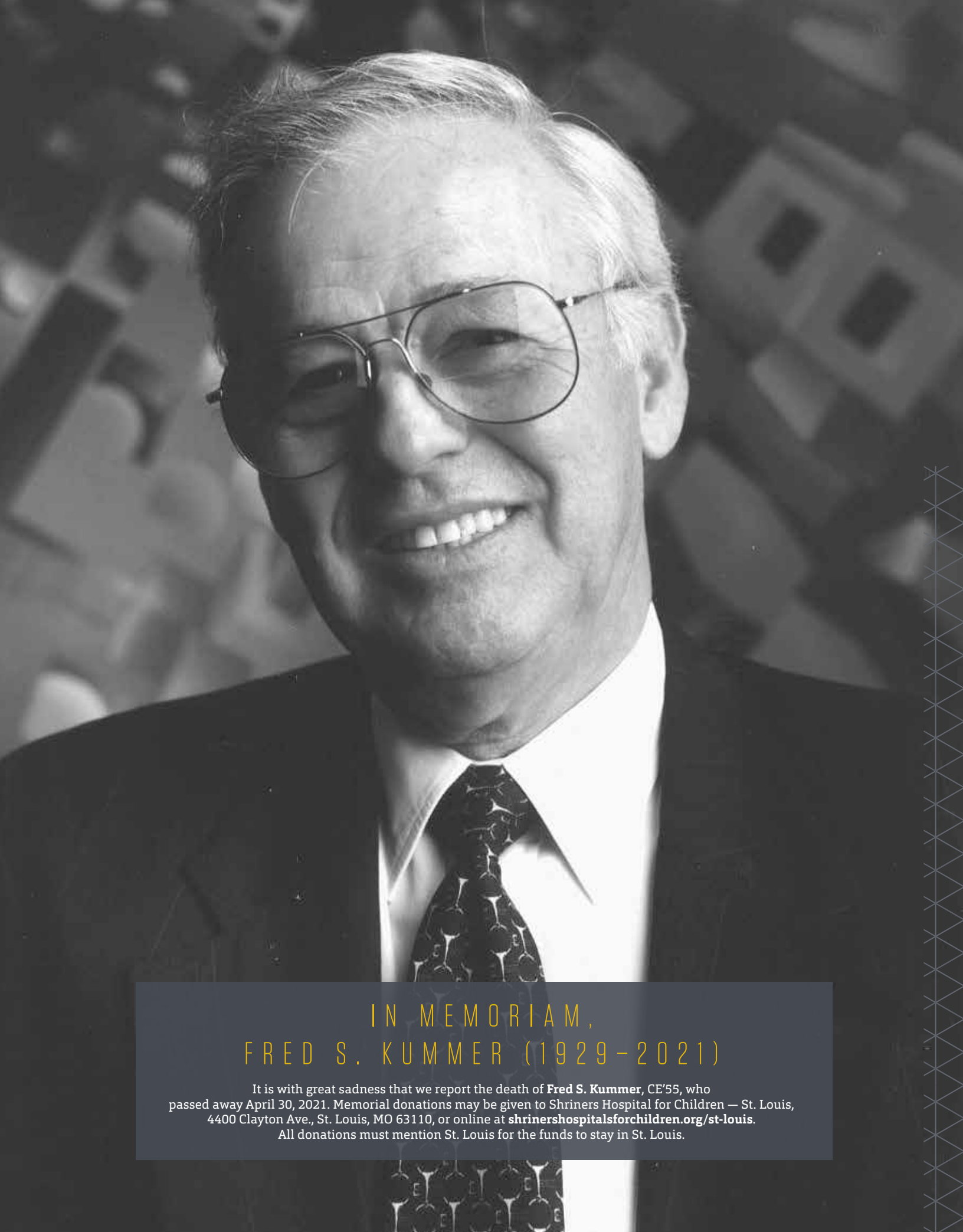


MISSOURI  
**S&T**  
MAGAZINE

SUMMER 2021 VOL. 95 NO. 1

INTO THE  
NEXT  
CENTURY  
AND BEYOND

Special  
**150th**  
Anniversary  
Edition



IN MEMORIAM,  
FRED S. KUMMER (1929-2021)

It is with great sadness that we report the death of **Fred S. Kummer, CE'55**, who passed away April 30, 2021. Memorial donations may be given to Shriners Hospital for Children — St. Louis, 4400 Clayton Ave., St. Louis, MO 63110, or online at [shrinershospitalsforchildren.org/st-louis](https://shrinershospitalsforchildren.org/st-louis). All donations must mention St. Louis for the funds to stay in St. Louis.



# A LEADER PASSES, A LEGACY ENDURES

Dear Friends,

On one wall of **Fred S. Kummer's** corporate office once hung a motto — a gift from his wife, June — that fittingly summarized how Fred viewed his business:

*Every organization is in reality a lengthened shadow of its leader.*

I can think of no better description of Fred Kummer's influence.

Fred's shadow was indeed long. During one of our frequent visits at his St. Louis home, I recall telling Fred about a trip to Dallas and the many upscale amenities and the beautiful design of the hotel where the meetings were held.

"You know, I built that hotel," Fred said with a smile.

Indeed, he had. It was one of the 25 Adam's Mark Hotel properties Fred had built and operated over the years. Even at age 91, Fred vividly recalled details of that property as though he was there the night before. His attention to detail was a characteristic that helped him grow his company, HBE Corp., into the world's largest design-build firm for health care and financial facilities.

Fred, CE'55, and June started their company in 1960 out of the basement of their Crestwood, Mo., home. An architect and graduate of Washington University in St. Louis, June was Fred's business partner in the truest sense. From their humble beginnings, Fred and June designed and built 1,012 hospitals and health care facilities, numerous financial institutions, the Adam's Mark Hotel chain, and a ski and golf resort in Colorado among many other remarkable undertakings. They gave generously to Missouri S&T projects including the Kummer Student Design Center, the Kummer Atrium in Butler-Carlton Civil Engineering Hall and the Kummer Garden at Hasselmann Alumni House. Fred was a leader in our Academy of Civil Engineers,

Order of the Golden Shillelagh and Board of Trustees. He co-chaired our Full Circle capital campaign in the 1990s. He also served on the University of Missouri Board of Curators.

Fred passed away April 30 of this year, just one week after his 92nd birthday and a little over six months after he and June gave our university the most transformative gift we have ever received. Their \$300 million donation to establish the Kummer Institute will create opportunities for thousands of future students and will create economic opportunities unlike anything our region has ever experienced.

In the brief time that I knew him, I came to know Fred as much more than a generous donor. For me, Fred was a true friend, a teacher, a mentor and an inspiration.

Fred was passionate about his alma mater. He was also concerned that we weren't realizing our true potential to transform education and graduate more outstanding engineers and scientists. For many years, Fred told me, he had been concerned about the declining interest in STEM education. He saw this as a threat to our nation's competitive edge in the global economy. He also saw Missouri S&T, as I do, as a crown jewel of STEM education, and as an institution deserving of greater investment.

I will be forever grateful for Fred and June's decision to invest once again in this crown jewel of higher education.

Rest easy, Fred. We dearly miss you, and on behalf of all of us at S&T, thank you.

Sincerely,



**Mo Dehghani**, Chancellor

This department of the State University will open for students on Monday, November the 6th, 1871.

The course of study extends through three years, and comprehends thorough practical instruction in MECHANICAL ENGINEERING, GEOLOGY, MINERALOGY.

# Making history for 150 years.

1870

The University of Missouri School of Mines and Metallurgy (MSM) was chartered Feb. 24, 1870.

1871

Classes began Nov. 6, 1871.



1908

Celebrating St. Patrick, the patron saint of engineers, became a signature social event.

1921

The MSM Alumni Association was established.



1950

The Miner football team won the Corn Bowl.

1964

MSM became the University of Missouri at Rolla, later called the University of Missouri-Rolla (UMR).

1972

An outdoor stage was built north of the old student center. Students dubbed it the "hockey puck" or "puck."

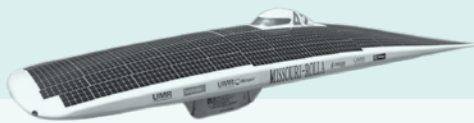
1984

The university's replica of Stonehenge was dedicated during the Summer Solstice.



1999

The university's Solar Car Team won the Sunrayce championship.



2015

Hasselmann Alumni House opened its doors.

2020-21

Missouri S&T celebrates its 150-year anniversary.

# MISSOURI S&T MAGAZINE

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

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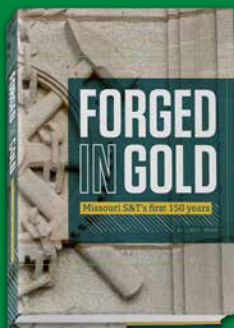
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This special edition of Missouri S&T Magazine commemorates S&T's 150th anniversary and the transformational \$300 million gift from June and Fred Kummer, CE'55. Regular publication of Missouri S&T Magazine remains suspended for budgetary reasons.



