshwater Using Electrokinetic Barriers Against Seawater Intrusion in Coastal Louisiana, 2017-18

Selected Publications and Presentations

Ahmed M.A., **Tewari, S.**, "Performance Evaluation of Asymmetric Capacitive Deionization with Carbon Aerogel Based Fiber-Paper Electrodes: Effect of Gold Deposition vs. Acid Treatment," *Journal of Electroanalytical Chemistry*, Vol. 835, pp. 30-39, 2019, <https://doi.org/10.1016/j.jelechem.2019.01.006>.

Ahmed M.A., **Tewari, S.**, "Capacitive Deionization: Concepts, Processes, Materials, and State of the Technology," *Journal of Electroanalytical Chemistry*, Vol. 813, pp. 178-192, 2018, <https://doi.org/10.1016/j.jelechem.2018.02.024>.

Tewari, S., Manning, F., "Identifying Corrosion Zones in Coastal Regions for Metal Pipes – A GIS Approach," *Proceedings of Pipelines 2017: Planning and Design*, Phoenix, AZ, pp. 618-625, 2017, <https://doi.org/10.1061/9780784480885.057>.

Jeffery Thomas



Teaching Professor MSU PROGRAM AND STRUCTURAL ENGINEERING

Ph.D., engineering mechanics,
Missouri University of
Science and Technology

Scholarly Focus, Teaching or Research Areas

Educational media, computer-based learning assessments, measurement of student engagement

Honors or Awards

- Joseph Senne Teaching and Service Award, Academy of Civil Engineers, 2022
- Dean's Educator Award, College of Engineering and Computing, 2020
- Faculty Achievement Award, Missouri S&T, 2020
- Faculty Excellence in Teaching, Missouri State University, 2018

Selected Publications and Presentations

Mechanics of Materials: International Adaptation, John Wiley & Sons, 2022.

Mechanics of Materials: An Integrated Learning System, 5th edition, John Wiley & Sons, 2020. (used by 23,000 students)

Mechanics of Materials: An Integrated Learning System, 4th edition, John Wiley & Sons, 2017. (used by 26,000 students)

Mechanics of Materials: An Integrated Learning System, 3rd edition, John Wiley & Sons, 2013. (used by 25,000 students)

WileyPLUS Learning Environment containing 2,000 reading questions, 2,750 problems, 1,100 tutorials and 770 videos.

Educational websites used by 805,000 people from 208 countries.

More than 5 million hours of student and faculty engagement with learning materials.

Jianmin Wang



Professor ENVIRONMENTAL ENGINEERING

Ph.D., civil engineering,
University of Delaware

Scholarly Focus, Teaching or Research Areas

Sustainable technologies for water and wastewater treatment, water reuse, waste-to-energy conversion

Honors or Awards

- CAPEES Best Paper Award
- Faculty Research Award

Selected Academic Activities or Research Projects

- Development of Robust Technologies for Advanced Wastewater Treatment and Reuse, U.S. Army
- Understanding the Oxygen Transfer Process in Biological Wastewater Systems

Selected Publications and Presentations

Campbell, K., **Wang, J.**, "Understanding the Role of Activated Sludge in Oxygen Transfer: Effects of Sludge Settability, Solids Retention Time, and Nitrification Reaction," *Water Environment Research*, 94 (11), e10806 (Cover story), 2022.

Liu, X., **Wang, J.**, Huang, Y.W., "Understanding the role of nano-TiO₂ on the toxicity of Pb on *C. dubia* through modeling – is it additive or synergistic?," *Journal of Environmental Science & Engineering*, 16 (5), 59, 2022.

Yu, Y.H., Su, J.F., Shih, Y., **Wang, J.**, Wang, P.Y., Huang, C.P., "Hazardous Wastes Treatment Technologies," *Water Environment Research*, Vol. 92, pp. 1833-1860, 2020, <https://doi.org/10.1002/wer.1447>.

Campbell, K., **Wang, J.**, "New Insights into the Effect of Surfactants on Oxygen Transfer in Activated Sludge Process," *Journal of Environmental Chemical Engineering*, Vol. 8, pp. 104409, 2020, <https://doi.org/10.1016/j.jece.2020.104409>.

Liu, X., **Wang, J.**, "Algae (*Raphidocelis subcapitata*) Mitigate Combined Toxicity of Microplastic and Lead on *Ceriodaphnia Dubia*," *Frontiers of Environmental Science and Engineering*, Vol. 14, No. 6, pp. 97, 2020, <https://doi.org/10.1007/s11783-020-1276-3>.

