

cal state

# east bay

For University Alumni and Friends

m a g a z i n e

## THE NEW FACE OF STEM

### HIRING POWER

Young alumni launch  
careers in STEM

### GO BIG

New big data program  
fills high demand

### DARK NEW WORLD

Professor explores the  
origins of life

Spring 2015



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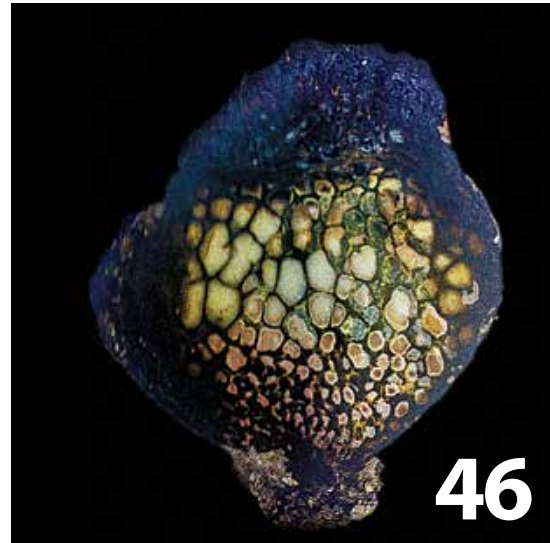
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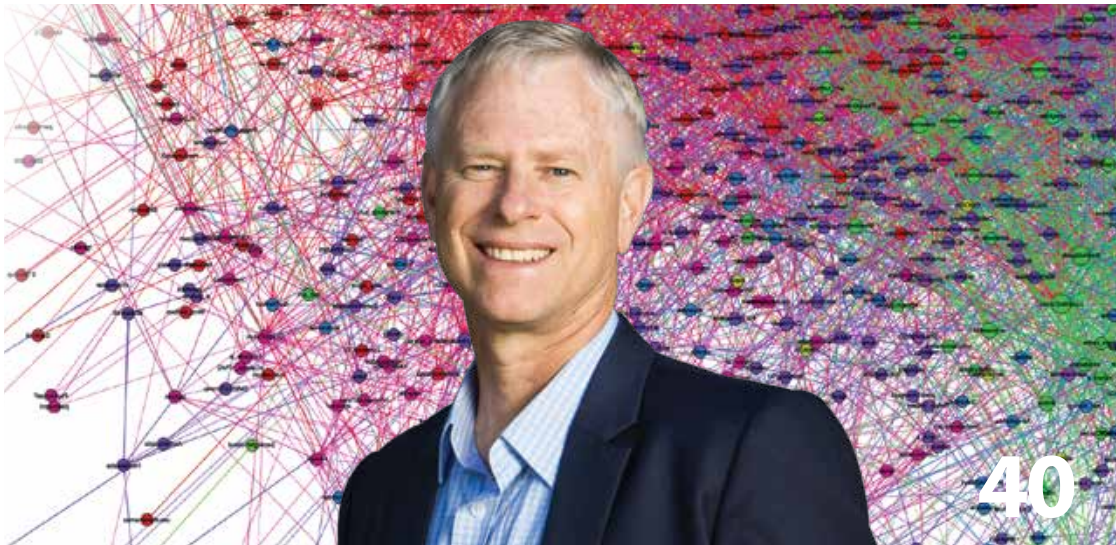
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KEN CULLINGS



GARVIN TSO



ERIC MILLETTE



GARVIN TSO



CALIFORNIA STATE  
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EAST BAY

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is published by the Office of University Communications, a department of the University Advancement division, and by the CSUEB Alumni Association.

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## PRESIDENT'S MESSAGE

### THIS UNIVERSITY IS A PLACE OF CONNECTION.



GARVIN TSO

Cal State East Bay is a place where people come together to learn: about other people and cultures; discovery and innovation; the humanities and sciences; and more.

