

Civil | Construction | Nuclear Spring 2022

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# UNDERGRADUATE SPOTLIGHT



### SUMMER STEVENS

Summer Stevens's path to CvEEN started in an unusual place, the preforming arts. "I was planning on a career path in the performing arts all throughout high school until I took a calculus class senior year" Stevens explained. "It flipped my world upside down, and I eventually realized that I would love building theaters and concert halls as much as I would love performing in them."

After growing up in a small town outside of St. George, Utah, she was ready to move to a larger city in order to pursue her degree. Following a tour of the University of Utah's campus, she was impressed by the infrastructure, students and research happening and knew that coming to the U was the perfect place to follow her dreams and be a part of something bigger.

Stevens is very active within the department, she joined ASCE Student Chapter her freshman year and has worked on construction of two concrete canoes and

one timber structure for competitions. She also served as the ASCE student president for a period of time. Most recently she was hired as a tutor in the dedicated department tutoring center, where she helps fellow students with some of the harder CvEEN courses. "These experiences have really been the foundation of my growth. I've gained lifelong friendships, made networking connections that have turned my career path, learned more about my interests, and had a ton of fun in the process. I've even decided to pursue a Ph.D. in Engineering Education because of my experience working with students across campus!"

One piece of advice Stevens would give to future students would be to get involved and use the resources provided to you. "There are an incredible amount of opportunities for growth across campus and in the College of Engineering." Stevens said "You never know what it will lead to--you may even have opportunities opened to you that wouldn't have been there previously."

## KARA STEAB

Kara Steab's interest in Civil Engineering was planted at a young age by her parents. As a child, she helped her mom show houses and would look at her dad's blueprints he used as a Foreman. "Since I was around structures so much, I became interested" Steab said. "I want to build sustainable structures that inspire people to be the best they can be."

Steab fell in love with the atmosphere of Salt Lake City, the U, and Utah making her decision to call CvEEN home for her undergraduate degree. She dove into the program and all of CvEEN's other offerings, getting involved in a variety of ways. "I was involved in research for COVID-19, I attended a semester abroad in South Korea at the Utah Asia campus, and I've had extensive involvement in the American Society of Civil Engineering" Steab explained. "Right now, I am the team captain for the Timber-Strong design build for ASCE, in which we are designing and building a mini structure."



When asked what she would recommend to future CvEEN students, Steab stated "Find your niche in Civil Engineering that you are passionate about. You can make such a difference in the world and participate in so many things by being a Civil Engineer. Being passionate makes all of the work worth it."

# **GRADUATE SPOTLIGHT**

### **ROCHELLE PLAIZIER**

Rochelle Plaizier, a second-year graduate student, began her studies with CvEEN as an undergraduate. After completing her undergraduate degree, she decided to pursue coursework in Environmental and Water Resources Engineering at the University of Utah. Civil engineering's strong drive to focus on helping the community, and the program at the U's dedication to do so is what convinced Plaizier to continue with CvEEN. "I liked how the program involves the community, and I felt that it would be an excellent place to simultaneously continue growing my professional network, education, and knowledge of ongoing needs within the engineering community" Plaizier said.

Her decision to attend the University of Utah started in high school. Plaizier knew she wanted to go into engineering and was exploring different disciplines through a variety of summer camps. The camp she attended at the U provided her with a better experience in professionalism, experiences and overall



enjoyment. This made the decision easy for where she wanted to study. "I knew that if I came to the U, I'd receive an exceptional education while still being around fun people!"

The program at CvEEN provided a focus on real engineering applications for Plaizier while she pursued her degree. The faculty focused on and incorporated current, real-world engineering problems into the course work to prepares students for the transition into industry while providing a high-quality education. This, along with involving the community in the program, is why she decided to stay at the U for her Master's program.

Following her undergraduate coursework and internship experiences, Plaizier decided to study environmental



and water resources engineering. "I realized that I had a passion for work related to water, and I'm also excited about finding solutions to our growing water crisis in Utah" she explains. Currently she is working with Dr. Andy Hong, an environmental engineering professor in the Department of Civil and Environmental Engineering.