Explore the rich backstories and little-known history of Missouri S&T as you get to know this land-grant institution on a whole new level.

Forged in Gold tells the tale of our university's 150-year history, from its hardscrabble "country academy" origins in the 1870s to its position today as one of the nation's top STEM-focused research universities. Order yours today!

[150.mst.edu/book](http://150.mst.edu/book)



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near the Havener Center.









# A NEW ROLLA LANDMARK

A new pedestrian bridge over U.S. Interstate 44 now connects the north and south portions of campus alongside the existing University Drive bridge. The steel truss bridge's signature green paint and arched top provide a colorful and iconic reminder to drivers on the interstate that the campus is close.

Featuring a 12-foot-wide deck that spans roughly 240 feet, the structure provides a safer crossing for both walkers and bikers. The \$2.75 million project also features concrete abutments and wing-walls for the foundation system on the north and south sides of the interstate. In addition, the bridge connects to the existing sidewalk network with 600 feet of new 100-foot-wide shared-use paths.

The bridge was made possible through a partnership among the city of Rolla, the Missouri Department of Transportation and Missouri S&T.

Celebrating

# 150 years

Here's how you  
can get involved

Visit [150.mst.edu](https://150.mst.edu) to find out everything you need to know about 150th anniversary contests and events, watch videos of past events, learn about our 150-year history, and shop for anniversary gear.

All in-person events will follow safety guidelines set by the CDC and S&T's COVID-19 task force during the scheduled time frame. Schedule and fees subject to change. Please check for event updates at [150.mst.edu](https://150.mst.edu).

## MINER LEGACY

### Share your story

We want to hear your story! We're asking Miners to share their memories and personal anecdotes. Your submission may be featured on our site with other Miner stories. Visit [150.mst.edu](https://150.mst.edu) to submit your story or share by phone at 833-MINER150.

### Explore our history

Visit [150.mst.edu](https://150.mst.edu) to explore our 150-year timeline of events, view historical photos, and browse through our newly archived digital collection of the *Missouri Miner* newspaper, S&T alumni magazines, yearbooks, cookbooks and more.

## 150TH CONTESTS

### Poetry and writing contest

Calling all writers! S&T, in partnership with Arts Rolla and *Southwinds*, is hosting a literary competition. Visit [150.mst.edu](https://150.mst.edu) to submit your original works of poetry and flash fiction to win various prizes.

**Entry deadline:** Sept. 1, 2021

**Ages:** 12+

**Fee:** Free

### Time capsule competition

Visit [150.mst.edu](https://150.mst.edu) to submit your ideas for the 150th anniversary time capsule, set to be sealed in fall 2021. Enter the time capsule competition and win the chance to place personal treasures and mementos in the capsule.

**Entry deadline:** Sept. 1, 2021

**Ages:** 12+

**Fee:** Free



## 150TH EVENTS

### Missouri 2021 Bicentennial Alliance Lecture Series

The series "Honoring our past, envisioning the future" celebrates our state's history and future as part of the Missouri 2021 Bicentennial Alliance. All lectures are free to watch on Zoom, and attendees will automatically be entered to win a gift bag.

**2 p.m. Tuesday, Sept. 1, 2021**

*Batteries in the microgrid/solar houses*

**2 p.m. Tuesday, Oct. 5, 2021**

*Building microsatellites for the future*

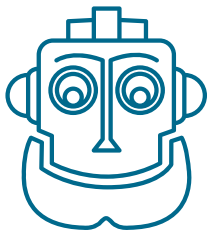
**2 p.m. Tuesday, Oct. 19, 2021**

*Missouri's German heritage*

**2 p.m. Wednesday, Dec. 8, 2021**

*Remembering Missouri's most famous generals*

View past lectures at [150.mst.edu](https://150.mst.edu).



### Rock-It the Robot

Look for Rock-It the Robot, a 9-foot-tall high-tech body puppet sponsored by S&T, at the 2021 Missouri State Fair. Rock-It projects an array of lights and puts on a light show after dark.

**Date:** Aug. 12–22, 2021

**Ages:** All

**Fee:** Free with admission to the Missouri State Fair

### STEM Fest

Celebrate science, technology, engineering and math at this family friendly event at the Student Rec Center. Hands-on activities, interactive demonstrations and other attractions are sure to be a hit with children, teens and families.

**Date:** Oct. 2, 2021

**Ages:** All

**Fee:** Free



### Homecoming 2021

Come back to campus to connect with friends, relive favorite traditions and make new memories. Help the university mark its 150th anniversary while the Miner Alumni Association honors its own milestone that's a century in the making.

**Date:** Oct. 8–9, 2021

**Ages:** All

**Fee:** Varies

### A "Best Ever" discussion

Join our panelists as they discuss the university's St. Pat's celebration and what it has meant to the campus. The event, co-sponsored by Coterie, will offer an opportunity for audience members to share memories about their own St. Pat's experiences. Watch the panel at 3 p.m. on Zoom or in St. Pat's Ballroom 206C of the Havener Center.

**Date:** Oct. 14, 2021

**Ages:** All

**Fee:** Free

### Gold Rush 5K

Join us for a 5K fun run/walk beginning and ending at the Havener Center on the S&T campus. The event will include a virtual option for those unable to participate in person. All funds raised will support the university's Health and Wellness Fund. Stick around after the race for the Health and Well-being Expo. See page 25 for details.

**Date:** Oct. 16, 2021

**Entry deadline:** Oct. 1, 2021

**Ages:** All

**Fee:** \$25–\$30 (includes T-shirt)

### Eduardo Kac: Telepresence, bio art and space poetry

An artist who challenges science, art, ethics and the imagination, Eduardo Kac is internationally recognized for his innovative artwork that focuses on the relationships among and between humans, animals, machines, and different life forms. Join Kac for a live presentation at 4:30 p.m. in S&T's Leach Theatre.

**Date:** Oct. 21, 2021

**Ages:** Recommended 14+

**Fee:** Free

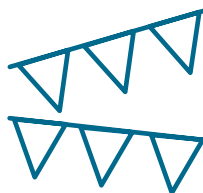
### TEDxMissouri S&T 2021

Students, community members and business professionals will come together to share their ideas and life experiences in this 150th anniversary-themed event at Leach Theatre. TEDx is a program of local, self-organized events that bring people together to share a TED-like experience. All presentations are recorded and shared through TEDx media.

**Date:** Oct. 29, 2021

**Ages:** Recommended 12+

**Fee:** TBD



### BooPalooza

Bring your little ghouls and goblins to downtown Pine Street in Rolla from 5–7 p.m. for this family friendly trick-or-treating experience. S&T student organizations, the Miner Alumni Association and local businesses will be on hand to ensure a safe event.

**Date:** Oct. 31, 2021

**Ages:** All

**Fee:** Free



### Founders Week 2021

This weeklong celebration is an opportunity to bring the S&T family together, welcome visitors to our campus and give back to the community. S&T held its first day of classes on Nov. 6, 1871. Join us as we celebrate Founders Week this November, the same month our university began to take shape 150 years ago.

Enjoy a festive week of activities, games and more. Stick around for some exciting football action on Founders Day as the Miners take on the Lindenwood Lions at 1 p.m. Saturday, Nov. 6.

**Date:** Nov. 1–6, 2021

**Ages:** All

**Fee:** Free

### Leonardo da Vinci Cantata

Hear the story of Leonardo da Vinci, an innovator who combined science with the arts during the Renaissance, like you've never heard it before. The performing arts program will debut the musical, written by S&T faculty, at 2 p.m. in Leach Theatre.

