



KUMMER INSTITUTE

FOR STUDENT SUCCESS,
RESEARCH AND
ECONOMIC DEVELOPMENT



Dear Colleague,

I'm pleased to share with you our inaugural annual report of the Kummer Institute for Student Success, Research and Economic Development at Missouri S&T. Established through a generous \$300 million gift from the late Fred Kummer, a Missouri S&T alumnus, and his wife June, the Kummer Institute is transforming our university by broadening STEM outreach, elevating our research and innovation profile, and creating economic impact throughout our region and state.

Sincerely,

Mo Dehghani

Chancellor
MISSOURI S&T

CONTENTS

- 2 A legacy lives on**
S&T Chancellor Mo Dehghani on the impact of Fred and June Kummer's gift
- 4 Key moments of 2021-22**
View our timeline of accomplishments
- 6 Bringing a vision to life**
Chief Operating Officer Stephen Roberts on the Kummer Institute's early achievements
- 7 Investing in the future**
A look at investments by the Kummer Institute Foundation
- 8 Fellowship program fuels innovative students**
Ph.D. student Radwa Eissa is determined to bring the circular economy to construction
- 10 Sparking the next big idea**
S&T's seed funding program poises researchers for multi-million-dollar grants
- 12 A community of collaborators**
How the Manufacture Missouri Ecosystem will strengthen the economy
- 14 Revving an economic engine**
Projecting the impact of the Kummer gift
- 15 A school for the future**
Acting Dean Susan Murray on the Kummer College's focus and vision
- 16 Breaking barriers for broadband**
The Kummer College's first Ph.D. graduate focuses on bringing better internet access to rural areas
- 18 Summer camp snapshots**
Photo essay of the Kummer Center for STEM Education's camps
- 20 On the vanguard**
Experiential learning drew scholar Matt Minatra to S&T from Tennessee
- 21 In gratitude**
Thanking those who have served on the Kummer Institute Foundation Board of Directors

Chancellor Mo Dehghani, left, celebrates the April 21 groundbreaking for S&T's Innovation Lab, one of several projects supported by the Kummer Institute.



A LEGACY LIVES ON

Dear Friends,

On behalf of our entire university community, I am delighted to present this annual report of the Kummer Institute for Student Success, Research and Economic Development at Missouri S&T. I hope you enjoy reading about the remarkable accomplishments and outcomes of this organization. I also hope you are inspired by the vision of our benefactors, June and Fred Kummer, whose generosity made the Kummer Institute and its many programs a reality.

Fred (pictured at right, in his office and with June) was a 1955 graduate of our university who passed away in 2021, just one week shy of his 92nd birthday. He was a true innovator whose entrepreneurial spirit and business savvy led him to great success in the business world. He also was a generous soul who loved this institution, held us to the highest possible standards and challenged us to pursue excellence in all our endeavors. Fred was also a true friend and mentor, and to this day I miss him greatly.

When I think of Fred's legacy, I think of a framed motto — a gift from June — that hung on the wall of his corporate office in St. Louis. I believe it fittingly summarized how he viewed his success in life and business:

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

Fred's shadow was indeed long. From the basement of their suburban St. Louis home, Fred and June founded Hospital Building and Equipment Co., which later became HBE Corp. Through their determination and hard work, they grew that company into the world's largest design-build firm for health care. HBE built 1,012 hospitals and health care facilities across the U.S. as well as numerous financial institutions. Building on HBE's success, the Kummers also founded the Adam's Mark Hotel chain of 25 properties, as well as a ski and golf resort in Colorado.