Plaizier's advice to future students is to get engineering internship while you are in school. "The things you learn in internships will help you in your coursework, and they will help you decide where you do (and definitely don't) want to end up when you graduate."

## **CVEEN ALUMNI SPOTLIGHT:**

After graduating from the civil and environmental engineering department, Grant and Ralph Marsh took different paths, but the brothers still ended up working together as business partners later in life.

The Marshes were raised in Salt Lake City and attended East High School near the U campus, so when the decision came on where to attend college, it was easy for them to decide that the University of Utah was a good fit.

Grant started his college career in the fall of 1951 as an undeclared student, after working part time during his teenage years at Buehner Concrete Company, he was fascinated with construction and enrolled in civil engineering. He spent two years at the U, then went on a Church of Jesus Christ of Latter-day Saints mission to Sweden before returning in May 1956. Shortly after, he received his draft notice for the U.S. Army. Following his service, he returned to the U in 1958 to complete his degree.

Ralph started at the University of Utah in 1955 and enrolled in mechanical engineering. After two years, he also left for a Church of Jesus Christ of Latter-day Saints mission to Sweden. Upon returning, he took a structures course which revealed his passion for structural engineering. This passion, along with the fact that his older brother was already enrolled in civil engineering, convinced Ralph to pursue civil engineering.

While attending school, Grant worked with the Buehner Concrete Company, first as a laborer, then a draftsman, and finally as an engineer. Meanwhile, Ralph worked on construction projects and then with the Utah Department of Transportation (UDOT) in the structures division as a draftsman. Although they followed similar paths during their time at the U, Ralph



#### Grant Marsh, Class of 1961

and Grant pursued different avenues after graduation.

Grant Marsh graduated from the U in 1961 and moved to Denver for a job with the company he worked with during school. After he moved, he got his professional engineering license as well as his real estate broker's license. He and his family spent the next four decades in Colorado, working on a variety of large construction projects across the state and country.

Ralph graduated in 1962, then obtained his engineer-in-training certificate, and was offered a position with UDOT to work in the structures

## **GRANT & RALPH MARSH**

division to design bridges for the Interstate Highway project. However, a friend persuaded him to take the law school admissions exam. After passing that exam, he decided to attend Columbia University for a law degree. He graduated from Columbia and moved back to Salt Lake City to practice law in 1965.

Eventually, Grant returned to Salt Lake City to work on construction projects. During this time, he asked Ralph to work with him on the projects and do the legal work required for building the new structures. The Marshes worked on a variety of projects in the Salt Lake City area, including what is now the Radisson Hotel at the Salt Palace and The South Towne Center shopping mall in Sandy, Utah. The duo then worked on the early development of properties in the newly established Eagle Mountain City.

Every year, Grant and Ralph would get together with their siblings and extended families in St. George to spend quality time together since they were spread across the country. "On one of those occasions, Grant was introduced to a local developer and others who formed a partnership to purchase and develop the SunRiver project," Ralph explained.

The SunRiver Communities, in St George, Utah, is the largest projects they worked on together. It now has nearly 3,000 homes, a golf course, a community center for the active adults who now live in the community and an expanding commercial area. Their success in these projects has enabled them to provide funding for the Cyber Infrastructure Lab in the HEDCO building, which is currently undergoing renovation and planned to open in fall 2022.

Both Grant and Ralph discussed how much civil engineering has evolved since they went through the program at the University of Utah.

"It is almost humorous." Grant explains, "From

the 1950s to this century, there has been a tremendous increase in complexity."

Grant recalled working at a drafting table, using T-squares and slide rules to make calculations, but now the technology of computers and calculators handle so much of that work. "Engineers are doing a lot of things that were never thought of when I was in school." Ralph said.

When asked what piece of advice they would give future engineers, fittingly, they said the same thing: If you do something you love, you will never have to work a day in your life.



Ralph Marsh, Class of 1962

### GEOTECHNICAL FACULTY AWARDED GRANT WITH LOS ALAMOS NATIONAL LABS

### **KAMI MOHAMMADI**

Kami Mohammadi, an assistant professor in geotechnical engineering with the Department of Civil and Environmental Engineering, was awarded a grant to analyze the three-dimensional site effects with Los Alamos National Labs (LANL).