Campbell, K., **Wang, J.**, Daigger, G., "Filamentous Organisms Degrade Oxygen Transfer Efficiency by Increasing Mixed Liquor Apparent Viscosity: Mechanistic Understanding and Experimental Verification," *Water Research*, Vol. 173, pp. 115570, 2020, <https://doi.org/10.1016/j.watres.2020.115570>.

Chenglin Wu



Assistant Professor STRUCTURAL ENGINEERING

Ph.D., engineering mechanics,
University of Texas at Austin
Ph.D., civil engineering,
Missouri University of Science
and Technology

Scholarly Focus, Teaching or Research Areas

Nano-mechanics, nanomaterials, nanomanufacturing, machine learning assisted material design and characterization, 3D printing of infrastructure materials, sensing and multifunctional materials

Honors or Awards

- NSF CAREER Award on Chemo-Mechanics of 2D Transition Metal Materials, 2021
- Joseph H. Senne Jr. Academy of Civil Engineers Faculty Scholarly Achievement Award, 2021
- Missouri S&T Faculty Research Award, 2021
- Missouri S&T Dean's Scholar Award, 2021
- SES Best Paper Award on MXene-Graphene Influenza and SARS-Cov-2 Sensor, 2021

Selected Academic Activities or Research Projects

- Office of Naval Research (ONR), Data-Driven Approach toward Ultra-High Temperature Tough Ceramics by way of Heterogeneity at Multiple Length Scales, 2023-25
- NIH, MBARC: Flexible Virus Sensor for Detecting Infectious Respiratory Diseases Including COVID-19 and Flu, 2022-23
- National Science Foundation, CMMI: Collaborative Research: NRI: Smart Skins for Robotic Prosthetic Hand, 2022-2025

Selected Publications and Presentations

Wei, C., Zhang J., Liechti, K.M., **Wu, C.**, "Data-Driven Modeling of Interfacial Traction Separation Relations using Thermodynamically Consistent Neural Network," *Computer Methods in Applied Mechanics and Engineering*, Vol.404, 2023, 115826, <https://doi.org/10.1016/j.cma.2022.115826>.

Li, J., Cheng, F., Lin, G., **Wu, C.**, "Improved Hybrid Method for the Generation of Ground Motions Compatible with the Multi-Damping Design Spectra," *Journal of Earthquake Engineering*, 2022, <https://doi.org/10.1080/13632469.2022.2095059>

Wei, C., Zhang J., Liechti, K.M., **Wu, C.**, "Deep-Green Inversion to Extract Traction-Separation Relations at Material Interfaces," *International Journal of Solids and Structures*, Vol. 2022, 111698, <https://doi.org/10.1016/j.ijsolstr.2022.111698>

Grace Yan



Bryan A. and Jeanne Stirrat Faculty Scholar and Associate Professor
STRUCTURAL ENGINEERING

Ph.D., engineering mechanics, Harbin Institute of Technology, China

Scholarly Focus, Teaching or Research Areas

Digital twins for disaster resilience, climate change adaptation, AI and deep learning for fragility/vulnerability analysis and surrogate modeling, physics-based modeling of natural hazards, risk assessment of a region to multiple hazards, hazard mitigation and community resilience

Honors or Awards

- Faculty Excellence Award, S&T, 2021
- Joseph H. Senne Jr. Faculty Academy of Civil Engineers Faculty Scholarly Achievement Award, 2021
- Faculty Research Award, S&T, 2020
- Dean's Scholar Award, S&T, 2020
- Presidential Engagement Fellow, UM System, 2020
- Missouri Accelerated Research Award, 2019

Selected Academic Activities or Research Projects

- SCC-CIVIC-PG Track B: Community Resilience Micro-Bonds to Balance Cost and Social Equity among Stakeholders, NSF
- CoPe EAGER: Coastal Community Resilience Bonds to Enable Coupled Socio-Physical Recovery, NSF
- Damage and Instability Detection of Civil Large-Scale Space Structures Under Operational and Multi-Hazard Environments Based on Change in Macro-Geometrical Patterns/Shapes, NSF

Selected Publications and Presentations

Li, T., **Yan, G.R.**, Yuan, F., Chen, G., "Dynamic Responses on Large-Scale Dome Structures Induced by Tornado," *Journal of Wind Engineering and Industrial Aerodynamics*, Vol. 190, pp. 293-308, 2019.