It is a place where the past and the future are connected through our faculty and students — who study what came before and anticipate what is yet to come; where we connect the best and brightest scholars with those most eager to learn. Our goal is that CSUEB graduates go on to become more than just productive citizens; they become creative problem solvers who tackle the biggest challenges facing their generation — and beyond.

At CSUEB, we strive to help students better understand their world by facilitating connections between disciplines, like those in STEM (Science, Technology, Engineering, and Mathematics) research and education. A popular buzzword these days, STEM is

an area of focus — and concern — for not just the University, but also the state and the nation. From the White House, to industry, to the global marketplace, there is the realization that American higher education has fallen behind when it comes to producing STEM graduates.

Because of our connections with key supporters, including alumni, this University is making a significant and lasting commitment to STEM education. At Cal State East Bay, we are not just training tomorrow's scientists and engineers, but also those who will be teaching STEM — especially in grades K-12. Furthermore, we not only ensure that our graduates have the requisite knowledge and skills for success, but we also partner with business and industry to benefit K-12 schools, community colleges, and the region at-large through STEM initiatives. When it comes to STEM, we are taking the long view and making substantial investments to ensure the future success of our graduates, the region, state, and nation.

Increasingly, Cal State East Bay is recognized as a STEM leader at the local, state, and national levels — and I can promise you our reputation in this area will grow. Already, we have witnessed that these efforts benefit those directly working and studying in STEM-related fields, as well as the entire University. These connections allow us to work together building common knowledge; developing and revising interdisciplinary strategies; breaking ground on new innovations; and more efficiently utilizing our assets.

Cal State East Bay is a place of connection, first and foremost, because of the people who are linked to each other through common experiences and aspirations: as faculty, students, alumni, staff, and friends.

I am reminded of the African proverb: "If you want to go fast, go alone. If you want to go far, go together." We live in an era where information and advances are growing exponentially. If we are going to succeed in educating this generation and those to come, we have to do it together. And the connections we make here will help us go far toward that end.

Go Pioneers!

*Leroy M. Morishita*

Dr. Leroy M. Morishita

# UNIVERSITY NEWS

## CSUEB'S PHYSICS DEPARTMENT JOINS *Global Effort to Understand Dark Matter*

The Department of Physics at California State University, East Bay is participating in a unique international experiment — the Global Network of Optical Magnetometers for Exotic physics (GNOME) — to search for a theoretical object known as a "domain wall," a fracture or boundary in space. If they exist, domain walls could help physicists understand the nature of dark matter.

Little is known about the nature of dark matter, invisible material in space that does not emit or absorb light but is detectable through its gravitational pull, which affects the motion of galaxies and galactic clusters. Measurements of these gravitational effects



Scientists believe creating a network of five global magnetometers could detect dark matter. G GARVIN TSO

of dark matter show that there is five times more dark matter than ordinary matter (material made of atoms: stars, planets, gas, clouds, etc.) in the universe.

If dark matter takes the form of domain walls, crossing such a wall would exert a tiny force on spinning atoms, similar to the force of a magnetic field. To search for a domain wall, the GNOME experiment will use five atomic magnetometers (sensors) strategically located around the world. These sensors can detect magnetic fields billions of times smaller than the magnetic field of Earth. If the planet passes through a domain wall made of dark matter, the atoms spinning inside the device will

begin to wobble, and the sensors will detect the moment when this wobble occurs.

Derek F. Jackson Kimball, PhD, associate professor of physics at CSUEB and one of the physicists spearheading the project, says that five sensors are necessary to get an accurate reading. "If we were to use one sensor, we couldn't be sure that what we were seeing wasn't caused by other outside factors, such as magnetic field noise or vibrations or other interference. But using five sensors synced together by GPS lets us filter out random, uncorrelated noise," he explained. "If we see a similar result at different times on the sensors around the world, and the timing of the events matches what we expect from Earth passing through a dark matter domain wall, then we know we've got a legitimate reading. Detection of events with four of the sensors predicts when the fifth event will occur. If a fifth event matches the prediction from the first four, it could mean we've moved through a domain wall and we'll have a huge clue as to what dark matter might be."

