

# CSU BAKERSFIELD W P A C T

FALL 2024





### Contents

Engineering a legacy4	-
50 years of nursing10	
NSF S-STEM grant14	-
Students at Lawrence Livermore Lab	}
Smithsonian interns18	
Student spotlight: Lanie Jackson20	
Faculty highlights22	

#### **Connect with us!** We're @CSUBNSME on these social networks: 🗗 🕥 🧿 in



Find the latest at csub.edu/nsme

### DEAN'S ADVISORY BOARD

**KYLE ATKIN** Director of STEAM, Kern County Superintendent of Schools

**AIMEE BLAINE** Senior VP Technical, Aera Energy

**JAVIER BUSTAMANTE** Physician and Entrepreneur, Valley Integrated Provider Network

**BRYNN CARRIGAN** Director, Kern County Public Health

**RICHARD CHAPMAN** President and CEO. Kern Economic Development Corporation

**TERRI CHURCH** VP and COO. **Dignity Health** 

**DANIELLE COLAYCO** Executive Director, Komoto Family Foundation

#### 2 | CSU BAKERSFIELD

**STAN ELLIS** President, Sierra Process System Inc.

**AMY GALENSKI** Subsurface Optimization Manager, Chevron

**KENT HALLEY** Founder. **Cornerstone Engineering** 

**OMAR HAYAT** Senior VP of Operations, California **Resources Corporation** 

**TERRI LINDSEY** School Health Coordinator, Bakersfield City School District

ANGELO L. MAZZEI Founder and CEO. Mazzei Injector Corporation

**FRED NILSON** Chief Commercial Officer, **CRA-Tubulars** 

**TED NYE** Director of Spacecraft Technology (retired), Northrop Grumman

**SHEM D. OESCH** VP of Engineering, Grimmway

**MELINDA PALMER** VP of Regulatory & Public Affairs, Kern Energy

**BLAIR PRUETT** CEO & Founder, Cal Microgrids

**MICHELLE ROY** Science Coordinator, Kern County Superintendent of Schools

**ISABEL SILVA** Director of Health Education, Kern Health Systems

**PAUL WATERS** 412 Test Engineering Group Director, Edwards AFB

### A MESSAGE FROM THE DEAN

Greetings, NSME community, partners and friends.

The 2023-2024 academic year was an extraordinary one, in which our nursing program celebrated 50 years of excellence and our engineering programs were reaccredited by the Accreditation Board of Engineering and Technology (ABET). The second edition of NSME Impact illustrates the growth of our young engineering programs that have produced 600-plus engineers for our regional workforce, and it highlights the impact of our nursing graduates on the community well-being over the past 50 years. The stories of our faculty, students and alumni reflect our deep commitment to education, innovation and service to our beloved community.

As we embark on the 2024-2025 academic year, we celebrate these exciting milestones:

- 1. NSME is now a College a significant achievement that opens new avenues for future growth.
- 2. A new Department of Public Health was established in Fall 2024, poised to support and elevate our public health program.
- 3. Our Doctor of Nursing Practice (DNP) program has received final approval, and we look forward to welcoming our first cohort of DNP students in Fall 2025.
- 4. We are launching a 2+2 degree completion program in computer science at our Antelope Valley campus starting in Fall 2025, extending educational access to the eastern Kern community and fostering opportunities in this vital field.

These milestones are a testament to our increasing capacity in educating and inspiring future leaders in STEM and health care. Deeply rooted in the region, NSME will continue to strengthen our collaboration with our industry partners and local communities. Our success is the result of the collaboration, dedication and shared vision of all our valued stakeholders — faculty, staff, students, alumni and industry and community partners. Together, we will cultivate the talents that empower our region's economy and enhance the well-being of those who live and work here.

#### Dr. Jianyu (Jane) Dong,

Dean of the College of Natural Sciences, Mathematics and Engineering





### **Engineering a legacy** NSME celebrates more than 10 years of its three engineering programs

Kern County is a region fueled by the energy, aerospace and agriculture industries, but until the early 2010s, many of its engineers had to be recruited from outside the area. With no local programs to educate and train those who already called the community their home, industry employers had to bring in people new to the Central Valley and hope they liked it enough to stay.

As companies dealt with poor retention from such recruits, a need for the community to grow its own engineers became evident. California State University, Bakersfield rose to the occasion, first adding a computer engineering major in fall 2011, followed by electrical engineering and traditional engineering majors the next year.

Since the first graduating computer engineering class in 2012 and the first graduating electrical engineering and engineering classes in 2014, more than 600 people have earned their degrees from CSUB's engineering programs.

"For over a decade, CSU Bakersfield's engineering programs have been a beacon of opportunity and affordable education in Kern County for students who dream to become engineers," said Dr. Jane Dong, dean of CSUB's College of Natural Sciences, Mathematics and Engineering. "As the only four-year public university in the area, our ABET-accredited programs have produced over 600 engineers, many of whom stayed in our region, driving innovation and contributing to the vitality of our local industries. This milestone celebrates not just our programs or graduates, but the bright future they are building for Kern County."



#### Building the programs from the ground up

The College of Natural Sciences, Mathematics and Engineering at CSUB was previously the School of Natural Sciences and Mathematics before adding the programs that would give it its new name.

Dr. Julio R. Blanco, dean of the school from 2006 to 2013, oversaw the addition of the engineering programs. He visited other universities with engineering degrees to get ideas for his school's new programs.

The first of the university's three engineering programs was computer engineering, which enrolled its first students in fall 2011. The late Dr. Marc Thomas, professor of mathematics and computer science, was chair of the Computer Science Department and wrote the proposals for the program.