Honerkamp, R., **Yan, G.R.**, & Van De Lindt, J., "Revealing Bluff-Body Aerodynamics on Low-Rise Buildings under Tornadoic Winds Using Numerical Laboratory Tornado Simulator," *Journal of Structural Engineering*, 148(3), 202204021294.

Honerkamp, R., **Yan, G.R.**, "Influence of Turbulence Modeling on CFD Simulation Results of Tornado-Structure Interaction," *Journal of Wind and Structures*, 35(2): 131-146, 2022.

Nofal, O.M., Van De Lindt, J.W., Do, T.Q., **Yan, G.R.**, Hamideh, S., Cox, D.T., & Dietrich, J.C., "Methodology for regional multi-hazard hurricane damage and risk assessment," *Journal of Structural Engineering*, 147(11), 2021, 04021185.

Xiong Zhang



James A. Heidman Professor
GEOTECHNICAL ENGINEERING

Ph.D., civil engineering geotechnical engineering, Texas A&M University

Scholarly Focus, Teaching or Research Areas

Unsaturated soil mechanics, advanced testing techniques, constitutive modeling, numerical methods and modeling, remote sensing, expansive and collapsible soils, frozen ground engineering, permafrost degradation, frost heave and thaw weakening, image analysis and computer vision

Honors or Awards

- Keynote Speaker, International Workshop on Advancements in Geotechnical Engineering: from Research to Practice (AGERP), 3rd Edition, May 2022 (online), www.age-rp.com
- Main Plenary Speaker, 3rd Pan-American Conferences on Unsaturated Soils, Rio de Janeiro, Brazil, July 25-28, 2021
- Keynote Speaker, 7th Asia-Pacific Conference on Unsaturated Soils, 2019, Nagoya, Japan
- Keynote Speaker, 4th International Conference on Transportation Soil Engineering in Cold Regions, 2019, St. Petersburg, Russia
- Keynote Speaker, GEO-Omaha 2020, 37th Annual Geotechnical Conference, Omaha, Neb.

Selected Academic Activities or Research Projects

- Navigating the New Arctic Track 1: Collaborative Research on Sociodemographic, Cultural, and Infrastructure Resilience and Adaptation under the Effects of Permafrost Degradation and Coastal Erosion, NSF, 2019-24
- National Center for Transportation on Infrastructure Durability and Life-Extension (TriDurLE), USDOT, 2019-22
- Development of Design Method for H2Ri Wicking Fabric in Pavement Structures: Phase II, TenCate Geosynthetics, Georgia, 2019-21

Selected Publications and Presentations

Zhang, X., Li, L., Chen, G., Lytton, R.L., "A Photogrammetry-Based Method to Measure Volume Changes of Unsaturated Soil Specimens during Triaxial Testing," *Acta Geotechnica*, Vol. 10, No.1, pp. 55-82, 2015.

Zhang, X., Lytton, R.L., "A Modified State Surface Approach on Unsaturated Soil Behavior Study (III) Modeling of Coupled Hydro-Mechanical Effect," *Canadian Geotechnical Journal*, Vol. 49, pp. 98-120, 2012.

Zhang, X., Briaud, J.L., "Three Dimensional Numerical Simulation of Residential Building on Shrink-Swell Soils in Response to Climatic Conditions," *International Journal for Numerical and Analytical Methods in Geomechanics*, Vol. 39, No. 13, pp. 1369-1409, DOI: 10.1002/nag.2360, 2015.

Adjunct Faculty



Daniel Abbott MECHANICS

B.S./M.S., Mechanical Engineering,
Missouri S&T
Engineering mechanics: statics,
materials testing, introduction
to engineering design



Robert Holmes Jr. WATER RESOURCES/USGS

P.E., F.ASCE, F.EWRI, D.WRE
Ph.D., Civil Engineering,
University of Illinois
Chief, Hydrodynamics Branch,
U.S. Geological Survey (USGS/retired)
Water resources engineering,
hydrologic modeling



Kevin McLain CIVIL ENGINEERING

P.E., Ph.D., Construction Engineering,
Iowa State University
Geotechnical Director (retired),
Missouri Department of Transportation,
construction and geotechnical
engineering



Robert Tucker ENVIRONMENTAL ENGINEERING AND GEOLOGY

Ph.D., Geochemistry,
Colorado School of Mines
U.S. Army (retired)
Frontier Environmental Technology
Tunnel detection in Iraq; deployable

baffled bioreactors for army trials of new equipment;
adobe blocks for theater building materials

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Steel Bridge Team wins fourth consecutive regional competition

The Steel Bridge Design Team from Missouri S&T won first place at a regional American Institute of Steel Construction (AISC) Mid-Continent Student Conference.

