

Meet ASU engineering students who are improving health care, computing and more

By TJ Triolo, ASU News
April 22, 2025

Furthering knowledge of water resource management, increasing the efficiency of manufacturing point-of-care health diagnostic tools and exploring new uses for emerging computer memory are just some of the ways Arizona State University students are addressing real-world challenges through hands-on research.

Undergraduate and graduate students in the [Ira A. Fulton Schools of Engineering](#) at ASU have several opportunities to conduct use-inspired research that has real-world impact.

Through individual projects mentored by Fulton Schools faculty members, students apply their classroom knowledge, build new skills and forge meaningful advances in the [research themes](#) of data science, education, energy, health, security, semiconductor manufacturing and sustainability.

In the [Fulton Undergraduate Research Initiative](#), also known as FURI, and the [Master's Opportunity for Research in Engineering](#), or MORE, programs, participants conceptualize ideas, develop plans and investigate research questions over the course of a semester.

Conducting research is one part of the rigorous competency requirements in the [Grand Challenges Scholars Program](#), and students in the program can apply for additional funding for their research through a stipend program.

These three programs enhance students' ability to innovate, think independently and solve problems in their communities. They also benefit from the technical and soft skills they gain, which prepare them for their careers and the pursuit of advanced degrees.

Each semester, students who participate in these programs are invited to present their findings at the [Fulton Forge Student Research Expo](#).

Learn about three of the researchers participating in this semester's expo.

Note: Answers have been edited for length and/or clarity.

Shriya Danekar

Shriya Danekar, an undergraduate environmental engineering student, used her Grand Challenges Scholars Program research stipend to explore her passion for sustainability. Danekar aims to improve the management of the limited water resources in the western U.S. under the supervision of [Margaret Garcia](#), a Fulton Schools associate professor of civil, environmental and sustainable engineering.

Question: What made you want to get involved in this program? Why did you choose the project you're working on?

A: As an environmental engineering student, I am passionate about exploring different aspects of sustainability, and this research project in hydrology has provided the perfect opportunity to develop my technical skills. I chose this project, "Assessing the Water Scarcity Problem in the Western United States," because it involves statistical modeling, an essential skill for analyzing environmental data and one that I was eager to strengthen.

Q: How will your engineering research project impact the world?

A: The goal is to better understand how weather changes affect water scarcity in the western U.S. and provide insights that can help address this critical issue. The findings have broad implications, including improving access to drinking water, informing water policy decisions and enhancing water infrastructure. In an era where sustainable water management is essential, this research plays a vital role in supporting long-term solutions.

Megan Murphy

After receiving encouragement from [Jennifer Blain](#), a Fulton Schools electrical engineering professor, biomedical engineering master's degree student Megan Murphy applied to join MORE. Blain now serves as Murphy's faculty mentor for her project, in which she investigates how to make the manufacturing process of point-of-care health diagnostic devices more efficient, therefore increasing health care access.

Question: What made you want to get involved in this program? Why did you choose the project you're working on?

Murphy: It was my mentor who encouraged me to look into the MORE program, and I'm so glad she did. I saw that it could provide an opportunity to continue my research with additional resources and support while engaging with a larger research community at ASU.

I chose this project because of my interest in point-of-care diagnostic devices and biomedical device manufacturing. This project is a great example of how engineering principles can directly impact health care by improving the design and production of medical devices.

Q: How will your engineering research project impact the world?

Murphy: Rapid and accurate disease diagnosis is the first step in effective treatment. Point-of-care diagnostics make testing more accessible by providing fast and cost-effective results outside of

traditional clinical environments.

For example, if you suspect you have COVID-19, the first thing you'll likely do is take a quick COVID test at home before seeking treatment. My project focuses on automating a critical step in the production of diagnostic chips made in the lab. The goal is to streamline manufacturing to make diagnostics more widely available and ultimately improve health care accessibility.

Andrew Rubio

After gaining research experience and learning about semiconductor devices throughout his time at ASU, electrical engineering undergraduate student Andrew Rubio decided he wanted to participate in FURI to push the boundaries of what's possible with microelectronics.

Rubio works under [Ying-Chen "Daphne" Chen](#), a Fulton Schools assistant professor of electrical engineering, to further understand how a type of memory device known as resistive random access memory, or RRAM, works to unlock new applications for its use.

Question: What made you want to get involved in this program? Why did you choose the project you're working on?

