

Transforming Missouri S&T

Presentation to the S&T Board of Curators
April 20, 2023
Mo. Dehghani, Chancellor



Overview

- ▶ Honoring a Pioneer
- ▶ North Star Goals
- ▶ Enrollment and Retention Update
- ▶ Financial Update
- ▶ Student Highlights: True Experiential Learning
- ▶ Faculty Highlights and Research
- ▶ New Initiatives
- ▶ Capital Projects Update

Honoring a Pioneer of Integration

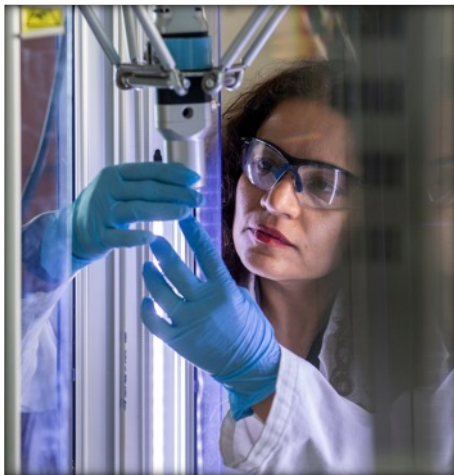
... Presenting the Chancellor Medal to George Horne



George Horne (pictured with Chancellor Dehghani) and Elmer Bell Jr. were the first African American students to enroll at the Rolla campus in 1950

In Pursuit of Our North Star Goals

... S&T will become a world-class science and technology university for workforce development, research breakthroughs and economic development



Carnegie R-1 University



Top 100 Ranking



12,000 Enrollment



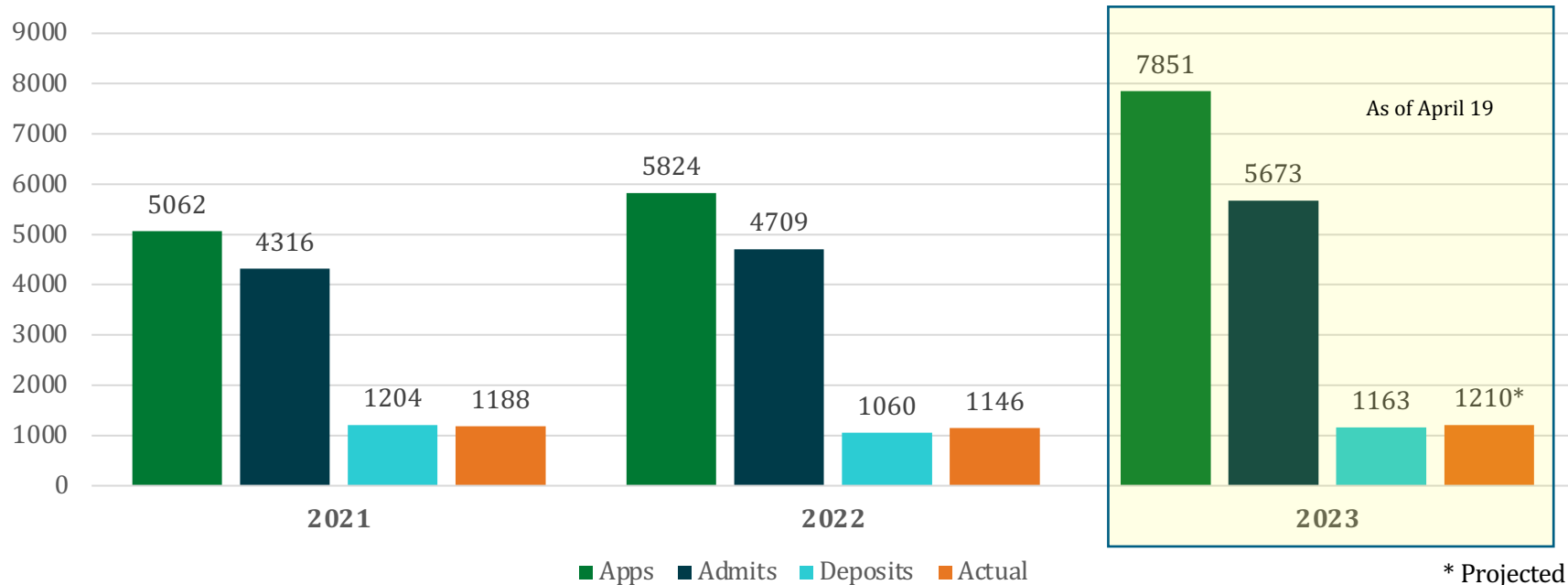
Enrollment Update

Matthew
Brennan
PHS18
For Mattie, Zachary, Thompson

Record applications and admits

... with enrollment projected to increase

Year-to-Date as of March 31st



Enhancing enrollment efforts

... to reach our 2030 North Star goal of 8,000 undergraduates and 4,000 graduate students

- ▶ Restructured enrollment management team
- ▶ Undergraduate yield campaign
- ▶ Graduate yield campaign
- ▶ Community outreach



S&T students wrote postcards to prospective freshmen during Miner Heart Week campaign in February