Missouri S&T earned first place overall at the event, held at Iowa State University in Ames in April. They also placed first in bridge stiffness, construction speed, structural efficiency and construction economy, second in lightness and cost estimation, and third in aesthetics.

“The team excelled again by defending their championship title despite the discontinuity imposed by Covid,” says team advisor **Dr. Nicolas Libre**, associate teaching professor of civil, architectural and environmental engineering.



Pictured left to right: Jeff Heniff, Jeannie Werner, and department chair, Dr. Joel Burken.

CArEE staff wins awards

Two CArEE staff members received awards at the College of Engineering and Computing Recognition Ceremony and Holiday Gathering.

Rookie of the Year Award

Jeff Heniff, Research Engineering Tech II.

Extra Mile Award

Jeannie Werner, Graduate Student Support Specialist.

Student Recognition

Ply gains hands-on experience with plant extractions, dioxane remediation

Several phrases can be used to describe **Shelby Ply**, a senior in environmental engineering at Missouri S&T, including: aspiring environmental engineer, accelerated master's degree student, decorated collegiate athlete, proud alumna of Rolla High School and equestrian aficionado.

Now, she can add one more phrase to her repertoire: successful student researcher.

Although this descriptor may still feel new to Ply, people may be surprised to learn this when they hear her share her knowledge in her field and see the passion in her eyes for environmental engineering.



L-R: Anthony Oha and Shelby Ply

"Two years ago, my department chair, Dr. Joel Burken, asked if I would be interested in assisting with some research, and I jumped at the opportunity," Ply says. "As a member of S&T's volleyball team, I haven't had as much time as I would like to be involved with other activities, but this project was perfect. I was able to set my own schedule and gain some hands-on experience in the process."

Ply says her focus was on assisting a graduate student, **Anthony Oha**, with his thesis project.

"This project was focused on remediating 1,4-dioxane from groundwater," she says. "For part of the project, we were out in the field and testing tree cores from contaminated sites. However, I spent a great amount of time in the greenhouse as well."

While in S&T's Baker Greenhouse, Ply tended to hundreds of tree saplings that were eventually tested as part of the research project.

"One purpose of the research was to develop new ways to extract and test liquid from these trees," she says. "Another variable we tested was to add dioxane-degrading microbes to the roots of the trees to determine how this would potentially mitigate the impact of dioxane we introduced."

Future researchers will also be able to build on the research team's findings related to the mitigation of dioxane.



L-R: Pourhassan, Regmi, Raster, Abhayaratne and Inalegwu

Pourhassan wins Missouri S&T Three-Minute Thesis competition

Alireza Pourhassan, a Ph.D. candidate in civil engineering, was awarded first place in Missouri S&T's seventh annual Three Minute Thesis (3MT®) competition held in March. Pourhassan impressed the judges with his research presentation titled "The Use of Tire-Derived Aggregate for Chip Seal Pavement Construction." He advanced to the regional 3MT competition hosted by the Midwestern Association of Graduate Schools in Milwaukee, where he competed for the chance to present his research at a national competition. His advisor is **Dr. Mohamed ElGawady**.

Varuni Abhayaratne, a master's degree student in environmental engineering, was named the runner-up. Abhayaratne's presentation was titled "Use of a Network of Low-Cost Multi-Pollutant Air Quality Sensors to Evaluate Environmental Justice in Twin Cities, Minnesota." The People's Choice Award went to **Sambad Regmi**, a Ph.D. student in mechanical engineering, with a presentation titled, "The Present and the Future of the Physically Interactive Robots." Ashley Raster and Ogbole Inalegwu were additional finalists that competed.

The 3MT competition originated with the University of Queensland, New Zealand, and is now held annually at over 900 universities worldwide.

Ma takes second place in student poster competition

The National Geospatial-Intelligence Agency and Saint Louis University co-sponsored the 2022 Geo-Resolution Conference which provided a venue for collaboration between students and geospatial experts for innovative solutions to mitigate the effects of climate changes.

