SYNAPSE

THE COLLEGE OF SCIENCE MAGAZINE

Annual Publication 2024-2025

"The UVU College of Science is proud to provide Utah with graduates that help our economy grow and that keep us safe and healthy."

– Dr. Daniel Horns

Building a Stronger Utah, One Scientist at a Time

Dr. Daniel Horns, Dean, College of Science.

At Utah Valley University's College of Science, we are committed to building the scientific economy of the Wasatch Front — an economy that extends beyond the well-known software industry of Silicon Slopes. Our region is home to world-leading companies in biotechnology, biomedical devices, and defense. These industries rely on a workforce that is deeply trained in the practical applications of biology, chemistry, mathematics, and physics.

Each year, hundreds of students graduate from the College of Science ready to step into these roles. They are not only well-prepared academically, but they also gain hands-on experience that equips them to make an immediate impact in Utah's innovation economy.

Alongside this mission, we are equally devoted to protecting the safety and well-being of our communities. Whether it's safeguarding drinking water, mitigating natural hazards, or supporting the healthcare workforce, our students and faculty work at the intersection of science and service. We train students in environmental science and geology, and we prepare them for graduate programs in medicine, physical therapy, and other health professions.

The College of Science is proud to play a central role in ensuring Utah remains both economically strong and physically well. Thank you for being part of this important work.

Sincerely,

Dr. Daniel Horns
Dean, College of Science

IGNITING THE SPARK OF SCIENTIFIC PASSION

Our Dedication to Inspiring and Mentoring Future Scientists.

AT the College of Science, our mission is to build the scientific economy and promote scientific literacy in the Wasatch Front region and beyond. We are committed to empowering the next generation of scientists and providing them with knowledge, skills, and opportunities to succeed in scientific professions or pursue advanced studies. Through our academic degrees, certificates, and courses, we strive to create an innovative atmosphere that fosters personal and professional growth for our students, faculty, staff, and stakeholders.

At the heart of our mission is the development and delivery of high-quality courses and programs that enable students to excel in scientific fields. We believe in the power of engaging and inclusive teaching methodologies that stimulate learning and enhance knowledge retention. Beyond the classroom, we provide various engaged learning opportunities, such as faculty-mentored student research, internships, service learning, and extracurricular field experiences. These experiences complement our teaching efforts and ignite a passion for scientific inquiry and discovery.

Because student success is our primary goal, we encourage our faculty to engage in research activities. We prioritize faculty expertise and continuous growth. We encourage our faculty to engage in research activities to stay at the forefront of their disciplines. Additionally, we provide training in effective teaching methods to ensure our students receive the best education possible. Effective advising is also a key aspect of our commitment to student success.

Our dedication to the next generation of scientists extends beyond our campus. We actively engage with the K-12 community and the public to promote science and science education. We aim to inspire young minds and cultivate interest in scientific exploration from an early age. By instilling a passion for science in the next generation, we contribute to a brighter and more scientifically literate future.

To ensure the sustainability of our mission, we cultivate understanding and support among our constituents. We establish strong partnerships with corporations, communities, and alumni and actively pursue and fund development initiatives. These resources are essential for us to continue providing exceptional educational experiences, fostering research opportunities, and expanding outreach efforts.

Together, we are shaping a future where scientific discovery and understanding thrive.

Nurturing Student Success

How the College of Science Leads the Way.

The College of Science takes great pride in promoting student success. We embrace our mission of providing holistic education and facilitating the attainment of terminal degrees and strive to create an environment where individuals thrive personally and professionally. Guided by our core values of exceptional care, exceptional accountability, and exceptional results, we are committed to supporting student success in diverse scientific disciplines.

EXCEPTIONAL

CARE

Exceptional care lies at the heart of our mission. We recognize that student success encompasses more than just academic achievements. That's why our faculty and staff go the extra mile to cultivate an inclusive and supportive community where students feel valued, respected, and inspired. Our academic advisors and mentors provide personalized guidance, fostering an environment of growth. We also offer opportunities for students to engage in research, internships, and hands-on experiences. Through exceptional care, we empower students to thrive in their scientific pursuits.

ACCOUNTABILITY

Accountability is a cornerstone of our approach to student success. We uphold rigorous academic standards and offer challenging programs that prepare students for the complexities of their scientific fields. Our curriculum emphasizes scientific inquiry, critical thinking, and problem-solving, instilling a sense of responsibility in our students. Our faculty members take pride in delivering high-quality instruction and mentoring, while students are encouraged to take ownership of their learning journeys. We strongly emphasize ethical conduct and foster integrity, equipping students to contribute responsibly and ethically to the scientific community.

RESULTS

We are dedicated to delivering exceptional results by producing graduates who are well-prepared to excel. Our comprehensive range of programs, such as biology, chemistry, physics, mathematics, and environmental science, combines rigorous coursework with hands-on experiences, research opportunities, and industry partnerships. Our laboratories, technologies, and collaborations with accomplished faculty ensure students receive top-tier educations. Through experiential learning and practical applications, we equip graduates with skills, knowledge, and critical thinking abilities to succeed in the scientific workforce or pursue advanced studies.

Guided by Expertise, Driven by Purpose

New board members bring fresh expertise and energy to support innovation, student opportunity, and the scientific economy of the Wasatch Front.

THE Utah Valley University College of Science is proud to announce the expansion of its Advisory Board — welcoming four new professionals whose leadership and vision will help elevate the college's impact on scientific education, research, and community engagement.

With deep roots in Utah's high-tech, life sciences, and defense sectors, these board members bring a powerful blend of business insight, industry knowledge, and philanthropic passion. Each of them joins a growing team of advocates helping the College of Science build stronger relationships with industry, expand access to hands-on undergraduate research, and drive the development of meaningful scientific solutions.

"Our Advisory Board is composed of exceptional individuals with diverse experience across science, business, and public service," said Dr. Daniel Horns, dean of the College of Science. "Their service on the board will help the College of Science better serve the employment needs of Utah's high-tech, life science, and defense and intelligence sectors."

The new additions—**Ruchika Joshi** (Texas Instruments), **Brad Graham** (bioMérieux), **Sterling Cornaby** (MOXTEK), and **Brad Norton** (Utah Community Credit Union)—join returning board members **Stan Lockhart** (Advisory Board Chair), **Kelvyn Cullimore** (BioUtah), **Andy Pierucci** (Savage), and **Carol Walker**, each of whom brings a wealth of experience and community connections to the table.

In 2024, the College is ushering in a new chapter — transitioning the Advisory Board into a more focused Advancement Board, with a sharpened emphasis on supporting philanthropic partnerships and aligning funding opportunities with institutional priorities.

These priorities include:

- **Expanding Undergraduate Research** by modernizing lab spaces, acquiring analytical instruments, and funding student travel for conference presentations and fieldwork.
- **Fueling Societal Impact Initiatives,** including groundbreaking cancer detection research and Utah Lake sustainability efforts.
- **Building Equity in STEM** through donor-funded summer programs and department-led pre-college camps.
- **Creating Naming Opportunities** in areas such as the GRIT Garden, Planetarium, InnovaBio Labs, and even the College of Science itself.

The Advancement Board will play a vital role in opening doors—for students, faculty, and the entire Wasatch Front—by supporting initiatives that increase access, improve outcomes, and cultivate a vibrant regional scientific economy. ■

Our board members are more than advisors—they're champions of science, student success, and innovation across Utah."

— Dr. Daniel Horns, Dean, College of Science

Meet your advisors: Bobby Hughes, Katie Stevens, Kinzie Greer, Hunter Jasperson, JoAnna Johnson, Kirsten Paustenbaugh, Ashlee Lawrence, Sara McGriff, Kellie Lake, and Monica Ferreyra.

Guiding Your Path

Meet the Dedicated Advisors of the College of Science.

STARTING college can be overwhelming, but fear not! The College of Science advising team are your dedicated partners during your time at UVU. We'll help you choose classes, chart your degree, and guide you through your UVU adventure. Together, we'll explore your academic pursuits, career goals, and personal aspirations. We'll be by your side, providing support and resources as you thrive.

Welcome to UVU and the College of Science!

Advising home page

COLLEGE OF SCIENCE STATISTICS

98% of our graduates rate their experience in the College of Science as excellent or good

45% of College of Science alums are pursuing graduate degrees within a year of graduating (this is the most of any college or school at UVU)

UVU's College of Science is a hub of scientific excellence, research opportunities, and academic support.

Most Common Majors

- BIOLOGY
- EXERCISE SCIENCE
- MATHEMATICS

400+ students conduct faculty-mentored research in the College of Science each year

There are almost **3,000** students majoring in the sciences taught by **142** full-time faculty and assisted by **42** staff

Source: UVU Business Intelligence and Research Services

BIOLOGY

InnovaBIO: Research Based Internships

InnovaBio is a biotechnology contract research organization that offers flexible, industry-based research internships for science students. We collaborate with local life science companies on various research and development projects, which our interns execute in teams. These projects are conducted on-site at UVU Biotechnology labs, under the supervision of InnovaBio's scientific staff. Students gain valuable research experience and internship credit, giving them a competitive edge when seeking employment as research associates in biotechnology companies..

Diversity of Disciplines

The biology department offers a wide range of courses and programs. An A.S. or B.S. degree in biology provides flexibility through elective courses, while seven additional bachelor's degrees specialize in bioinformatics, biology education, biomedical science, biotechnology, botany, microbiology, and zoology. Minors in biology, horticulture, and zoology ensure options for all students.

Course-Based Undergraduate Research Experiences

The biology department offers 10+ course-based undergraduate research experiences (CUREs), integrating hands-on research within courses. These experiences apply theoretical concepts to real-world problems, fostering scientific understanding, critical thinking, and problem-solving skills. CUREs cover disciplines like botany, microbiology, and genetics, inspiring future scientists and facilitating growth.

Conference Participation

Scientific conferences significantly contribute to students' academic and professional growth, providing opportunities to share research, network with professionals, and access cutting-edge discoveries. Each year, UVU biology students participate in and present their research at regional, national and international conferences. As an example, this year 10 students attended the international entomology conference, some teaching bioinformatics to graduate students. Also, 10 students participated in the Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS) conference, advancing research and professional development.

CHEMISTRY

Introducing the Chemistry Department

UVU's Department of Chemistry is a dynamic hub of scientific inquiry. The department is led by dedicated faculty and offers comprehensive programs to nurture the next generation of chemists. It provides a stimulating environment for students to explore the wonders of chemistry and build strong career foundations.

Academic Programs and Opportunities

The department offers a Bachelor of Science degree in chemistry with a rigorous curriculum covering organic, inorganic, physical, and analytical chemistry. Undergraduates can also participate in research alongside faculty members, gaining valuable hands-on experience.

State-of-the-Art Facilities and Research

Students will find a rich learning environment with state-of-the-art facilities and well-equipped laboratories. From advanced instrumentation for spectroscopy and analysis to computational chemistry resources, students have access to tools that foster exploration and discovery. Faculty members actively engage in diverse research areas, addressing critical challenges in materials chemistry, biochemistry, environmental chemistry, and drug discovery.

Community Engagement and Collaboration

The Department of Chemistry values community engagement and collaboration. Through partnerships with industries, government agencies, and research institutions, students and faculty participate in collaborative projects with real-world applications. The department organizes outreach programs, such as science fairs and workshops, to inspire and educate the wider community. These initiatives enhance learning experiences and contribute to scientific advancement in the region.

EARTH SCIENCE

Interdisciplinary Nature

The Department of Earth Science offers programs and courses that foster collaboration across scientific disciplines. Students can immerse themselves in curriculum offerings to address pressing environmental issues, climate change, natural resource management, geological hazards, and other challenges. This interdisciplinary focus equips graduates with skill sets applicable in diverse professional settings and future graduate studies.

Faculty Expertise and Research Opportunities

Our diverse faculty possess research backgrounds and expertise in many areas, including geology, hydrology, paleontology, petrology, environmental science and management, climatology, geochemistry, geoscience education, geospatial analysis, and human geography. Students benefit from the wealth of knowledge and mentorship provided by faculty members and have ample opportunities to engage in impactful research projects.

High-Impact Practices

We strongly emphasize high-impact practices that offer transformative learning experiences, such as science excursion courses to Yellowstone, the Grand Canyon, and Capitol Reef, and study abroad programs in countries like Italy and India. These hands-on experiences expose students to natural environments and allow them to apply their theoretical knowledge in real-world settings, fostering practical skills and enriching their experiences.

Collaboration With Industry Partners

We maintain strong connections with industry partners, including mining companies, environmental consulting firms, and government agencies. Students gain opportunities to pursue internships, engage in research collaborations, and secure job placements upon graduation. By bridging the gap between academia and real-world applications, these collaborations enhance students' learning outcomes and strengthen their professional networks.

EXERCISE SCIENCE AND OUTDOOR RECREATION

The Department of Exercise Science and Outdoor Recreation is a thriving hub of knowledge and activity, equipping students with the skills and expertise to excel. With a commitment to hands-on learning and a passion for promoting health and wellness, this department offers a diverse range of programs and opportunities for students to explore and engage in their areas of interest.

Cutting-Edge Programs and Research

At the heart of the department is a collection of cutting-edge programs and research initiatives. Through rigorous coursework and practical experiences, students delve into the intricacies of exercise physiology, biomechanics, sports psychology, outdoor leadership, and more. The curriculum fosters critical thinking, problem-solving, and a deep understanding of the human body's response to physical activity. Under the guidance of experienced faculty, students can conduct groundbreaking research that advances knowledge in the field.