Enhancing retention efforts

... to reach our 2030 North Star goal of 92%

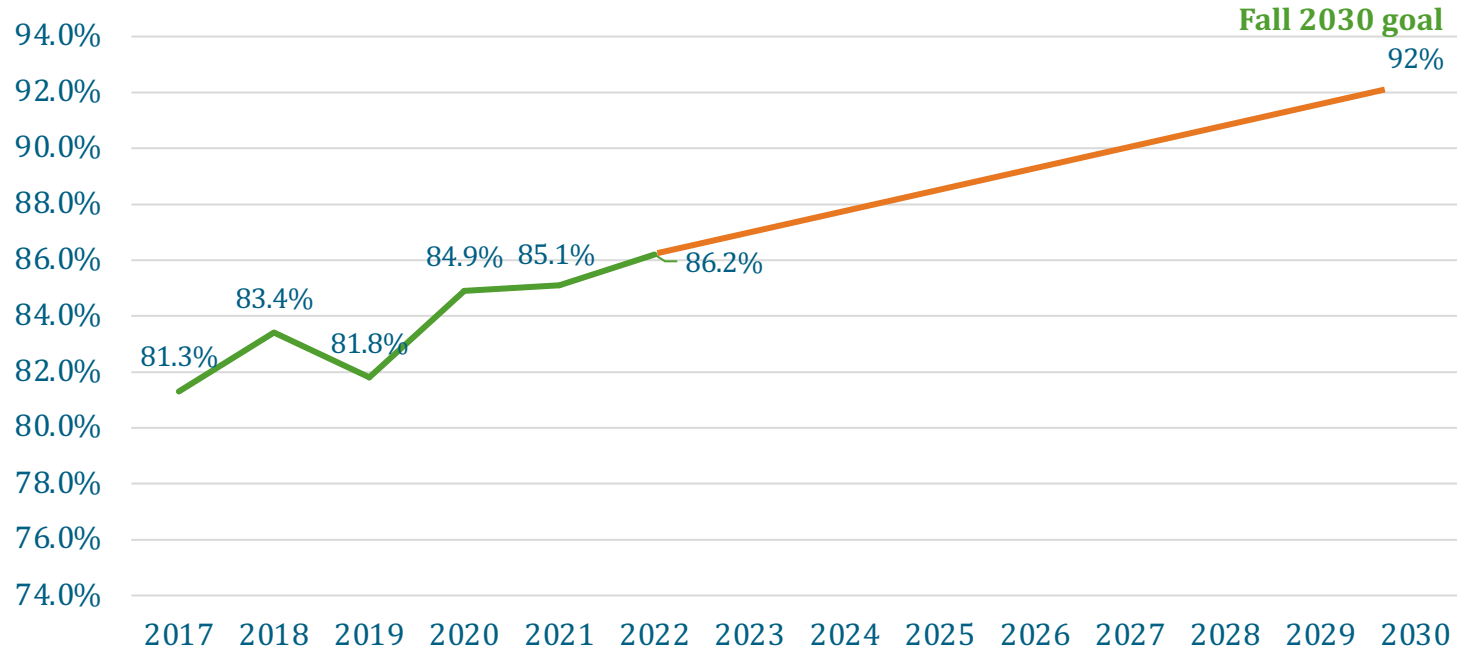
- ▶ Predictive Analytics
 - ▶ Cornerstone Peers Scholarship and Support Program
 - ▶ Summer Scholars Program
- Hit the Ground Running Summer Bridge Program
- On-demand 24/7 tutoring by approved and trained S&T tutors



Individualized tutoring and success coaching is available free to students at S&T's Student Success Center.

First-Year Retention Rate

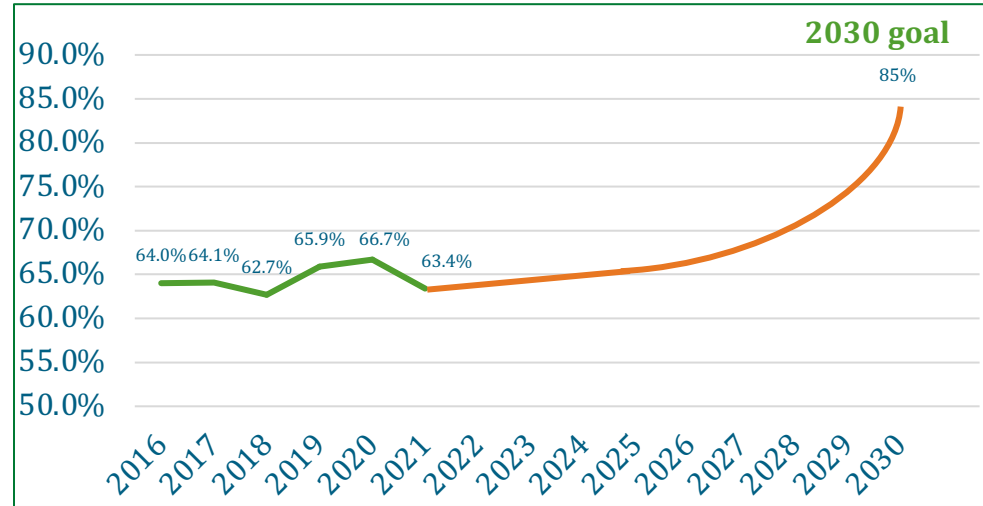
... has improved since 2019 toward our 92% North Star goal



Enhancing Graduation Rate Efforts

... to reach our 2030 North Star goal of 85%

- ▶ Efforts to improve retention will help stem attrition
- ▶ New tuition model
- ▶ Will apply Kummer Vanguard Scholars programming at scale
- ▶ Tutoring software to match first-year students with seniors
- ▶ Revamping specific introductory courses



Financial Update



Co-Ops and Internships



"I worked as an intern for the [company name] and it was a great experience. I learned a lot about the industry and the company's operations. It was a great opportunity to gain hands-on experience and to work with a team of professionals." - Sarah Johnson, Co-Op at [Company Name]



"I got experience with 'hands on application of all types and their manufacturing concepts' and 'hands on exposure to inventory management and supply chain planning'." - Scott H. Wilson, Co-Op at [Company Name]



"The hands on experience and real world applications offered by the Co-Op course are invaluable when it's time to start your career." - Carl Schmitt, The Boeing Company



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Co-Op Statistics - 2012

- 20% more companies offered internships
- 15% of companies plan to hire more interns
- 85% of companies had more applications
- 85% of companies +100 employees made full-time job offers to interns (Internship.com, 2012 Survey)

Where our students work...