The electrical engineering program, also led by Dr. Thomas and his faculty, started in fall 2012. The Computer Science Department then became the Computer and Electrical Engineering and Computer Science (CEE/CS) Department.

For the traditional engineering program (then called engineering sciences), Dr. Blanco worked with Dr. Jorge Talamantes, then-chair of the Physics Department, which adopted the new program when it began in fall 2012 and became the Physics and Engineering Department.

"It was a hell of a lot of work!" Dr. Talamantes said. "It took a lot of convincing that we should have an engineering program and that we could do it and that it would be good for the university."

Dr. Andrea Medina, director of NSME's Grants and Outreach team, worked as a program coordinator

for various CSUB grants when the new programs were being developed. Though the programs were championed by then-CSUB president Dr. Horace Mitchell and then-provost Dr. Soraya Coley, a lack of funding support from the state required the team determined to bring engineering programs to CSUB to take matters into their own hands.

Two consecutive Department of Education grants in 2010 and 2011 gave CSUB \$3.8 million and \$3.4 million, respectively, for a combined \$7.2 million to fund the programs. In 2015, the university was awarded a third grant for \$3.25 million.

"I just remember being really proud of us, because, as Jorge mentioned, we didn't get really any support for the program, so we did it ourselves," Dr. Medina said. "We got the two back-to-back grants and said, 'Fine, we'll make it happen for us.' Knowing that just really made me proud of being part of NSME, that we saw the demand, the community wanted it and we wanted to provide it for our students and our community, so we did it, without help from the state."

With funds secured to get engineering started, the team had to go about actually creating the programs and their curricula.

"Of course, none of us were engineers," Dr. Talamantes said. "Marc Thomas was a mathematician; I was a physicist. So, there was a lot of trying to figure out how to hop into the abyss without knowing exactly what we were doing. I think in the end it turned out pretty good!"

Engineers at local companies were consulted on the curricula for the programs to ensure students would receive an education relevant to the jobs they might get in the community. Dr. Melissa Danforth, computer science professor, was a new faculty member when the engineering programs were being planned and in 2014 took over for Dr. Thomas as PI on the 2010 grant when he went on medical leave. Though not an engineer herself, she worked closely with those faculty members involved in developing the new programs, including Dr. Wei Li.

"If you think about it, other than Wei Li, these programs were started by faculty who were tangential to the discipline but not actually in the discipline," Dr. Danforth said. "The fact that they were so successful so quickly just shows the dedication on both departments of those early faculty involved, and also in recruiting appropriate engineers to help bring the programs forward."

Among the engineers recruited to join the two departments as faculty was Dr. Saeed Jafarzadeh for CEE/CS and Dr. Dayanand Saini for Physics and Engineering, both of whom are still with CSUB today.

#### **Growth and milestones**

Early response to the new programs was positive. Dr. Talamantes said the community and area employers were hugely supportive of CSUB's efforts to bring engineering degrees to Bakersfield. In June 2011, Dr. Blanco even received a Beautiful Bakersfield Award in its education category for his efforts in launching the engineering programs.

Students responded to the new programs as well.

"When we started the program, it was like we hit a jugular; we cut a vein and all hell broke loose, because we got tons of students, and we were just going crazy trying to open enough sections for all the students," Dr. Talamantes said. "The program went from zero to like 250 majors in a span of a few years."

Ahead of the engineering programs' official start, CSUB built Science III to accommodate the additional classrooms and lab spaces the new faculty and influx of students would need. The building opened in September 2008.

That growth continued with the opening of the Engineering Complex in 2013. The modular complex houses additional lab space and the NSME Student Advising and Success Center. It is also home to the Chevron Fab Lab, where students and the public alike can use fabrication machines to make all kinds of items. For engineering students especially, it is a valuable resource for turning their ideas into reality.

"Chevron has always been a huge supporter of NSME and to be selected as their first of 10 initial Fab Labs was a huge honor," said Dr. Medina, who oversees the Fab Lab team. "Having that belief in us only solidified our resolve that we were doing what was right for our community. The Chevron Fab Lab is truly a campus gem and has provided dozens of internships that have led to impressive careers for our engineering students."

Another big milestone in CSUB's engineering history came in 2018, when all three programs received accreditation from the Accreditation Board for Engineering and Technology (ABET). This year, the programs were reaccredited, proving a continued commitment to offering students the very best academic experience.





Then- president of CSUB Horace Mitchell cuts a ribbon to celebrate the opening of Science III in 2008. In attendance are then-dean of NSME, Dr. Julio Blanco, and other members of the CSUB community.



"Earning a degree from an ABET-accredited program is a powerful credential that opens doors for our students, since ABET accreditation is recognized worldwide through international agreements and lays the groundwork for pursuing professional licensure, such as the professional engineering license," Dr. Dong said. "To maintain ABET accreditation, programs must continually improve to meet the changing demands of the engineering profession. Our programs' initial accreditation and successful reaccreditation reflect our faculty's dedication to providing quality education and their commitment to growing and enhancing our programs."

Engineering at CSUB continues to grow even now. A groundbreaking for a new outdoor maker space was held in the summer of 2023, and a celebration for the planned Energy Innovation Building was held in the fall of 2022.

#### 'Success is almost baked into the degree'

Class of 2019 graduate Raul Caballero always knew he wanted to study computer engineering. Born in Los Angeles, Caballero and his family later moved to Mexico before returning to California when he was 7 years old, this time in Bakersfield. When he heard that CSUB was working on getting its engineering programs ABET accredited, he knew his local university was where he wanted to enroll.