Taylor Geospatial Institute (TGI), a consortium of eight of the Midwest's outstanding research institutions, helped organize a student poster competition at the conference and received 40 posters from students with a wide range of research topics.

Pengfei Ma, a Ph.D. student in civil engineering, took second place for his poster titled "Pipeline Leakage Detection by Mapping Vegetation Stress Indices from Hyperspectral Imaging." Ma represented the Center for Intelligent Infrastructure and INSPIRE University Transportation Center at the competition. His advisor is **Dr. Genda Chen**.

Pool attends Missouri Governor's Leadership Forum

Before he graduated, **Brenan Pool**, ArchE '22, was among a group of students selected to attend the 2022 Missouri Governor's Student Leadership Forum, an offshoot of the National Student Leadership Forum — held Feb. 25-27 in Jefferson City, Missouri.

Since 1986, the Missouri Governor's Student Leadership Forum has been convened by Missouri's Governor and other prominent community leaders and invites young people of diverse backgrounds and aspirations to put aside their differences and learn together how to better lead in their spheres of influence.

"The conference was inspirational and important to my spiritual and professional growth. It was a great honor for me to represent a group of leaders, and it helped me work on growing my networking and professional skills," says Pool.



Brenan Pool, pictured left, with Missouri Governor Mike Parson

ASCE St. Louis Section events and awards

In September, the American Society of Civil Engineers (ASCE) St. Louis Section gathered for its annual dinner to recognize student scholarship winners and the achievements of section members. The event was held at the International Photography Hall of Fame. More than 65 people were in attendance for the dinner and ten students received scholarships.

Awards were presented for professional Recognition and Younger Member of the Year, along with Project of the Year which was the Timber Trail to Briar Ridge Channel in Frontenac, Mo. **Marsia Geldert-Murphey**, MS CE'97, 2022/23 Society President-Elect, installed the 2022/23 Board of Direction.



Brendan Schmidt, CE'22, pictured left, with Dr. Joel Burken

Those from S&T to receive awards were:

MISSOURI S&T STUDENT SCHOLARSHIP

Brendan Schmidt, CE'22

FACULTY ADVISOR OF THE YEAR

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

ASCE YOUNGER MEMBERS

Brenan Pool, a senior in architectural and civil engineering, was selected to serve on The American Society of Civil Engineers' (ASCE) Committee on Younger Members for a three-year term.

ASCE-Missouri S&T wins Distinguished Chapter Award for Region 7

Missouri S&T American Society of Civil Engineers (ASCE) student chapter was awarded the 2022 ASCE Distinguished Chapter Award for Region 7, which includes Wyoming, Colorado, South Dakota, Nebraska, Kansas, Iowa and Missouri.

S&T also received a national ASCE Significant Improvement Award. The ASCE Committee on Student Members recommended S&T for the awards based on activities in the chapter's 2021 annual report.

ASCE sponsors nearly 300 student chapters in the U.S., including 26 in Region 7. Internationally, ASCE has more than 400 student chapters and nearly 32,000 student members.



ASCE Regional Governor Shawna Erter, pictured front left, and ASCE President Dr. Dennis Truax, front right, met with ASCE student chapter officers and advisors at S&T. First row, from left: Michael Radlund, Ryan Watts and Christopher Steinbach. Second row, from left: Jacob Fitzpatrick, Brenan Pool and Cameron Zalmanoff. Third row, from left: chapter advisor Dr. Joel Burken, St. Louis ASCE Section President John Weiland, and chapter advisor Dr. Kevin McLain.



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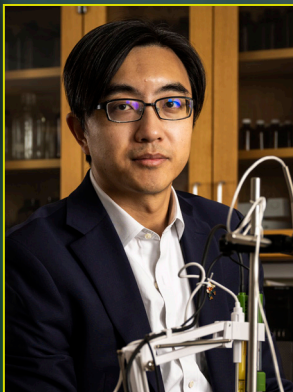
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Dr. Mohamed ElGawady
Kaplan Faculty Scholar



Dr. Jenny Liu
James A. Heidman Professor



Dr. Hongyan Ma
Benavides Faculty Scholar



Dr. Grace Yan
Stirrat Faculty Scholar



Dr. Xiong Zhang
James A. Heidman Professor

**Civil, Architectural and
Environmental Engineering
would like to announce
the new titles of five faculty
scholars in 2022.**

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