Where our students work...



Business and Information Technology
Internships and Co-Ops are important for students and employers. They allow students the opportunity to get relevant experience and contribute to a company. Employers gain the opportunity to work with potential talent which can help them grow their business.



"The real world experience I got at [company name] is invaluable. It was a great opportunity to gain hands-on experience and to work with a team of professionals." - Sarah Johnson, Co-Op at [Company Name]

Where our students work...

A collage of logos for various companies, including Cargill, Procter & Gamble, Intel, Boeing, SAP, Accenture, Deloitte, Monsanto, IBM, Horlicks, Scotttrade, Corner, Coca-Cola, Caterpillar, Pioneer, and others. The logos are arranged in a grid-like pattern.

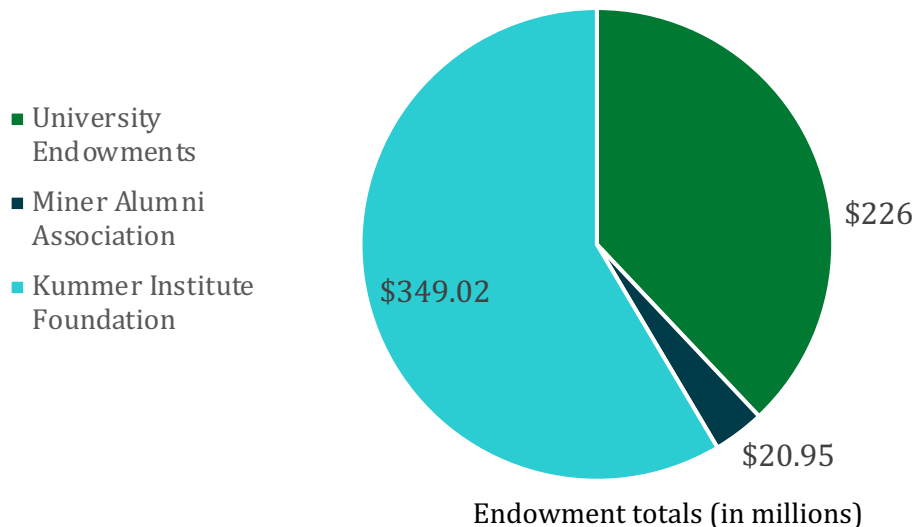
Center for Enterprise Research and Analytics (CERA), Department of Business and Information Technology, Dallas, 960 41400 0500, USA
672.541.4010 (phone)
672.541.4012 (text)



Endowment balances

... S&T's financial position is strong

FY23 Endowment Balances
\$596.37M total



\$300M Gift from Fred and June Kummer, Fall 2020

- ▶ Over \$349M at end of FY23
- ▶ Endowment value at \$373.1M as of April 12, 2023

A male student with glasses and a beard, wearing a black lab coat and purple gloves, is smiling as he works on a piece of laboratory equipment. A female student with blonde hair tied back, wearing a black t-shirt, stands beside him, looking at the equipment. The background shows a laboratory setting with various pieces of equipment, including a computer monitor and a rack of test tubes. The text "Student Highlights" is overlaid in the center of the image.

Student Highlights

Exceptional Graduate Outcomes

... Our grads earn high starting salaries and graduate with a low debt load

\$72,600 Average starting salary, undergraduates
(SmartAsset, 2022)

\$129,000 Top salary offer for B.S. graduate, 2022

\$84,404 Average starting salary, master's degree

\$90,304 Average starting salary, Ph.D.

100% Employer satisfaction

\$29,005 Average student debt (2021) – less than
half the average starting salary

\$8,864 Tuition (in-state, 28 credit hours/year)

\$27,580 Tuition (out-of-state)



Missouri S&T Spring Career Fair, February 2023

Record-breaking Career Fairs

... Fall 2022 and Spring 2023

- ▶ Fall 2022:
 - ▶ 422 in-person companies (a record)
 - ▶ 3,400 students
 - ▶ 1,000+ day-after, on-campus interviews
- ▶ Spring 2023:
 - ▶ 352 companies (also a record)
 - ▶ 2,200+ students
 - ▶ 1,000+ on-campus interviews



Top employers

... include well-known, global, Fortune 500 companies

- ▶ Boeing
- ▶ Burns & McDonnell
- ▶ Garmin
- ▶ Honeywell
- ▶ US Army
- ▶ Caterpillar
- ▶ AT&T
- ▶ Emerson
- ▶ Ameren
- ▶ Altec Industries
- ▶ Epic
- ▶ Accenture
- ▶ Mastercard
- ▶ L3 Harris Technologies
- ▶ Brinkmann Constructors
- ▶ Cleveland Cliffs
- ▶ Anheuser-Busch
- ▶ IMEG
- ▶ POWER Engineers
- ▶ Cigna

Exceptional Outcomes, High Return on Investment (ROI)

... S&T students are highly sought after by employers

Selected 2022 Rankings	
SmartAsset Best Value (in-state)	1
Money Magazine Best Value (in-state)	1
Princeton Review Career Placement (public universities, national)	3
DegreeChoices: Best Colleges (national)	12
DegreeChoices: Best Colleges (in-state)	1

Exceptional Outcomes, High Return on Investment (ROI)

... S&T students are highly sought after by employers

The New York Times

There's Only One College Rankings List That Matters



By [Frank Bruni](#)

Mr. Bruni, who writes a weekly newsletter for Opinion, is the author of "Where You Go Is Not Who You'll Be," a book about college admissions. He graduated from the University of North Carolina at Chapel Hill.