Experiential Learning and Field Opportunities

The department strongly believes in the value of experiential learning and provides numerous field opportunities to complement classroom education. From outdoor expeditions and leadership training to internships with local sports teams, students gain hands-on experience that prepares them for their careers. These real-world experiences not only solidify classroom knowledge but also foster essential teamwork, communication, and problem-solving skills.

Career Paths and Alumni Success

Exercise science and outdoor recreation graduates have gone on to become exercise physiologists, personal trainers, outdoor adventure guides, sports coaches, and wellness program directors, among other career paths. The department's strong alumni network provides ongoing support and mentorship to current students, ensuring a seamless transition from the classroom to the professional world. By offering innovative programs, conducting groundbreaking research, providing experiential learning opportunities, and fostering a strong alumni network, the Department of Exercise Science and Outdoor Recreation inspires and educates the next generation of leaders.

PHYSICS

Unveiling the Secrets of the Universe

Physics, the study of the universe from the smallest particles to the vastness of space, is the foundation for all other sciences. In UVU's Department of Physics, this discipline is explored and applied to address pressing technological and environmental challenges. From nanotechnology to medical advancements and astronomical discoveries, the Department of Physics is at the forefront of scientific exploration and innovation.

Physics and Technology

Under the leadership of physicists Paul Weber and Daniel James, the department collaborates with the College of Engineering and Technology to drive advancements in nanotechnology. Through the UVU nanotechnology program, students gain hands-on experience with equipment such as scanning electron microscopes and 3D laser microscopes. The program's integration of advanced virtual reality training ensures students are well-prepared to operate complex machinery in real-world settings.

Nanotechnology and Medical Breakthroughs

Beyond technology, the department demonstrates its commitment to improving lives through medical research. Faculty members Vern Hart, Dustin Shipp, Cyill Slezak, Vince Rossi, and York Young lead efforts to enhance medical procedures for cancer detection and treatment. Leveraging laser imaging and infrared spectroscopy, UVU researchers explore ways to identify individual cancer cells, paving the way for more precise and effective
medical interventions.

Exploring the Cosmos With the Department of Physics

The department's engagement with the cosmos is equally remarkable. Joshua Lothringer and the astronomy group contribute to groundbreaking discoveries using space telescopes. Lothringer, as part of an international team, recently employed the new James Webb Space Telescope to detect elements like water and carbon dioxide in the atmospheres of exoplanets located hundreds of light years away. Physics students actively participate in astronomical research by accessing and analyzing data from the Hubble and James Webb Space Telescopes. Moreover, in collaboration with the city of Eagle Mountain, UVU is constructing a public observatory featuring a 20-inch professional telescope, expanding opportunities for astronomical exploration.

Honoring Dr. Steven Wasserbaech's Legacy

It is with deep sadness that we remember Dr. Steven Wasserbaech, who passed away in November 2022 after a courageous battle with cancer. Dr. Wasserbaech was an exceptional teacher and will be greatly missed by students, staff, faculty, and alumni. In honor of his enduring legacy, the Department of Physics has established a student research award in his name. His loss leaves a void in the UVU community, but his contributions and memory will continue to inspire future generations of physicists.

MATHEMATICS

The Department of Mathematics is a vibrant and dynamic academic unit dedicated to fostering a deep understanding and appreciation for the world of numbers, patterns, and logical reasoning. With a team of esteemed faculty members and a wide range of innovative courses, the department strives to empower students with the skills and knowledge to excel in various fields that require mathematical proficiency.

Academic Excellence and Research Opportunities

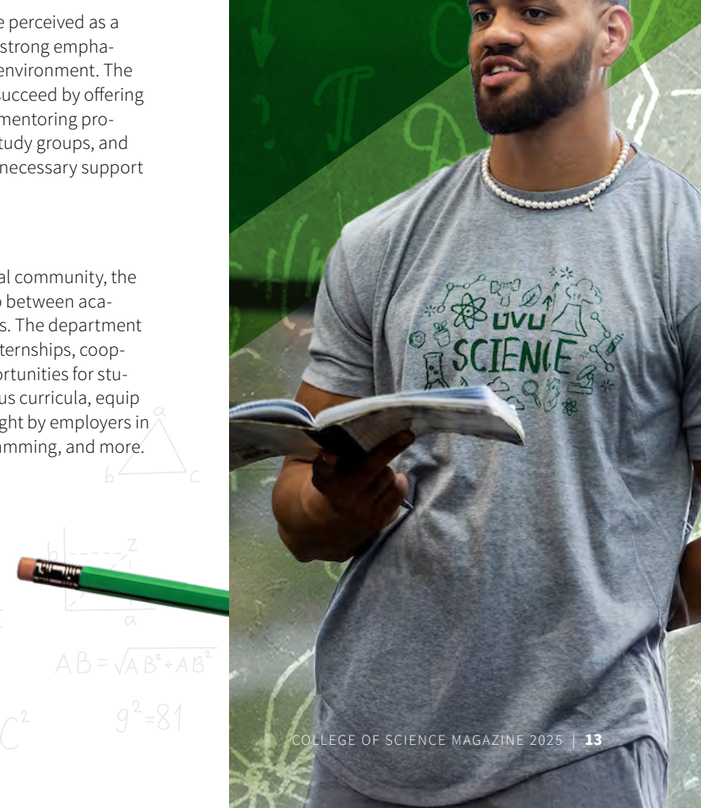
The Department of Mathematics prides
itself on offering rigorous academic programs that cater to students of all levels and interests. From foundational courses in calculus and algebra to advanced topics like differential equations and mathematical modeling, students explore the vast landscape of mathematical concepts and applications. The department is committed to nurturing a research-oriented environment, providing students with hands-on experiences in research projects, encouraging collaboration, and offering opportunities to present their findings at regional and national conferences.

Engaging and Supportive Learning Environment

The department recognizes that mathematics can be perceived as a challenging subject for many students, so it places a strong emphasis on creating an engaging and supportive learning environment. The faculty members are dedicated to helping students succeed by offering regular office hours, one-on-one consultations, and mentoring programs. The department also organizes workshops, study groups, and tutoring services to ensure that students receive the necessary support to excel in their mathematical studies.

Industry Connections and Career Prospects

With its strong connections to industries and the local community, the Department of Mathematics strives to bridge the gap between academia and the real-world application of mathematics. The department collaborates with various organizations to provide internships, cooperative education experiences, and networking opportunities for students. These connections, combined with the rigorous curricula, equip students with the skills and practical knowledge sought by employers in fields such as finance, data science, computer programming, and more.



MATHEMATICAL AND QUANTITATIVE REASONING

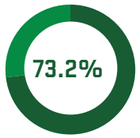
The Department of Mathematical and Quantitative Reasoning is a teaching-focused department. Our diverse group of faculty focuses on excellent teaching, and we emphasize continued growth and professional development of faculty. We research and assess best practices for teaching mathematics to ensure all students have meaningful classroom experiences.

We help our students move beyond our courses so that they can succeed in their academic careers and lives. Based on students' math abilities, we meet students where they are and find a place for them. To help students succeed, we developed co-requisite-style courses that accelerate the completion of quantitative literacy course requirements and provide support outside the classroom.

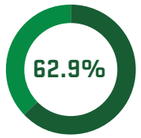
We work closely with the math lab to ensure tutors are trained and prepared to support students in their classes, and our unique Math Mentor Program directly supports students in the classroom. We also engage with the community through our summer math camp program, which encourages positive attitudes toward math among students in grades 4-7. Research shows that students develop math attitudes during this timeframe, and by positively impacting those attitudes, we hope to help our campers succeed in math through high school and college.

Our peer mentor Math Mentor Program is staffed by students who once struggled with math and/or the transition to the college environment. The math mentors are assigned to specific sections and work closely with faculty to teach students mathematical and metacognition skills. This program has boosted success rates of students in mentored sections, especially for students of color and women.

The Department of Mathematical and Quantitative Reasoning is an innovative, student-centered program that improves mathematical proficiency and quantitative literacy. We enable students to successfully use mathematics in the pursuit of their educational, professional, civic, and personal goals.



MENTORED
Average GPA: 2.53
Sample Size: 67,687



NOT MENTORED
Average GPA: 2.31
Sample Size: 55,408

Igniting Curiosity

Science Ambassadors.

"As torchbearers of the College of Science, these ambassadors play a pivotal role in nurturing connections with the community and prospective students."

The Impact of College of Science Ambassadors

IN the vibrant halls of the College of Science, a cadre of exceptional students stand as shining examples of academic prowess and community dedication. These remarkable individuals are known as the Science Ambassadors.

They go above and beyond in their quest to bridge the gap between academia and the wider community. With a spirit of unwavering dedication, they not only excel in their studies but also actively contribute to the enrichment of education through their involvement in outreach events and college tours.

One standout event that showcases their passion for spreading the wonders of science is Science Night at UVU. This flagship event, characterized by its high attendance and enthusiastic participation, owes much of its success to the diligent efforts of these ambassadors. Through captivating demonstrations, engaging presentations, and interactive exhibits, they bring the marvels of science to life, igniting curiosity and inspiring the next generation of scientists and innovators.

The impact of the Science Ambassadors reverberates throughout the organization and the community it serves. Their enthusiasm fosters a culture of inquiry, discovery, and inclusivity. By leading by example, they not only enhance the reputation of the College of Science but also ensure a brighter future for generations to come.

Their dedication and passion remind us of the transformative power of education and the importance of giving back to the community.■

Geology Professor Contributes to International ‘Geo Tour de France’ Project

UVU geology professor Michael Bunds contributed to this year’s Geo Tour de France, a series of daily articles published during the Tour de France analyzing the landscape and geological history of the terrain the racers traverse.

THE Tour de France is one of the most beautiful, fascinating spectacles in all of sport, highlighting both the motion of the hundreds of cyclists in peak physical condition and the stunning landscapes of France.

Dr. Michael Bunds, professor of geology at UVU, has been an avid cyclist for decades, giving him a unique perspective on the world’s most famous cycling race. This year, he was asked to contribute to the Geo Tour de France, a series of daily articles published during the race analyzing the landscape and geological history of the terrain the racers traverse.

“I’ve had this lifelong passion for cycling,” Bunds said. “The ability to bring the passion for geoscience and education together with the sporting thing is pretty fun.”

The Geo Tour de France is led by faculty at Utrecht University in the Netherlands. Along with the daily articles, the project produces commentaries and lectures that air on television in the Netherlands and the United Kingdom.

Bunds’ article covers Stage 19 of the race, which includes the highest point in the race elevation-wise: a mountain in the French Alps known as the Cime de la Bonette. He also discusses the challenge of measuring elevation, or the distance above sea level, of a point that sits entirely above solid ground. Factors such as Earth’s rotation, distance from the equator, and the density of the material below the surface can affect how its elevation is calculated.

Bunds said the Tour de France is unique among sporting events because it is “both a showcase of and enabled by the geography and the geology of the location.” He said the landscape of the Alps is notable for the relative difference between the high points of the mountain peaks and the depths of the nearby valleys, as well as the variety of geological material found there.

“Through much of the Alps and the Pyrenees, you see rocks that were originally formed in the bottom of the ocean at the top of the mountains,” Bunds said. “That’s an illustration of how dynamic the Earth is.”

Bunds said he loves teaching and living in Utah because of its own geographical and geological variety. He enjoys cycling in the various mountains and canyons across the Wasatch Front, including Little and Big Cottonwood Canyons and Millcreek Canyon. But he’s also traveled to Europe and ridden some of the famous climbs included in the Tour de France, as well as other notable locales.

“Cycling lets me see the world,” Bunds said. “The physical fitness, the challenges — you’re challenged to be the best at it you can. I like the speed and going downhill fast. And it’s almost got this spiritual aspect to it for me. To have gone to some of these really famous climbs in Europe that they’ve used now for 120, 125 years … to have gone and ridden those is like a pilgrimage.”

To read Bunds’ article and to see more from the Geo Tour de France project, visit geo-sports.org. ■

Inside the College of Science’s Human Performance Lab

Training Olympic Gold Medalist Sifan Hassan.

THIS summer, UVU’s Exercise Physiology Laboratory played host to one of the world’s elite athletes. Sifan Hassan, Olympic gold medalist and record-breaking distance runner, and her coach, Tim Rowberry, visited the lab several times each week throughout June 2024. The purpose of these visits? To help Sifan acclimate to the intense heat and humidity she would face during the upcoming competitions in Paris.

Dr. Andrew Creer, who has worked with Hassan and Rowberry since the Tokyo 2020 Olympics (held in 2021), expressed his excitement about finally being able to bring their work into the lab. “It was great to finally get them in the lab and do some actual work,” Dr. Creer shared, highlighting the shift from his usual role in sports nutrition and performance consulting to hands-on testing and assessments.

Inside the Lab: Testing and Assessments

Hassan’s acclimation sessions took place in UVU’s state-of-the-art environmental and altitude chamber. Set to 40°C (104°F) and 40% humidity, the chamber simulated the exact conditions Hassan would experience in Paris. Each session was meticulously planned, with the goal of raising Hassan’s core temperature to 38.5°C (101.3°F) and maintaining it for at least 40 minutes. This was achieved by having her cycle at a low-moderate intensity to avoid increasing her overall running volume.

Throughout each session, Creer and his team collected crucial data, including core temperature, heart rate, body mass, and blood values. These metrics allowed them to monitor Hassan’s sweat rate and changes in plasma volume — key factors in understanding how her body was adapting to the heat.