**Date:** Dec. 5, 2021

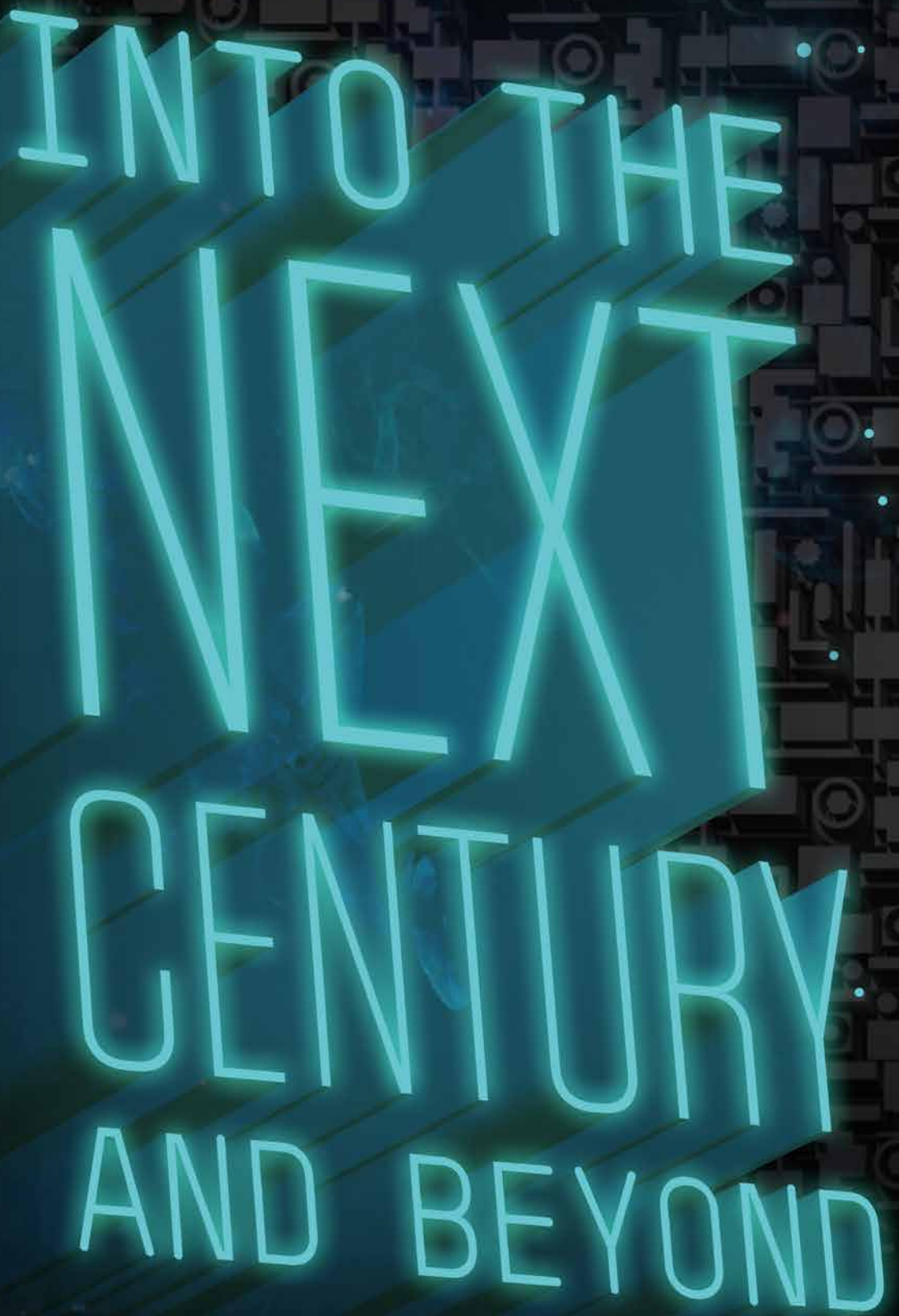
**Ages:** All

**Fee:** \$7 in advance, \$10 at the door. Free for youth 18 and under.

Join the celebration!

Use the official 150th anniversary hashtag on social media.

#Miner150



# INTO THE NEXT CENTURY AND BEYOND

By Nancy Bowles, [nancy.bowles@mst.edu](mailto:nancy.bowles@mst.edu)

As we celebrate our milestone 150th anniversary and reflect on our inspiring history, we also look to the future at how S&T can continue to strive for a better world in the next 150 years. We have big plans.

The Kummer Institute for Student Success, Research and Economic Development will transform STEM research and economic development, positively affect our state and region, and expand our reach and influence on the world.

New laboratories like the Center for Aerospace Manufacturing Technologies, the Clayco Advanced Construction and Materials Lab, and the Rock Characterization Lab increase our research opportunities. We have our eyes set on Carnegie R1 research status, the highest classification for a research university.

Our faculty and students are fighting climate change and making discoveries in smart medicine and artificial intelligence applications for daily life. They're developing new materials for infrastructure, health care and transportation.

S&T's roots are deep in the coal and lead mines of Missouri, but our branches reach for the far corners of our universe. S&T stands at the forefront of space exploration. Our researchers are testing new nanoscale materials that could reduce wear and tear on extraterrestrial vehicles and examining the role of neutrinos in shaping the universe. We are helping develop hypersonic flight. Our faculty are preparing students to mine on the moon, other planets — even asteroids.

S&T students are making an impression on space exploration with research into nimble small satellite swarms. NASA recently recognized our students with a BIG Idea Challenge grant to find a way to remove lunar dust from solar cells that power lunar landers, moon explorers and, someday, inhabitants.

Shakespeare wrote, "What's past is prologue," and S&T is living those words. We have a history of big ideas. And as we look ahead to the next century and beyond, S&T will continue to build on a legacy 150 years in the making.



# A LOOK TO THE FUTURE

Missouri S&T Magazine staff asked alumni, students and faculty to fast-forward their minds to 150 years in the future and tell us which of today's big ideas will become reality. Here are a few of their answers.

I see the most creative use of **advanced materials and clean energy in power storage, flying cars and spaceships**, and equipment that can be used for extracting minerals from other planets. We can also continue to provide food for the growing population in a more sustainable and energy-efficient manner than what we have today.

Fateme Rezaei, associate professor of chemical and biochemical engineering

**I think 150 years from now people will be living and working on the moon,**

commercial companies will mine resources from asteroids, and brave explorers will survey other planets like Mars. Missouri S&T's focus on interdisciplinary research efforts will foster space system technology development by challenging what was done in the past and looking to what can be accomplished in the future.

Jill Davis, Ph.D. student in mechanical and aerospace engineering

Metals are critical components of modern society. Aside from recycling, we recover metals from non-renewable ore deposits. To guarantee a steady metal supply in the future, we must open new search space for ore deposits. Missouri S&T can lead global exploration efforts and design

**new ways to recover metals from unprecedented depths within Earth as well as on extraterrestrial bodies such as meteorites.**

Marek Locmelis, assistant professor of geosciences and geological and petroleum engineering



## Ethics matters.

As advances continue to expand the reach of human power, it seems likely that more reflection on possible consequences, including existential risks to humanity, will be necessary for us to continue to flourish. Beyond consequences, we need to continue to think of the ways in which the systems we design and create can be just.

Patrick Gamez, assistant professor of arts, languages and philosophy

Construction will be cheaper and more sustainable because of more efficient processes using artificial intelligence and recycled materials. Prefabrication will be widespread. We'll see 3D-printed buildings.

**Robots will perform hands-on tasks under the supervision of humans in the trades, and drones will do the work of cranes.**

Trevor Becherer, CE'14, project manager at Clayco

Einstein's Theory of Special Relativity will be replaced with the theoretical construct that includes speeds beyond the original limitation of the speed of light.

**Missouri S&T's 2,000-square-foot Lightwave Technology Lab will be a lab on a chip,**

which students will routinely use to jump backward in time to boost their grades and find their misplaced communication devices and transporters.

Jie Huang, assistant professor of electrical and computer engineering

## WHAT DO YOU THINK?

What will life be like in the year 2171? How do you think technology will be integrated into people's lives? What will be entirely new? Go to [150.mst.edu/future](https://150.mst.edu/future) to share your thoughts.

968,860.