Prototypes for the sensors are currently being built, and at least three of them, including CSUEB's, are scheduled to go online this summer. In addition to the sensor on CSUEB's Hayward campus, three others will be located in Poland, Germany, and South Korea. The fifth site has yet to be determined, but possible sites include Ohio, India, Israel, and Latvia.

Jackson Kimball said the GNOME experiment presents a unique opportunity for CSUEB undergraduate students. "Our prototype sensor at East Bay is being built by undergraduates and that's very unusual," he said. "Normally this type of work in the physics community is reserved for graduate students or postdoctoral researchers, but since the physics department here at East Bay doesn't have a graduate program, it allows our undergrads to experience actual field research from the ground up. There aren't that many universities where that occurs."

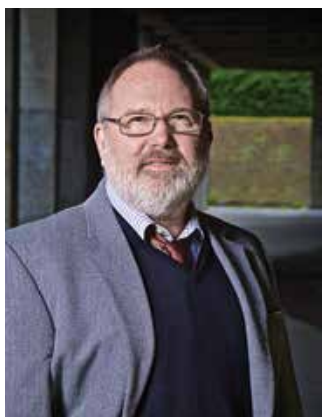
— T.P.

## Professor changes landscape of forensic science

### KEITH INMAN PRESENTS AT THE ROYAL SOCIETY, LONDON

Cal State East Bay Associate Professor Keith Inman presented his research findings in forensic science at a conference of The Royal Society, London, in February.

Inman, who teaches in Cal State East Bay's Department of Criminal Justice Administration, was one of a handful of U.S. scholars to be invited to speak at this prestigious conference for his extensive experience in change



Keith Inman © GARVIN TSO

management, forensic-science research, and judicial influence.

Inman's presentation, "Crime Scene Science – What Will the Future Look Like?" examined the physical evidence that is created during a violent act.

"Much, if not all, of the current research in forensic science is limited to the analysis and interpretation of items believed to be

'evidence,' and therefore relevant to a violent event," Inman said. "But the reverse work is rarely undertaken: research dedicated to understanding how and what kind of physical evidence is produced during a violent act — with the exception of bloodstain patterns."

Following his presentation, Inman was interviewed by *Forensic Magazine*, where he gave further details about how specific acts might be reproduced in a "crime scene theater" to create a "sphere of expectations" for a given crime. "The research would have to consist of simulations, and be very interdisciplinary," he says, ranging from the use of stunt actors, to computer gaming programmers, to drones equipped with sensors to scan crime scenes. Inman's ultimate goal would be to create a database of evidence that corresponds to violent crimes, and helps investigators search crime scenes more broadly, particularly for the unseen — things like fingernail scrapings, palm swabs, and clothing fibers.

"Current practice relies primarily on using the physical evidence resulting from a violent event to assist in the identification of involved individuals or the prosecution of previously identified suspects," Inman said. "This research

would move the use of physical evidence from confirmatory (is this the right suspect?), to predictive (what evidence would be created during this violent event?), resulting in the recovery of more relevant physical evidence."

To hear the full presentation from The Royal Society, London conference visit: [royalsociety.org/events/2015/02/forensic-science/](http://royalsociety.org/events/2015/02/forensic-science/). — J.L.

### INTERNATIONAL EXCHANGE PROGRAM ENABLES

## Blind Student to Pursue Passion for Opera

For a music major studying opera, what could be better than immersing oneself in the birthplace of opera itself? Cal State East Bay student Brandon Keith Biggs, blind from birth, is doing exactly that. Currently in Italy as part of an international exchange program, Biggs, 22, is the first blind CSUEB student to participate in a study abroad program.

"My main goal in coming to Italy is to learn the language," said Biggs. "Because most operas are in Italian, it is very important that I am able to say all the words correctly and know the meaning of everything I am saying." Biggs is studying at the Catholic University of Milan through June.