After 50 years of extensive experimental and theoretical studies in ground response analysis, Mohammadi's research will bridge a gap between the output of our predictive models and what is usually observe in the field. "Now, with a wealth of subsurface geodata available at LANL and the advanced computational models in our group at the U, we have a chance to diagnose the sources of this gap and propose techniques to bridge it." Mohammadi explained.

Through this research, Mohammadi and his students will investigate the mechanical properties of local site conditions, theoretically and experimentally, to alter the characteristics of ground motion significantly. The alterations, known as site effects, can include large amplification of horizontal



Computational Analysis of Three-Dimensional Site Effects at LANL



and vertical motions, frequency content shifts, and significant spatial variability of seismic ground motion, all of which are crucial for the seismic risk assessment of both surficial and subterranean infrastructure.

The proposed work will significantly improve the quantitative estimations of surface ground motions, in addition to, determining the extent to which high-fidelity numerical simulations can quantitatively capture the frequency and amplitude characterizes of the site effects.

"My students and I are excited to work on this project together with some renowned theoretical and experimental geoengineers and geoscientists to improve the estimation of surface ground motions as a fundamental step in seismic hazard analysis."

# CELEBRATING 50 YEARS OF NUCELAR ENGINEERING

The University of Utah's Department of Civil and Environmental Engineering provides students with the only nuclear engineering program in the state, and this year marks its 50th anniversary.

In 1972, U mechanical engineering professor Gary Sandquist led a team to establish the Nuclear Engineering Program (UNEP) at the university and knew that to have a successful nuclear engineering program, the U needed to obtain a research reactor.

The history of the TRIGA (Training, Research, Isotopes, General Atomics) Reactor currently housed at the University of Utah does not start in Utah but instead in Arizona. Sandquist learned from colleagues that the University of Arizona planned to shut down their nuclear engineering program and decommission their TRIGA Mark I Reactor. With the help of the U's Vice President of Research, William Partridge, Sandquist was able to acquire sufficient funds to arrange transportation of the reactor to the U and the construction of the facility to house it.

Construction in the Merrill Engineering Building began with cutting into the concrete floor and lowering the floor to accommodate the 25-foot-tall cylinder structure that housed the reactor and water pool that provides shielding and cooling for the core.

Another safety mechanism that was installed, because the University of Utah sits on the Wasatch Fault Line, was an external cylinder structure around the internal cylinder that was filled with sand. The purpose of this outer container is to absorb any seismic damage in the event of an earthquake. This design allows the seismic shock waves to dissipate within the external container and sand without causing damage to the internal container. After completing construction and passing initial inspections, the reactor was licensed by the federal government and became operational in 1975. Now, 50 years later, the U's Nuclear Engineering Program has world-class nuclear research facilities that are being modernized to enable novel, state of the art research and collaboration with other agencies and national laboratories. Civil and environmental engineering professor Glenn Sjoden, director of the Utah Nuclear Engineering Program, has been overseeing upgrades on the TRIGA Reactor, including a new modern reactor control system, infrastructure controls, and a new cooling system that will enable extended reactor operations.

"These upgrades are the most substantive for the reactor in the past 30 years, and will enable novel research in spectral

tuning, isotope production, spacecraft shielding, and novel use of the unique radiation sources," Sjoden explained.

In addition to the TRIGA Reactor, the team at the U has enabled firstrate laboratory facilities with broad university collaborations and the ability to handle a wide range of research objectives to propel nuclear research and science.

Currently, research in nuclear forensics, radiation detection, nuclear medicine and reactor physics are ongoing. "We look forward to enabling nuclear science and engineering to the next generation of nuclear engineers" Sjoden said.





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### **DR. STEVE BARTLETT AWARDED DISTINGUISHED** FACULTY SERVICE AWARD FROM THE BENNION CENTER



Dr. Steve Bartlett was awarded the Distinguished Faculty Service Award from the University of Utah's Bennion Center for Community Engagement.

Every year, the Bennion Center recognizes faculty members who have demonstrated a commitment to the campus-community connection through a life of active, unpaid community service and the integrations of service with research and teaching.