*Fig. 1.*

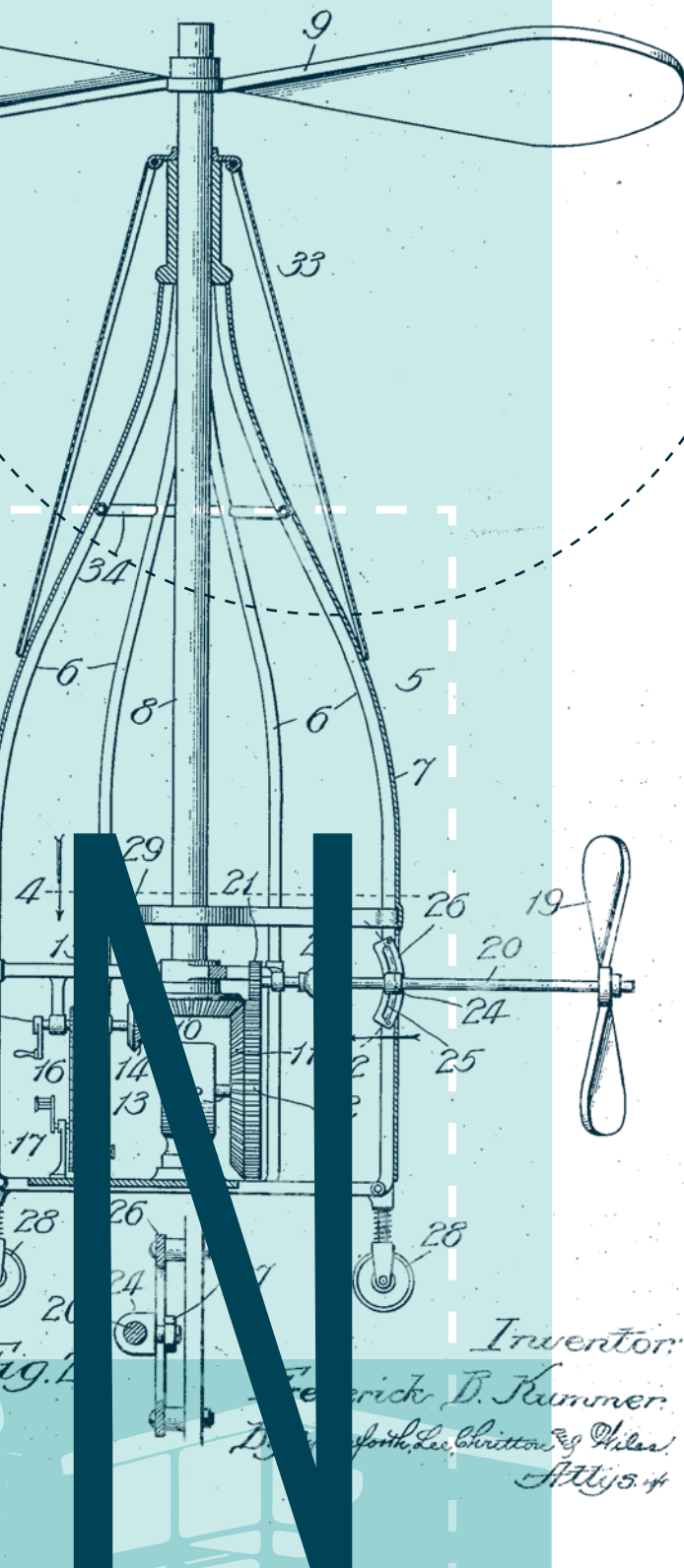
REALIZING

# THE KUMMER VISION

*Witnesses:*

*John Ende  
Hart H. B.*





For over a year, Chancellor **Mo Deghani** met weekly with **Fred Kummer**, CE'55, to discuss his desire to make a transformative gift to the university. Some weeks, Deghani's visits with Kummer were even more frequent. But by October 2020, Kummer and his wife, **June**, were ready to announce their \$300 million gift to the university — the largest single donation to any university, public or private, in the state of Missouri.

The donation established the Kummer Institute, and the resulting blueprint splits the effort into three distinct but complementary sections, each corresponding to one part of the Kummer's three-fold vision: the Kummer Institute for Entrepreneurship and Economic Development, the Kummer Institute for Education and Research, and various outreach efforts.

"Fred was a strong leader, and he was very committed to helping S&T flourish and helping our students get an outstanding STEM education," says Deghani. "During sessions with Fred and June, we were able to boil down their vision to three elements — elevate S&T, make a positive economic impact and broaden STEM outreach."

Deghani envisions a future S&T where all first-year students are exposed to the idea of entrepreneurship. This exposure could light a creative spark and give students a solid foundation for success as they learn the importance of market research, creating a business model, and testing and launching products.

"Fred was a strong leader, and he was very committed to helping S&T flourish and helping our students get an outstanding STEM education."

Patent inventor noted in graphic is no relation to Fred S. Kummer, CE'55. Image used for artistic purposes only.

# THE BIG THREE

The plan to carry out June and Fred Kummer's vision is complex. At its essence, though, the Kummer Institute plan is driven by three goals.

## Elevate S&T

Hiring renowned researchers for the institute's four research centers of excellence, attracting new endowed chairs and professorships, and recruiting a transformative academic leader as dean of the Kummer College of Innovation, Entrepreneurship, and Economic Development will bring more research funding and greater visibility for the institute and the university as a whole.

The four academic research centers will ensure S&T's work plays an important role when it comes to helping build the state and country's economy.

- **THE CENTER FOR ADVANCED AND RESILIENT INFRASTRUCTURE** will work to improve the nation's roads and bridges, the electrical grid and cyber-physical systems.
- **THE CENTER FOR RESOURCE SUSTAINABILITY** will decrease the footprint of material extraction, increase access to clean drinking water, and use local resources for energy, water and materials consumption.
- **THE CENTER FOR ADVANCED MANUFACTURING** will develop processes, materials and sensors to advance the next generation of manufacturing, boosting regional and national economic development.
- **THE CENTER FOR ARTIFICIAL INTELLIGENCE AND AUTONOMOUS SYSTEMS** will deploy the latest machine learning and artificial intelligence techniques to improve a range of robotic processes.



To lead these centers, S&T is seeking four leaders with a clear vision of future research.

"The founding directors will have to develop a vision for the centers that leverages existing campus resources and faculty strengths, while each identifying transformational opportunities to develop a nationally recognized center," says **Costas Tsatsoulis**, vice chancellor for research and graduate studies. "This is a transformational period in university history and a new era of opportunity and innovation."

### BUILDING THE VISION

The Kummer Institute will also change the physical landscape of campus. Plans call for an innovation campus north of U.S. Interstate 44. The first of its buildings, called the Missouri Protoplex, will form the cornerstone of manufacturing outreach, research and development for Missouri companies, governmental agencies and other prospective customers. The Kummer Institute will also support efforts to construct a 62,000-square-foot addition to the Engineering Research Lab (ERL) and a new student experience center, called the Innovation Lab, connected to the Havener Center.

"When we hire more endowed faculty and attract hundreds of new students and postdoctoral scholars to do their research, they will need space to develop their line of products," says **Steve Roberts**,



Conceptual renderings on pages 14–21 courtesy of Mackey Mitchell Architects



chief operating officer of the Kummer Institute. The ERL expansion will provide that space, and the Missouri Protoplex will bring the manufacturing sector together with researchers to address industry research and development challenges.

At approximately 50,000 square feet, the Innovation Lab will provide a creative space for students to gather, explore ideas, and make, design and build using the latest technologies and techniques.

“We’re looking for those people who are going to advance STEM,” said Fred Kummer in a 2020 interview. “Rolla is already in the same league as some of the best STEM universities, and it’s what we’ve got to build on.”

A key component of the Kummer Institute for Entrepreneurship and Economic Development will be the Missouri Protoplex. This proposed \$104 million structure will be part of an envisioned Manufacture Missouri Ecosystem — a network of companies across the state that come together, virtually and in person, to gain the latest manufacturing knowledge and expertise. At the Missouri Protoplex, experts will work with a goal of creating social and economic value by streamlining the process of moving research from the lab to the marketplace. The university is seeking state and federal support to match Kummer Institute Foundation funds to make this building a reality.

#### THE INNOVATION CAMPUS

Located adjacent to U.S. Interstate 44 and across from the main S&T campus, the Innovation Campus is shown at full buildout in this conceptual rendering.





**MISSOURI PROTOPLEX**

Located alongside U.S. Interstate 44, the Missouri Protoplex, shown here in a conceptual rendering, will be a centerpiece of the Innovation Campus. The structure is designed to provide collaborative space for advanced manufacturing experts from Missouri S&T and elsewhere to interact with Missouri innovators and entrepreneurs. It will also provide research and development space for Missouri manufacturers.





## VISITOR EXPERIENCE

Transparency and connectivity will be key features of this three-story structure, leading to creativity and innovation among different disciplines. Visitors to the Missouri Protoplex will have views into the specialized high-bay areas from second-floor gallery spaces along the building's perimeter.













#### HIGH-BAY AREAS

Three of the four areas will each have approximately 20,000 square feet of designated high-bay space, in addition to adjacent labs where additional testing and research will take place. The final area, cyber-physical security, requires a smaller high-bay area to house testing chambers and perform immunity tests.



# Broaden STEM outreach

Science, technology, engineering and mathematics (STEM) fields are important to June and Fred Kummer alike. Both benefited from a strong STEM education — she in architecture, he in civil engineering — and both shared the vision that attracting more students into STEM fields is the key to economic success, both locally and globally. That’s why a significant portion of their gift is devoted to outreach and programs like the Kummer Vanguard Scholarships for first-year students and Kummer Innovation and Entrepreneurship Doctoral Fellowships for Ph.D. candidates.

## KUMMER SCHOLARS

One immediate impact of the Kummer gift is the Kummer Vanguard Scholars Program. Over 500 first-year students have accepted the annual \$1,000 to \$3,000 scholarship, which is renewable for four years.

“This support will contribute to the feasibility of my attending the university in the first place, as I come from modest means,” says **Albavera Melesio**, a Vanguard Scholar from Oxnard, Calif. “I plan to obtain a doctorate in computer science minoring in economics. What specific business venture I will pursue is still up for debate, but I suspect it will be related to energy production.”

“S&T has been my dream school since designing and building my first house in seventh grade,” says **Ciarrah Bell** of Marceline, Mo. “The Kummer Vanguard Scholarship will help me focus on my studies rather than my financial situation.”