In addition to his Italian language course, Biggs is taking a theater class, a course in entrepreneurial finance and — the course he describes as the most difficult — an Italian cooking class. Biggs was also featured in one of Italy's oldest and most influential newspapers — *Corriere della Sera*. "Now I'm kind of a minor celebrity here," Biggs says. "All my friends came up and told me they read my article in the newspaper!"

Biggs took part in the International Student Exchange Program (ISEP), an organization with a network of more than 300 colleges and universities in 50 countries, which enables Cal State East Bay students to attend schools overseas and gain credit toward their degrees. "I can't say 'DO IT' enough," Biggs confirms. "It is probably the best part of a California State University."

For more information about ISEP visit: <http://www.isep.org/>. — E.M.



CSUEB student Brandon Keith Biggs enjoys a bowl of pasta after a cooking lesson. © COURTESY OF BRANDON BIGGS

## SEMESTER CONVERSION

### Cal State East Bay prepares to transition in fall 2018

In order to better align Cal State East Bay with other universities, allow community college students smoother transfers, and give students valuable opportunities for deeper, richer learning experiences, CSUEB will transition from quarters to semesters by fall 2018. President Leroy M. Morishita has called the conversion a "critical strategic priority" that is, at its core, a student-centered initiative.

During the winter 2015 quarter, the Semester Conversion Steering Committee (SCSC) was formed, led by co-directors Professor of English Eileen Barrett and Professor of Physics Jason Singley, associate director Professor of Nursing Lindsay McCrea, and project manager Assistant Vice President of Special Projects Glen Perry. The SCSC has begun meeting regularly and working with the Academic Senate and its standing committees. Among other tasks, the SCSC has completed a budget for semester conversion for the academic departments and programs, and published a framework of principles and timeline on a new semester conversion website. "The conversion to semesters will be a once-in-a-lifetime opportunity for our faculty to transform our curriculum in a way that will increasingly emphasize critical thinking skills, independent thought, student creativity, and bring life to our Institutional Learning Outcomes (ILOs)," said Provost and Vice President of Academic Affairs James L.J. Houpis. "We will be known for developing students that are not only globally aware, but also globally prepared."

Faculty across campus has also begun planning for the transfer of its curriculum over to the 15-week semester format, which Barrett explains is an "opportunity to take a fresh look at our curriculum and our pedagogy." As the Chancellor's Office has committed to funding a substantial portion of basic conversion costs, the Office of Academic Affairs has set aside additional funding for faculty to elect to take a more transformative approach, beyond what will be required to move classwork from the quarter to semester schedule.

Additionally, the University has made a pledge to students that during the conversion process it will maintain the quality of education and academic programs, and that the conversion will have no impact on students' financial standing or progress toward their degrees. Also important is the pledge's commitment to

keeping students up to date through academic advising; advisors will work with students to create Individualized Advisement Plans that lay the groundwork for academic requirements and a timely graduation. "The goal for the conversion is to make the process seamless for our students," Barrett said. "Advising will be key to this process."

To read the full University pledge, and learn more about semester conversion and the activities of the SCSC visit: [www20.csueastbay.edu/oaa/Semester/index.html](http://www20.csueastbay.edu/oaa/Semester/index.html). — K.D.

“The conversion to semesters will be a once-in-a-lifetime opportunity for our faculty to transform our curriculum in a way that will increasingly emphasize critical thinking skills, independent thought, student creativity, and bring life to our Institutional Learning Outcomes.”

**James L.J. Houpis**  
PROVOST AND VICE PRESIDENT OF  
ACADEMIC AFFAIRS



Samantha Zacarias plans to graduate from CSUEB with a master's in biology in 2016. She hopes to pursue a PhD researching the neurology of cephalopods like octopuses, cuttlefish, and squid.