Enhancing Performance Through Science

The results from these acclimation sessions are more than just numbers on a chart — they directly impact Hassan’s training regimen and performance. Heat acclimation is known to improve athletic performance in hot environments, primarily by increasing plasma volume. This not only enhances thermoregulation by boosting sweat capacity but also contributes to an overall increase in blood volume. These adaptations reduce cardiovascular and thermoregulatory stress during competition, giving athletes like Hassan a crucial edge when competing in challenging conditions.

A Unique Resource in the Region

UVU’s Human Performance Lab stands out as one of the few facilities in the state equipped with an environmental chamber capable of such specialized acclimation sessions. This unique capability was a deciding factor for Rowberry when he was researching heat acclimation protocols for Hassan. Creer said he is proud to offer this resource, noting that it attracts high-profile athletes looking for an edge in their performance.

A World-Class Experience

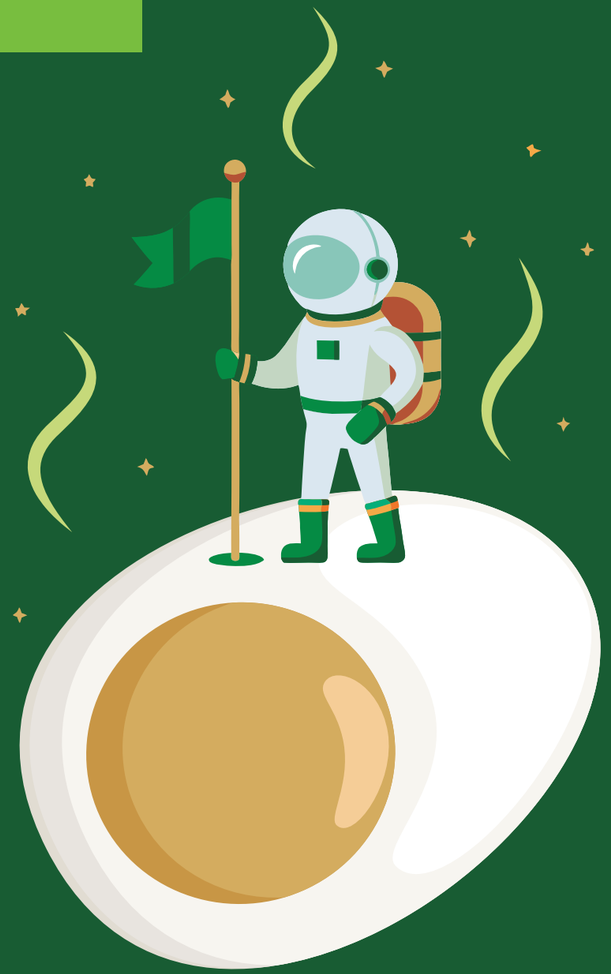
While Creer previously worked with locally -known ultramarathon runners and UVU athletes, his collaboration with Hassan is on a whole different level. “For being the best female distance runner on the planet, Sifan is incredibly grounded and easy to work with,” he shared. “It has truly been a pleasure working with her.”

Inspiring Future Research

The work done with Hassan has sparked new avenues of research within the lab. UVU exercise science students are already investigating the impact of heat acclimation on performance, not only in hot environments but also in milder conditions. Creer said he is excited about the potential findings, which could further enhance the training and performance of athletes at all levels. ■

Gas and Eggs

Stench of a Gas Giant? Nearby Exoplanet Reeks of Rotten Eggs — and That's a Good Thing.



Johns Hopkins University | Peer-Reviewed Publication

A notorious exoplanet known for its extreme weather now has another claim to fame: It smells like rotten eggs. A Johns Hopkins University study using the James Webb Space Telescope has detected hydrogen sulfide in the atmosphere of HD 189733 b, a Jupiter-sized gas giant 64 light-years from Earth.

Hydrogen sulfide, the molecule responsible for the stench, is also a key to understanding how sulfur, a fundamental planetary building block, shapes the formation and composition of gas giants beyond our solar system. The discovery, published in Nature, marks the first confirmed detection of this molecule outside our solar system.

"We're not looking for life here — it's far too hot — but this is a stepping stone," said lead researcher Guangwei Fu. "It helps us understand how different types of planets form." Co-author Joshua Lothringer, formerly of UVU and now at NASA, also contributed to the study.

The team also measured the planet's oxygen and carbon sources — water, carbon dioxide, and carbon monoxide — and ruled out methane, previously thought to be present. Heavy metals were also detected, offering insights into how a planet's metallicity relates to its mass.

HD 189733 b, discovered in 2005, is a "hot Jupiter" orbiting its star every two days at temperatures around 1,700°F. It's infamous for violent weather, including sideways glass rain driven by 5,000 mph winds.

Webb's precision allows scientists to track sulfur and other molecules across exoplanets. "If many hot Jupiters are sulfur-rich, it could reshape our understanding of how they form," Fu said.

Next, the team plans to study sulfur in more exoplanets to explore how it influences their formation and proximity to stars. ■

"Detecting hydrogen sulfide in an exoplanet's atmosphere is a big step forward," said Joshua Lothringer, a co-author of the study and former Utah Valley University researcher now at NASA. "It's not just about the smell– it's about unlocking the chemistry that shapes these distant worlds."

Rare Plants

For Scientists Hope Seed collection will help a rare plant 'persist' in Southern Utah.

In June 2024, nearly 20 volunteers braved 100-plus-degree heat and an unexploded ordnance warning to gather seeds of the endangered Holmgren milkvetch near the White Dome Nature Preserve. The milkvetch (Astragalus holmgreniorum) is unique to the narrow ecological band where the Mojave Desert, Great Basin Desert, and Colorado Plateau meet — and where development now threatens its survival.

"This area produces so many weird and rare species because it's a very narrow band of ecosystem," explained Kody Rominger, a research fellow and program manager at Southern Utah University, who began studying the plant in 2015 as an undergraduate at UVU.

The milkvetch plant grows on specific limestone and shale members of the region's Moenkopi and Chinle formations, and its life cycle hinges on annual precipitation. "If conditions are met, seedlings and second-year adults will emerge," Rominger said, and only the latter flower and produce seeds.

When first listed as endangered in 2001, about 10,000-11,000 plants were estimated range-wide. A 2021 status review pegged the population at just 7,100 — a declines driven largely by land development and invasive grasses like cheatgrass and red brome, which reduce seed output even on protected federal lands. Of the roughly 6,300 acres designated as critical habitat in Utah and Arizona, nearly 500 have already been lost, with another 1,000–1,500 plants projected to disappear without further action.

Milkvetches receive federal protection only on lands with a "federal nexus," so much of their habitat on state-leased land remains vulnerable. "Plants aren't protected on state lands like this without that kind of federal nexus," said Jennifer Lewinsohn of the U.S. Fish and Wildlife Service, which must secure landowner permission for conservation work.

To bolster numbers, Rominger and partners from the Fish and Wildlife Service, The Nature Conservancy, BLM, Red Butte Garden, and others collect seeds for planting on secure sites and long-term storage in seed banks at Red Butte Garden and the federal facility in Fort Collins.

"It's just so small and helpless," Rominger said of the plant. "It took my heart — I really like the species. It would be OK if we stopped building our houses on top of the species, frankly. This best population is going to be gone … We're going to do what we can to save the species." ■

"This best population is going to be gone … We're going to do what we can to save the species."

– Kody Rominger, UVU Alum and SUU Research Fellow

Rooted in Purpose

A vibrant new space at the heart of campus showcases Utah's native flora while supporting student research, waterwise landscaping, and community education.

UVU'S College of Science has unveiled a dynamic addition to its already green campus: a newly redesigned Native Garden that's as beautiful as it is purposeful. Tucked into a thoughtful landscape near the science buildings, the garden invites visitors to explore the colors, textures, and resilience of Utah's native plants, many of which are seldom seen in commercial landscapes.

More than just a pretty space, the Native Garden is a living lab. Every plant in the garden has been carefully cataloged in the UVU Herbarium, creating a robust database for students and faculty studying local botany. With clear ties to UVU courses like Flora of Utah, the garden serves as a hands-on classroom where learning literally takes root.

"UVU's campus is already known for its greenery, but this garden expands our biodiversity and demonstrates the benefits of using native species," said Boston Swan, director of the UVU Greenhouse. "It's not just about aesthetics — it's about sustainability. By reducing water usage and increasing habitat diversity, we're creating a long-term ecological asset for the university."

Designed with four key goals — beauty, research, sustainability, and community engagement — the garden is a model of waterwise landscaping. Carefully selected species were chosen for their ability to thrive in Utah's dry climate with minimal irrigation, making the garden a beacon for environmentally conscious design.

Just as the plants grow, so does student involvement. From initial research and irrigation installation to ongoing maintenance and scientific observation, UVU students have played a central role in bringing the garden to life. Future plans include research projects, plant monitoring, and outreach programs to engage the wider community.

"The Native Garden is a great example of what can happen when science, sustainability, and student leadership intersect," said a botany student involved in the project. "It's a space to learn, to reflect, and to connect with the natural world."

As the garden matures, it will continue to inspire curiosity and conservation, serving as a flourishing reminder of UVU's commitment to innovation, education, and the environment.■

> "By reducing water usage and increasing habitat diversity, we're creating a long-term ecological asset for the university."
> – Boston Swan, UVU Greenhouse Director

$100K Donation to DDx Foundation Helps Further Research Partnership with UVU

This collaboration will directly benefit UVU science students by providing invaluable research opportunities while strengthening ties with the biotech and pharmaceutical industries.

THE UVU College of Science, in partnership with the DDx Foundation, proudly announced a generous $100,000 donation from the Redrock Roadrunners Charity Cup to support research between the DDx Foundation and UVU's contract research organization, InnovaBio. This collaboration directly benefits UVU science students by providing invaluable research opportunities while strengthening ties with the biotech and pharmaceutical industries.

The Charity Cup — the final event of the Sand Hollow Golf Week — featured a Ryder Cup-style competition between alumni teams from the Utah Jazz and Las Vegas Raiders. The annual event supports the DDx Foundation's mission to advance prostate cancer research through the aggregation of clinical data. This year, it also extends its impact to collaborative research with UVU's InnovaBio.

A Symbiotic Partnership Benefiting Students and Industry

The partnership between UVU's InnovaBio and the DDx Foundation is rooted in mutual benefit. DDx requires advanced lab capabilities and expertise to further its basic science initiatives, while UVU's InnovaBio offers students hands-on experience through industry collaborations, preparing them for successful careers in science and health sectors. This collaboration empowers students to engage in meaningful, industry-relevant research while contributing to DDx's healthcare advancements.

"The College of Science at UVU has a strong focus on providing students with the practical skills needed to become productive members of Utah's science and health industries. There is no better way to develop industry-relevant skills than to partner with industry," said Dr. Daniel Horns, dean of the UVU College of Science. "Our partnership with DDx will provide many students with experience working alongside healthcare professionals and will offer opportunities for those students to participate in industry-relevant research projects. These experiences will allow the students to step straight into top-tier jobs or get accepted to top medical schools once they graduate."

Through this partnership, UVU students will engage in cutting-edge biotech research, contributing to DDx's mission of democratizing access to advanced cancer diagnostic technology. The students' work will directly impact healthcare equity, bridging the gap between patient care and innovation in Utah and beyond.

"The DDx Foundation is excited to join forces with UVU to help patients harness their own data as a lifeline to access the most effective cancer therapies," said Matthew O. Leavitt, MD, executive director of the DDx Foundation.

A Shared Mission of Innovation and Impact

This $100,000 donation reflects the shared commitment of UVU's InnovaBio and the DDx Foundation to advancing science, improving patient care, and preparing the next generation of scientists and healthcare professionals to meet the evolving needs of the biotech and pharmaceutical industries. ■

Ryker Eads' Journey in Optical Science

Physics alumnus Ryker Eads ('17) helped put UVU on the map at one of the world's top optics programs—and now pioneers glass innovation at Corning.

WHEN UVU physics alumnus Ryker Eads walked across the commencement stage in 2017, few could have predicted how quickly he would become a standout in the elite world of optical science. But five years later, Eads earned his Ph.D. from the renowned College of Optical Sciences at the University of Arizona, one of the most selective graduate programs in the nation, admitting only 8-10 students from over 300 applicants each year.

Not only did he get in — he stood out.

During a recent conversation between UVU Physics Department Chair Dr. Joe Jensen and the director of the University of Arizona's Steward Observatory, Eads' name came up. The response was immediate. The director lit up, recalling Eads as a star student and a favorite of one of the world's foremost experts in telescope mirror design.

Now a scientist at Corning Incorporated in New York, Eads continues to innovate. His name is listed on a 2020 patent filed during his time at the University of Arizona, describing a novel method for manufacturing large glass lens arrays using gas flow and liquid metal. The technology allows for the precise shaping of convex lenses directly into sheets of molten glass, advancing the kind of large-scale optics needed for space telescopes, advanced imaging systems, and next-generation optical devices.

Behind that technical achievement lies a deeper story: one of curiosity, discipline, and the power of undergraduate mentorship.

During his time at UVU, Eads worked closely with faculty mentors, developing a strong foundation in physics and research. That foundation would become the launchpad for everything that followed.

Eads' story is now helping open doors for future Wolverines. His example, combined with the relationships UVU is building with institutions like the University of Arizona, means that more students will have opportunities to follow in his footsteps.