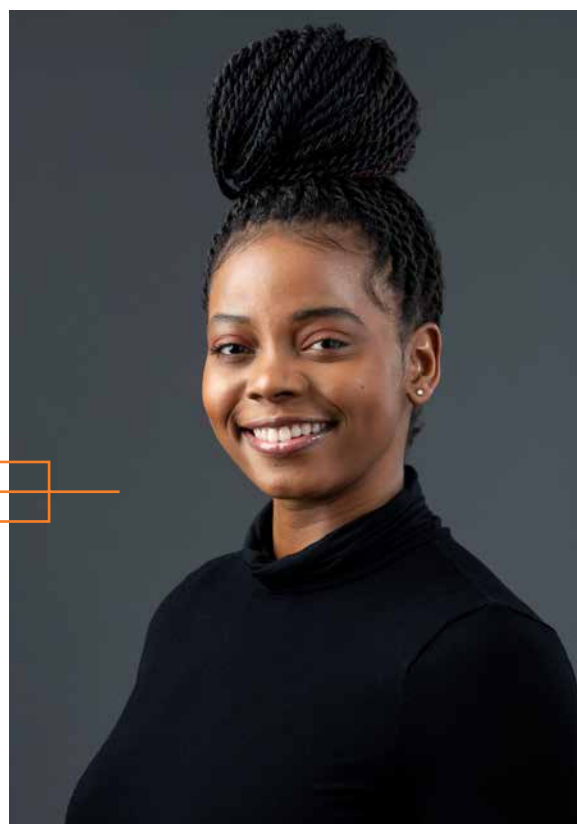
## KUMMER DOCTORAL FELLOWS

The Kummer vision extends beyond undergraduate education. It includes research-focused efforts like the new Kummer Innovation and Entrepreneurship (I&E) Doctoral Fellows Program, which will provide 12-month stipends and tuition remission for up to four years to qualified Ph.D. students. As the program ramps up, it eventually will provide funding for up to 100 top-notch doctoral students to pursue research that is tightly connected to innovation.

“Our hope is to incentivize research-active and grant-active faculty members by providing them with fully supported research students for a year or two, and then they will fund them through their research,” says S&T Chancellor **Mo Deghani**.

The university offered 21 fellowships to potential Ph.D. students this first year. One of the inaugural fellows is **Ashley-Ann Davis**, EMgt’21.

“A lifelong goal of mine has been to become an entrepreneur producing a product that is impactful,” says Davis, of Jefferson City, Mo. “This program allows me to not only do research on impactful topics with the professors I’ve come to love, but also help to develop my entrepreneurial and innovative skills.”





Advanced manufacturing and prototype development is at the core of the four new research centers. These centers will help broaden STEM outreach and support economic growth in Rolla and the surrounding region.

Photo by Taisia Gordon

## Make a positive economic impact

The Kummer Institute's myriad activities are expected to yield significant economic gains over time for the regional and state economy. Investments in new research facilities, scholarships and fellowships, and research will give a significant boost to the local economy — as much as \$250 million in additional goods and services within the first five years, according to a study by a University of Missouri-Columbia economist. Startups and new products developed through the institute will create further economic growth.

The institute's four new research centers are expected to stimulate greater innovation in areas critical to the economic development of the state and nation. These form the "R" in R&D and are housed in the Kummer Institute for Education and Research.

The "D" — turning S&T research and ideas into marketable products and processes — will come from a new entity designed to serve as the university's node for partnerships with industry, public and private research foundations, and governmental agencies to stimulate business innovation, provide corporate research and development,

and develop prototypes for new products. These activities fall under the aegis of the Kummer Institute for Entrepreneurship and Economic Development. Dehghani envisions this operation as analogous to the Georgia Tech Research Institute at Georgia Institute of Technology or NASA's Jet Propulsion Laboratory at Caltech — operations that are affiliated with universities but that have dedicated research scientists and engineers who work full time turning research findings into prototypes and products.

### THE BOTTOM LINE

The MU professor's economic analysis found that the Kummer donation will have an incredible impact on the region and the state for future generations. The investment is predicted to add \$2 billion to Missouri's gross domestic product (GDP) by 2045. The additional financial support it generates is expected to increase that amount significantly. For example, a \$100 million investment in any combination of federal and state funds will add \$1.5 billion to Missouri's GDP by 2045, on top of the \$2 billion from the Kummer's gift.

"The future is very bright, and it's very encouraging to be involved in developing the Kummer vision," says Dehghani. "What we do now will certainly impact S&T and the Rolla region for many generations to come." □



# GET SOME SCHOOL SPIRIT

Whether you want to rep your alma mater by wearing retro college apparel or by pouring your coffee into a modern anniversary mug, here are our top picks for showing off your Miner pride this fall.



## Legacy Hat

100% cotton relaxed twill adjustable hat with embroidered graphic



## Legacy Pennant

A throwback to the classic wool pennants of the past, this soft felt pennant measures 12" x 30"



## Legacy Sweatshirt

Classic crewneck sweatshirt from Champion with 50/50 blend of cotton and polyester and a full-chest screen print



## Anniversary Mug

16 oz. ceramic mug with a blue-and-white speckled finish and a deep-etched logo

[150.mst.edu/merchandise](http://150.mst.edu/merchandise)

# *Join the Gold Rush*

*The Gold Rush 5K fun run/walk is returning in 2021 as a hybrid event in partnership with Student Well-being and Joe's Peers.*

This family-friendly event is open to participants of all ages and fitness levels — whether you're walking your first 5K or you're a seasoned runner.

*The in-person, chip-timed run will take place Saturday, Oct. 16, at the Havener Center.*

Following the walk/run, we will host a Health and Well-being Expo, a community event designed to provide resources and practical, everyday tools attendees can use to better understand and manage their mental and physical well-being.

*Don't worry if you can't come. You can still support mental well-being wherever you are by participating virtually by Nov. 6, 2021.*

*Race registration will open Aug. 1, 2021.*

*Packets are \$25 for a short-sleeved shirt or \$30 for a long-sleeved shirt. Pre-order your race packet at [5k.thesandtstore.com](http://5k.thesandtstore.com)*



*All proceeds will support Missouri S&T's Health and Wellness Fund.*



# FRED KUMMER : THE MAN BEHIND THE VISION

By Mary Helen Stoltz, mhstoltz@mst.edu



Original photo of Fred Kummer courtesy of *St. Louis Post-Dispatch*, May 10, 1972

**I**f you consider the origins of **Fred Kummer's** business savvy, it's no wonder innovation and entrepreneurship were central to his vision for the Kummer Institute at Missouri S&T.

In high school, while holding down jobs as a runner on Wall Street and for Macy's department store, Kummer, CE'55, and a classmate ran a printing press to print menus for area restaurants out of the basement of the New York City hotel where his family lived and his father worked as an engineer.

Kummer's engineering background was inspired by his father, but his interest in construction began in Rolla. When he arrived on campus to begin his civil engineering coursework, a local construction project was underway.

"They were building an addition to the high school in Rolla, and I went to work for a man by the name of Powell, who was the inspector for William B. Ittner architectural firm out of St. Louis," Kummer said in a 1994 *Alumnus Magazine* interview. "I did all kinds of miscellaneous drafting and all sorts of other things for Mr. Powell."



Left: Fred and June Kummer in the early days. Photo courtesy of the Kummer family

Below: Kummer's office in 1993. On one wall hangs a gift from his wife, June — a motto that explains how Kummer viewed himself and his business: "Every organization is in reality a lengthened shadow of its leader." Photo by Doug McKay

Pleased with his work, Powell recommended Kummer for a draftsman job at a St. Louis architectural firm. That's where Kummer met his wife, **June**, an architect who recently had graduated from Washington University in St. Louis.

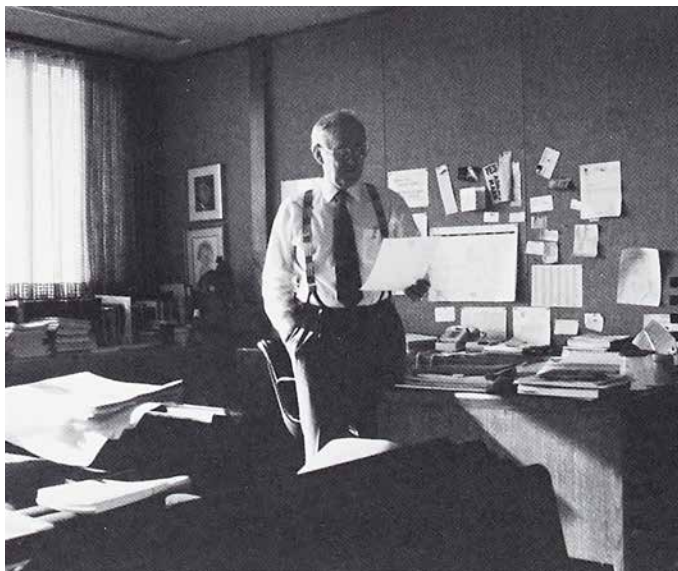
After two years of Army service and marriage to June, Kummer returned to Rolla in 1954 to finish his degree. Five years later, the Kummers founded their own business — building nursing homes — from the basement of their house with a \$17,000 investment. He had one part-time employee, a secretary.

From that modest beginning came HBE Corp., the world's leading design-build company for health care. The firm, which employed over 6,000, has been involved in the design and construction of financial facilities, retirement communities, a major ski resort and hotels in addition to health care facilities. At S&T, his handiwork includes

the Gale Bullman Building, Straumanis-James Hall and Curtis Laws Wilson Library.

Fred and June Kummer have been among Missouri S&T's most generous donors over the years. They provided the lead gift for the Kummer Student Design Center, which houses Missouri S&T's student-run design teams. They also supported the expansion in the 1990s of Butler-Carlton Civil Engineering Hall and, in the early 2000s, of Toomey Hall, which houses S&T's mechanical and aerospace engineering programs. In recognition of June's passion for landscaping and gardening, the Kummers provided a gift to name the Fred and June Kummer Garden at Hasselmann Alumni House.