STEPHEN WEBSTER

# THE NEW FACE OF STEM

HOW CAL STATE EAST BAY IS  
LEADING THE WAY IN STEM  
RESEARCH AND EDUCATION,  
NOW AND INTO THE FUTURE

BY KRISTA DOSSETTI  
PHOTOGRAPHY GARVIN TSO

MARIA PADILLA, AGE 13, WALKS TO HER MIDDLE SCHOOL IN THE FRUITVALE NEIGHBORHOOD OF OAKLAND EACH MORNING. SHE IS IN THE EIGHTH GRADE. THE SCHOOL IS 87 PERCENT LATINO, WITH MORE THAN 50 PERCENT OF ITS STUDENTS DESIGNATED AS ENGLISH AS A SECOND LANGUAGE (ESL) LEARNERS. THE FRUITVALE AREA HAS LONG BEEN RECOGNIZED AS THE MOST DIVERSE SECTION OF ONE OF THE MOST DIVERSE CITIES IN AMERICA, WITH A HIGH POPULATION OF ASIAN AND HISPANIC IMMIGRANTS. ACCORDING TO CITY-DATA.COM, 26 PERCENT OF RESIDENTS IN THE NEIGHBORHOOD LIVE BELOW THE POVERTY LINE AND A STAGGERING 67 PERCENT HAVE LESS THAN A HIGH SCHOOL EDUCATION — NEITHER OF WHICH CREATES HIGH EXPECTATIONS FOR CUTTING-EDGE PROGRAMS IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH (STEM) IN THE IMMEDIATE NEIGHBORHOOD. ►





“You can make art into science by making things into 3D ... I want to help people by making things like a robotic arm.”

**Maria Padilla**  
8TH GRADE  
URBAN PROMISE ACADEMY, OAKLAND

The rules for the MESA balsa glider competition require students to build their gliders using original construction (no pre-fab kits allowed) from limited materials. The gliders can be of any size or weight — the longest to stay in the air wins.  
OPPOSITE PAGE: Maria Padilla, age 13.

Yet at Urban Promise Academy, a public middle school in Oakland Unified School District, 300 sixth, seventh, and eighth graders enjoy desirable student-teacher ratios (1:16), and Padilla is excelling in science and math. “I like doing experiments, and I like algebra,” she explains. “In the seventh grade we started doing more interactive, fun things. Last year we did a cow eye dissection — we got to learn about the eye with a hands-on experiment.” Padilla also says that the use of algebra tiles has made learning math easier in middle school, as she calls herself a “visual learner.” She’s even incorporating her love of art — Padilla is the designated student artist and draws all the school dance and assembly posters — into her future plans of becoming a doctor. “You can make art into science by making things into 3D ... I want to help people by making things like a robotic arm,” she says.

Padilla speaks Spanish at home, and is the youngest of four children. She was re-designated in elementary school as Fluent English Proficient through a series of tests. If she follows through with her plans to become a doctor, she will be the first in her family to go to college.

She may also get her chance at robotics sooner rather than later. In early March, Padilla came to Cal State East Bay through the Math Engineering Science Achievement (MESA) program, which does feature a robotic arm competition. MESA is a statewide program in its eighth year on the CSUEB campus that helps schools like Urban Promise Academy inspire students to pursue college degrees and careers in STEM.

To give robotics a try, Padilla will have to return to the MESA program next year as a freshman in high school. This year she competed in the bridge building and balsa wood glider (airplane) events with the rest of her class. “I liked the bridge building best,” Padilla says of the load-bearing competition. Rules for the bridges at the middle school level included a maximum of 200 wood pieces, constructed to exacting dimensions, with students scored on neatness, craftsmanship, and creativity. “The rules were strict,” she continues. “Like you could only glue 50 percent of the Popsicle sticks together, so that pushed me to think.”