Priorities: High earnings + low price

1. Princeton University
2. Massachusetts Institute of Technology
3. Stanford University
4. CUNY Bernard M Baruch College
5. Georgia Institute of Technology
6. Yale University
7. Harvard University
8. Missouri University of Science and Technology
9. University of Florida
10. California Institute of Technology

Among these high-value institutions are public research universities like Missouri University of Science and Technology, where the average in-state student pays less than \$15,000 a year.

Frank Bruni, "There's Only One College Rankings List That Matters," *The New York Times*, March 27, 2023

Exceptional Outcomes, High Return on Investment (ROI)

... S&T students are highly sought after by employers

Money.com article snippet: "The 10 Best Colleges for Engineering Majors". The article is categorized under "FAMILY FINANCE > BEST COLLEGES".



5. Missouri University of Science and Technology



- Location: Rolla, Missouri
- Estimated price with average grant: \$14,200
- Graduation rate: 65%
- Median earnings for recent engineering graduates: \$67,000

1. Georgia Tech
2. MIT
3. Colorado School of Mines
4. Purdue
5. **S&T**
6. Texas A&M
7. Princeton
8. Worcester Polytechnic
9. University of Illinois
10. New Jersey Institute of Technology

Roughly three-quarters of undergraduates at Missouri S&T study engineering. Students have **15 different engineering degrees** to choose from, including civil, geological and petroleum engineering. Another cornerstone of campus life at S&T is its many **design teams**, made up of over 1,300 students who collaborate with industry professionals to build everything from dirt bikes to robots to remote-controlled aircrafts.

Kummer Vanguard Scholars Program

... A model for student engagement and retention



NASA astronaut and alumna Dr. Sandra Magnus (center) with Kummer Vanguard Scholars and I&E Doctoral Fellows.

- ▶ Established Fall 2021 through Fred and June Kummer gift
- ▶ Scholarships awarded annually for up to four years for qualified STEM majors
- ▶ 400 new Kummer Vanguard Scholars in Fall 2023, bringing total to 1,100
- ▶ Professional and leadership programming

Kummer Vanguard Scholars Program

... A model for student engagement and retention

“I love the fact that the Kummer Vanguard Scholars Program expects more from us than a high GPA. We’re given the scholarship with the understanding that we are expected to be active members of the S&T community.”

Hannah Slings
Chemical and Biochemical Engineering
Branson, Missouri



Kummer I&E Doctoral Fellows Program

... Strengthening innovation and entrepreneurship at the Ph.D. level



I&E Doctoral Fellow Angela Rayle of St. Louis studies the network of serotonin-releasing fibers in the brain.

- ▶ Up to 100 I&E Doctoral Fellows
 - ▶ 12 new fellows in Fall 2023
 - ▶ Total I&E Doctoral Fellows will be 45
- ▶ Emphasis on innovation and entrepreneurship
- ▶ Full graduate research fellowship for up to four years

Kummer I&E Doctoral Fellows Program

... Strengthening innovation and entrepreneurship at the Ph.D. level

“Being a Kummer I&E Fellow makes it possible for me to network throughout the university and with the program’s partners, which has given me an amazing level of insight into the industry and research worlds.”

Remy Mathenia
Mechanical Engineering Ph.D. student
Independence, Missouri
Research emphasis: additive manufacturing



True Experiential Learning



Thrills and frills

... Geology student discovers 66-million-year-old fossil



- ▶ Emma Puetz, a junior in geology, discovered a find of a lifetime in the Montana Canyons.
- ▶ Puetz discovered the edges of a triceratops frill sticking out of the rocky soil.
- ▶ Excavation of the fossil should happen this summer once the federal permit is approved.
- ▶ Puetz named the fossil – Joe Miner

National accolades for NSBE chapter

... Missouri S&T group recognized for leadership, growth, outreach



- ▶ The Missouri S&T chapter of the National Society of Black Engineers won Chapter of the Year at NSBE's annual conference in March.
- ▶ The chapter was also named Region V Chapter of the Year. Chapter membership has grown from 24 students to over 60 this year.
- ▶ The group was recognized for Pre-College Initiative event to promote STEM to youth.

A woman with dark hair, wearing safety glasses and blue nitrile gloves, is working in a biosafety cabinet. She is holding a small vial or pipette tip. The image is overlaid with a semi-transparent version of the same scene, creating a double-exposure effect. The text "Faculty and Research Highlights" is centered over the image in a white, serif font.