Kummer remained active in his business ventures, working with that same determination, vision and peerless work ethic until just before his death in April. It's those traits he hoped to share with future generations of Rolla graduates.



“My Rolla experience taught me how to think, how to work hard and how to manage my own career.”

“I owe much of my success to the education I received at Rolla,” Kummer said in an October 2020 interview. “My Rolla experience taught me how to think, how to work hard and how to manage my own career. June and I believe in the mission of this great university, and that’s why we have chosen to invest in S&T’s future success. We believe that Missouri S&T’s best days are ahead.” □





A passion for architecture  
inspires a lifelong  
design-build partnership

By Maridel Allinder, [news@mst.edu](mailto:news@mst.edu)

**June Kummer remembers her first job interview after earning her architecture degree in the early 1950s. “We’ve never had a woman architect here before,” said the engineer conducting the interview. “I suppose it shouldn’t make any difference,” she replied.**

June got the job but her hurdles weren’t over.

“I was offered \$50 less a month than a friend of mine who interviewed with the same firm,” she says. “I asked to be paid what he was.”

June joined William B. Ittner architectural firm in St. Louis at the same salary as her friend. Soon after, she met a young engineering student from the Missouri School of Mines and Metallurgy, **Fred Kummer**, CE’55, who was also working at the firm.

“He started two weeks before me,” says June. “We didn’t date right away but we eventually did get married.”

June remembers the high school drafting class that sparked her passion for design.

“I went to a technical high school,” says the St. Louis native. “When they gave me a straight edge and a triangle, I knew I had arrived.”

As one of three women in the architecture program at Washington University in St. Louis, June sums up the experience in a sentence. “The men didn’t greet us with open arms.” She describes her partnership with Fred in a different way. “We’ve always worked together. We’re a good team. I learned a lot about engineering from Fred, and he learned a lot about design from me.”

The Kummers married in 1954 and Fred completed his civil engineering degree the following year. In 1960, they founded a construction company with less than \$17,000 in assets. HBE Corp. later became the world’s leading design-build firm for health care.

While June continued to advise Fred on design as he grew the company, she focused on raising their three children. She also became an avid gardener and leader in garden design, development and philanthropy.

“My grandmother was a gardener and I’m a gardener,” she says.

After many years of board leadership positions for the Missouri Botanical Garden, National Garden Clubs and

Federated Garden Clubs of Missouri, she still describes the deep joy of gardening as solitary.

“You’re all by yourself and no one argues with you,” she says. “It’s just you and the flowers. If you take care of them and love them, they will love you back.”

When June was installed as president of the Federated Garden Clubs of Missouri, she received a gift she describes as one of her greatest honors: the June Kummer Daylily.

“The bloom is a beautiful peach pink color,” she says. “I couldn’t be more honored than to have a flower hybridized and named for me.”

June Kummer Daylilies can be found in the Fred and June Kummer Garden at Hasselmann Alumni House, and they will be planted in the gardens of the university’s planned Arrival District, a new main entrance connecting the campus to U.S. Interstate 44 through a series of infrastructure and landscaping transformations.

While treasuring her namesake flower, June finds it impossible to have a favorite. “That would be like saying you love one child more than another.” The many windows of her St. Louis home overlook gardens she designed, planted and nurtured until the physical labor became too much.

“I can’t garden anymore,” she says. “I can’t get down on my hands and knees. Some things you just have to stop at 90.” □

“

I learned a lot about engineering from Fred, and he learned a lot about design from me.

”







# FUNDING THE FUTURE OF HIGHER EDUCATION

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

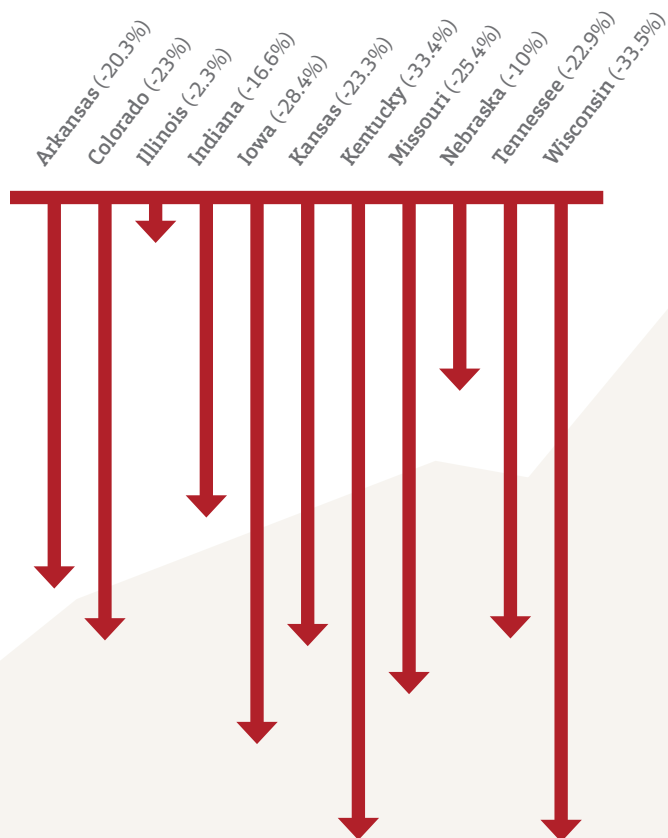
**A**s state funding for public universities continues to decline, institutions across the country are turning toward other sources of support. At Missouri S&T, donors have stepped in to address strategic needs. A more balanced approach to sustaining revenue, one that includes private support and enrollment growth, would also help S&T better navigate economic downturns or cuts in state funding.

The *Chronicle of Higher Education* reports that state and federal support for higher education has declined as a share of overall revenue throughout the country. This places a greater burden on college students. According to the U.S. Department of Education, Missouri S&T has seen a 6.1% decline in state support over the past decade. *Grapevine*, the Illinois State University database of state tax support, ranked Missouri 46th in state funding for higher education per capita in 2019.

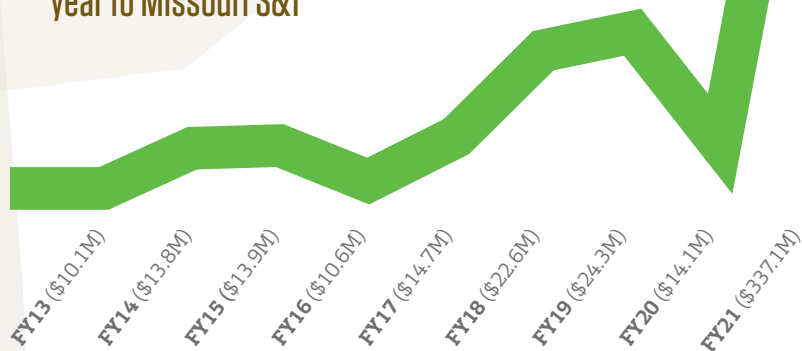
## How public higher education support in the Midwest has declined over the past decade

Support per \$1,000 of personal income by state

Source: State Higher Education Executive Officers Association  
FY2019 report



## Fundraising total by fiscal year to Missouri S&T



## ROLLA ON THE RISE

Given the past 10 years' state support trends, future support from donors and alumni will help ensure the university's future growth and development. The \$300 million gift from **June and Fred Kummer**, CE'55, has garnered the most attention. But days before that gift was announced, **Linda and Bipin Doshi**, ChE'62, MS ChE'63, donated \$10 million to endow the chemical and biochemical engineering department — a gift that was the largest ever to S&T at the time.

Since then, gifts such as **Anthony J. Steinmeyer's** \$2 million to endow the Steinmeyer Chair of Economics, a \$2 million gift from **Gary Havener**, Math'62, to endow the Havener Chair of Mathematics and Statistics, a \$1.5 million gift for scholarships from **Rosemary Kilker**, and donations from **Kay and Tim Bradley**, PetE'77 (\$5 million), Havener (\$4 million), **Pat and Jeff Sheets**, ChE'80 (\$1 million), **Joyce and Mike Bytnar**, ME'68 (\$500K), **Betty and Steve Suellentrop**, PetE'74, MS PetE'75 (\$250K), and **Carol and Tom Voss**, EE'69 (\$100K), to support the new Arrival District all ensure that S&T students will continue to receive an exceptional S&T education in an environment equipped with modern labs, quality faculty, and robust technology and facilities that ensure S&T's trademark academic excellence. □



# A new *front door* ON THE horizon

## *Reimagining S&T's campus footprint*

By Velvet Hasner, [hasnerv@mst.edu](mailto:hasnerv@mst.edu)

"You have arrived at your destination," says a chipper robotic voice when you use GPS. Soon the thousands of visitors who explore Missouri S&T each year will know when they've reached our campus, thanks to a new Arrival District.