"The experience was definitely one I enjoyed, coupled with a little bit of thrill from being the first ABETaccredited class," Caballero said. Despite some initial reservations about the new program, "I felt that the education I received was definitely what I was looking for."



CSUB celebrated Chevron's continued support of NSME with a groundbreaking for a planned outdoor maker space.



Ivan Martinez Hernandez, seen here in an early Fab Lab photo, worked as a student assistant in the Fab Lab while earning his engineering degree. He is now the interim Fab Lab Specialist.

Caballero's time at CSUB included research with professors like Dr. Jafarzadeh, who the alum said is one of a team of hard-working faculty members dedicated to giving their students a quality education and formative research experiences.

As an alum, Caballero stays involved as a member of the Industrial Advisory Board for engineering programs. Thinking about the 10-plus years of CSUB engineering makes him feel a little old, Caballero admitted, but it also has him feeling "responsible for the torch that was given to me to be prepared to be given to the next generation."

Like many CSUB grads, Caballero has gone on to work locally. As a technology services supervisor for the Kern County Department of Public Health, he is responsible for all the department's technology, including computer deployment, networking, servers and applications.

"What I learned from CSUB was more than topics on a whiteboard but instead a way to involve myself in technology while understanding the inner workings of what makes it so," Caballero said. "I was always very happy to fix something, but understanding why and how I could make it better always led to better solutions."

Class of 2018 electrical engineering grad Sandra Peters is another alum who stays involved with CSUB to encourage students to pursue their interests in engineering. In 2023 and 2024, she joined NSME's annual Engineering Day to tell visiting high schoolers about her time at the university and her job as an electronics engineer at Edwards Air Force Base.

"My journey to engineering wasn't necessarily traditional," Peters told the students at this year's event. "I didn't necessarily know everything that encompassed engineering, but I knew I was good at math, and I knew I liked art and being creative. Engineering married both those topics."

After applying to CSUB as an art student and then switching to nursing, Peters ultimately found her calling in electrical engineering. That CSUB is an ABET-accredited university right at home is "topnotch," she told the students.

Many of Peters' coworkers are also CSUB engineering grads, including Grace Roman and Alfredo Arevalo, who both graduated with degrees in electrical engineering in 2020 and were offered jobs at Edwards before they even graduated. The



"What I learned from CSUB was more than topics on a whiteboard but instead a way to involve myself in technology while understanding the inner workings of what makes it so."

— Raul Caballero, Class of 2019

two worked on campus at the Fab Lab, which they agree helped to prepare them for their jobs.

While plenty of CSUB engineering grads leave school with jobs waiting for them, others have chosen to continue their education into graduate and doctoral programs.

Omar Samara earned his degree in engineering sciences from CSUB in 2017 and is now a Ph.D. candidate in biological systems engineering at University of California, Davis. Samara was born in Bakersfield but lived all throughout the state growing up. Of all the places he called home over the years, when it was time for college, he decided on CSUB.

"I felt there was a lot of opportunity," Samara said of CSUB. "The engineering program was new at the time, and I wasn't sure if it was going to be a good idea to risk it, but I got to take some engineering classes while I was in high school ... and I ended up meeting some of the engineering professors and saw both that there were a lot of resources being invested to build CSUB's engineering program and that there were good people who cared a lot."

Samara said his time at CSUB was "easily one of the best experiences of my life."



It was at CSUB that Samara learned all about the different career paths he could pursue with a degree in engineering. Through early research experience studying agriculture, Samara found his way to agricultural engineering.

At UC Davis, he has been studying agrivoltaics, a new form of agricultural production where crops are grown under photovoltaic solar panels. With some conflict between solar panel farms and agriculture farms, this practice "is a win-win type scenario where you can potentially deploy solar panels, improve crop production and reduce water use while improving land productivity," Samara explained.

It's complicated work, but Samara believes his time at CSUB prepared him for it well. He credits three aspects of his time at CSUB to his current success: the academic skills it gave him, the ability to work closely with faculty members and get hands-on research experience and the caring nature of the people the university hires, from professors to counselors to support staff.

"I would not have been able to succeed and be where I am now without them and their passion," Samara said of CSUB faculty and staff. "I never felt abandoned or lost at CSUB. There are so many people who are working overtime to make sure you succeed and are supported."

Now as a working scientist himself, Samara meets all kinds of engineers coming from different schools around the world. When he talks to his colleagues, what stands out about his time at CSUB is the opportunities and resources available to students. Though Samara admitted he and some classmates were worried the newness of the CSUB programs could mean their degrees would be taken less seriously, he said that has not been the case at all.

"So many of us are successful working for all sorts of big fancy engineering companies and research agencies, or owning our own businesses, and living lives as engineers," he said. "Success is almost baked into the degree."



### CSUB celebrates 50 years of nursing excellence

In 1974, California State University, Bakersfield graduated its first class of nurses, a pioneering group that kickstarted a legacy of nursing excellence that has continued five decades and some 2,500 nursing graduates later.

On April 27, CSUB's Department of Nursing welcomed back to campus those from the first graduating class, this year's 50th graduating class and alumni from every class in between for a special anniversary fundraiser. Themed "50 Years of Excellence: Reflecting on the Past and Envisioning the Future," the event covered the program's early years, its success since then and exciting developments still to come.

Although the alumni event was originally to take place in CSUB's Doré Theatre, a power outage that day forced organizers to quickly adapt for an outdoor setting. Fortunately, nurses know how to pivot, said Krystal Ball, assistant professor of nursing and one of the event's lead organizers. With chairs set up outside the theater and a wireless, battery-powered PA system, the event went on without a hitch.