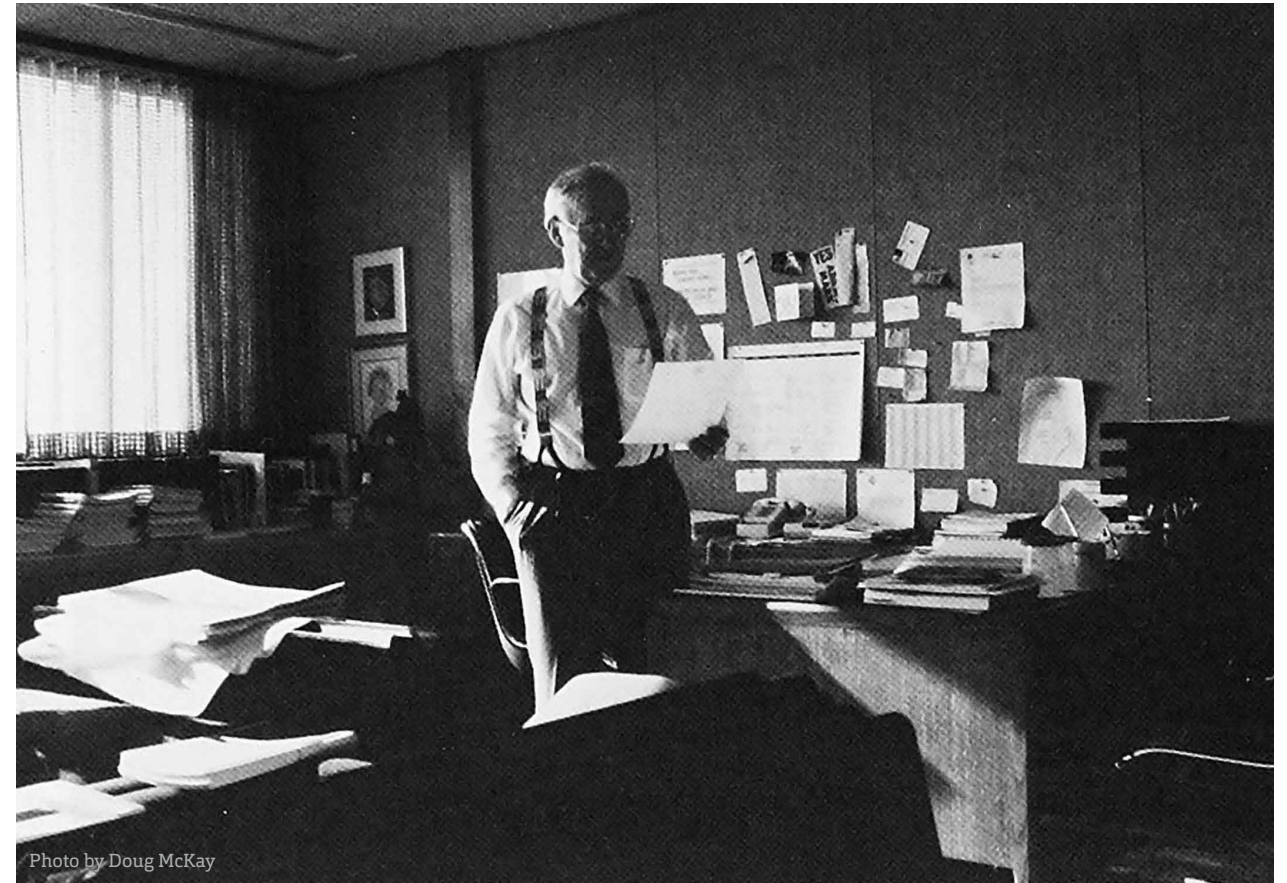
The Kummers were among our most generous supporters and volunteers. Fred was passionate about his alma mater. He was also concerned that we weren't realizing our true potential to transform education and graduate more outstanding engineers and scientists. For many years, Fred told me, he had been concerned about the declining interest in STEM education among high school students. 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.

Fred and June's remarkable \$300 million gift to S&T established the Kummer Institute. And today, the institute is carrying out their vision. I will be forever grateful for their decision to invest in this crown jewel of higher education.

Warmly,

Dr. Mo Dehghani

Chancellor
MISSOURI S&T



KEY MOMENTS 2021-22



OCTOBER 9, 2021

S&T celebrates the first anniversary of the transformative \$300 million gift from June and Fred Kummer.



JANUARY 12, 2022

S&T announces the first 12 Kummer Ignition Grants for Research and Innovation projects, totaling \$365,000. The awards provide S&T researchers with seed funding.



APRIL 21, 2022

Leaders break ground for the 50,000-square-foot Innovation Lab, which will serve as a home for student innovation, creativity and discovery. The Innovation Lab is expected to be complete in Fall 2023.

JULY 1, 2022

The Kummer College of Innovation, Entrepreneurship, and Economic Development is officially established, with three founding departments: business and information technology, economics, and engineering management and systems engineering. Dr. Susan Murray, an S&T faculty member since 1994, is named acting vice provost and dean.

JUNE 2022

S&T awards the second round of Kummer Ignition Grants for Research and Innovation projects. These five awards bring the total amount of seed funding to \$500,000.

AUGUST 23, 2021

S&T welcomes the inaugural class of Kummer Vanguard Scholars and Kummer Innovation and Entrepreneurship Doctoral Fellows.



JANUARY 4, 2022

Dr. Richard Billo is appointed founding director of the Kummer Institute Center for Advanced Manufacturing.

MARCH 2022

S&T awards the first six Kummer Institute Ignition Grants for Sustainable Educational Transformation, totaling \$275,000.

DECEMBER 1, 2022

Dr. Donald C. Wunsch II begins his duties as founding director of the Kummer Institute Center for Artificial Intelligence and Autonomous Systems.





Bringing a vision to life

As you'll see in the following pages, we've made remarkable progress toward realizing the vision behind the transformational gift from June and the late Fred Kummer. That progress has been achieved by focusing on three simple yet powerful ideas:

- Harness the power of STEM to engage with the bright young minds in our K-12 communities.
- Increase research and educational opportunities at S&T.
- Drive economic development regionally, in Missouri and beyond.

A record number of pre-college students from throughout Missouri attended a summer camp in Rolla this year. Many were supported by scholarships from the Kummer Institute. All of them, I'm certain, left camp with a new perspective. In July, we established not merely a new college, but a new *kind* of college, one that will prepare students to become the entrepreneurial leaders the future calls for. We launched research centers that tackle important global issues from a decidedly entrepreneurial perspective. And we invested in capital projects that will serve S&T for generations to come, helped educate and train a future-ready workforce, and funded research that deepens our understanding of critical subjects.