Rubio: Through my involvement in the Semiconductors and Device Research Lab as well as my studies of [physical electronics](#), I've had the great opportunity to learn from professors and students who ignited my own passions through theirs. I've had the opportunity to explore the work of other researchers and witness what discoveries they have been able to achieve. ... My mentor, as well as fellow students, began to encourage me to consider research as a path. Their encouragement gave me a whole new sense of confidence in my abilities as an engineer, which led me to join FURI.

Question: How will your engineering research project impact the world?

Rubio: My project aims to understand how RRAM, an emerging memory device type, operates. In increasing our knowledge of RRAM, we are able to find new and amazing ways to implement it into the future of integrated circuits, also known as semiconductors or microelectronics. I believe my research project has the potential to consider a whole new way of making computing cost efficient and sustainable.

This story originally appeared on [ASU News](#).

Main image

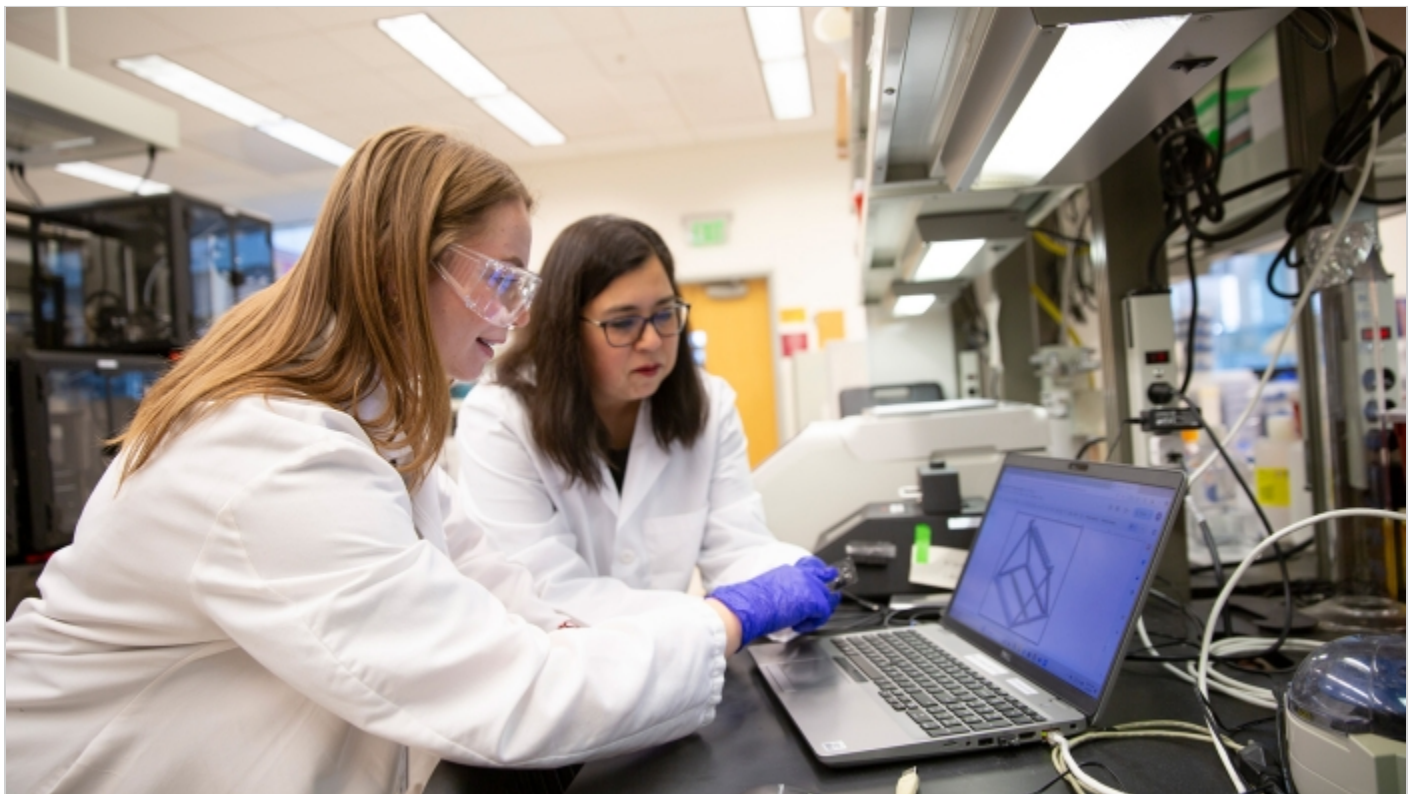


Shriya Danekar, an undergraduate environmental engineering student in the Ira A. Fulton Schools of Engineering at Arizona State University, examines dry dirt in a drainage canal. As a participant in the Grand Challenges Scholars Program research stipend initiative, Danekar is one of many students helping to solve real-world problems through use-inspired research. Photographer: Erika Gronek/ASU