And as UVU invests in student-centered learning and undergraduate research, Eads' path from Orem to the frontiers of optical science may soon be a well-worn trail.■

DR. JOHN KIDD
Mathematics professor

Where Numbers Matter: Statistical Research Lab Drives Cross-Campus Discovery

BEHIND many of the research successes at Utah Valley University is a quiet powerhouse of support: the Statistical Research Lab, led by Dr. John Kidd from the Department of Mathematics. The lab offers consulting and collaboration services to researchers across campus — helping them ask the right questions, structure their studies, and analyze data with confidence.

"We're not doing the data collection for them," says Dr. Kidd. "We guide the design, recommend collection methods, and analyze results so researchers can trust the story their data tells."

One of the lab's most active partnerships is with UVU's Master of Social Work (MSW) program, where students rely on the lab to strengthen their capstone research projects. In the 2024–25 academic year alone, Dr. Kidd and his student collaborators supported 17 social work studies.

The lab also contributed to an environmental study modeling snail and clam populations in Utah Lake — a project that highlights the lab's interdisciplinary impact. "We're seeing real opportunities for collaboration across science, social science, and health," Kidd says.

Nine College of Science students worked in the lab over the past year, gaining hands-on experience in consulting, data modeling, and real-world research. "It's a space where students grow as thinkers and scientists while providing an essential service to the university," says Dr. Kidd.■

Want to swing your driver faster? Start recycling more cardboard

WE promise that headline is not clickbait — it's true! The more cardboard you recycle, the better chance you have of increasing your swing speed. Let an expert explain.

One of golf's biggest myths is that your grip pressure should stay light throughout the swing. Not so, said Tyler Standifird, a biomechanics professor at UVU. After testing 130 golfers, including elite pros, he found that while grip pressure starts light (around three out of 10), it increases significantly during the swing — especially in better players.

In fact, during the transition from backswing to downswing, skilled golfers apply more pressure with their lead hand — up to 73% of their max grip strength, compared to 62% in average players. "Think of it like a cycle," said Standifird. "Start light, relax at the top, then squeeze hard to power through the downswing."

Another key factor? Grip circumference. It's not about hand size — it's about strength. Larger grips can boost grip strength instantly, giving players more control and better pressure patterns.

So how do you build grip strength? One eco-friendly way: Tear up cardboard boxes for recycling. You can also hit the gym. Karen Palacios-Jansen, a Golf Digest-Certified Fitness Trainer, explained that your hands and the club form a "grip bond," like a Chinese finger trap. The tighter the pressure at the right moment, the more stable and powerful your swing.

If your grip is weak or mistimed, the club twists at impact. But with proper grip strength and timing, you'll swing faster and strike more cleanly. Two simple gym exercises can help you build that strength — and learn when to apply it.■

The Science Behind Golf Shoes: Why Grip Matters

A human movement expert warned that the wrong golf shoes could be holding players back. Tyler Standifird, a UVU professor of biomechanics and kinesiology, recently discussed the topic with GolfWRX alongside BodiTrak co-founder Terry Hashimoto.

The duo emphasized the importance of friction between the shoe and the ground. "The name of the game is friction," said Standifird. "A secure connection lets players push into the ground confidently without slipping."

He explained that during the backswing, the trail foot must push hard into the ground. If the shoe lacks grip — like when standing on ice — the foot slips, reducing power and stability. The coefficient of friction, or how "sticky" the surfaces are, plays a crucial role. Cleats and their placement can significantly affect performance.

Standifird noted that while some players do fine in spikeless shoes, they might be limiting their potential. "If your shoe only allows 100 Newtons of force, but you can generate 120, you're either slipping or holding back," he said. "It's like a basketball player slowing down to avoid slipping — athleticism gets dialed down."

He concluded that golfers may unknowingly be compromising their swing due to inadequate footwear.■

Silver in Paris: UVU's iGEM Team Shines on the Global Stage

Students use synthetic biology to engineer real-world solutions, earning international recognition along the way.

UVU'S International Genetically Engineered Machine (iGEM) team earned a silver medal for the second year in a row at the world's premier synthetic biology competition:, the 2024 iGEM Grand Jamboree in Paris, France. Competing against 400 teams and more than 4,500 students from across the globe, the UVU team stood out with their innovative project "Bloom Busters," a solution designed to help restore water health in Utah Lake.

The project tackled the growing problem of harmful algal blooms by engineering the algae species Chlamydomonas reinhardtii to absorb excess nutrients from wastewater — specifically phosphorus and nitrogen — that feed the toxic blooms. Over 10 months, the team designed, tested, and refined this biotechnological solution. They successfully increased phosphorus uptake and are working to improve nitrogen absorption.

But iGEM is about more than just lab work. The 15-member team, made up of junior and senior students in biotechnology and bioinformatics, went beyond the bench by building a project website, producing videos, and engaging the local community at more than 36 outreach events. The competition culminated in a four-day showcase of innovation in Paris, where students presented their work on a global stage and connected with peers solving real-world problems through synthetic biology.

"This was a life-changing experience. Working on a long-term project with a team of peer scientists gave me the confidence that I belong in this community," said UVU senior Jonathan Kinross. "Being seen on the same level as scientists from around the world opened my eyes to what's possible."

Senior Elise Bennett echoed that sentiment, highlighting the value of tackling a local challenge with international-level rigor.

"This opportunity showed me that student-driven research at UVU can go toe-to-toe with Ivy League and global teams," Bennett said. "It's an experience that changed my career goals. I now plan to pursue graduate work in synthetic biology."

Participation in iGEM reflects UVU's commitment to high-impact undergraduate research. The hands-on nature of this experience — applying cutting-edge techniques to solve real problems — equips students with technical skills and the confidence and collaborative mindset needed to lead in the sciences.■

"iGEM showed me that student research at UVU can compete on the world stage – and win."
– Elise Bennett, Senior, UVU iGEM Team

How a UVU Alum Became a Global Voice in Climate Science

UVU alumna Dr. Emily Judd is helping the world understand 500 million years of planetary temperature, starting with a passion for research discovered on campus.

WHEN Dr. Emily Judd's landmark paleoclimate study appeared in Science and Smithsonian Magazine, her former mentor at UVU wasn't surprised. Dr. Alessandro Zanazzi had seen the spark long before the spotlight.

"Emily was incredibly intelligent and deeply passionate about Earth sciences," said Zanazzi, a UVU earth science professor. "Even as a student, she could grasp difficult concepts quickly — and often explained them better than I could in class."

That rare mix of talent and curiosity emerged early in Judd's undergraduate journey. Originally from Massachusetts, she came to UVU looking for a fresh start, unaware that the opportunities she'd find here would set the course for a career in world-class science.

In Zanazzi's isotope geochemistry lab, Judd dove into paleoclimate research, contributing to projects that helped her discover a love for data, storytelling, and the Earth's ancient history. Presenting at conferences and engaging with advanced coursework helped her develop technical skills and confidence.

Now a published researcher helping to reconstruct half a billion years of Earth's temperature history, Judd represents the power of opportunity and the resilience to pursue it.

"Emily's success is a reminder that great science doesn't only come from the Ivy League," Zanazzi said. "It starts wherever there's curiosity, support, and determination."■

EMILY JUDD
Earth Science Alumni

"Emily's success is a reminder that great science doesn't only come from the Ivy League. It starts wherever there's curiosity, support, and determination."
–Dr. Alessandro Zanazzi, UVU Earth Science Professor

Utah Valley University Receives

$1.9 Million Grant to Support Underrepresented STEM Students

Utah Valley University's College of Science has been awarded a $1.9 million grant from the National Science Foundation's Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program.

UTAH Valley University's (UVU) College of Science has been awarded a $1.9 million grant from the National Science Foundation's Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM) program. The grant will support the retention and graduation of high-achieving, low-income students pursuing STEM degrees at UVU.

The six-year project aims to address attrition factors such as lengthy time to completion, excessive part-time work, and feelings of isolation. By providing scholarships to at least 32 unique full-time students, the project seeks to improve the retention and graduation rates of students majoring in biology, biotechnology, botany, microbiology, or bioinformatics.

Dr. Geoff Zahn, associate professor in UVU's Department of Biology, said, "Students in our previous S-STEM program had a graduation rate of 95%, highlighting the strength of mentored research. This new grant reflects the strength of the undergraduate research culture we have built in the biology department, and it builds on our past successes."

The project will offer scholarship recipients the opportunity to participate in faculty-mentored research programs, teaching assistantships, internships, and other activities. Weekly cohort meetings with faculty, administrators, and industry professionals, as well as professional development opportunities, will further enhance the students' education and preparation for the workforce and graduate school.

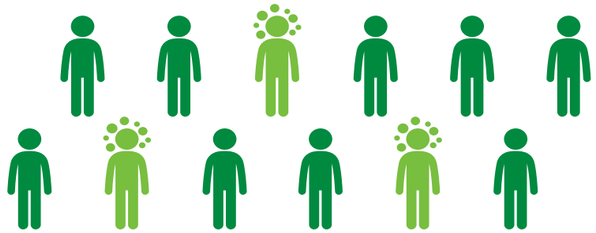
Dr. Daniel Horns, dean of UVU's College of Science, emphasized the importance of these networks, stating, "The S-STEM scholars will be able to cultivate supportive networks with faculty members and other students, and these networks will provide them with intellectual and emotional support, which will also help ensure that they graduate."

The overall goal of the project is to increase STEM degree completion among low income, high-achieving undergraduates with demonstrated financial need.■

Scan for more information.

Operation Outbreak : Modeling Pandemic Response Through Simulation

Science Students Take Infectious Disease Education on the Road With App-Based Pandemic Simulations.



What would you do if a new virus swept through your school—and you were suddenly responsible for saving your community?

WHAT would you do if a new virus swept through your school and you were suddenly responsible for saving your community?

That's the question high school students across Utah have been grappling with — virtually — thanks to Operation Outbreak, an immersive, app-based pandemic simulation led by UVU College of Science students. Designed to educate participants on the dynamics of infectious disease spread, public policy, and individual responsibility, the program turns classrooms into crisis centers where students step into roles like health officials, mayors, shop owners, and everyday citizens trying to navigate the chaos of a virtual epidemic.

The simulation uses Bluetooth technology to transmit a "virtual pathogen" between participants' smartphones, mimicking real-world proximity-based virus spread. Students can monitor their infection status in real time via emojis on their avatars, scan QR codes to get virtual vaccines or diagnostic tests, and work together to mitigate the outbreak. Behind the scenes, UVU students coordinate the simulation setup, guide the experience, and help participants debrief what they've learned.

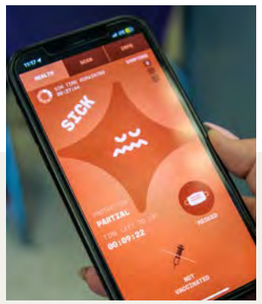
"Watching high schoolers make real-time decisions based on incomplete data, public announcements, or misinformation — just like in a real pandemic — is both eye-opening and empowering," said one UVU student leader involved in the program. "It's one thing to read about how a virus spreads, and another to feel the urgency as your classmates start turning 'sick' on your screen."

Operation Outbreak began as a collaborative research and outreach initiative led by The Broad Institute of Harvard and MIT. Now, with help from UVU students and faculty, it's being adapted for high school audiences throughout the state. Program Manager Kian Sani sees the future of the project heading toward a more open-access model. "We're working through what's the best level of supervision that may or may not be needed," saidys Sani. "The goal is for any school or organization to be able to run their own simulation."

The app doesn't just simulate sickness — it models the impact of decisions. Organizers can modify key parameters such as transmission rates, duration, and availability of interventions. Each simulation generates data on how the outbreak played out: who got sick, how quickly it spread, which interventions worked, and how social behaviors influenced outcomes. With this "God View" perspective, both students and educators gain insight into the systems-level complexity of public health responses.

UVU, the experience has become a unique way for science students to blend their academic training with hands-on outreach. From biology and public health majors to data science and pre-med students, participants help bring scientific literacy to life in local communities, preparing not just for future pandemics, but for thoughtful, informed citizenship.

And in a world that's seen firsthand how quickly things can change, that's knowledge worth spreading.■



Celebrating Excellence:

PACE Distinguished Employee Award Winners at UVU

Recognizing dedication, innovation, and service that elevate our university community.

AT UVU, excellence in teaching, service, and leadership does not go unnoticed. Each year, the Professional Association of Campus Employees (PACE) honors outstanding faculty and staff who go above and beyond to make UVU a better place. This year's PACE Distinguished Employee Award winners are a true testament to the high standards and deep commitment that shape our vibrant campus community.

Full-Time Award Winner:

- Monica Ferreyra: As the director of Academic Advising in the College of Science, Ferreyra has been a driving force behind providing exceptional support and guidance to students. Her unwavering dedication to student success and her innovative approaches to academic advising have made a profound impact on the College of Science, ensuring that students are equipped to achieve their academic goals.

Provost's Distinguished Teaching Award:

- Dr. Alessandro Zanazzi | Earth Science Dept, College of Science: Dr. Zanazzi's commitment to fostering a deep understanding of earth science in his students has earned him this prestigious award. His innovative teaching methods and dedication to student success make him a cornerstone of UVU's academic excellence.

Provost's Distinguished Employee Award:

- Dr. Lindsey Gerber | Mathematical/Quantitative Reasoning, College of Science
- Dr. Debra Ward | Mathematics, College of Science: These faculty members, in collaboration, have made substantial contributions to UVU's academic mission. Their leadership and advocacy for general education programs enrich the learning environment for all students, ensuring that UVU's impact extends far beyond the classroom.