Being on Cal State East Bay’s campus also pushed her peers to think, shares Tierre Mesa, dean of students at Urban Promise Academy. “They came away with so many questions about college,” she says. “That exposure is really important for them.” ▶





## LOOKING BACK

In hearing a 13-year-old like Padilla talk about the difference between active and passive learning, and how “some teachers just focus on writing things down a lot,” it’s almost unbelievable that the term STEM was virtually unknown a handful of years ago. If you passed someone in the hall circa 2010 and said, “Hey, have you heard of STEM?” they would surely respond, eyebrow raised, “You mean stem-cell research?”

The acronym was actually introduced more than 20 years ago by the National Science Foundation (NSF), and covers any number of policies, events, curriculum, or programs. Despite its slow-building momentum, STEM has always been fueled by a sense of urgency — the idea that our children must do better in these areas to meet the demands of an increasingly sophisticated workforce *and* be able to think critically about solving global challenges. According to the U.S. Department of Education, “Only 16 percent of American high school seniors are proficient in mathematics and interested in a STEM career. Even among those who do go on to pursue a college major in the STEM fields, only about half choose to work in a related career. The United States is falling behind internationally, ranking 25th in mathematics and 17th in science among industrialized nations.”

Meeting the demand is a tall order — one that has required a much deeper ideological shift than simply upping the class time for math and science. The implications of STEM are as far-reaching as how to expose preschoolers to engineering concepts, to how tenured teachers will reformulate lesson plans. Reconciling the overwhelming lack of diversity in the STEM workforce with the realities — and richness — of the Bay Area’s demographics is another pressing issue: A June 2015 article in *The Guardian* stated, “Nearly 75 percent of U.S. scientists and engineers are white. And, despite comprising 26 percent of the workforce, African Americans and Hispanics represent only 11 percent of all STEM employees. Addressing this lack of diversity is key if the U.S. wants to be a leader in STEM fields.”

## HERE AND NOW

It is no wonder that it has taken time for STEM, with all its implications, to gain speed across the entire bandwidth of education, but results are finally surfacing all along the preK-18 continuum.

Cal State East Bay is rising to the challenge of STEM with a dynamic model of campus learning and community engagement that is distinctive among California State Universities (CSUs). “Across the campus, across the community — the comprehensiveness of what we are doing, there’s nothing else like it currently out there,” says CSUEB’s Stephanie Couch, Bayer Executive Director, Institute for STEM Education, and Director, Gateways East Bay STEM Network.

What Couch is referring to is the vast web of curriculum, programs, and grant-funded initiatives that have not only transformed education on the Cal State East Bay campus, but the relationship the University has with the community ►

“This equipment is used in hands-on research, (the experience) is resume-worthy.”

**James Murray**  
ASSOCIATE PROFESSOR,  
DEPARTMENT OF BIOLOGICAL  
SCIENCES

The confocal microscope uses fluorescent tagging to identify different components of an organism — pictured here cyanobacteria, otherwise known as Spirulina. OPPOSITE PAGE: Associate Professor James Murray shares his research of *Tritonia tetraquetra* (a type of sea slug, pictured right) with Katrina Mayol (BS '15, Biology).







**Light Show:** Assistant Professor Jennie Guzman (center) works with students (left to right) Aracely Cobos, Taichi Inaki, Alexander Penaflor, and Dominic Fuentes to understand dark matter. Here, students use a blue laser light to cool atoms to  $< 1$  mK (100,000 times colder than room temperature) to test the spin-statistics theorem, which states that all particles must be classified as one of two types: fermions or bosons.

“Across the campus, across the community — the comprehensiveness of what we are doing, there’s nothing else like it currently out there.”

**Stephanie Couch**

BAYER EXECUTIVE DIRECTOR, INSTITUTE FOR STEM EDUCATION,  
AND DIRECTOR, GATEWAYS EAST BAY STEM NETWORK



**Tube Test** (left to right): Josh Lefkowitz (BS '15), Angelica Guevara, and Channing Polk examine growth conditions for bacteria, such as various concentrations of oxygen, salt, pH levels, and different temperatures.