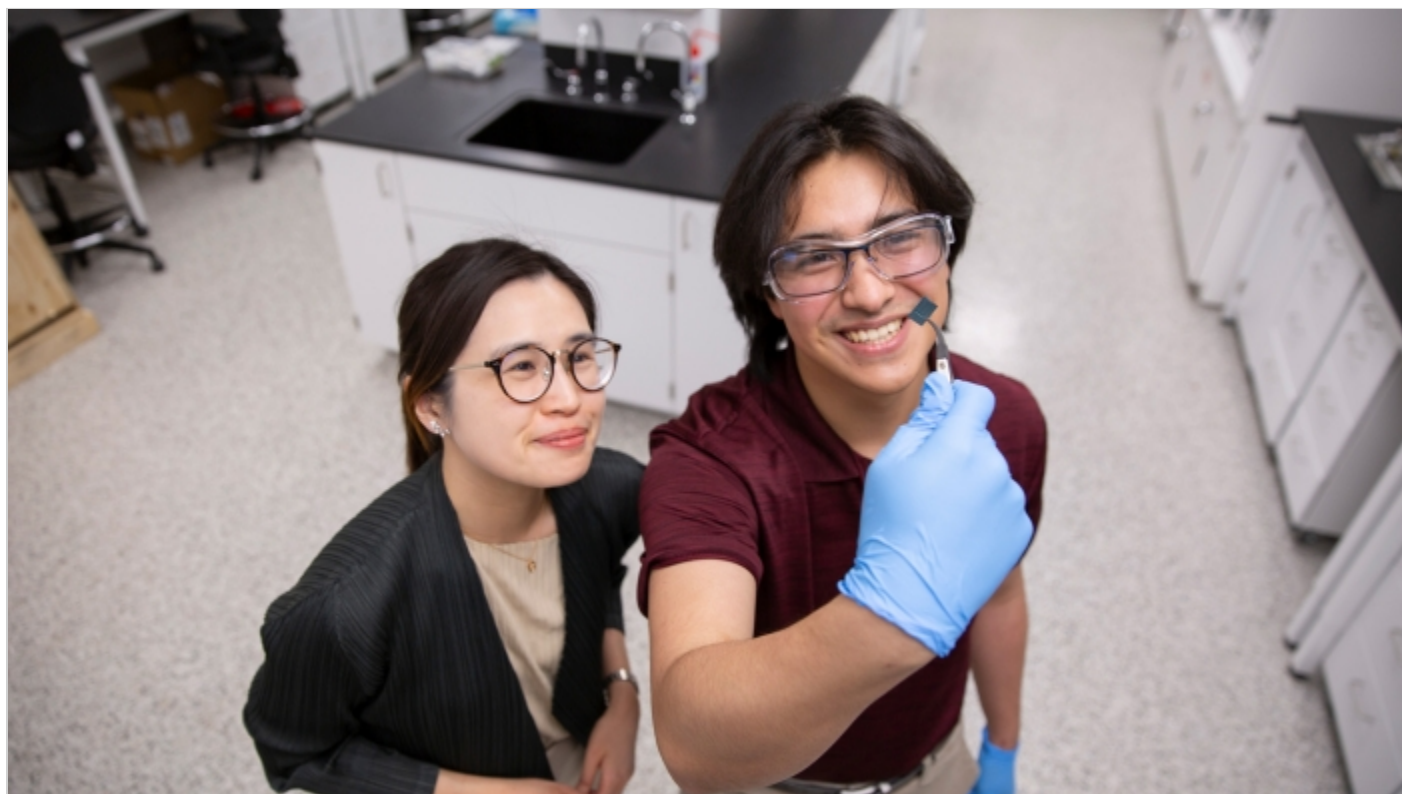
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Shriya Danekar (left), a Fulton Schools undergraduate environmental engineering student, and Margaret Garcia (right), a Fulton Schools associate professor of civil, environmental and sustainable engineering, go over Danekar's research. Photo by Erika Gronek/ASU



Megan Murphy (left), a Fulton Schools biomedical engineering master's degree student, works with Jennifer Blain (right), a Fulton Schools professor of electrical engineering. Photo by Erika Gronek/ASU



Ying-Chen "Daphne" Chen (left), a Fulton Schools assistant professor of electrical engineering, and Andrew Rubio (right), a Fulton Schools electrical engineering undergraduate student, observe a semiconductor device in a lab. Photographer: Erika Gronek/ASU