MONICA FERREYRA
Director of Academic Advising

DR. LINDSEY GERBER
Mathematical/ Quantitative Reasoning

DR. ALESSANDRO ZANAZZI
Earth Science

DR. DEBRA WARD
Mathematics

Congratulations to all the awardees! Your hard work, passion, and commitment continue to inspire and positively impact UVU. We are proud to celebrate your achievements and the difference you make every day.

Celebrating Exceptional Achievement

This year's recipients of the Outstanding Student Awards.

THIS year's College of Science Outstanding Student Awards were a momentous occasion, shining a spotlight on the remarkable achievements and contributions of 18 outstanding COS students. These recipients have embodied dedication, passion, and scholarly excellence within their respective fields, setting a standard for academic and personal growth. Their commitment to intellectual curiosity and the pursuit of knowledge has left an indelible mark on the college and inspired fellow students and faculty members.

Each award recipient exemplifies the fundamental values of scholarship, innovation, and leadership. Through pursuits of academic excellence, groundbreaking research endeavors, and engagement in extracurricular activities, these individuals have excelled in their studies and contributed to the advancement of scientific knowledge.

Whether unraveling the mysteries of the cosmos or devising solutions to global challenges, these students have meaningfully impacted the College of Science and will undoubtedly do the same in their careers and respective fields. Their passion, perseverance, and commitment to excellence make them trailblazers and role models, igniting a sense of scientific discovery and innovation that extends far beyond college boundaries.■

LYNLEY PETERSEN
Mathematics & Quantitative Reasoning

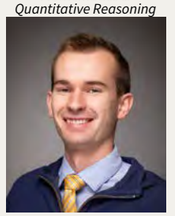
BARBARA JETTON
Biology

BRITTON BORGET
Mathematics

CASSANDRA BEDDES
Chemistry

ELISE BENNETT
Biology

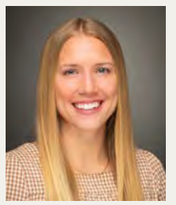
KENDALL ROSENKRANTZ
Physics



KURT DECKER
Mathematics & Quantitative Reasoning

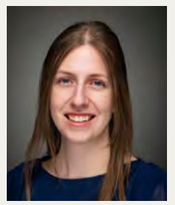
SARAH MARCHANT
Earth Science

Aljexi N. Olson
Earth Science



MEGAN ASTLE BYE
Exercise Science & Outdoor Recreation

TYLER O'LOUGHLIN
Physics



CAELIE NOALL
Exercise Science & Outdoor Recreation

JESS BARCLAY
Exercise Science & Outdoor Recreation

NATHAN KLUNDT
Mathematics

OLIVIA FRARY
Biology

SARAH ADAMS
Chemistry

TABITHA WEIR
Biology

ULISES BOMBELA
Exercise Science & Outdoor Recreation

Driven by Curiosity: Tessa Black's Journey from Aspiring Physician to Pioneering Scientist

College of Science Salutatorian Tessa Black redefines undergraduate excellence through groundbreaking biochemical research, national recognition, and a relentless passion for discovery.

TESSA BLACK
Alumni

Tessa's exceptional work has earned her the 2024 American Chemical Society Utah Undergraduate Award.

IN a College of Science filled with high achievers, **Tessa Black** stands out as a once-in-a-generation student — one whose talent, drive, and intellectual curiosity have set a new benchmark for undergraduate achievement at UVU.

"She is perhaps the most outstanding student I've taught in nearly 29 years, and that's out of more than 6,200 students," said her faculty mentor, Craig Thulin, a seasoned researcher and educator. "She's brilliant in the classroom, fearless in the lab, and genuinely passionate about science."

Black's academic record is nearly flawless. She scored perfectly on all her biochemistry midterms and missed only one question on the final exam, a feat described by faculty as unheard of. She continued to lead her cohorts in advanced courses such as Biochemistry II and Proteomics. But her brilliance extends far beyond test scores.

In the lab, Black has invented a novel analytical biochemistry technique: the **Midwestern blot**, a method designed to elucidate pigment-binding proteins. It's a technique with potential applications in both academic and industry research, and one that she has already shared at high-profile venues. She presented her findings at the Utah Conference on Undergraduate Research and the international meeting of the Protein Society in Vancouver, British Columbia.

Currently, Black is preparing a manuscript for publication that formally describes the Midwestern blot. In parallel, she's collaborating with **Goldwater Scholar Kyri Forman** on pigment research related to Monarch butterflies and leading a third research project exploring the substrate diversification of **tyrosinase enzymes,** which she plans to present at this summer's Protein Society meeting in San Francisco.

Black's exceptional work has earned her the **2024 American Chemical Society Utah Undergraduate Award.** She has also been selected for the highly competitive **InterMountain Post-Baccalaureate Research Education Program (IM-PREP)** at the University of Utah — an intensive, research-focused program designed to prepare underrepresented students for top-tier biomedical Ph.D. programs.

Interestingly, Black didn't originally plan on a career in research. When she first enrolled at UVU, she intended to become a physician. But over time, her exposure to faculty-led research shifted her focus. "I realized that what truly motivates me is curiosity — understanding how things work at the molecular level," she said. That realization led her to change course and pursue a path in biochemistry, with a particular interest in **protein evolution.**

As the **2024 College of Science salutatorian,** Black embodies the curiosity of a scientist well. "She's not just a talented student," her mentor reflected. "She's the kind of scientist who's going to make a real difference in the world."■

Cori Baille and UVU Leaders Recognized for Advancing Women in Tech

UVU microbiology student honored by Women Tech Council for her early impact and future promise in STEM.

CORI BAILLE
Microbiology student

CORI Baille, a microbiology major in UVU's College of Science, was named one of seven **Rising Stars** by the Women Tech Council, a prestigious recognition celebrating women creating a powerful impact early in their STEM journeys.

Chosen from among hundreds of nominees, Baille stood out for her academic excellence, passion for science, and commitment to mentorship and research. She also received a **Student Pathway Award,** honoring women in STEM degree programs who are driving change in tech.

"This recognition means a lot," Baille shared. "It's not just about me — it's about showing young women that there's a place for them in STEM. I want to help build that path."

She was recognized alongside a group of women whose achievements span disciplines —from Mars Rover engineering and Marvel Studios technology to national science policy and social media infrastructure. The awards highlighted five Ph.D.s, 15 master's degrees, seven C-suite executives, and eight patents, showcasing the scale and diversity of innovation driven by women across Utah's tech sector.

UVU's presence at the event didn't stop with student honors. **Dr. Daniel Horns,** dean of the College of Science, and **Val Peterson,** vice president of Administration and Strategic Relations, were honored for their ongoing commitments to advancing women in STEM. Their leadership reflects a decade of support for inclusive excellence and strategic growth in tech-related education.

Held as a once-in-a-decade celebration, this year's Women Tech Council Awards also recognized 30 longtime advocates who have championed women in tech for more than 10 years, building a legacy of mentorship, leadership, and opportunity across the state.

Baille's recognition and UVU's multiple honorees underscore the university's influence in STEM and its commitment to preparing students to lead with innovation, confidence, and purpose.■

"It's not just about me—it's about showing young women that there's a place for them in STEM."
—Cori Baille, UVU Microbiology Major and Women Tech Council Rising Star

JOURNEY FROM MOTHERHOOD TO MEDICINE

After a decade away from school, Carly Stucki returned to education with a vision to lead, serve, and show her children that learning never ends. Her path through UVU's College of Science has been marked by resilience, research, and relentless purpose.

TEN years after graduating high school, Carly Stucki felt a quiet but persistent pull — a desire to grow, lead, and contribute to the world beyond her role as a stay-at-home mother. The turning point came during the COVID-19 pandemic, as she welcomed her third child and reflected on how quickly life can change. Her husband's leg injury, combined with her desire to model lifelong learning for her children, sparked a bold decision: return to school and pursue a career in dentistry.

"I wanted to show my kids that growth doesn't stop in adulthood," Stucki said. "That service, learning, and leadership can exist alongside motherhood."

What followed was a life-changing journey through UVU's College of Science, where Stucki found a rigorous academic environment, a deeply supportive community, and the resources to balance family life with academic success. Drawn to UVU's inclusive and welcoming atmosphere, Stucki quickly found her place — and her purpose.

She credits the university's pre-dental advising and academic support network for helping her thrive as a non-traditional student. "The College of Science prepared me not only to succeed, but to excel," she said. "I hit my dream DAT score and was accepted to my top three dental schools. I could not have done that without UVU."

Along the way, Stucki built meaningful relationships with faculty and mentors who shaped her confidence and fueled her determination. "Dr. Xiaoyi Ji was my very first professor at UVU. She lifted me up when I was full of doubt and helped me believe I belonged. And she's just one of many," Stucki recalled. She also praised the professors, advisors, and staff members who empowered her, from Douglas Watson's focused pre-dental guidance to Emilee Mabrey's support through the Student Success Center.

Beyond the classroom, Stucki dove into research and leadership. Her chemistry education research with Dr. Emily Heider emphasized how hands-on learning enhances comprehension — insights she plans to carry forward as a future healthcare provider. She also held leadership roles in the Women of Physical Sciences club, forging friendships and finding her voice as a woman in STEM.

That identity came with challenges. "Being in a classroom with younger students — while parenting four kids — I wrestled with imposter syndrome," she said. "But I've come to see my non-traditional path as a strength. My experiences help me stay grounded in why I'm here: to grow, to serve, and to show my kids that learning never stops."

Stucki is now preparing for dental school, but her story at UVU leaves a lasting impact. To the next generation of women in STEM, her message is clear: **Start now — don't wait to feel ready.** "STEM careers offer flexibility, security, and the chance to lead," she said. "Your experience matters. Your voice matters. Find your community and go after it."

Her success is not just a personal triumph but also a reflection of UVU's mission to support every kind of learner, and to make excellence accessible for those bold enough to pursue it.■

"Your life experience matters, your voice matters, and your path doesn't have to look like anyone else's."

– Carly Stucki

College Was the One Dream I Hadn't Chased

—Until Now

After years of running successful businesses and helping others feel confident, Kyra Anderson faced her biggest fear — enrolling in college — and discovered a whole new kind of strength.

KYRA Anderson had built a life that looked like freedom. She owned two small businesses, worked for herself, hiked on weekends, and spent her days helping others look and feel confident as a professional hairstylist. But when a close friend asked her during a heart-to-heart what she was still afraid to do, Anderson's answer surprised them both: "College."

"It just popped into my head," Anderson said. "I had done everything else I wanted to do. But school — it was something I'd dreamed about but never felt I could pull off."

At 26 years old, Anderson decided it was time to rewrite that story. She had already taken bold steps toward a new path, becoming certified in personal training and nutrition, completing an internship at a local gym, and developing a passion for health and wellness. Still, the idea of enrolling in college felt overwhelming.

"I'd tried before," she explained. "But I didn't know where to start, and it was scary to admit I needed help. I didn't even know who to ask."

Everything changed after a friend who graduated from UVU encouraged her to reach out. One phone call led to another, and soon Anderson was walking through the doors of UVU's administration building — no appointment, just courage. She was greeted by a first-year advisor who took the time to sit down, explain the process, and help Anderson apply.

"UVU made everything feel possible," Anderson said. "From the beginning, it felt like everyone was cheering for me. It's not just professors — it's every staff member. They want you to succeed in life, not just in class."

Now a student in exercise science and outdoor recreation, Anderson is thriving. She's still exploring exactly where her studies will take her — perhaps personal training, perhaps something she hasn't discovered yet. But this time, she's not afraid to ask.

"Coming to UVU helped me face a fear I'd carried for nearly 10 years," she said. "It feels so good to finally be here." ■

"Confidence doesn't come from having no fear – it comes from being scared and doing it anyway."
– Kyra Anderson, Exercise Science and Outdoor Recreation Student

Revitalizing Nature

Collaboration with Students and Orem City Brings New Life to the Arboretum Trail and Celebrate Arbor Day with a Bold Environmental Vision

DR. Ashley Egan, a UVU environmental science professor, has partnered with Orem City to revitalize the Orem City Arboretum Discovery Trail at Orem City Park. This yearlong collaboration transformed the space into a vibrant, educational outdoor community experience, thanks to the work of environmental science students and a digital media capstone group advised by Paul Cheney.

In April 2025, Orem City celebrated the project, recognizing the students' contributions and creativity. The project marks a significant milestone in the city's commitment to enhancing green spaces and environmental education.

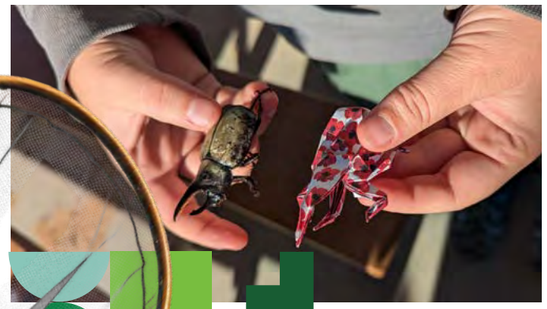
The Arboretum Discovery Trail is now more accessible and enriched with informative signage and design elements. Egan also participated in Utah City's Arbor Day celebrations in April, where the city aimed to plant over 1,000 trees to enhance local biodiversity, improve water sustainability, and reduce urban heat effects.