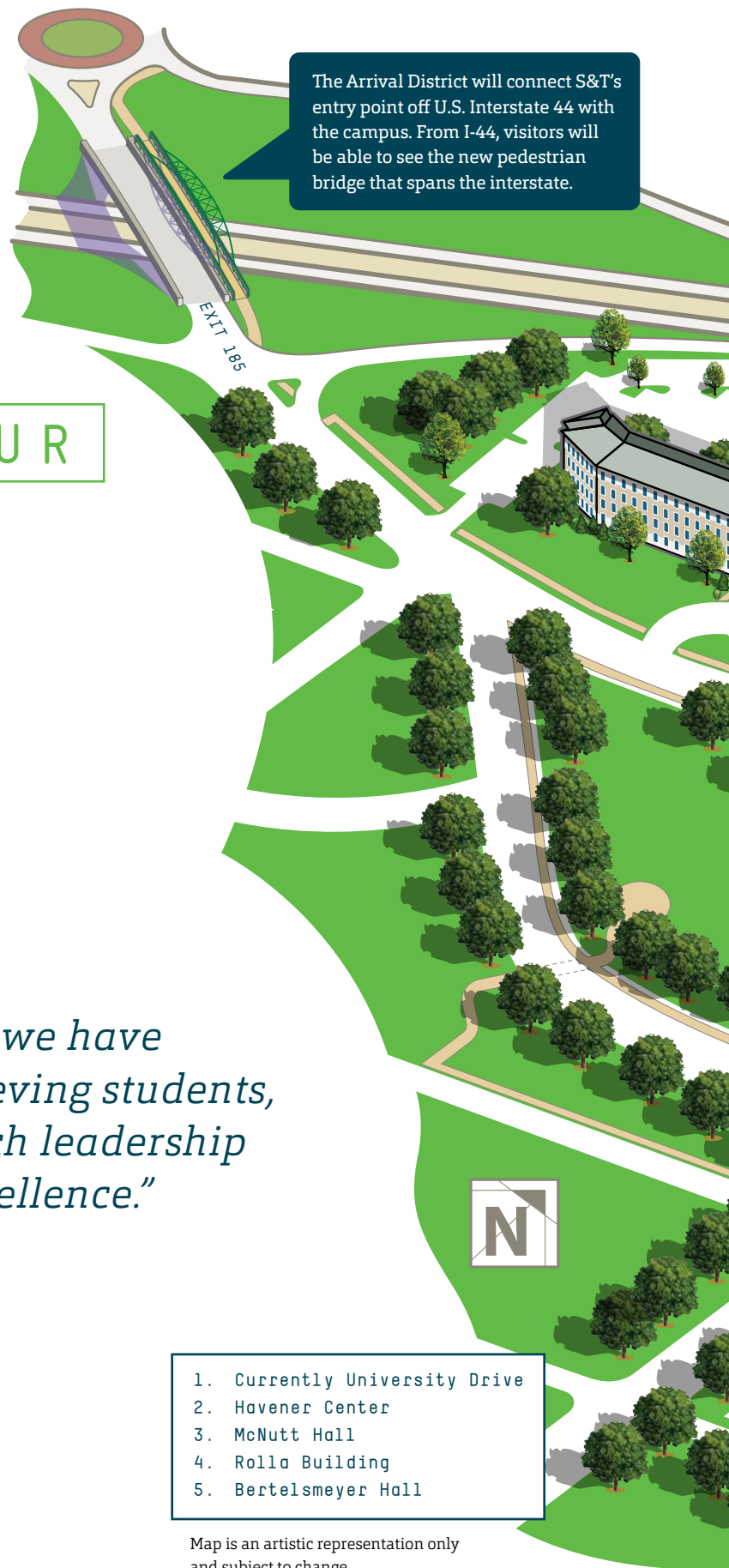
The Arrival District will provide something our university has never had: an official campus entrance or "front door" that signals the beginning of the S&T experience. This symbol of arrival will serve as an icon of the university experience and provide a powerful first impression.

- ▶ Landmarks, green spaces, roads and walkways are all components of the Arrival District. Illustration by Vesa Sammalisto









The Arrival District will connect S&T's entry point off U.S. Interstate 44 with the campus. From I-44, visitors will be able to see the new pedestrian bridge that spans the interstate.

# Coming to campus,

## TAKING A TOUR

Every fall, thousands of students return to Rolla to complete the next chapter of their lives. Yet for those who've never visited campus, that first journey can seem confusing, unwelcoming and downright difficult to navigate — despite the campus being nestled right off of U.S. Interstate 44 and Highway 63. The Arrival District will transform that experience through a series of memorable landmarks, intentional landscaping and modern building projects.

*“We need to do a better job of presenting to the world what we have at Missouri S&T — high-achieving students, distinguished faculty, research leadership and a 150-year history of excellence.”*

**Mo Deghani,**  
*Missouri S&T Chancellor*

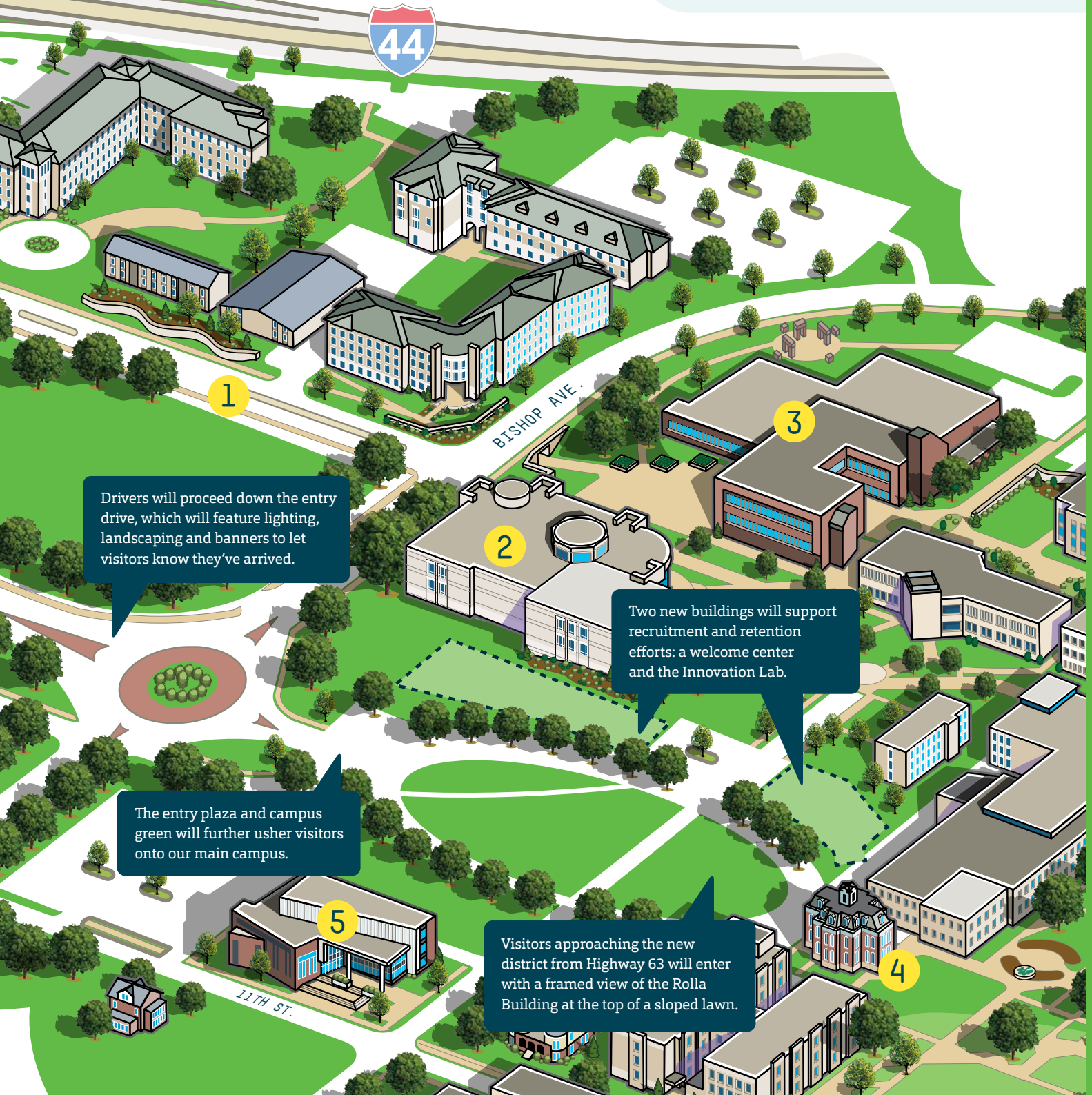
- 1. Currently University Drive
- 2. Havener Center
- 3. McNutt Hall
- 4. Rolla Building
- 5. Bertelsmeyer Hall

Map is an artistic representation only and subject to change.

Visible from the interstate, the future Missouri Protoplex will reflect S&T's research and economic development endeavors. See page 15 for details and conceptual images.

*"The Innovation Lab will be a great stop on campus visits, but also has the potential to be a hallmark of the campus. The resources it offers would really help more students get involved earlier in their time at S&T, as well as offer a much-needed collaborative space."*

**Ian McIntosh, a senior in chemical engineering**



Drivers will proceed down the entry drive, which will feature lighting, landscaping and banners to let visitors know they've arrived.