It's been my privilege to collaborate with and support the individuals and teams behind these achievements. In the year ahead, I look forward to working across the S&T community as that collaboration continues.

Dr. Stephen Roberts

Chief Operating Officer

KUMMER INSTITUTE FOR STUDENT SUCCESS, RESEARCH AND ECONOMIC DEVELOPMENT

INVESTING

IN THE FUTURE



Since the founding of the Kummer Institute in 2020, the Kummer Institute Foundation Board of Directors has made significant investments in S&T, including buildings, scholarships, endowed faculty positions and more. The funds invested by the board into the Missouri Protoplex®, Innovation Lab and Welcome Center projects will be matched by other sources, including state and federal appropriations and private donors.

The Kummer Inspiration Program, a philanthropy initiative, matched donor contributions to provide

\$900,000

IN SCHOLARSHIPS

and

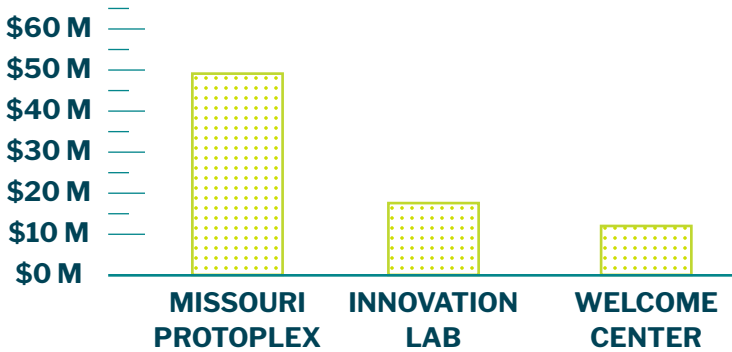
\$1,100,000

FOR ENDOWED FACULTY POSITIONS

\$848,100

invested in 460 Kummer Vanguard Scholars for the 2021-22 academic year.

CAPITAL PROJECT INVESTMENTS



63 SCHOLARSHIPS TOTALING

\$36,000

for summer camps offered by S&T's Kummer Center for STEM Education.

\$275,000

Six Kummer Institute Ignition Grants for Sustainable Educational Transformation



\$500,000

17 Kummer Ignition Grants for Research and Innovation projects, which provide seed funding for S&T researchers.

\$640,260



11 Kummer Innovation and Entrepreneurship (I&E) Doctoral Fellows for the 2021-22 academic year.



FELLOWSHIP PROGRAM FUELS INNOVATIVE STUDENTS

\$1,500

per year in supplementary funds are provided to fellows for use to advance research
August 2021-May 2022

12-MONTH

fellowship and tuition remission for up to 4 years for Kummer I&E Doctoral Fellows

Radwa Eissa grew up in a family of architects, so it seems natural that she would be drawn to a career in building design. When she told her family about her research to bring the circular economy to construction, they had one question: Will it help?

As a Kummer Innovation and Entrepreneurship Doctoral Fellow, Eissa is confident her research will help develop greater sustainability in building design and construction. The circular economy is a production and consumption model that reduces material use, optimizes resources, and promotes recycling or reusing waste materials. It has played a role in packaging for years. Now, Eissa is studying ways to build structures that incorporate reusable, modular components and materials that could be recycled at the end of the building's useful life.

"There are design strategies that involve disassembly and reuse," says Eissa, who is working toward a Ph.D. in civil engineering. "Buildings can be designed for two lifespans, first for one use and then for a different use. There are also strategies to extend the life cycle of the building itself."

Eissa also wants to develop a metric to measure the circular economy. She says there are metrics in current literature, but no uniform measurement. The metric is important to show the transition to circular construction models and ultimately a more sustainable built environment.

"We can't have a circular economy while using extensive amounts of water and energy," Eissa says. "The transition has to include water and power efficiency in building construction and operation."

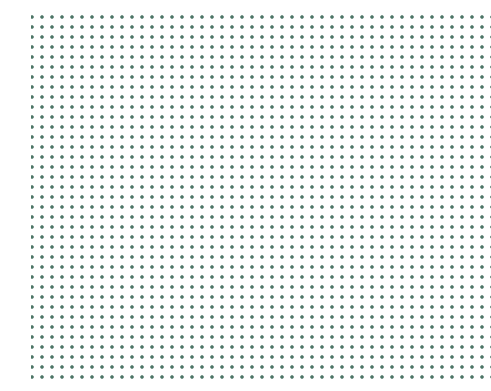
So, why come to S&T from Egypt? Eissa says she wanted to work with **Dr. Islam El-adaway**, the Hurst-McCarthy Professor of Civil Engineering and director of the Missouri Consortium for Construction Innovation. One of Eissa's first reading assignments as a master's degree student was a paper El-adaway had written with one of his students. She also appreciates the ability to conduct applied research.

"We have to make a contribution to the field," Eissa says. "And I appreciate Missouri S&T's multiple partnerships with industry."

The Kummer I&E Fellows program provides inventive students like Eissa with a 12-month fellowship and tuition remission for up to four years. The program is open to domestic and international students.