"This project is not just about beautifying the landscape — it's about educating the community and fostering a deeper connection to the environment. It's inspiring to see my students lead the way in making lasting changes to our local ecosystem." — Dr. Ashley Egan, UVU Environmental Science Professor ■

Bugs, Botany, and Bonding: UVU Students Explore Utah's Wild Landscapes

A collaborative field expedition brings biology students into nature for hands-on learning, expert mentorship, and late-night talks under the stars

OVER a weekend in mid-September 2024, 20 UVU students packed their gear and curiosity for a unique field experience that blended two cornerstone biology courses: field botany and entomology. The trip, co-led by Dr. Carl Hjelmen and Dr. Michael Rotter, took students from the red sands of Coral Pink Sand Dunes to the alpine meadows of Fish Lake National Forest for three days of immersive, hands-on science.



Botany students, under the guidance of Rotter, focused on identifying, collecting, and pressing plant specimens directly in the field. Entomology students used a variety of collection techniques during both daytime and nighttime hours, working to gather and study insects in vastly different environments.

The experience was not only academically enriching but also built a strong sense of community. Students shared group meals, warmed up around campfires, and connected through music, origami, and lively conversations — some even diving into extraterrestrial theories under the night sky.

A special addition to the trip was the participation of Dr. Lauren Weidner, a forensic entomologist from Arizona State University, who joined the group for a night of insect collection. Her presence offered additional insight into applied entomology and reinforced the value of professional exposure in the field.

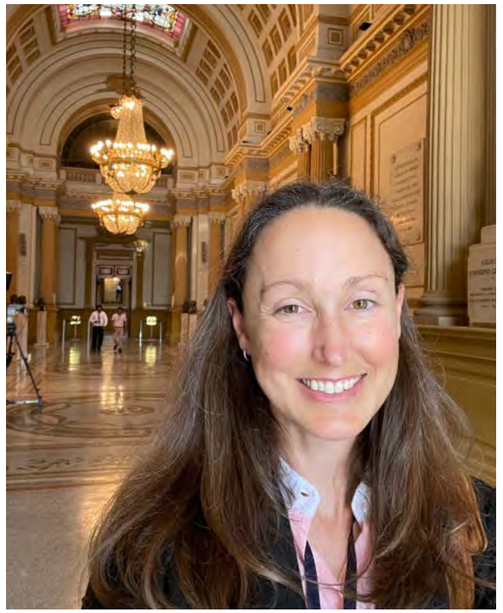
The success of the trip has sparked student interest in making it a recurring opportunity. The combination of experiential learning, real-world applications, and personal connection exemplified the power of field-based education in the College of Science. ■

Science Faculty Members Launch Global Sustainability Projects Through UNESCO Chair

Interdisciplinary teams tackle water quality, flooding, and microplastic pollution in Peru, forging research partnerships that serve both local and global communities.

THE inaugural Executive Board meeting of UVU's newly established **UNESCO Chair on AI and Environmental Stewardship for Sustainable Futures** marked a pivotal moment for the university's role in global research. **Science faculty members** from UVU's earth science, chemistry, and biology departments gathered to propose innovative, interdisciplinary projects that blend environmental stewardship with cutting-edge technology.

Presiding over the meeting was **Dr. Baldomero Lago, UNESCO Chair director** and **UVU's chief international officer,** whose vision has been instrumental in launching the Chair and building global academic partnerships. "This work reflects the spirit of engaged learning and international collaboration that UVU is known for," said Lago. "Our faculty are addressing problems that matter — locally and globally."



Two working subcommittees emerged from the meeting: one focused on **AI and education,** and the other on **social and environmental sciences.** These groups are building bridges with global partners and leveraging external funding to tackle challenges ranging from climate resilience to clean water access.

One such initiative centers on Peru, where science faculty members and international collaborators address urgent water issues. On the western side of Lima, flooding in municipalities such as Santa Eulalia, Chosica, and Trujillo is disrupting infrastructure, agriculture, and drinking water systems. UVU-affiliated researchers are studying the causes and consequences of excess water and working alongside local governments to develop practical, community-informed solutions.

A separate research team is examining **microplastic pollution** and **trace metal contamination** in Peruvian freshwater systems, including the Rímac River and Lake Titicaca. In collaboration with Peruvian institutions like the Universidad Nacional de Educación and the National University of Trujillo, the team is testing rivers, springs, reservoirs, and tap water to trace contaminants and understand their impact on human and environmental health.

Dr. Sally Rocks, a chemist and microplastics specialist, is leading efforts to identify plastic particles in both natural water sources and household water systems. Her work includes testing freshwater fish to assess how microplastics enter the food chain.

Dr. Eddy Cadet, an earth scientist and expert in trace metals, is studying the presence of heavy metals and other pollutants in these same waters.

Meanwhile, **Dr. Lauren Brooks,** a biologist specializing in residual and fecal water contaminants, is working to understand the microbial and biological threats present in untreated or poorly treated water sources.

"Microplastics are invisible to the naked eye but may carry significant health risks," said Rocks. "Our goal is to identify contamination points, raise awareness, and lay the foundation for policy change."

This work gained further momentum during a visit to the Peruvian Congress, where UVU researchers engaged directly with policymakers and local communities. These dialogues helped raise public awareness and open future pathways for collaborative action.

Led by faculty like Dr. Hilary Hungerford (earth science), Dr. Vi Vin (behavioral and social sciences), Dr. Kevin McCarthy (emergency services), Dr. Cheung Chau (music), and now joined by Rocks, Cadet, and Brooks, UVU's participation in the UNESCO Chair showcases the university's growing influence in global sustainability research. As new initiatives take shape, **science faculty members** remain committed to applying science for sustainable development at home and abroad.■

"Our goal is to identify contamination points, raise awareness, and lay the foundation for policy change."
– Dr. Sally Rocks

Education Off the Grid

Hosted at UVU's Capitol Reef Field Station, Nature to the Classroom is a transformative learning experience powered by students and faculty.

HOW do you teach sustainability, ecology, and experiential learning in a way that sticks? For over a decade, Scott D. Williams, a faculty member in UVU's Department of Exercise Science and Outdoor Recreation, has helped answer that question through Nature to the Classroom (NTTC), a faculty- and student-led initiative that's reshaping K-12 education by bringing nature-based learning into the heart of the classroom.

Since 2014, NTTC has hosted more than 150 educators from across the Rocky Mountain region — from elementary teachers and principals to high school science instructors — creating an ecosystem of ideas that go well beyond textbooks. The centerpiece of the program is a unique conference held twice a year at the UVU Capitol Reef Field Station, an off-grid, state-of-the-art facility nestled inside Capitol Reef National Park. There, surrounded by red rock cliffs and a stunning dark sky, educators dive deep into workshops on sustainability, ecology, experiential education, and Leave No Trace principles.

What makes NTTC stand out is its student-powered model. UVU students from the outdoor recreation program don't just attend — they plan, market, and facilitate the entire experience. From managing logistics to leading hands-on workshops, students apply classroom knowledge in real time, gaining professional experience while making a lasting impact.

"NTTC is the embodiment of engaged learning," said Williams. "Our students become leaders, our faculty serve as mentors, and our K-12 participants leave with real tools to transform their classrooms."

The impact is clear. One participant shared, "The experience was nothing short of paradigm-shifting. The content, the facilitators, and the facility have definitely influenced the way I teach and the way I interact with nature and my students." Another said simply, "It changed my life."

NTTC is more than a conference — it's a growing movement. Through an active social media presence, ongoing workshops, and a thriving network of alumni educators, the program is sparking a lasting shift in how science, sustainability, and stewardship are taught in schools.

It's a model UVU is proud to support — where learning extends beyond the walls of a classroom, into a national park, into a student's career, and into the hands of every child reached by the teachers NTTC inspires. ■

Opting for Life: UVU Researchers Explore Global Organ Donation Policies and Their Impact on Transplant Rates

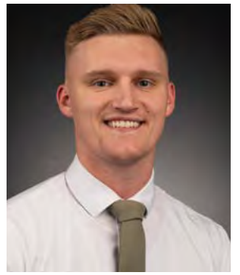
THE global demand for donor organs is staggering — over 90% of the need remains unmet each year. For patients awaiting life-saving transplants, the wait can be agonizing and, for some, fatal. But at UVU, Dr. Ruhul Kuddus and his team of undergraduate researchers have undertaken a groundbreaking study to examine how national policies on organ donation may play a critical role in addressing this global shortage.

The research, titled "Impact of the Opt-In and Opt-Out Organ Donation Policies on Recovery of Organ Transplantation After the Decline During the COVID-19 Pandemic," looked at transplant data from 66 countries spanning a nine-year period, including pre-pandemic years, the pandemic itself, and the years following.

The team, including students Brad Theel, Joshua Hammond, Mohammad Islam, and Kuddus, compared countries with opt-in policies (where consent must be explicitly given) to those with opt-out policies (where consent is presumed unless formally declined). Their analysis aimed to assess how these differing consent models affected organ procurement and transplantation rates.

The results were significant: Countries with opt-out policies showed higher average transplant rates — 12.95 transplants per million people — across six of the 10 organ types studied. This finding suggests that presumed consent may be an effective way to increase organ donation and transplantation, offering hope for addressing the severe organ shortages worldwide.

"I've always been interested in science, but this project opened my eyes to the impact that policy has on healthcare outcomes," said Theel, a key contributor to the study. "We were able to see how different consent policies in various countries directly affected transplant rates, and that was an eye-opener for me. It's clear that policy decisions can have a profound impact on people's lives."



BRAD THEEL
Biology student

JOSH HAMMOND
Biology student

Hammond noted how the research gave him a deeper understanding of public health and global healthcare systems. "The most surprising thing for me was seeing Hungary, a country I've visited, grouped with low-income nations in the analysis. Watching the data come together and seeing countries I've been to fit into the larger picture was fascinating," he reflected. "This experience has shaped my perspective on healthcare. I always thought about medicine in terms of what happens in the lab or with patients directly, but now I see how crucial it is to understand the policies that make these advances possible."

Hammond's newfound interest in public health policy has also influenced his career goals. "Studying public health policy, rather than focusing purely on lab-based research, has made me realize how important it is to advocate for the right policies in healthcare," Hammond said. "These policies enable life-saving procedures to take place, and I now want to be a physician who advocates for change in that regard."

For Theel, the research has broadened his horizons. "I never really thought about how policies in different countries could impact healthcare outcomes on such a large scale," he said. "Now I can see that by understanding how policies work, we can make a significant impact on public health. It's not just about medical procedures — it's about making sure those procedures are supported by the right policies."

"This research has the potential to influence organ donation policies around the world," said Kuddus, who mentored the team throughout the study. "Our findings are showing that policies can directly impact how many lives are saved through organ transplantation. That's something we're all incredibly proud of."

The team's research is set to be presented at the 2025 National Conference on Undergraduate Research (NCUR) in Pittsburgh, Pennsylvania, and will be published in the JAMA Health Forum. For Theel and Hammond, their participation in this study has opened new doors in their academic and career pursuits, and they both said they are eager to continue exploring the intersection of science, policy, and healthcare. ■

Finding His Focus: Tyler O'Loughlin's Journey From Uncertainty to MD Anderson

From early academic detours to cutting-edge undergraduate research, physics student Tyler O'Loughlin discovered his path in medical physics and earned a place at one of the nation's top cancer research centers.

WHEN Tyler O'Loughlin started college, he wasn't entirely sure where he was headed — only that it had to involve science. Driven by a deep curiosity about how the universe and the human body function, he cycled through majors like bioengineering and biochemistry, searching for the right fit. It wasn't until a required course — Physics 2220 at UVU — that everything changed. "That class hooked me," O'Loughlin said. "I didn't leave physics from that point on."

His path to medical physics wasn't a straight line, but once he found it, it was unmistakable. Now, after years of research and relentless learning, O'Loughlin has accepted an offer to attend the University of Texas MD Anderson Cancer Center, one of the top medical physics programs in the country. He was also offered admission to Washington University in St. Louis and Wake Forest University, and interviewed at several others. But MD Anderson's mission of "Making Cancer History®" resonated deeply with O'Loughlin's passion to use science in the service of healing.

Before that came the groundwork: transferring to UVU, discovering a passion for physics, and immersing himself in undergraduate research. O'Loughlin's introduction to research began with a conversation. A friend introduced him to UVU physics professor Dr. Cameron Hart. Together, they crafted an ambitious project at the intersection of optics, tomography, and medical imaging. "We developed a project idea that really morphed and developed over time," he said. "I'm really proud of how it worked out."

That project — "A Modified Tomography Algorithm for the Reconstruction of 3D Holographic Images using Scattered Light Signals" — involved building a rotating beam profiler to collect data from multiple angles and developing an optimized algorithm for 3D reconstruction. It was a daunting task that required coding, system design, and an in-depth understanding of imaging physics.

And like most research, it didn't always go according to plan.

"I built a test phantom out of UV resin months before our imaging system was ready," O'Loughlin said. "When we finally tested it, we got no image. It turns out the phantom acted like a lens and bent the light away from the camera." With deadlines looming, O'Loughlin and Hart found an unlikely and ingenious solution: clear Jell-O. By suspending microbeads in gelatin, they created a unique, effective phantom that allowed them to capture the needed images.

That hands-on problem-solving experience, coupled with the freedom to contribute original ideas, is what O'Loughlin believes sets UVU apart. "When I interviewed at MD Anderson, a lot of the other candidates had research experience, but it wasn't always in a related field. Many were doing more routine tasks. At UVU, I got to work on my own ideas and contribute meaningfully."