Faculty and Research Highlights

Welcome to our new academic leaders

... leading our three colleges



Dr. Mehrzad Boroujerdi,
College of Arts, Sciences, and
Education



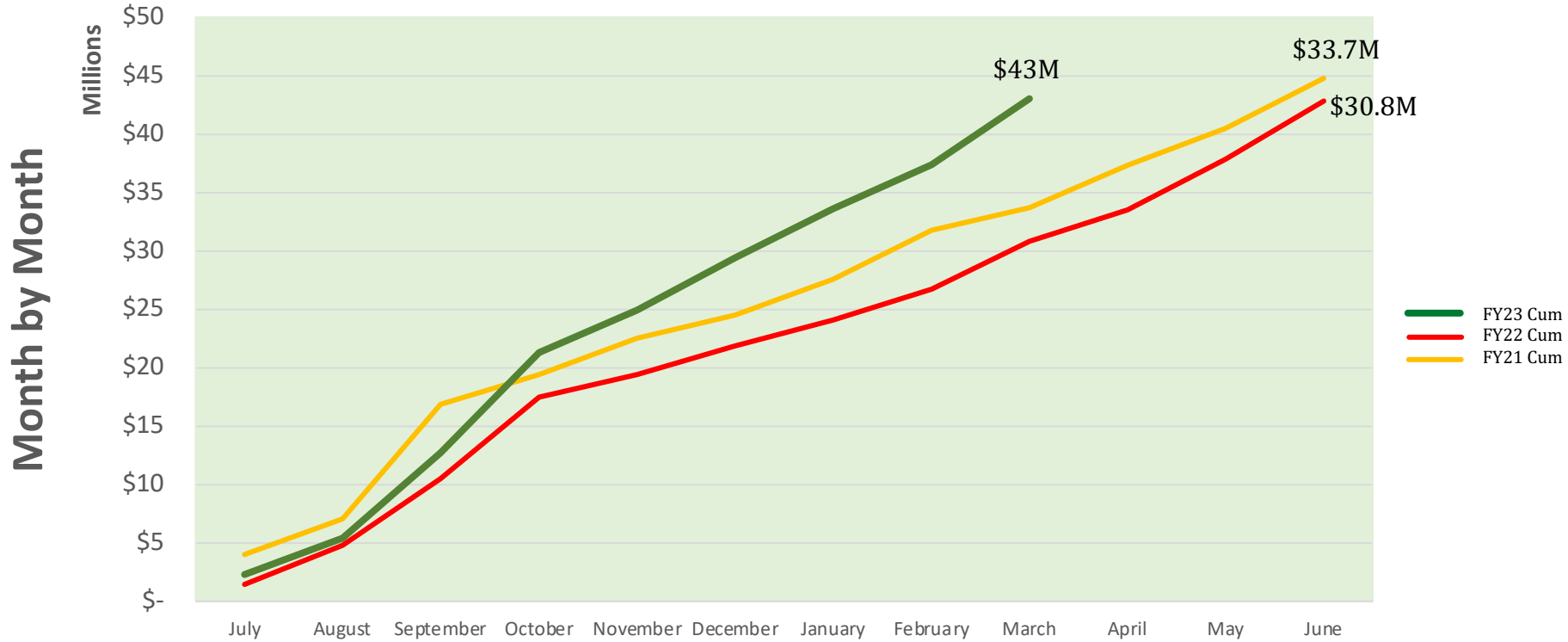
Dr. David Borrok, College of
Engineering and Computing



Dr. Timothy Faley, Kummer
College of Innovation,
Entrepreneurship, and Economic
Development

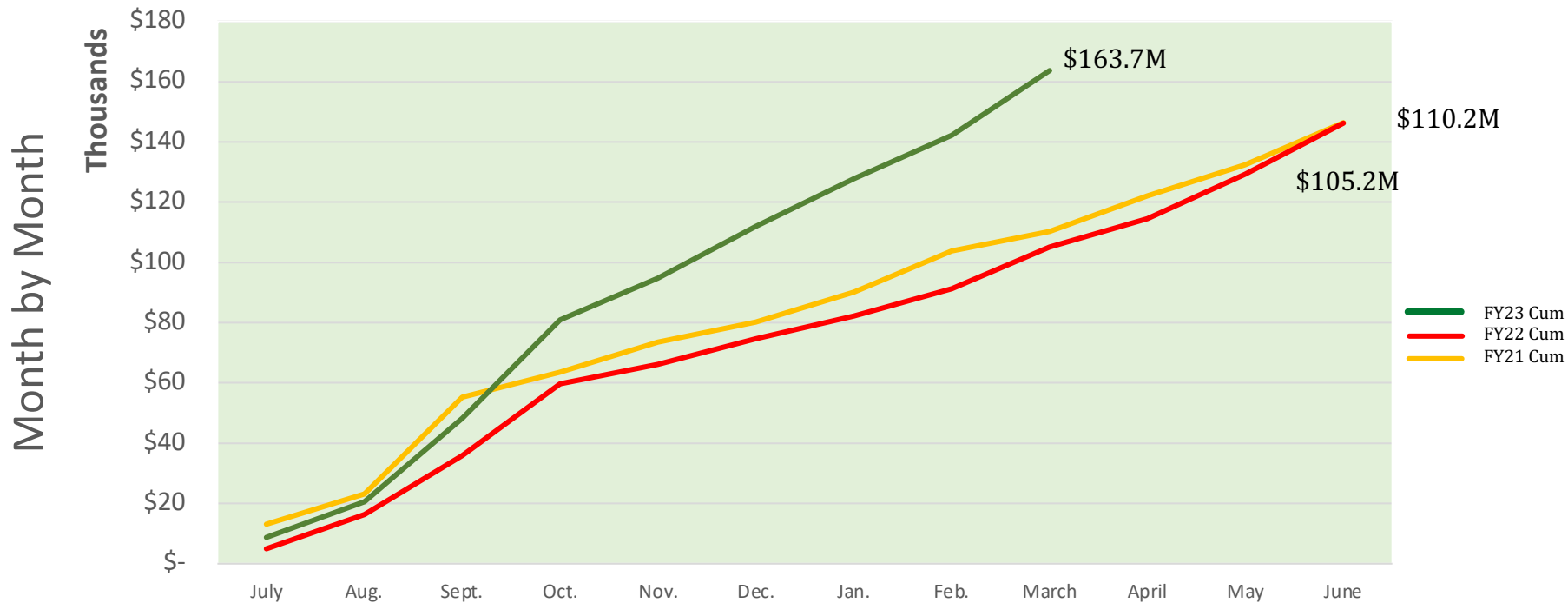
Research Awards

... 33% increase compared last 2 years (year to date)



Research Award Per T/TT Faculty

... 51% increase compared last 2 years (year to date)