"While the power outage was distressing, I was proud of the way the CSUB team was able to

pull it together so that we could continue with this event," said Dr. Debra Wilson, chair of the Nursing Department. "This was a great time to celebrate our past and present students, our amazing staff and faculty and to showcase what is new in our labs. I heard from many alumni both during and after the event who expressed how much they enjoyed reconnecting with their classmates. I'm hoping that this event will encourage our alumni to get involved in our program with either a donation of time or money. We have an excellent program, and I feel that our future is bright!"

Around 225 alumni and family members came to the event, which started with speaker presentations. With power restored as the keynote speaker was wrapping up, nursing building tours were able to go on as planned. In the end, the event and the fundraising period that followed raised around \$30,000 for CSUB nursing.

#### A job that makes a difference

Following welcomes from Dr. Wilson, Ball and CSUB Interim Vice President for University Advancement Heath Niemeyer, nurses joined together to recite the Nightingale Pledge, an oath named for Florence Nightingale in which nurses

promise to faithfully practice their profession to its highest standards.

Dr. Peggy Leapley, who taught in the nursing program for 31 years and earned her postmaster's family nurse practitioner certificate from CSUB in 1999, was the first speaker. She led attendees through a look back on the program's beginnings.

The CSUB nursing program got its start back when the university was California State College Bakersfield. Classes started in 1970 on a campus not yet fully developed and still frequently visited by the sheep who grazed on the property before the university was built, Dr. Leapley told the crowd. The nursing building opened in 1973.

The first group of nursing students, then dressed in blue and white skirted uniforms, helped to design the nursing cap and pin. The first graduating class also started the tradition of a class composite photo; theirs is framed and hangs in a prominent spot in the nursing building today, with composite photos from subsequent classes lining the building's halls.

Nursing alumna and 2022 CSUB Alumni Hall of Fame inductee Terri Church followed Dr. Leapley by talking about nursing's future. She pointed to the ways science fiction has at times predicted health care developments, like an early form of telemedicine seen in an episode of "The Jetsons."

While health care providers might not have a tricorder like Dr. McCoy in "Star Trek" yet, there are many ways that medicine is advancing. Surgeons can now use robots to operate on patients, artificial blood can be created in a lab and smart watches monitoring heartrates are only the beginning of wearable health trackers, Church said. One of the more exciting developments, she said, is the potential of designer drugs tailor-made to target a patient's specific illness.

"With all that comes a lot of issues that nursing will be involved in," Church said. "How do we make that safe, how do we make it ethical, what are the moral ramifications? I've been a nurse for a long time — if anybody is going to raise that there is a moral issue out there, it's going to be a nurse, so we play a really key role in that." Beyond advanced technologies, the future of nursing also holds an increased demand



Dr. Peggy Leapley recounts the history of CSUB nursing.

for advanced practice providers like nurse practitioners. (CSUB is already answering that call with a recently announced Doctor of Nursing Practice program, slated to begin in the fall of 2025.)

Motivational speaker Jean Steel gave the keynote address, called "Happy Nurses Win!" As nursing can be a demanding and exhausting job, Steel encouraged nurses to be resilient by asking for help when they need it, practicing gratitude daily, seeking out awe, keeping their sense of humor and being optimistic and mindful.

"You're going to have the best days of your life nursing and you're going to have some of the worst, so you have to take care of yourself," Steel said. "You have a job that makes a difference every single day."

Ball concluded this part of the event by reminding alums why they were there: to come home to their alma mater and walk its halls and also to learn how to get involved. Alums were encouraged to donate money or their time to the program to give back to the program that gave them their careers.

A CSUB alum herself, Ball got emotional looking out at the crowd of nurses.

Margaret Freyberger Levy, Beverly Copeland and Brenda Bennet Welch from CSUB's first graduating nursing class were among those in attendance.

"I can't tell you how proud I am to be around all of you," she said. "The amount of knowledge in this room, the amount of patients that have been impacted, by everyone in this room, is just amazing."

#### **Train them well**

Among the returning alumni were a few from the inaugural nursing class. Brenda Bennet Welch came all the way from Arkansas for the event. Her nursing career has taken her all over the country, including as a member of the Army reserves. She looked back fondly on the school that gave her her start.

"It's astonishing that it was 50 years," Welch said, adding that she wondered what the nursing program was like today. "I knew it would change. You know, 50 years, it's got to change, but I was just kind of curious to see what it was and see if anybody showed up that I knew."

Margaret Freyberger Levy lived down the hall from Welch in the dorms and said the first graduating class was a close-knit family back then. The nursing program gave Levy and her classmates "an excellent foundation," she said.

After graduating 50 years ago, Levy worked locally until she joined the Air Force and was stationed in Spokane, Wash., where she met her husband. When the two moved back to California, she joined the California Air National Guard, serving for 20 years before retiring as a Lieutenant Colonel. Following that, she was a public health nurse and school nurse.

"It wasn't until I was exposed to nurses from all the different nursing programs... that I realized how superb my foundation in nursing was and how

"It wasn't until I was exposed to nurses from all the different nursing programs... that I realized how superb my foundation in nursing was and how much knowledge I had gained in those four years."

> Margaret Freyberger Levy, Class of 1974

much knowledge I had gained in those four years," she said.

Levy made the trip back to CSUB from her home in Ripon, Calif. to share memories of her time at the university and see how the program had grown since she was a student.