Another defining experience came when O'Loughlin shadowed medical physicists at Utah Valley Hospital, observing radiation therapy techniques that target tumors with millimeter precision. "Every moment of that experience confirmed I was on the right path," he said.

O'Loughlin's advice to other students? Don't be afraid to make mistakes, and don't be afraid to be yourself. "If everything worked perfectly the first time, it wouldn't be science," he said. "Learn from your mistakes. And when applying to top programs, don't try to be someone else. Let your personality and passion come through — that's what people remember."

Looking ahead, O'Loughlin is eager to join MD Anderson's collaborative research environment, where he'll contribute to efforts that may one day revolutionize cancer treatment. "If I can be even a small part of 'Making Cancer History' for one person, then my time and research will have been well spent," he said. ■

"It's okay if it takes time to figure out what you want to do. Your experiences don't make you less of a candidate — they make you better."
— Tyler O'Loughlin, Physics '25

Marathons, Mentors, and Medical Break throughs

Blending research, fieldwork, and leadership training, Dr. Kelly redefines what it means to learn by doing.

Where the Real Work Begins

WHEN Dr. Melani Kelly, assistant professor in UVU's Department of Exercise Science and Outdoor Recreation, volunteers at the Boston Marathon each year, it's more than service — it's an immersive example of applied sports medicine. And she brings that same commitment to high-impact learning back to the students she mentors at UVU.

The Boston Marathon — renowned not just for its prestige but also for its highly organized medical response — became a personal tradition and the catalyst for her doctoral research.

Today, Kelly works alongside nurses, EMTs, physical therapists, and physicians on Tent B's "heat deck" team. When a physician scheduling mix-up occurred in 2024, Kelly confidently led the team's medical timeout, ensuring care protocols were followed until supervision arrived.

"Athletic trainers aren't always viewed as leaders in these moments," she said. "But when I had the chance to guide the team on how to manage heat stroke, it really showcased what we're capable of."

Kelly instills that same confidence and capability in her students. Each year, she leads a student research team at the Bear 100 ultra-marathon, an intense field research opportunity where undergraduate students help collect, manage, and analyze physiological data across the multi-day race event.

Mentorship in Motion

In 2023 and 2024, students including Kiara Fradin and Ryan Ott managed real-time participant recruitment during the race expo, performed comprehensive data collection, and supported 24-hour post-race follow-ups. "They lived a data collection marathon from start to finish," said Kelly.

Their work continued even after the last runner crossed the finish line. In summer 2025, the team engaged in a "salt study," examining hydration status and electrolyte levels. The students plan to submit their research to the national American College of Sports Medicine (ACSM) conference.

"They're not just observing science. They're doing it."
– Dr. Melani Kelly

Kelly also serves as the faculty advisor for UVU's Undergraduate Sports Medicine Club. This year, the club hosted high school sports medicine students for lab tours across rooms RL 111, 112, and 113 to engage the next generation and inspire early interest in the field.

"Whether we're on the trail, in the lab, or at the finish line of the Boston Marathon, my goal is always the same: prepare students to lead," said Kelly. "They're not just observing science. They're doing it."■

A Brilliant Mind for the Infinite: Nathan Klundt Heads to Ph.D. Program in Mathematics

UVU's top math student earns a place in the University of Wisconsin–Milwaukee's Ph.D. program after leading undergraduate research, mastering advanced theory, and inspiring faculty and peers alike.

WHEN Nathan Klundt walks into a classroom, it's not just to learn — it's also to explore, to question, and to elevate the discussion. Now, the exceptional mathematics student is taking that curiosity and passion to the next level: Klundt has been accepted into the Ph.D. program in mathematics at the University of Wisconsin–Milwaukee.

"Nathan is by far the best student I have ever had in any of my classes," said one faculty mentor. "He is brilliant, driven, and brings a deep enthusiasm for mathematics that is rare at any level."

Klundt excelled in UVU's most rigorous upper-division mathematics courses, including a proof-based sequence in advanced mathematics (Math 4310 and 4320). In fact, he completed the second half of the sequence as an independent study, demonstrating remarkable discipline and a self-guided mastery of the material.

But his academic journey didn't stop at coursework. During fall 2023 and spring 2024, Klundt collaborated with faculty on an undergraduate research project titled "Fault Tolerant Power Domination," a problem in graph theory — a subject he hadn't formally studied before. True to form, he independently learned the necessary foundations and made meaningful contributions to the research.

He shared his findings at the 2024 Utah Conference on Undergraduate Research (UCUR), where he presented "Graph Coloring and Power Networks: Using Graph Coloring to Model the Network Monitoring Problem." The project applied theoretical mathematics to practical challenges in network reliability, demonstrating how abstract ideas can illuminate real-world systems.

"He is brilliant, driven, and brings a deep enthusiasm for mathematics that is rare at any level."
– UVU Faculty Mentor

Nathan Klundt
Professor of Mathematics

Klundt's thoughtful communication style, technical clarity, and leadership in collaborative settings have made him a standout not just for his intellect, but also for his humanity. Faculty describe him as deeply engaged, generous with his peers, and genuinely joyful about learning.

Now headed to a top research university, Klundt represents the very best of what UVU's undergraduate programs can produce. As he embarks on a Ph.D. and future contributions to the field of mathematics, the College of Science celebrates not just where he's going, but also the passion and excellence that brought him there. ■

SCIENCE DIARIES

A Day in the Life of a Science Student.

CONNER DEARDEN

In my junior year, while playing soccer, I suffered a significant concussion. Someone kicked the ball from roughly six yards away, and I was knocked unconscious. On the way to the hospital, I worriedly told my athletic trainer that I was going to fail organic chemistry. My professors, especially my organic chemistry professor, worked with me to succeed in their courses. I couldn't have done it without them. Credit for my success is due to all of the dedicated professors that helped me learn and grow.

"Many blessings and opportunities came out of my decision to attend UVU, work hard, and keep walking."
– Conner Dearden

MATT FINDLAY

There is a well-known motto in the wrestling world that I love: "Embrace the grind." I feel like that's something UVU instilled in me — to embrace the grind of life and to keep moving forward despite adversity. I'm applying that same ideology in my studies, and it's serving me well. If I could go back, I would not change my experiences. UVU got me exactly what I needed, and it developed me as a person in a way that I wouldn't trade for any other opportunity. I'm proud to have been a Wolverine.

CLAYTON RAWSON

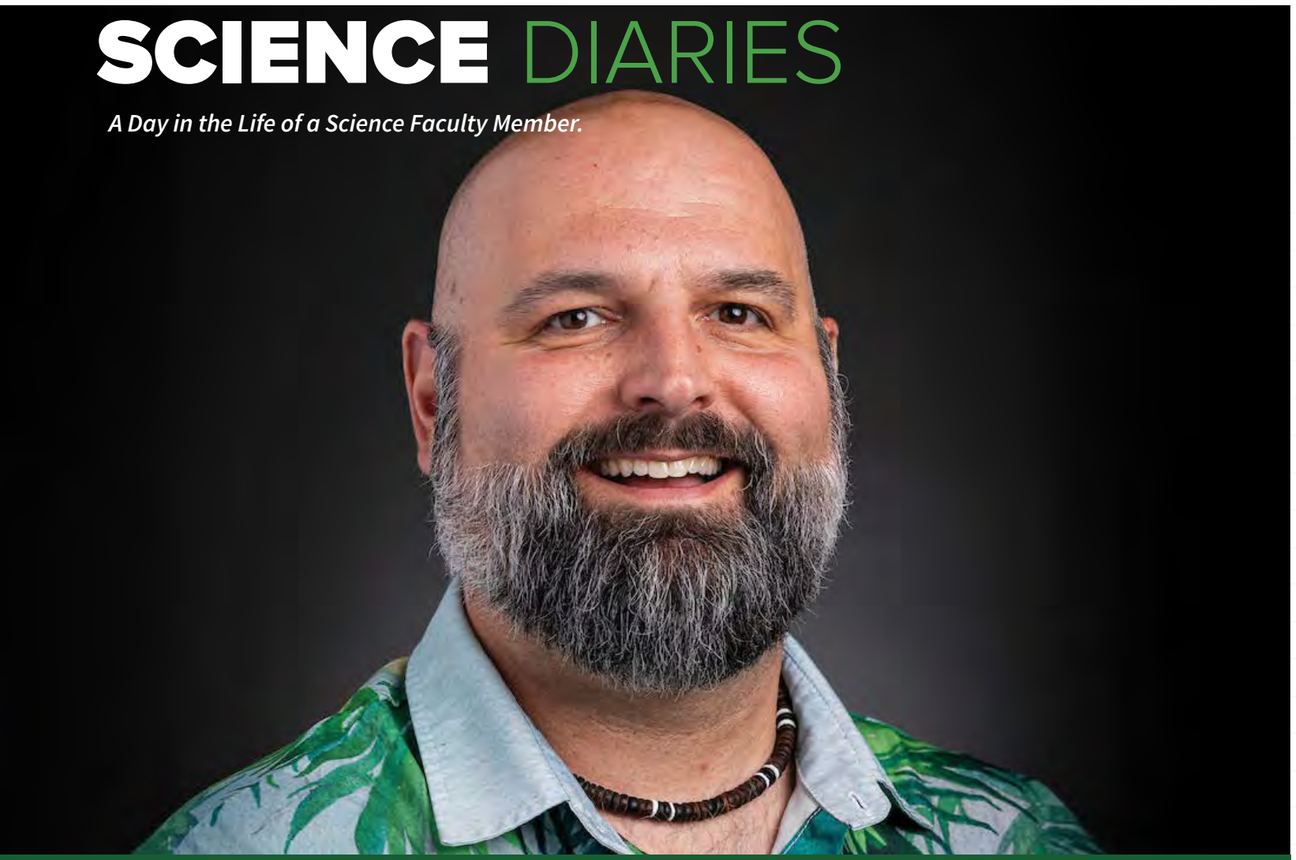
It was in the role of lab lead that [UVU earth science professor] Dr. Eddy Cadet and I fostered a connection, and I felt comfortable opening up to him. He helped solidify my desire to pursue medicine while instilling a new love for research. I went into Dr. Cadet's lab not knowing what I wanted to do and left knowing exactly what I wanted to be: a physician-scientist.

PORTER BISCHOFF

During my life and time at UVU, I've discovered that it might take someone 10 minutes to learn what will take me three hours, or vice versa. But I truly believe that we can all learn everything we want to learn. I could become the next Einstein. It might have taken him only twenty years to make a crazy discovery, and it might take me a million years, but I can gain incredible amounts of knowledge, too. I believe it all depends on how hard I work.

SCIENCE DIARIES

A Day in the Life of a Science Faculty Member.



I'm Vince Rossi and I'm a Biomedical Optics Professor

Our vision is to make UVU the premier undergraduate research program for biomedical optics in the state. We have the faculty, support from the College of Science and the university, and most importantly, the students to make that happen. Students are responsible for building, testing, and operating each of the lab's novel imaging systems. We use computation to guide our design of those optical systems and to analyze our results to better understand cancers at the cellular level.

"Our vision is to make UVU the premier undergraduate research program for biomedical optics in the state."

– Vince Rossi

I'm Alan Parry and I'm a Mathematics Professor

[With ranked choice voting,] what you end up finding is the second election has a massive amount, typically, of people who don't come back and vote. So you have a lot of people who don't represent their voices in the second election. You might be more likely to indicate who you actually prefer as your first choice, as opposed to voting for the lesser of two evils.

I'm Ashley Egan and I'm an Environmental Science Professor

This project is not just about beautifying the landscape — it's about educating the community and fostering a deeper connection to the environment. It's inspiring to see my students lead the way in making lasting changes to our local ecosystem.

I'm Paul Weber and I'm a Physics Professor

The VR training modules developed here will immediately benefit our nanotechnology and materials science courses. And I'm eager to use these new methods in my own experiments and to build new partnerships with high-tech companies in Utah Valley. I want students to feel the exhilaration of doing research that has real-world impact. That's what this collaboration is all about.

Uncovering the Science of Healing: Thoughts From Our Valedictorian

Megan Astle's deep curiosity about the human body has led her from sports injuries to advanced research in kinesiology, shaping her academic and career goals.

MEGAN Astle's journey to becoming UVU's 2025 valedictorian was anything but typical. Growing up alongside her father, an anesthesiologist, Astle's curiosity about the human body was sparked at a young age. From witnessing his work with patients — from severe injuries to childbirth — she was captivated by the body's ability to heal and adapt. Her passion for sports and outdoor activities, from soccer to skiing, further deepened her appreciation for the physical body and its resilience, especially after experiencing her own injuries.

In high school, an injury to her navicular bone led Astle down a path that ultimately defined her academic career. Despite the frustration of being sidelined from soccer for several months, she found solace and inspiration in physical therapy. Her time spent recovering and asking questions ignited a desire to one day work in the field herself. But a transformative experience at UVU pushed Astle's passion to new heights.

While initially planning to attend physical therapy school, Astle's involvement in research at UVU changed her trajectory. She joined Dr. Tyler Standifird's advanced biomechanics class, where she helped design and conduct research on the biomechanics of pregnant women. The hands-on experience of collecting data and seeing firsthand how research can solve real-world problems not only solidified her love for biomechanics but also opened doors to a future she hadn't fully imagined.

"Seeing the participant's feedback in the data was incredible," Astle reflected. "It confirmed how significant the FITsplint was, and that really deepened my love for research."