Two new buildings will support recruitment and retention efforts: a welcome center and the Innovation Lab.

The entry plaza and campus green will further usher visitors onto our main campus.

Visitors approaching the new district from Highway 63 will enter with a framed view of the Rolla Building at the top of a sloped lawn.

11TH ST.



A conceptual drawing showing the welcome center courtesy of Drake Wells Architecture.



# Welcome

## CENTER

This new facility will welcome prospective students and their families as they explore S&T. Features will include:

- An auditorium and theater for presentations and panel discussions
- The latest technology for high-quality audiovisual presentations
- A generously sized lobby with electronic exhibits for prospective students and their parents to view
- Banquet space
- A catering kitchen
- A gallery area to showcase student creations
- Meeting rooms for faculty advisors to meet with prospective students and parents.

Currently these areas are spread among three buildings throughout campus (Parker Hall, Havener Center and Castleman Hall) and none of the three buildings focuses only on future students. The welcome center will be dedicated to prospective students and their families.



# Innovation

LAB

Located next to the Havener Center, the Innovation Lab will be all about students. Features will include:

- Active learning classrooms
- A student lounge
- A coffee shop
- Multipurpose event space
- Idea labs
- Gallery space
- Augmented and virtual reality spaces
- The Student Success Center
- The Writing Center
- Makerspaces
- A roof terrace.

This will be a space for students of all majors to gather, learn, collaborate and create. The building will feature abundant natural light to connect indoor and outdoor spaces.



A conceptual drawing showing the Innovation Lab courtesy of Mackey Mitchell Architects.



Illustration by Vesa Sammalisto

## Funding the future

Missouri S&T has completed the first phase of the Arrival District fundraising campaign. We are grateful for the generosity of these donors who contributed to the \$18 million project:

**Tim Bradley**, PetE'77, and **Kay Bradley**

**Mike Bytnar**, ME'68, MS EMgt'73, and **Joyce Bytnar**

**Gary Havener**, Math'62

**Nucor**


**Jeff Sheets**, ChE'80, and **Pat Sheets**, ChE'80

**Steve Suellentrop**, PetE'74, MS PetE'75, and **Betty Suellentrop**

**Tom Voss**, EE'69, and **Carol Voss**

The campaign total includes federal funding to support removal of the decommissioned power plant and replacement of an aging electrical substation

For more information on the Arrival District, please contact

**Tory Verkamp**, assistant vice chancellor for university advancement, at, [verkampv@mst.edu](mailto:verkampv@mst.edu) or 573-341-6090. 









## MOVING FORWARD

Determination and resilience are common traits for S&T students. In a year unlike any other, Miners adjusted to limited in-person gatherings and a disrupted athletic season. As shown in this multiple exposure photograph, **Bryn Wooldridge** pitched for six innings and allowed just four hits, picking up the win for S&T in the second game of a double-header against William Jewell. The sophomore from Salisbury, Mo., plans to major in architectural engineering.

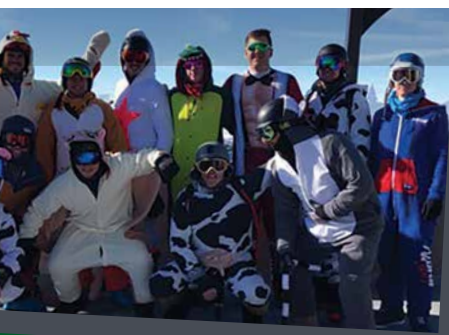




# WE WANT TO HEAR FROM YOU

Even though you aren't receiving an alumni magazine on a regular basis right now, we know you want to keep up with your fellow alumni.

You can still do that — and let your classmates know what you've been up to. Send information about your professional and personal accomplishments — career changes or promotions, weddings, births, and other news — and we will publish it in our newly improved class announcements section at [mineralumni.com/classannouncements](http://mineralumni.com/classannouncements).



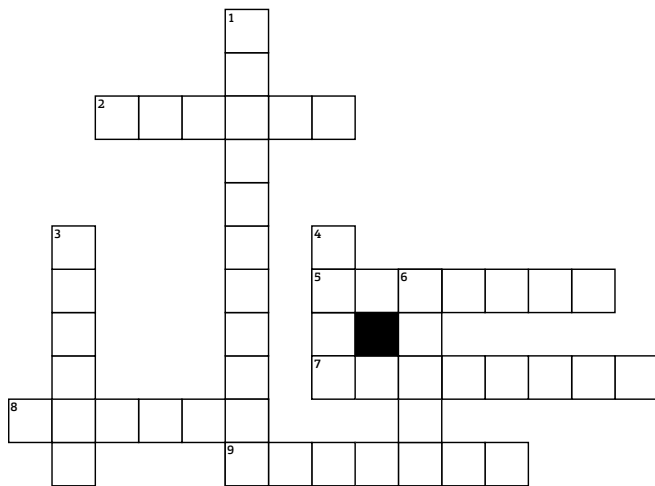
# Who knew?



Put your IQ to the test with these brain-teasing challenges. □

## Crossword

Test your S&T knowledge.



### Across

- This mining entrepreneur who discovered the world's first subterranean potash has an S&T building named for him.
- This building was named for the father-in-law of John D. Vincil, former president of the University of Missouri Board of Curators.
- Last name of the university's first director, who served 1871-77.
- The first MSM alumni meeting was held at the Windsor Hotel in this city, in conjunction with the annual meeting of the American Institute of Mining Engineers.
- In January 1903, 12 students established this, S&T's first fraternity.

### Down

- Eating clubs flourished on campus, starting with this one in 1902.
- This building was named after a Rolla attorney who later served as solicitor general for the St. Louis and San Francisco Railroad.
- "First to \_\_\_\_\_ and then to do" — University of Missouri President Daniel Read in a speech about MSM's purpose at an inauguration ceremony.
- S&T's first building. It still stands today and houses the university's mathematics and statistics department.

## Riddle me this

Joe Miner likes cookies but not cake. He likes mutton but not lamb, and he likes okra but not squash. Will Joe like cherries or pears?

## Wordsearch

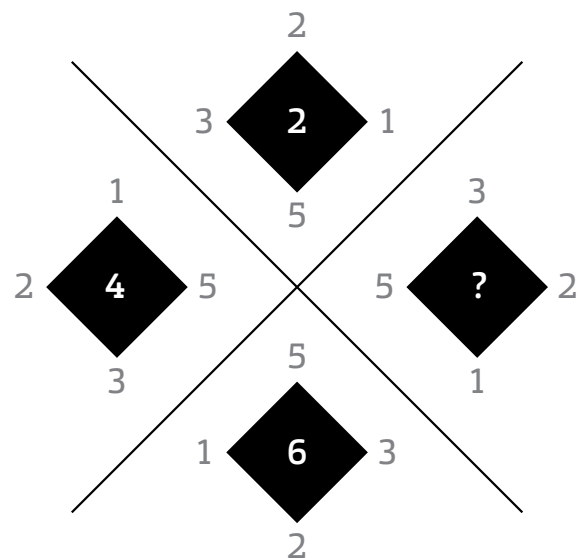
Eagle eyes at the ready — spot our 15 hidden words in the grid below.

V W O O S Q M U Y R E G Z U B  
 H X K Y X R E I O R T O K C E  
 Z E S M J S E L N A F I O B S  
 P I C K A X L E N E K C U P T  
 H N J T C A U R N G R S N S E  
 P W L M K M R T E I Y H G V V  
 H D A X L R E F R A G W S A E  
 R E B F I Z D M H E C N Q R R  
 B C G X N P I A K K V T E J D  
 P V R X G S L Z U M G L I F M  
 X T J I L F S M B L H Z I O D  
 X E R C A P M X M A D C W S N  
 P I T C H E W Q M Y O Q S J T  
 L I K Y R D L O G A B H V M R  
 D J E T H I R J Y R B U S F P

- |           |          |           |
|-----------|----------|-----------|
| beam      | jackling | puck      |
| bestever  | kummer   | reaction  |
| engineers | miner    | rolla     |
| gear      | pickax   | silver    |
| gold      | pitch    | sliderule |

## The Blank Diamond

Good with patterns? You'll need to be to fill in the missing value.



Looking for solutions?

Visit [150.mst.edu](http://150.mst.edu) to see how you did.





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

# Homecoming 2021: A REASON TO CELEBRATE

This fall, as Missouri S&T's 150th celebration nears the end, the Miner Alumni Association turns 100!

On Nov. 4, 1921, the MSM Alumni Association was formed during the Homecoming celebration, and **Arthur D. Terrell**, MinE 1898, CE 1898, was elected its first president. Soon volunteers began building the organization, and alumni sections were formed in major cities across the U.S.

Join us Oct. 8–9, 2021, to celebrate Homecoming in true Miner fashion. We have special 150th anniversary events planned, as well as traditional alumni gatherings. Help us make this MinerFest the best ever!

For more information, visit [mineralumni.com/homecoming](http://mineralumni.com/homecoming).