Dr. Islam El-adaway



SPARKING THE NEXT BIG IDEA

Designing glass to engineer heart tissue. Creating hubs for hydrogen energy. Delivering cancer treatment to patients in rural areas. These innovations and more could result from a new program designed to support S&T researchers' big ideas — with small amounts of seed funding.

In its first year, the Kummer Institute invested \$500,000 in 17 S&T faculty-led research proposal development projects through the Kummer Ignition Grants for Research and Innovation program.

Ranging from \$25,000 to \$50,000 per project, these grants support researchers' efforts to develop compelling proposals for multi-million-dollar grants from federal agencies, foundations and corporations. The program requires principal investigators to submit proposals for at least \$500,000 to agencies such as the Department of Energy,

National Science Foundation and National Institutes of Health.

"Our researchers are searching for solutions to the challenges that face our society, from extending lives with better health care to creating cleaner energy to avert a climate crisis," says **Dr. Kamal Khayat**, interim vice chancellor for research and innovation. "S&T researchers appreciate the funding from the Kummer Institute and we anticipate that the investment will pay off many times over in terms of research funding and societal impact."

As one example, **Dr. Yue-wern Huang** estimates that his team's research could ultimately benefit 360,000 newly diagnosed breast cancer patients per year. The team is developing two new drug delivery systems to treat triple-negative breast cancer — an aggressive type of breast cancer that is often difficult to treat.

"Our researchers are searching for solutions to the challenges that face our society, from extending lives with better health care to creating cleaner energy to avert a climate crisis."



Photo by Dominik Sostmann, Unsplash

THE KUMMER INSTITUTE
INVESTED

\$500,000

IN

17

S&T FACULTY-LED
RESEARCH PROJECTS

through the Kummer
Ignition Grants for Research
and Innovation program
2021-22

Through Ignition Grant seed funding, S&T researcher **Guang Xu** is studying the fire risks of electric vehicle batteries.

"Not only does the targeted delivery enhance treatment efficacy, but it also significantly reduces off-target side effects," says Huang, professor of biological sciences. "By reducing side effects, patients can recover their strength faster and stay on the prescribed treatment regimen for better outcomes."

Another researcher is hoping that his team's research will put out fires — quite literally. **Dr. Guang Xu**, associate professor of mining engineering, is using his Ignition Grant funding for preliminary research into the fire risks of electric vehicle batteries. He used some of his grant funding to host a battery-electric-vehicle fire safety workshop in June for electric vehicle manufacturers and drivers, fire safety experts, and university researchers.

"The chemical products used for making batteries are combustible and bring a new source of fire risks," Xu says. "We want to develop preparation and mitigation standards to help electric vehicle users, firefighters and others know what to do."

KUMMER INSTITUTE RESEARCH CENTERS

Connecting points of learning and innovation

An important part of the vision behind the \$300 million gift from June and Fred Kummer was their desire to connect the often-disconnected points throughout the learning ecosystem. The Kummer Institute research centers are critical to realizing that vision.

The research centers are redefining how and where learning happens, whether it involves putting current R&D in the hands of manufacturers to help them attain a competitive edge, incorporating breakthroughs from the frontlines of artificial intelligence (AI) into what's taught in S&T classrooms, or deepening our understanding of sustainability by deepening the partnerships with industry.

This year, S&T appointed founding directors for two centers.

Dr. Richard Billo, director of the Kummer Institute Center for Advanced Manufacturing, joined S&T in January. Since then he's focused on developing the new center's mission, vision and strategic plan as he builds a nationally recognized manufacturing center to foster collaboration between the classroom and the factory floor.

Billo brings nearly four decades of experience in administration, teaching and research to the role.

Dr. Donald C. Wunsch II, who has been an S&T faculty member since 1999, is a recognized AI expert. In December, after completing his appointment as a program director in the National Science Foundation's Energy, Power, Control, and Networks program, he'll put that expertise to work in his new role as director of the Kummer Institute Center for Artificial Intelligence and Autonomous Systems.

Wunsch's primary focus will be leading the center to fulfill its mission of deploying the latest machine learning and artificial intelligence techniques to advance the performance and intelligence of robotic and autonomous solutions.

Fundamental to the success of both centers is the breadth of capabilities and expertise among S&T's faculty. Billo and Wunsch will work with several university research centers and consortia in various fields, including advanced manufacturing, on efforts that align with the Kummer Institute vision.