This research experience led Astle to present at the Rocky Mountain ASB and sparked a newfound goal to pursue a master's degree in applied physiology and kinesiology at the University of Florida. Throughout her journey, she was encouraged by professors like Standifird, who patiently guided her through the complexities of biomechanics and research.

Astle's involvement in research at UVU wasn't limited to a single project. She took on several studies, exploring topics from rucking to golf performance.

"UVU gave me the opportunity to dive into research that interested me, from designing my own projects to presenting at conferences," Megan said. This hands-on approach allowed her to apply classroom lessons to real-world scenarios, a process she described as both challenging and incredibly rewarding.

Looking back, Astle has advice for future UVU students: "Take the time to get involved in research. Professors here want to see you succeed, and research allows you to apply what you're learning in class to something meaningful. Don't wait — start early, get involved, and ask questions."

Having graduated, Astle is ready for the next chapter in her journey. Alongside her husband, who will be attending dental school in Portland, she will begin an online master's program. Astle's aspirations don't end there: She aims to pursue a Ph.D. in biomechanics and contribute to the growing field of exercise science.

Astle said her time at UVU set her on the path to not only achieving her academic goals but also discovering her true passion. "UVU helped me find out who I truly want to be," she said. "I can't wait to see what the future holds." ■

"UVU gave me the opportunity to dive into research that interested me, from designing my own projects to presenting at conferences. It made what I was learning come to life."
– Megan Astle, 2025 College of Science Valedictorian

Where Science Meets Industry

Under Michelle Townsend's leadership, UVU's InnovaBio is giving students hands-on experience that matters — fueling innovation, building talent, and transforming the future of biotech research.

AT UVU's College of Science, the line between student and scientist is intentionally blurred. That's by design at InnovaBio, UVU's in-house biotechnology contract research organization. Directed by Michelle Townsend, InnovaBio functions as a bridge between academic training and real-world application, offering students high-impact opportunities to contribute to real industry-sponsored research.

"InnovaBio exists to mentor the next generation of biotechnology professionals," said Townsend. "We provide a low-risk, high-growth environment where students develop meaningful lab skills while contributing to active research projects for life science companies."

Students at InnovaBio don't just shadow scientists — they become them. Each intern is placed on a team that tackles real R&D challenges in areas ranging from cellular biology to molecular diagnostics. All research is conducted on-site in UVU's state-of-the-art biotechnology labs under the guidance of professional scientific staff. The result? Industry-ready experience and a resume that speaks volumes.

This year, Townsend is overseeing a dynamic portfolio of projects. A collaboration with doTERRA evaluates the antimicrobial and anti-inflammatory potential of essential oils on human fibroblast cells and bacteria. A project with DDX and Lumea explores innovative tissue preservation techniques, while a new partnership with Arlington Scientific will assist in the development of diagnostic testing technologies. Another internal project dives deep into neuroimmunology, designing a chimeric protein with potential therapeutic implications for multiple sclerosis.

InnovaBio's reach even extends beyond the Earth. A team working on the "Red Planet" project is testing DNA stability under simulated extraterrestrial conditions to better understand the limits of life in space. Meanwhile, another student researcher is contributing to the Utah Biobank, helping organize local genomic data for location-specific bioinformatic studies in collaboration with the Huntsman Cancer Institute.

"Each project represents an authentic opportunity to contribute to science," Townsend said. "Whether it's testing tissue processing methods or exploring new therapeutic approaches, our students are developing the confidence and skill set needed to step directly into the biotech workforce."

Interns at InnovaBio receive academic credit along with competitive lab experience that gives them a clear edge in post-graduate employment. Many graduates credit their time in the lab as pivotal in landing research associate roles across Utah's growing life sciences industry.

InnovaBio's mission is simple but powerful: cultivate tomorrow's scientific talent while supporting the research needs of today's biotech innovators. Under Townsend's leadership, that mission is thriving.■

Science by the Shoreline

UVU brings research, conservation, and fun to the Utah Lake Festival, one of the College of Science's most beloved outreach events.

EACH summer, the shores of Utah Lake come alive with excitement, education, and community spirit during the annual Utah Lake Festival — a celebration of science, sustainability, and one of Utah's most treasured natural resources.

Held at Utah Lake State Park, the festival draws crowds of 3,500 to 4,000 people, offering a unique blend of recreational activities, hands-on exhibits, and engaging educational opportunities. For the UVU College of Science, it's a highlight of the outreach calendar and a chance to connect people of all ages to the real-world impact of scientific research.

"The Utah Lake Festival is a great opportunity for the public to learn what's being done to protect and improve the lake," said one event organizer. "But it's also about inspiring curiosity — showing families and kids that science is all around them, even right here at the water's edge."

From booths showcasing ongoing student and faculty research around the lake to interactive demonstrations on water quality, conservation, and local ecosystems, the College of Science's presence at the festival is both educational and eye-opening. Visitors can chat with student researchers, test water samples, explore the tools used in environmental monitoring, and even win science-themed prizes.

It's a chance for the public to enjoy a beautiful Saturday outdoors while discovering how science plays a critical role in preserving Utah Lake for generations to come.

Whether you're a curious kid, an outdoor enthusiast, or a science-minded adult, the Utah Lake Festival has something for everyone. And for the UVU College of Science, it's a perfect opportunity to make science approachable, exciting, and deeply relevant to the community we serve.■

"Science is everywhere, especially at Utah Lake. This festival helps people see how research, conservation, and community go hand in hand."

Mentor, Optimist, Advocate: Dr. Eric Domyan Named Honors Mentor of the Year

Dr. Eric Domyan's unwavering support, encouragement, and dedication to student success earned him top honors in UVU's prestigious mentoring award.

WHEN a student thinks their project is destined to fail, Dr. Eric Domyan doesn't waver. He leans in, listens, and, more often than not, reminds them that failure is just part of the scientific process. That steady optimism and mentorship have now been recognized with a significant accolade: UVU's 2024-2025 Honors Mentor of the Year.

"I am surprised, humbled, and honored," said Domyan upon receiving the news.

Selected from a competitive pool of faculty across multiple colleges, Domyan stood out for what the Honors Program called the "most impactful and lasting" contributions to Honors Program students.

In recent years, Domyan has chaired or served on the committees of at least six Honors Program thesis projects, while also supporting many other students through Honors Contracts. His willingness to take on this uncompensated workload highlights his deep belief in mentorship as a cornerstone of undergraduate education.

One student nominator put it best: "Even when I think the project will most definitely, certainly fail, Dr. Domyan is always an optimist in believing that something will work, which I am always appreciative of. Even if it does fail, we find a way to make it work, and I always learn from it."

The Honors Mentor of the Year award included a $1,000 honorarium and an invitation to speak at the Honors Senior Celebration dinner in April. More than a token of recognition, it reflects the enormous impact thoughtful mentorship can have on the student experience.

With gratitude from the many students he has guided, Domyan's story is a powerful reminder: Great science education isn't just about knowledge — it's about belief, encouragement, and seeing potential, even when the path forward isn't always clear.■

"Even when I think the project will most definitely, certainly fail, Dr. Domyan is always an optimist in believing that something will work."
– Honors Program Student Nominator

Launching a Scientific Career, One Experiment at a Time

UVU biochemistry graduate Elizabeth "Lizzie" Henstrom turns curiosity into innovation with a low-cost teaching tool now poised for classrooms—and a future in protein research.

SOME of the most innovative scientific tools don't come from million-dollar labs — they come from students like **Elizabeth "Lizzie" Spencer Henstrom**, who see a challenge and decide to build the solution themselves.

As an undergraduate researcher in the UVU College of Science, Henstrom led the design and development of a bioanalytical apparatus for **high-voltage paper electrophoresis (HVPE),** a method for separating molecules based on their charge. Her innovation, dubbed the DIY-HVPE setup, uses affordable and accessible materials to demonstrate advanced chemistry principles in a hands-on way. Her goal: bring real molecular science into high school classrooms.

Henstrom now uses the device to teach chemistry students at the **Utah County Academy of Sciences,** helping them visualize acid-base chemistry and how molecular charges change in real time. Her work is being prepared for publication in the ***Journal of Chemical Education,*** offering instructors a clear roadmap to replicate her success in their own classrooms.

"Lizzie's project is a powerful example of applied science," said her research mentor. "She created something useful, functional, and scalable. That kind of thinking is exactly what makes for a great scientist — and a great teacher."

Henstrom's research has attracted attention beyond UVU. She received a competitive **Western Alliance to Expand Student Opportunities (WAESO)** scholarship for her work, which recognizes research by underrepresented students in STEM.

Now, with her UVU degree in hand, Henstrom is heading to **graduate school to study biochemistry,** where she will explore protein chemistry and science education.

"Lizzie's trajectory is exactly what the College of Science hopes for in our students," her mentor added. "She's leaving UVU with a legacy of innovation and the tools to thrive at the next level."■

FROM VIOLIN STRINGS TO GRANITE LAYERS

How Emmaline found harmony between music and science—and uncovered her true calling in the Earth beneath her feet.

WHEN Emmaline Saunders arrived at UVU, she didn't expect to trade concert halls for canyons. A gifted violinist since the age of six, Saunders came to UVU on a full-ride scholarship to study with Dr. Donna Fairbanks, following the advice of her high school instructor. But while her musical journey brought her to campus, it was a concurrent enrollment geology class in high school that lingered in her mind and ultimately pulled her in a different direction.

"Something about geology just satisfied an itch in my brain," she recalled. "I couldn't stop thinking about it."

Saunders tested the waters during her first semester, taking chemistry and math courses to see if she could handle the rigor of a STEM major. When she passed that self-imposed test, she took the leap and never looked back.

Her transformation from musician to scientist solidified during a pivotal course: Earth Materials, taught by Dr. Mike Stearns. "That class captured my attention and opened up a whole new world of geochemistry and petrochronology," she says. "Because of Mike and his class, I got involved in research — and that changed everything."

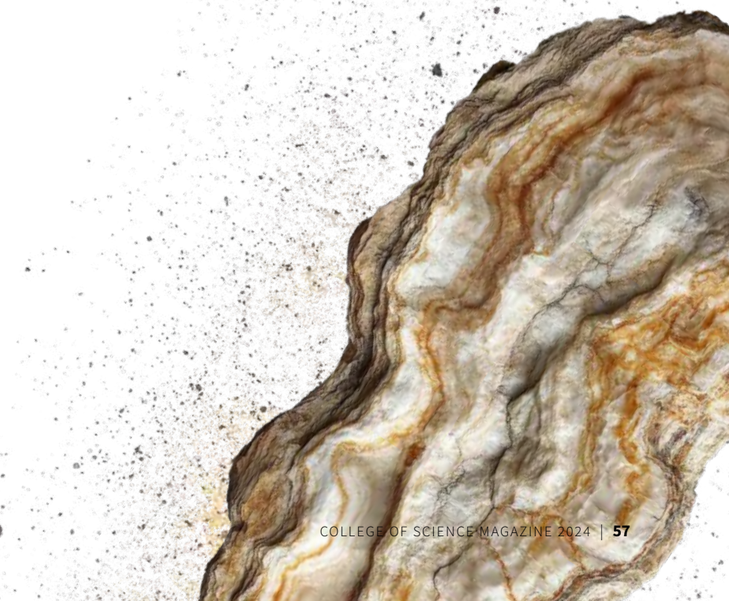
Saunders' research journey began with a study of the Tuolumne Intrusive Suite in the Sierra Nevada. Under Stearns' mentorship, Saunders learned how to interpret granite chemistry to reconstruct geologic history. That project led to her first national presentation at GSAConnects 2023 in Pittsburgh. But she wasn't finished — Saunders went on to research the Alta Stock in Little Cottonwood Canyon, presented at AGU 2024, and gave a regional talk in May 2025.

"These projects made me into the scientist I am today," she said. "Mike taught me how to approach projects without bias, think critically about data, and engage with science deeply."

As a woman in science, Saunders' experience has been overwhelmingly positive. "At UVU, most of my classmates in geology were women," she said. "Even though many professors were men, I always felt empowered and supported."

To young women considering STEM careers, she offered heartfelt encouragement: "If I can do it, you can. It's not about being the smartest — it's about putting in the hours and staying curious. And it helps to surround yourself with people who believe in you."

For Saunders, the score of her life shifted from the stage to the strata. In the rock record, she found her rhythm. ■



THE COLLEGE OF SCIENCE

FALL & SPRING EVENTS 2025-26

Follow us on Instagram for more events.

AUG

AUG 20:
UVU CLASSES BEGIN

AUG 26:
DONUTS, CLUBS & SCIENCE
9-11 am, Science Atrium
UVU Students only

SEPT

SEPT. 16-17:
STEM FEST AT SANDY EXPO CENTER

OCT

OCT. 19- 25:
SCIENCE WEEK
MONDAY, OCT. 20:
Explore the Sciences Day
TUESDAY, OCT. 21:
Searing Scovilles (public invited)
WEDNESDAY, OCT. 22:
Research and Treats; Science Night (public invited)
THURSDAY, OCT. 23:
Science vs Hollywood Movie (public invited)
FRIDAY, OCT. 24:
Science Service Day

JAN

JAN. 5:
SPRING CLASSES BEGIN

FEB

FEB. 12:
DARWIN DAY AT UVU

MAR

MAR. 14:
PI DAY AT UVU

MAY

MAY. 4-5:
UVU GRADUATION AND CONVOCATION

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