Current CSUB nursing students led alumni on tours of the Romberg Nursing Skills Lab and

Simulation Center where they could see what was new. On her tour through a lab, Levy was introduced to a high-tech, life-like mannequin, complete with dilating pupils, pained groans and palpable pulses.

"I'm just amazed you have this kind of stuff! This is great; it's good to see all the new inventions," Levy told the current nursing students leading the tour. Her next comment was directed to the manneguin on the bed as she patted its foot: "Train them well!"

Aimee Gibson and Jaspinder Khaira, two students from the class of 2024, said it was an honor to be

part of this milestone for CSUB nursing. Being part of the 50th class reminded them that they and their classmates are part of so many nurses before them.

"It's almost like family," Gibson said. "You may not know that person, but you feel connected. It's an experience that we all know we've been through. They've gone through very similar classes before us, similar stresses. We share it all."

"It's like they all put down steps for us to walk on," Khaira agreed.



The nursing class of 2024, with faculty and NSME Dean Dr. Jane Dong.

### CSUB nursing to offer DNP starting fall 2025

The Nursing Department at California State University, Bakersfield will soon add a Doctor of Nursing Practice program, starting in the fall of 2025. The program was made possible in part thanks to a \$1 million grant from Kern Health Systems gifted earlier this year.

"Through your generous support, you are providing the seeds we need to establish the Doctor of Nursing Practice Program, a game-changer for our students and graduates as well as the primary-care landscape here in the Central Valley," President Dr. Vernon B. Harper Jr. told Kern Health Systems at a press conference. "And you have stepped forward to help without a second to lose."



# NSME granted nearly \$2.5 million by NSF for scholarships, support services

Earlier this year, the National Science Foundation awarded nearly \$2.5 million for scholarships and student support services to California State University, Bakersfield's College of Natural Sciences, Mathematics and Engineering.

"S-STEM: Providing Aid for STEM Success," or PASS, is a six-year grant that aims to improve retention and degree completion of STEM majors by providing scholarships for low-income, academically talented NSME students with unmet financial need. The "last-mile" scholarships will award however much additional help an S-STEM scholar needs after financial aid and other scholarships and grants, up to \$15,000 a year.

"When I saw that the program was taking proposals a few years back, I thought this would be a good opportunity to provide that fiscal support to students so they could focus on their academics and not have to worry about taking jobs or taking loans," said Dr. Melissa Danforth, the grant's principal investigator (PI) and a professor in NSME's Department of Computer and Electrical Engineering and Computer Science. In addition to the scholarships, the grant also funds support services for S-STEM scholars. Each student in the program will be paired with a faculty mentor based on their major. When possible, S-STEM scholars will take classes as a cohort with others in the program in the same major.

"That hopefully provides the ability for them to build community amongst themselves," Dr. Danforth said. "They're not just having the support of their mentor but having the support of their peers."

Other funded activities like workshops on student success, career preparation, mental health and more will be open to all NSME students, though S-STEM scholars will receive priority registration. The grant also funds a speaker series in which an external STEM professional will come to campus to speak to students once a semester.

"We know our S-STEM scholars aren't the only students who could use some additional support," said Dr. Andrea Medina, co-PI of the grant and NSME's director of grants and outreach. "These activities are a way to extend the benefits of the grant beyond those who are selected for scholarships."

Students pursing degrees in biology, biochemistry, chemistry, computer engineering, computer science, electrical engineering, engineering/ engineering sciences, geology, mathematics and/ or physics are eligible for the program. The grant team estimates it will be able to accept between 10 and 18 students a year, depending on the magnitude of students' needs.

This was the third time applying for the grant for Dr. Danforth and her team of co-PIs: Dr. Medina, NSME Associate Dean Dr. Karlo Lopez and NSME faculty members Dr. Yize Li and Dr. Jesse Bergkamp.

"We are excited and grateful to have been awarded the S-STEM grant because it provides talented science and mathematics students a path to completing their education," Dr. Lopez said. "These students are our future doctors, dentists, engineers and scientists, and from experience we know that many will return to the valley and serve their community as professionals." "As a chemistry graduate and later a professor of chemistry and biochemistry at CSUB, I know firsthand the rigor of the classes our STEM students take," Dr. Lopez continued. "Having a scholarship like S-STEM to help cover expenses that get you over the finish line will be a tremendous help because it means students do not have to worry about paying tuition and working long hours away from campus and can instead focus on completing their education."

Dr. Danforth also knows firsthand what the scholarships will mean to the students who receive them. A CSUB alumna herself, she was able to earn her undergraduate degree without loans thanks to a merit-based scholarship that covered her first four years of school.

"I wanted to kind of pay it forward and give that experience to current students that I had myself as a student," she said. "Working on the grant was about looking for how we can best benefit the students. That was the primary motivation and that's why we kept trying year after year to receive this grant, because we knew it would be very beneficial to the students."



"To me, being chosen for this scholarship and support program means that they see my potential and ambition and have expectations for me. They want to help develop the potential of us recipients by giving us this opportunity of financial support as well as for us to support each other. So, I'm going to work hard and motivate myself every day for that exact reason. They want to see me succeed, and that's exactly what I plan to do."

#### — Mykierah West, Electrical Engineering

"I applied for the S-STEM scholarship because the increase of cost of living was making it difficult to provide for my two sons while being a full-time student. The scholarship will directly contribute to my quality of life this semester because I will lessen the stress of not having enough money to sustain my family with."





"To be chosen for this scholarship program means that I am being given a chance to succeed and puts forth a motivation in me to continue what I am doing at CSUB. The support I have received from staff is incredibly helpful and I can't explain the gratitude I feel for being able to put my academics first this semester. I feel proud to have received this scholarship and will make the absolute most of the opportunities afforded to me."