Finding consistency in ceramics

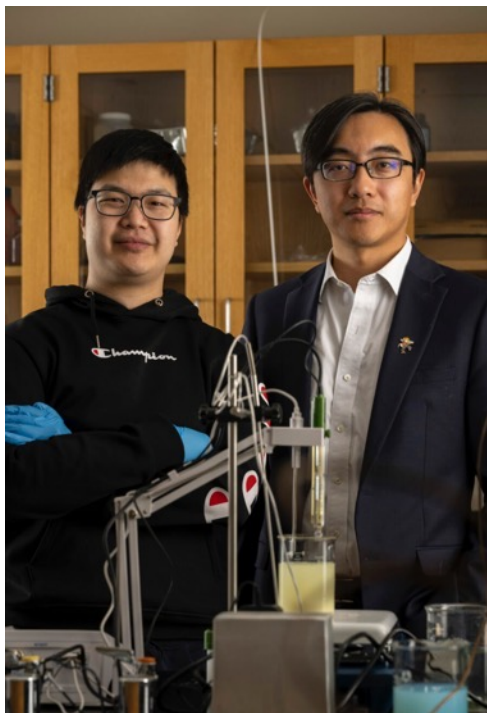
... \$1.4M Air Force grant for applications for hypersonic vehicles

Dr. Bill Fahrenholtz is researching ultra-high-temperature ceramics processing for hypersonic vehicles. Working with him is undergraduate student Grace Epp.



S&T faculty focus on critical minerals

... through major grant and national representation



- ◀ Dr. Hongyan Ma received \$2 million from the Department of Energy to study critical minerals.

Dr. Michael Moats testified before a U.S. Congress committee on critical minerals production. ▶



Congratulations to our recent Fellows

... chemistry and psychological science



Dr. Amy Belfi named Fellow of the Psychonomic Society.



Dr. Vadym Mochalin named Fellow of the Royal Society of Chemistry.



Dr. V. Prakash Reddy named Fellow of the American Association for the Advancement of Science.



New Initiatives

Academic Affairs

... Aligning New Academic Programs with Strategy

Resource Sustainability

- ▶ BS/Environmental Sciences
- ▶ BS&MS/Geospatial Science and Engineering

Intelligent & Automated Systems

- ▶ BS&MS/Data Sciences
- ▶ PhD/AI Engineering

Biothematic

- ▶ BS/Biomedical Engineering
- ▶ PhD/Biological Sciences
- ▶ PhD/Bioengineering
- ▶ MS/Health Physics

Technology Degrees

- ▶ BS/Manufacturing Technology Management
- ▶ BS&MS/Construction Management
- ▶ MS in CivE/MechE through the Springfield program

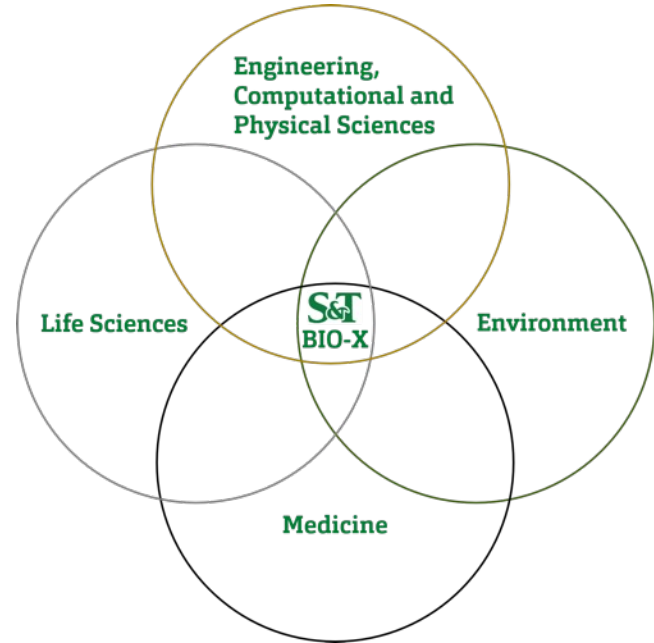
STEM-Adjacent

- ▶ DBA/Business Administration
- ▶ PhD/Psychological Sciences
- ▶ PhD/Technical Communications

The S&T Biothematic Initiative

... maximizing impact and opportunity at the intersection of our unique strengths

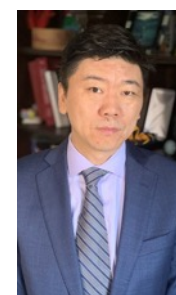
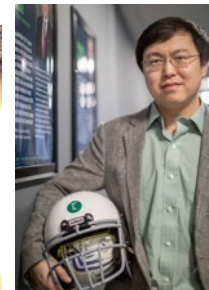
- ▶ Over 20 faculty already conducting research at this nexus
- ▶ A history of business success
- ▶ Solidifying our pathway to R1
- ▶ Partnerships with UM System medical centers, Phelps Health, Washington University
 - Ozark Biomedical Initiative established 2015
 - Traumatic brain injury research
- ▶ A platform to grow diversity and partnerships



S&T Biothematic Initiative

... examples of ongoing research

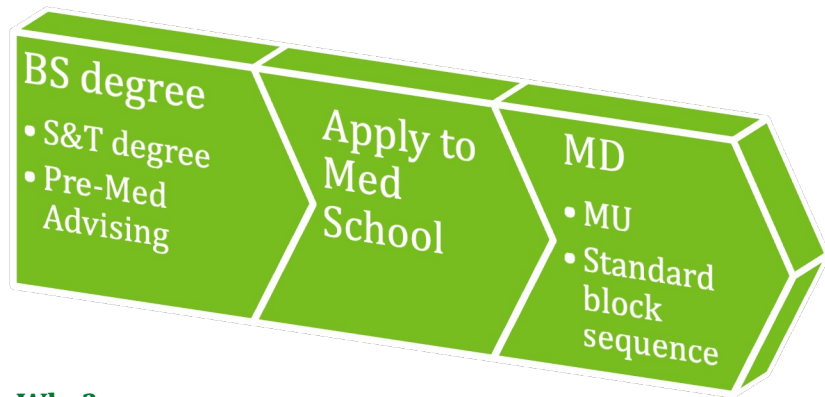
- ▶ Traumatic brain injury
- ▶ Nanoparticle drug delivery systems
- ▶ Bio-active glass for health applications