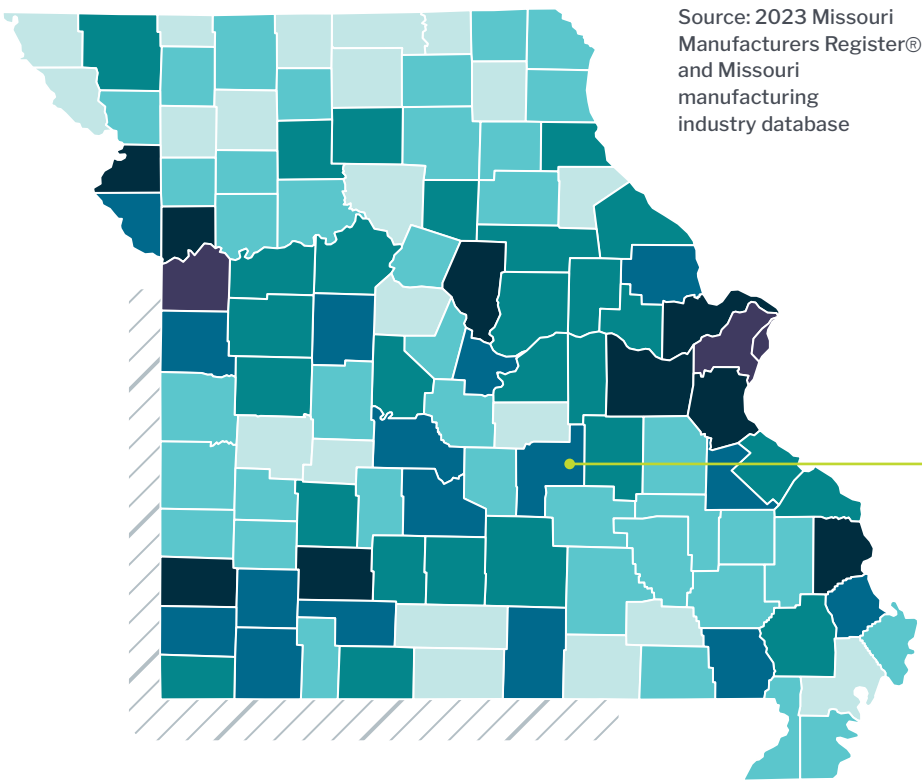
The Kummer Institute has established two other research centers. The Kummer Center for Advanced and Resilient Infrastructure will develop new approaches to rehabilitate and sustain the infrastructure that connects the businesses and communities that drive the Missouri economy forward. And the Kummer Center for Resource Sustainability will lead efforts to decrease the footprint of mineral and fuel extraction, increase access to clean drinking water, and leverage regional resources for resilient use of energy, water and materials. National searches for founding directors for both centers are ongoing.

A community OF COLLABORATORS

Many of us think of an ecosystem in the biological sense: a community of diverse types of organisms that come together with their environment for mutual support. Aided by the Kummer Institute, Missouri S&T is applying that concept not to organisms, but to organizations, to create a community to bolster the state’s manufacturing sector.

The Manufacture Missouri Ecosystem, or MME, is a concept championed by Chancellor **Mo Dehghani** to connect the state’s manufacturers — from mom-and-pop shops to multinational conglomerates — and provide the research and development, educational, and workforce training support needed for this ecosystem to flourish.

The COVID-19 pandemic hit Missouri’s manufacturing sector hard, erasing roughly 10,000 manufacturing jobs in 2020, according to the Missouri Economic Research and Information Center. As companies emerge from the pandemic, they face a mix of unfamiliar economic challenges: unstable supply chains, spikes in demand, shortages of workers and rising costs. Universities like S&T have the talent and expertise to help these companies prepare for these new realities. Partnering with other colleges and universities in the state, as well as local, state and federal agencies, S&T can provide the research, tools, training and technology companies need to remain competitive in the global market. The R&D expertise is especially important, as most small firms don’t have the people power or bandwidth to conduct their own research, prototyping or product development.



CONCENTRATION OF MISSOURI MANUFACTURERS BY COUNTY

2-10	11-25	26-50
51-100	101-500	501-1,500



As an ecosystem, the MME will serve as the facilitator that connects individual companies into a community of collaborators.

54 manufacturing companies are in Phelps County, where S&T is located

2.76 M of Missouri’s workforce is employed in manufacturing
2022 Missouri Economic Research and Information Center

As an ecosystem, the MME will serve as the facilitator that connects individual companies into a community of collaborators. S&T already has a model for this approach. Four models, in fact — four collectives of firms, called consortia. Companies in four sectors — aerospace, computing and electronics, construction, and steel manufacturing — pay annual fees to S&T. In return, they get to bring their common research problems to university professors and Ph.D. students. The result: non-proprietary solutions that address these common problems.

The MME plan follows that model. Companies pay annual fees to join, then benefit from the R&D expertise S&T and its partner institutions will provide.

While the MME is in many respects a virtual organization, it soon will have a tangible, physical place to call home: the Missouri Protoplex®. This structure will

provide the lab space, shared meeting and office space, and equipment researchers and companies will need to create and test prototypes. At approximately 200,000 square feet, the Protoplex also provides needed space for research in support of grants from the U.S. Army and U.S. Department of Energy. These projects address manufacturing process improvements for the steel industry — from the development of lightweight-yet-strong armor for military vehicles to more energy-efficient ways to manufacture steel. The Protoplex will anchor Missouri S&T’s new Manufacturing Technology and Innovation Campus.

The Kummer Institute Foundation has provided \$50 million in matching funds for state, federal or other resources. In June, Missouri Gov. Mike Parson approved \$41.25 million in federal American Rescue Plan Act funds to go toward the project.

For more information, visit mme.mst.edu.