— Eder Tavera, Geology

— Lailah Garrido, Electrical Engineering



### CSUB students doing research with world's best

Over the last two years, California State University, Bakersfield students have worked hand-in-hand with the experts at Lawrence Livermore National Laboratory as part of a partnership between the university, the research institute and the Livermore Lab Foundation.

Eder Tavera and Julnar Al Azzam were the first CSUB students to be selected as research fellows in a highly competitive program launched in 2021 by the Livermore Lab Foundation, a philanthropic partner that supports the vital work at Lawrence Livermore National Laboratory, a hub of cutting-edge research since 1952.

"Our mission is two-fold," said Sally Allen, executive director of the Livermore Lab Foundation. "We want to advance science and innovation at the lab and inspire and cultivate the next generation of STEM leaders, while diversifying the ranks of our scientific community. CSUB has been on our radar at the foundation for three years. The university is essential in carbon-management research because of Kern County's unique geography and position as a leader in energy for generations."

Tavera never dreamed he would be considering graduate school, but that changed in the summer

of 2023 during his work with Lawrence Livermore National Laboratory scientist Dr. Elwin Jacob Hunter Sellars, who is researching direct air capture of carbon dioxide.

"My mentor developed his own breakthrough analyzer, a machine that records data and the concentration of carbon dioxide as it's passing through a column and being absorbed by certain materials," Tavera, a geology major, said. "The machine he created and developed, it's so simple. He put the components together and made it out of a storage container he bought at Walmart. My mentor is teaching me that being resourceful and inventive is so important in research."

Tavera and Al Azzam each had their own mentor and work on small teams that allow for one-oneone access to the nation's premier scientists.

"I mean right off the bat, it felt very eye-opening," said Al Azzam, who worked with Corey Myers on carbon-capture technology. "You feel this new sense of importance and appreciation in the work you're doing and the work other people are doing. You can tell the people there care about what they're doing and that they have the resources they need to not only succeed, but enjoy what they're doing and to collaborate." At CSUB, Al Azzam has partnered with Dr. Karlo Lopez, associate dean of the College of Natural Sciences, Mathematics and Engineering and professor of chemistry and biochemistry, on research that seeks to uncover an enzymatic process to reduce sulfur in fossil fuels. Dr. Lopez said that Al Azzam's "inquisitive spirit" made her an excellent candidate for the fellowship.

"For an undergraduate student to be invited to do research at a national laboratory is a big deal," Dr. Lopez said. "These opportunities are usually reserved for graduate students and postdoctoral fellows. That Julnar was selected from a competitive pool speaks to her ability as a scientist and to the quality education she has received at CSUB."

The Livermore Lab Foundation executive director agrees with Dr Lopez's assessment of the CSUB fellows.

"They have been incredibly enthusiastic and impressive young people, so motivated and excited," Allen said. "We couldn't ask for better ambassadors to introduce this type of opportunity to their peers."

### More NSME students at Lawrence Livermore National Laboratory

Over the summer, computer science students Noah Gallego and Cristian Pena participated in the Data Science Challenge, a two-week project where they were given four tasks to solve, all using electrocardiogram data to predict heart health. Their participation was sponsored by SeedCore Foundation.

Electrical engineering major Ruby Diaz and physics major Justin Peterson were both recently selected as LLNL research fellows. Diaz, a Davis Family Carbon Fellow, studied the societal and policy frameworks essential for the implementation of CDR technologies. Peterson, a Davis Family Physics Fellow, worked on Physics with Phones, a project aiming to give students and educators more opportunities to engage with physics by using the high-quality sensors found in smartphones to conduct experiments.



Above: Noah Gallego and Cristian Peña at the Data Science Challenge at Lawrence Livermore National Laboratory, with Susan Houghton and Sally Allen of Livermore Lab Foundation. Below left: Ruby Diaz. Below: Justin Peterson.





### 'A paleontological wonderland'

A night at the museum might be fun for natural history buffs, but two California State University, Bakersfield geology students found that a summer at the Smithsonian is even better.

In summer 2023, Joshua Barnes and Tyler Garza interned at the Smithsonian National Museum of Natural History researching foraminifera, a microscopic, single-celled organism that lives at the bottom of the ocean. The two worked with Dr. Brian Huber, the museum's curator of foraminifera.

"I wanted to do this internship because it is a once in a lifetime opportunity to work at THE Smithsonian in our nation's capital," Barnes said. "I think the experience from this internship really solidified my plan of getting into paleontology from geology."

Foraminifera, or forams, live in most marine environments, from as deep as the seabed to free-floating in the water. After these organisms die, their calcium carbonate shells are buried and fossilize. Their sensitivity to environmental changes means they can provide insight into past climates when dug up in sediment cores from the seafloor.

"These forams can store the oxygen and carbon levels of their time in their shells," Barnes explained. "In a well-preserved specimen, you can tell exactly what the ratio of the oxygen isotopes were at the time. With those ratios, you can tell the amount of ice there would have been at that time, which lets you know the average temperature of that time as well."

Both Barnes and Garza had experience working with foraminifera, having previously participated in a marine research voyage with CSUB professor Dr. Anthony Rathburn and scientists from the Scripps Institution of Oceanography. There, they obtained and processed seafloor samples and studied them back on campus.

"Luckily as far as my academic career goes, I was already interested in foraminifera and oceanography," Garza said. "This just confirmed it." With funding from the National Science Foundation Geopaths internship program at CSUB, Dr. Rathburn was able to find a perfect opportunity for the two student scientists with Dr. Huber. He knew being immersed in a paleontological research environment under the mentorship of one of the world's leading researchers would be "a unique and potentially life-changing experience."