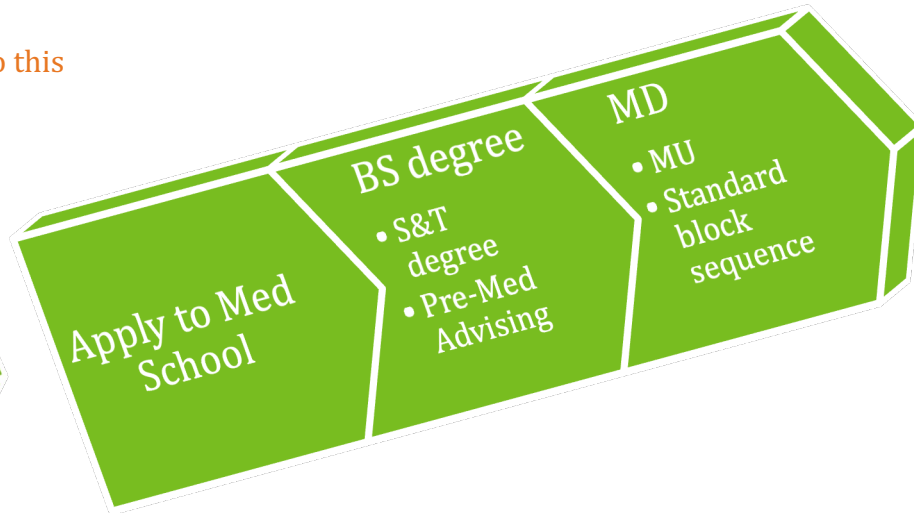
A New Type of Medical Education: The Escalator

... incorporate guaranteed professional program admissions processes into S&T and med schools

From this



To this



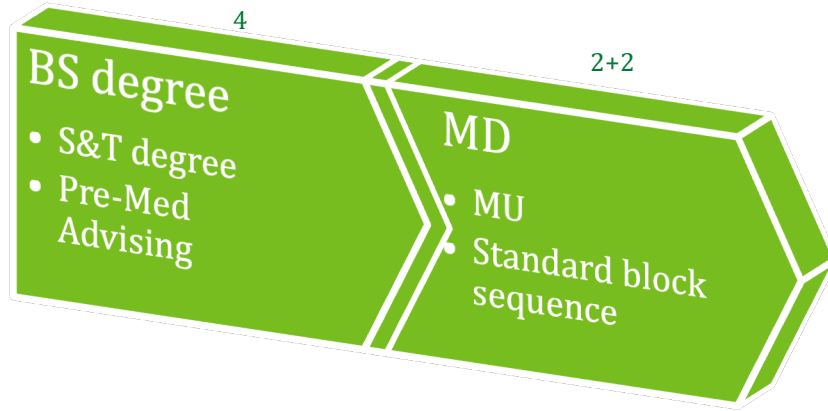
Why?

To provide guaranteed access to med school (subject to academic requirements) and recruit and retain best students in Missouri

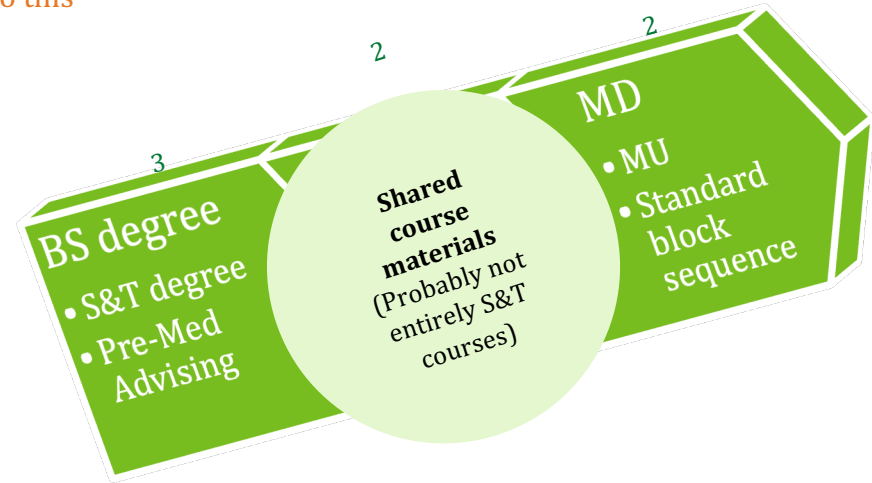
A New Type of Medical Education: The Accelerator

... a 3+2+2 model to accelerate learning of medical foundations

From this



To this



Why?

To expedite entry of Missouri students into the health care workforce



STEM Outreach

Outreach on campus and on the road

... successful summer camps, STEM Day and a new STEM Mobile

- ▶ 23 summer camps
- ▶ STEM Day (November 8, 2022)
 - ▶ Nearly 1,000 K-12 students on campus
- ▶ New STEM Mobile for community outreach
- ▶ Many on-campus outreach activities







Building and Construction Update

Current Capital Projects

... progress on our new Arrival District and Innovation Campus

- ▶ Subsurface Parking Structure, Completion by August 2023
- ▶ Innovation Lab, Completion by October 2023
- ▶ Welcome Center, Completion by December 2024
- ▶ Missouri Protoplex, Completion by September 2025



Innovation Lab



Welcome Center



Missouri Protoplex

The S&T Arrival District

... our future front door

- ▶ Tim Bradley Way connects I-44 to roundabout and Arrival Court
- ▶ Underground parking
- ▶ Innovation Lab
- ▶ Welcome Center



Innovation Lab

... a hub of creativity and possibility thinking for all students







SRT3

MISSOURI
S&T

Hand-drawn technical diagrams and notes on a whiteboard, including a flowchart and a graph.