REVVING AN ECONOMIC ENGINE

With its emphasis on STEM education and research that tackles real-world problems, Missouri S&T is already an economic powerhouse in the state. According to a report commissioned by the University of Missouri System, S&T contributed over \$487 million to the state's economy between July 1, 2020, and June 30, 2021. S&T also supported 6,540 Missouri jobs during that fiscal year.

Now, with the Kummer Institute initiatives beginning to rev up, expect S&T's impact to be even greater.

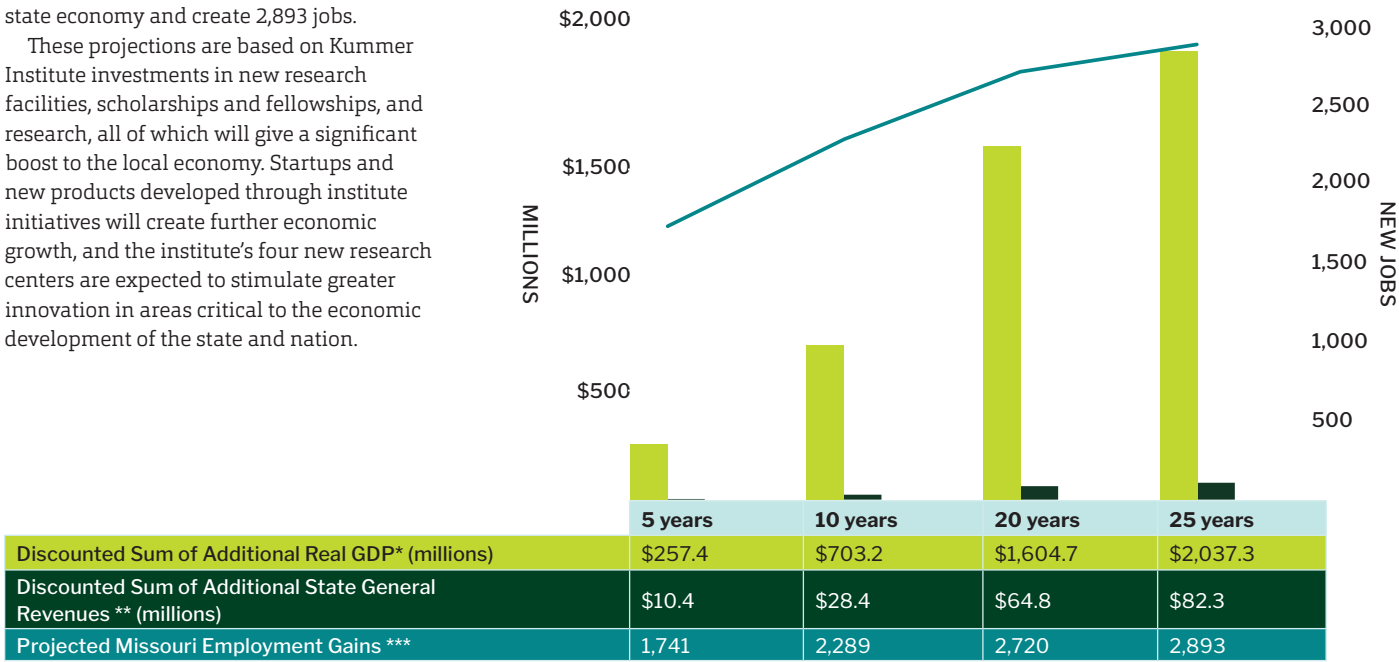
Another study — this one by Joseph H. Haslag, professor of economics at the University of Missouri-Columbia — projects that within five years, the Kummer Institute will add another \$257.4 million to Missouri's economy and create 1,741 new jobs. Within 25 years, the Kummer Institute's myriad activities will contribute \$2.037 billion to the state economy and create 2,893 jobs.

These projections are based on Kummer Institute investments in new research facilities, scholarships and fellowships, and research, all of which will give a significant boost to the local economy. Startups and new products developed through institute initiatives will create further economic growth, and 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.

Not included in these projections, however, is the impact of additional investments expected to occur due to the Kummer Institute activities. For example, a \$100 million investment in any combination of federal and state funds will add \$1.5 billion to Missouri's economy by 2045, on top of the \$2 billion resulting from the Kummer gift.

These numbers are even more impressive considering that S&T is situated just north of the poorest region of Missouri.

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



* Value of final goods and services produced in Missouri, controlling for inflation. (Note the Missouri economy reported real GDP equal to \$282 billion in 2018.)

** Measures additional flow of revenues collected by the State of Missouri due to economy expansion.

*** Measurement based on projected gains in Missouri real GDP.

WITHIN 5 YEARS
\$257.4 M

will be added to Missouri's economy by the Kummer Institute and 1,741 new jobs created

WITHIN 25 YEARS
\$2.037 B

will be contributed to Missouri's Economy from the Kummer Institute's activities

THE KUMMER COLLEGE

A SCHOOL FOR THE FUTURE



Preparing the leaders of the future

Greetings from the newly established Kummer College of Innovation, Entrepreneurship, and Economic Development. I assure you that the leaders and faculty of the college's three founding departments and I will continue to provide each of our students the foundational skills and knowledge required for success in engineering, business, IT, economics and beyond.