"In addition to their research activities, Josh and Tyler were exposed to behind-the-scenes, world-class collections of fossils from large dinosaurs to tiny microfossils, and they were able to engage with an array of eminent research scientists that study the natural history of the planet," Dr. Rathburn said. "This internship will not only provide skills and transformative experiences that they will benefit from academically but will also provide memories of a paleontological wonderland that will last a lifetime."

Barnes and Garza learned a lot during their summer, and not just when they were busy working in the lab. They regularly passed Capital landmarks on the National Mall on their way back to their rooms after work and they took advantage of being in the Smithsonian when tourists were not.

"My favorite part has been being able to go into the museum early and before work walk in areas of the museum without any other people inside," Garza said at the time of the internship. "D.C. was very enjoyable, almost every weekend we got out to the city to museums or to somewhere with historical significance."

Both Barnes and Garza said they were inspired to keep pursuing their interests in paleontology and oceanography. For Barnes — a Navy veteran who decided to follow his lifelong love of dinosaurs to a geology degree following the death of his mother two years ago — the experience showed him he was on the right path to achieving his dreams.

"I met multiple post grads that are doing research at the museum, and they seem to really love what they do," he said. "I love learning about the past and everything about the climate and ecology from different eras, and I hope to get another chance to come back to the Smithsonian in the future to do more research."



In a tour of the museum for interns, Tyler Garza snapped this picture with a juvenile ceratopsid in the backrooms, which are not available to the public.





In the lab, Tyler Garza breaks up a sample, preparing to soak it and then sieve it to get a workable sample.

### Lanie Jackson finds her path

Lanie Jackson overcame a lot on her way to earning her bachelor's degree in biochemistry. In addition to the pandemic that started in her second semester as a college student, she was also trying to find out who she was without basketball, which had dominated her life until she decided to step away from the sport and focus entirely on her education.

What helped her with these difficulties, and all the others that come along with pursuing an education, was the community she found at California State University, Bakersfield, especially in the Chemistry and Biochemistry Department and in the College of Natural Sciences, Mathematics and Engineering's Career Pathways mentorship program.

"I had a sense of community, I had stability and I had a support system, most importantly," Jackson, 23, said. "I think my first year would have been a lot different, and then going into the pandemic would have been a lot different, if I hadn't made the friends I did in that program."

In the time since that tough first year, Jackson went from mentee to mentor in Pathways, conducted research with Assistant Professor Dr. Lance Talbert and was accepted into Marshall B. Ketchum University's pharmacy program. In the spring, Jackson commemorated her degree and all that went into earning it by walking in commencement.

A Bakersfield native, Jackson's teen years were all about basketball. Her life really started when she decided not to pursue the sport in college and instead concentrate on school.

It took some time for Jackson to decide exactly what she wanted to do, but she knew she wanted to work somewhere in the medical field. When she was in junior high, her mother was diagnosed with multiple sclerosis. Jackson would often accompany her mom to doctor appointments.

"That's when I started realizing, 'Oh, I could do this job," she remembered. "I was able to talk with her different doctors and realize that I wanted to help



people the way they were helping my mom."

With that in mind, Jackson decided to major in biochemistry. As a declared science major in her first year, she was able to join the NSME Career Pathways program's 2019-20 cohort. As part of the program, Jackson was paired with an older student who would mentor her.

"I went in there like, 'OK, I gave up basketball, I don't really have an identity right now, and here's someone who is going to mentor me through the first year and get me on my feet to where I can be successful," she said. "I feel like I needed that in order to realize that I can still be successful in other things that I haven't been pursuing my whole life."

When the COVID pandemic struck in her second semester, Jackson admitted she was scared and struggled with motivation. Fortunately, the community she found at CSUB with her classmates, mentees and fellow mentors in the Pathways program and her professors in the Chemistry and Biochemistry Department kept her afloat.

"I think one of the best things that came out of me being at CSUB was the people who surrounded me coming out of the pandemic," she said. "Having people around me to reassure me and support me through these years was really important to me and something I'll never forget that I had at CSUB."

After her first year in the Pathways program, Jackson became a mentor herself, working with younger students to start their college experience on the right foot.

In between classes and her work in the Pathways program, Jackson also worked in Dr. Talbert's research lab studying phthalate esters and their presence within soils in the Central Valley. Phthalates are an endocrine-disrupting chemical often found in items like food packaging, personal care products and medical tubing.

The research team presented its work at the American Chemical Society meeting, and Jackson herself presented her work at the Southern California Conferences for Undergraduate Research in the fall 2023 semester. Last year, she won second place in the Physical and Mathematical Sciences category of CSUB's Student Research Competition.

"While we are trying to bring awareness of the concentrations in the soils in the Central Valley, we're also trying to just bring awareness to the topic, because these chemicals are very harmful, and they do pose a significant risk to consumers," Jackson said.

Jackson's time researching with Dr. Talbert was her first lab experience, something she said her

professor didn't realize until after she joined his group. But lab newcomer or not, he was impressed with Jackson's abilities.

"Over the past two years, Lanie has developed excellent lab technique and critical thinking skills while working in my lab," Dr. Talbert said. "She demonstrated a thirst for knowledge in her drive to read scientific literature, which led to new research ideas for her project about phthalate esters in soil."

Jackson believes her time at CSUB, and especially time spent under Dr. Talbert's mentorship, has prepared her well for pharmacy school.