Welcome Center

... a one-stop shop for students and their families



MISSOURI S&T



WELCOME



FOR TOMORROW









Missouri Protoplex

... enabling testing and prototyping for Missouri manufacturers

View from southeast



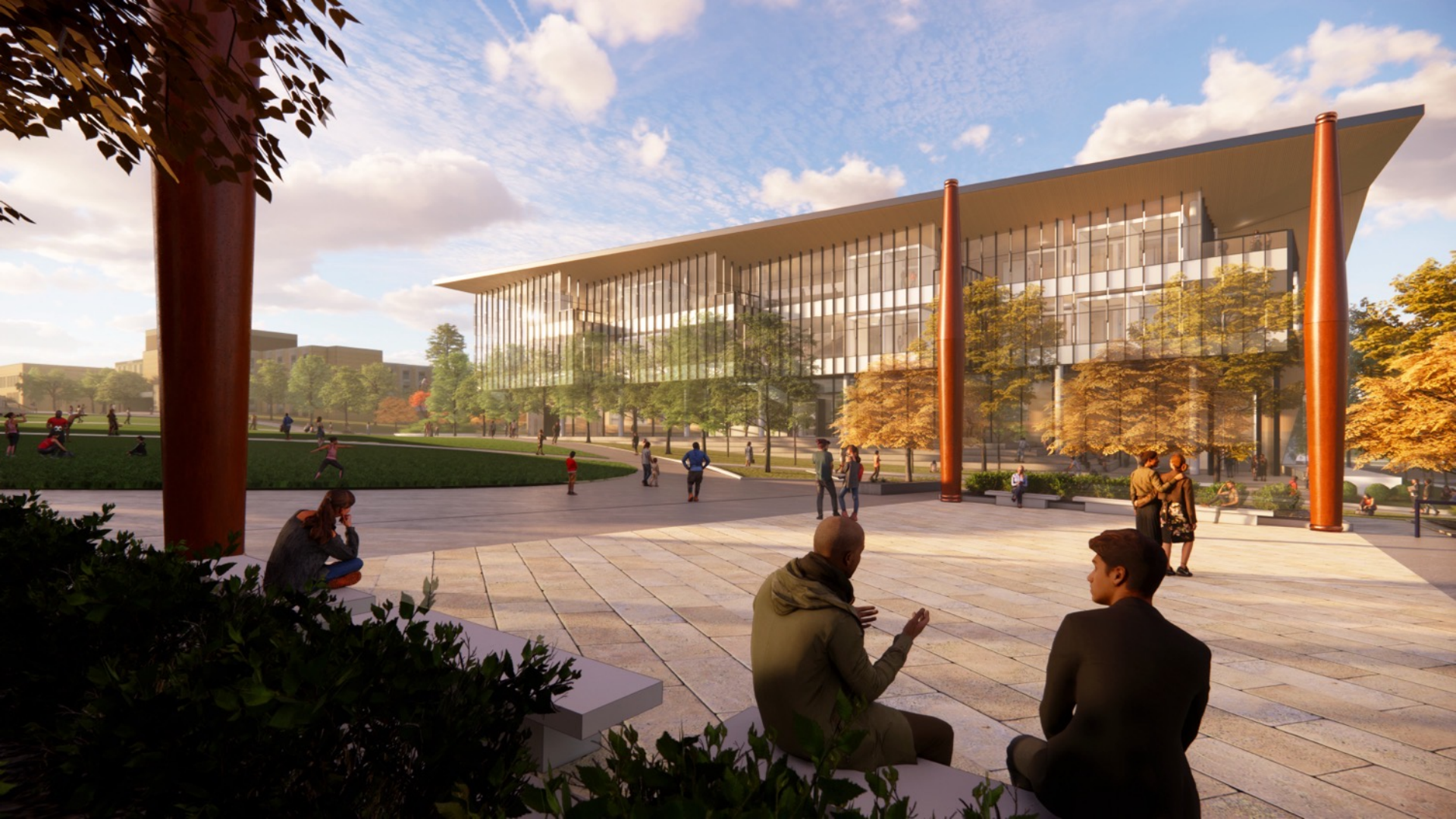
High Bay Space for industry partners



The image is a detailed architectural rendering of a modern building, identified as the S&T Biomedical Complex (Bioplex). The building features a prominent facade of large glass windows with dark frames, set against a light-colored, possibly wood-clad, upper section. The ground floor is a mix of glass and solid panels. A wide, multi-level plaza with concrete steps and walkways leads to the building's entrance. The plaza is landscaped with green grass, several rounded green bushes, and young trees. Numerous people are depicted in various activities: walking, sitting on the grass, and standing on the steps, which adds a sense of scale and life to the scene. The sky is bright blue with scattered white clouds, and a few birds are visible in the upper left corner. The overall atmosphere is clean, bright, and modern.

The S&T Biomedical Complex (Bioplex)





A stone relief sculpture is mounted on a light-colored brick wall. The sculpture features a large gear in the center, with a hammer and a wrench positioned behind it. Several chains are draped over the gear and other elements. The wall is partially covered with green ivy. A yellow rectangular box is overlaid on the right side of the image, containing the text "Thank you! Questions?".

**Thank you!
Questions?**