But we've also made a commitment to instill in our students a focus on the future, an instinct for bringing about change by bringing people together, and a foundational understanding of and appreciation for the many ways innovation impacts others.

As you'll read in the pages ahead, we're off to a great start. We hosted the college's first Ph.D. dissertation defense on July 1, less than 12 hours after we became official, and our departments are each led by phenomenal teachers and researchers who — lucky me! — are also wonderful colleagues.

The opportunity to lead the Kummer College as it establishes itself is the single most exciting experience I've had in my nearly three decades with the university, and I look forward to celebrating what's ahead with the S&T community.

Dr. Susan Murray

Acting Vice Provost and Dean

KUMMER COLLEGE OF INNOVATION, ENTREPRENEURSHIP, AND ECONOMIC DEVELOPMENT

COLLEGE LEADERSHIP

Before its official establishment on July 1, the Kummer College announced the appointments of department chairs.

- **Dr. Cassie Elrod**, associate professor of business and information technology (BIT) and an S&T alumna, is interim chair of the BIT department. Elrod led the department's successful effort to obtain accreditation by the Association to Advance Collegiate Schools of Business (AACSB).
- **Dr. David Enke**, Curators' Distinguished Teaching Professor of engineering management and systems engineering and an S&T alumnus, leads the department on an interim basis. Enke has been honored with an award for best journal article from the *Engineering Management Journal* and has received seven research conference paper awards and 12 campus awards for teaching excellence.
- **Dr. Melody Lo** joins S&T as the inaugural John and Ruth Steinmeyer Memorial Endowed Chair of Economics. Lo previously served as professor of economics and senior advisor to the chancellor in the Neil Griffin College of Business at Arkansas State University in Jonesboro. As chair of economics at the University of Texas at San Antonio, she drew on industry feedback to create master's-level multidisciplinary concentrations in financial economics and business data analysis and forecasting. She also updated the undergraduate economics curriculum to better reflect industry changes.

► 3 FOUNDING DEPARTMENTS

Business and Information Technology; Economics; Engineering Management and Systems Engineering

► 5 BACHELOR'S DEGREES

Business and Management Systems (B.S.); Economics (B.A., B.S.); Engineering Management (B.S.); Information Science and Technology (B.S.)

► 22 UNDERGRADUATE MINORS

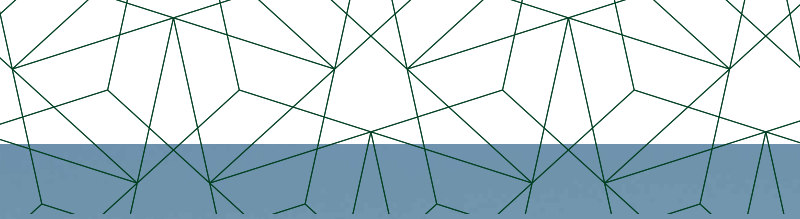
► 3 MASTER'S DEGREES

Business Administration (M.B.A.); Engineering Management (M.S.); Systems Engineering (M.S.)

► 2 DOCTORAL DEGREES

Ph.D. in Engineering Management; Ph.D. in Systems Engineering

FOR MORE INFORMATION, VISIT [KUMMERCOLLEGE.MST.EDU](https://kummercollege.mst.edu)



BREAKING BARRIERS FOR BROADBAND

“It was an honor to defend my doctoral dissertation on the Kummer College’s first official day,” says Dr. Javier Valentín-Sívico, who defended his thesis, “Evaluating Barriers to and Impacts of Rural Broadband Access,” at 10:30 a.m. July 1. He presented his research via Zoom, then took questions from the audience, which included his committee and several family members.

Valentín-Sívico’s dissertation investigates the lack of adequate broadband infrastructure in many rural communities. His advisor, **Dr. Casey Canfield**, is an assistant professor of engineering management and systems engineering.

“This is an example of how a Ph.D. dissertation can play a valuable role,” says Canfield, “tackling big social problems and breaking them down in a way that has impact.”

An analysis of rural broadband is a natural fit for the Kummer College, the creation of which was inspired by a vision of empowering future leaders to rise to new challenges, even those that have yet to be identified. The college comprises three longstanding, successful S&T academic departments: business and information technology, economics, and engineering management and systems engineering.

“Rural communities need access to adequate broadband infrastructure to support the entrepreneurial spirit of residents, to continue innovating and to create opportunities for generations to come,” says Valentín-Sívico. “Understanding the value, cost and impact of technology aligns with the vision and mission of the Kummer College. I trust that our findings and the tools we developed will help the expansion of broadband for rural communities everywhere.”



Jackling Intro to Engineering
S&T hosted three sessions of its most popular camp, Jackling Introduction to Engineering. Students in grades 10–12 were introduced to various engineering fields and participated in activities such as “Project Flutag Launch” (above) and pouring glass (below).



Camp Invention
The only day camp in S&T’s lineup, Camp Invention welcomed elementary school children in grades 2–6 to campus to brainstorm and build inventions. Projects included creating a habitat for a robotic fish, making spin art and building a marble arcade (bottom photo).