"It's easy to run away from the scary things, and doing analytical chemistry with him is the most detail-oriented, rigorous thing you can go into," she said. "But in the end, pushing myself through that, he has made me realize that I am capable, and I can pursue whatever I want."

Through her research and classes, Jackson said she developed the skills to write lab reports, analyze data, problem-solve and be flexible.

"I am proud of the scientist she has become over the last four years," Dr. Talbert said. "I have no doubts that she will continue to be successful, and I know she will excel in pharmacy school due to the skills and knowledge she acquired at CSUB."



- Lanie Jackson



"Having people around me to reassure me and support me through these years was really important to me and something I'll never forget that I had at CSUB."

## New faculty join NSME



Microbiologist **Dr. Thibault Allain** joins the Biology Department as an assistant professor, coming to CSUB most recently from a postdoctoral fellowship at the University of Calgary in Canada. Originally from a small town near Paris, France, Dr. Allain received his master's in microbiology from the Sorbonne University. He earned his Ph.D. in parasitology from the National Museum of Natural History in Paris, the INRAE Institute and the Alfort National Veterinary School.

During his postdoctoral fellowship, Dr. Allain researched pathophysiology of gastrointestinal diseases, including parasitic infections and inflammatory bowel diseases. Dr. Allain's research focuses on understanding the complex relationship between parasites, the bacteria in our gut and our overall health. He will

continue this research at CSUB, where he will investigate the role of extracellular vesicles in host-pathogen interactions.

When not in the lab or the classroom, Dr. Allain can often be found outdoors. He enjoys hiking, climbing and mountaineering, and he is excited to explore the diverse landscapes California has to offer. His other hobbies include woodworking and playing jazz guitar.



An alumna of CSUB Nursing herself, **Stacy Elrod** joins the department as an assistant professor this year. Originally from San Juan Capistrano, she moved to Bakersfield in 2012 when she was accepted into CSUB's nursing program. She then went on to earn her MSN in nursing education from CSU Dominguez Hills in 2020. She has worked part-time for CSUB's nursing department since 2018.

Since graduating from CSUB in 2015, Elrod has worked in intensive care units, specializing in trauma and surgery patients. This semester, she will teach nursing senior students during their critical care didactic and clinical course. In addition to teaching, Elrod continues to work in the trauma unit. Outside of the

classroom and hospital, Elrod enjoys beach vacations with her husband, Jake, and their two young children, Jackson and Luke.



**Edward Kish** joins the Nursing Department as an assistant professor this fall, having previously worked as a clinical instructor in the department. Born and raised in Washington State and a Bakersfield resident since 2008, Kish first earned a degree in religion and philosophy from Northwest University before later earning both a B.S. in Nursing and a Master of Science Administration — Health Care Management from CSUB in 2015.

Kish will draw on years of experience as he teaches his psychiatric nursing classes: he worked for six years at Kern Behavioral Health and Recovery Services at their Crisis Stabilization Unit or Psychiatric Evaluation Center, two years in similar units at Santa Barbara County Behavioral Wellness and for nearly three years as an

addiction medicine registered nurse for Kaiser Permanente (both on a per diem basis), and in short stints at California Department of Corrections and at a Crisis Stabilization Unit just outside of San Francisco.

In his free time, Kish enjoys traveling, mostly throughout the United States. Of particular interest on his travels are baseball stadiums, he said, noting that he recently returned from a trip to New York, where he got to visit both Yankees and Mets stadiums. He also loves checking out the dining scenes in cities he visits.

# NSME faculty recognized

This summer, CSUB presented this year's faculty and staff awards during University Day. Among the recipients were three faculty members from the College of Natural Sciences, Mathematics and Engineering.

Dr. Anna Jacobsen (Biology) received the Millie Ablin Excellence in Teaching Award, Dr. Linh Bui (Public Health) received the Promising New Faculty Award and Dr. Antje Lauer (Biology) received the Faculty Scholarship and Creative Activity Award.





## Congratulations to our faculty members who received tenure and/or promotion this year!

AUBREY KEMP Associate Professor –Mathematics Tenure and Promotion

EHSAN REIHANI Associate Professor –CEE/CS Tenure and Promotion

HANOZ SANTOKE Associate Professor –Chemistry & Biochemistry Tenure and Promotion KANE KELLER Associate Professor –Biology Tenure and Promotion

KANWALINDERJIT KAUR Associate Professor –CEE/CS Tenure and Promotion

RACHEL MCNEISH Associate Professor –Biology Tenure and Promotion AMBER STOKES Professor – Biology Promotion

SAEED JAFARZADEH Professor – CEE/CS Promotion

YIZE LI Professor – Physics & Engineering Promotion



California State University, Bakersfield Mail Stop: 13 SCI/132 9001 Stockdale Highway Bakersfield, CA 93311

#### **SUPPORT** The CSUB College of Natural Sciences, Mathematics and Engineering

Contribute to the success of NSME students with a tax-deductible donation.

Visit **give.csub.edu/nsme.shtml** to donate online or make a check out to "CSUB Foundation" with "NSME Fund"

in the memo and send it to: CSUB Foundation 9001 Stockdale Highway, 19 AW

Bakersfield, CA 93311-1099

Name/Business
Phone Email
I/We would like to support our students by making a gift of: □ \$25 □ \$50 □ \$100 □ \$200 \$
<ul> <li>CHECK Checks payable to CSUB Foundation</li> <li>ONLINE Pay online at give.csub.edu/nsme.shtml</li> <li>CARD Charge my gift to my credit card</li> <li>VISA MASTERCARD DISCOVER AMEX</li> </ul>
Credit Card Number
Name on Card
Signature