The Kummer Center for STEM Education welcomed over 700 pre-college students to Rolla over the summer for fun, educational camps. Sponsors such as the National Science Foundation, Kummer Institute Foundation, Boeing and Oxy helped minimize the cost for families.



Art of Science
High school students explored unique ways to photograph, write and create multimedia art through natural discovery at S&T’s Ozark Research Field Station.



63

SCHOLARSHIPS AWARDED
TO CAMPERS
2022

Aerospace Camp
In addition to launching rockets, middle school and junior high students learned about flight, astronomy and space exploration.



CyberMiner Camp
High schoolers practiced their soldering skills on circuit boards (below) and investigated the fields of computer engineering, computer science, and information science and technology.



SUMMER CAMP SNAPSHOTS

LEARN MORE AT STEMCENTER.MST.EDU

ON THE VANGUARD

Drawn to Missouri S&T by the focus on experiential learning, **Matt Minatra** is already making his mark on campus. In his first year, he helped with logistics for the university's annual hackathon and served as secretary of the campus improv group.



"I came to this school because Miners have truly gone on to change the world," says Minatra, a sophomore in computer science from Cordova, Tennessee. "I want to make my mark on the world."

Minatra is also part of a historic group: the inaugural class of Kummer Vanguard Scholars. He was one of 460 students in 2021 selected for the scholarship program, designed to support student success.

Up to 500 incoming STEM students each year may be chosen for the program, and will receive between \$1,000 and \$3,000 per student per year. The inaugural class included students representing 20 U.S. states and territories, as well as Canada and India.

Kummer Vanguard Scholars Program helps improve retention

Data collected throughout the year show that students participating in the Kummer Vanguard Scholars Program enjoyed a 13-percentage-point advantage in first-to-second-year retention when compared to first-year students in the same cohort who are not Kummer Vanguard Scholars. Research shows that students are most likely to leave college between their first and second year.

Broken down into specific groups, the retention rates are even higher. Among female students, retention rates are higher by 8%. Among underrepresented minority students, the retention rates are 17% higher. And for those students who are eligible for federal assistance through the Pell Grant, the retention rates of those who are Kummer Vanguard Scholars are 23% higher than for those who are not.

Not only do Kummer Vanguard Scholars receive funding renewable for eight academic semesters, but they gain access to exclusive out-of-classroom meetings and activities designed to help them think more like entrepreneurs and innovators. The scholars participate in a wide variety of experiences to learn more about five focus areas: entrepreneurship, research, design and build, leadership, and social impact and engagement.

In addition to the connections they make with fellow students in the program, the scholars may connect with mentors among senior-level faculty members, Kummer Innovation and Entrepreneurship Doctoral Fellows, alumni, and leaders of innovation. Beginning in their sophomore year, students will also be able to serve as mentors to newly admitted Kummer Vanguard Scholars.

The connections and mentoring seem to be paying off, as the retention rate for students in the inaugural class is 94%, significantly higher than the national college retention average of 72%.

"The program has helped me learn more about what options I have available to me in the world when it comes to topics like research and entrepreneurship," says Minatra. "It shows us what is possible, and provides all the encouragement you could ever need to follow your dreams and ideas."

WITH GRATITUDE

Missouri S&T is grateful for the leadership and dedication of those who have served on the Kummer Institute Foundation Board of Directors during the Kummer Institute start-up phase and through our first full year of operation.



Fred Kummer
Founding Chair, 2020-21
Founder, former president and CEO of HBE Corp. and 1955 S&T graduate



Dr. Mohammad "Mo" Dehghani
President and Chief Executive Officer
Missouri S&T chancellor



Dr. George P. "Bud" Peterson
Chair
Former president of Georgia Institute of Technology



Dr. Delbert Day
Curators' Distinguished Professor emeritus of ceramic engineering at S&T, former president of Mo-Sci Corp. and 1958 S&T graduate



Gary Havener
Owner of Havener Companies and 1962 S&T graduate



Dr. Martin C. Jischke
Former president of Purdue University



Joe D. Lehrer
Of counsel with St. Louis law firm Greensfelder



Dr. Joan B. Woodard
Retired executive vice president and deputy director of Sandia National Laboratories, and 1973 S&T graduate



Kummer Institute for Student Success,
Research and Economic Development
106 Parker Hall
300 W. 13th St.
Rolla, MO 65409
kummerinstitute.mst.edu

NONPROFIT ORG.
U.S. POSTAGE
PAID
PERMIT NO. 170
ROLLA MO

Help develop the next generation of

ENTREPRENEURIAL LEADERS



To learn how your experience
and insight can help develop
the next generation of
entrepreneurial leaders, contact:

Dr. Rachel Kohman
Director of Kummer Student Programs
rkohman@mst.edu
573-341-6230



Entrepreneur **John Lovitt** played an instrumental role in developing focus areas for Kummer Vanguard Scholars. Lovitt, who earned a master's degree in computer science from Missouri S&T in 1970, mentors Kummer I&E fellows, and leads sessions that help students learn to think like an entrepreneur.

Known for pairing visionary thinking with a pragmatic understanding of limitations, he encourages S&T students to develop an instinct for teamwork and an ability to discern what constitutes true value in any project.