— the pipeline of students, teachers, researchers, and working professionals coming in and out. New, hands-on undergraduate classes, for example, are changing the lecture-based General Education (GE) courses of the past: some environmental science courses, enabled by a Programmatic Excellence and Innovation in Learning (PEIL) grant, now include fieldwork to reforest the East Bay Hills with their native oak trees.

Likewise, Physics 1700, through an NSF grant, has been reconfigured into an inquiry and experiment-based course that gives

would-be teachers ideas for science in the classroom in advance of upper-division coursework. Service-learning opportunities are also expanding, bringing elementary and middle school students here on campus: Hands-On Science Teaching (HOST) labs give science students the opportunity to teach experiments to middle schoolers as part of their science classes. And, the value of direct access to lab time and equipment that has long been offered at CSUEB (compared to other universities where time must be paid for and scheduled weeks in advance) gives students

a competitive edge when looking for jobs. Department of Biological Sciences Associate Professor James Murray, who works with students in the University’s confocal microscope lab, says, “This equipment is used in hands-on research, (the experience) is resume-worthy.”

Off-campus efforts are just as extensive. Outreach and mentoring programs like Hayward Promise Neighborhood (HPN) — a partnership with residents, colleges, schools, businesses, government, and non-profit organizations led by CSUEB that targets the Jackson Triangle area in Hayward — are ▶



“Nearly 75 percent of U.S. scientists and engineers are white. And, despite comprising 26 percent of the workforce, African Americans and Hispanics represent only 11 percent of all STEM employees. Addressing this lack of diversity is key if the U.S. wants to be a leader in STEM fields.”

The Guardian

Joseph Bouampo (MS '14, Computer Science) writes out Java script. Cal State East Bay's Department of Mathematics & Computer Science offers more than 40 undergraduate courses and 30 graduate courses.

advancing STEM within underserved, minority communities. In addition to helping children in the Jackson Triangle, HPN offers adults and parents access to STEM skill sets for the purposes of jobs and engaging with their children more confidently. Project STEM, funded by a U.S. Department of Education grant, will match 150 CSUEB STEM student teachers with 150 mentor teachers in nearby Fremont Unified School District, giving them practical experience and enhancing both participants' exposure to leading-edge STEM teaching strategies. And, programs like MESA show

kids throughout the East bay that there is a place well within reach where they can pursue a college education and build a future in STEM.

Because of Cal State East Bay's inclusive approach to evolving STEM, the East Bay Economic Development Alliance has recognized the University's Gateways East Bay STEM Network, a joint leadership collaborative of faculty, staff, and students from all four colleges and campus divisions, as critical — and influential — to the regional economy. ▶



“The CIRCLe Project is designed to advance interdisciplinary research and collaborative learning in STEM — it is a STEM teaching and learning incubator. We have a responsibility to promote STEM careers for our students in all areas.”

**Michael Leung**  
DEAN, COLLEGE OF SCIENCE



Plans for the CIRCLe building include flexible workspace with cutting-edge technology, shared study and research spaces, and state-of-the-art lab equipment. **FLAD ARCHITECTS**

## HIVE OF INNOVATION

In continuing to shape the model for STEM learning — one that incorporates faculty, full-time and professional-development students, community stakeholders, and preK-12 outreach — the next step at Cal State East Bay is to form a living hive where all of these efforts and entities can continue to expand: The Center for Interdisciplinary Research and Collaborative Learning (CIRCLe) Project.

As of now, there is nothing like it among CSU campuses. The CIRCLe Project will complement and advance the many STEM initiatives taking place all across the Cal State East Bay campus, and create funding for a state-of-the-art building that has already received a gift of \$2.5 million from the S. D. Bechtel, Jr. Foundation. The CIRCLe building will create a place for all four colleges to come together, with opportunities for students from every discipline —

engineering, mathematics, computer sciences, business, the arts, and more — for cross-pollination and lab use. In the shared study, lab, and classroom areas, students and faculty that might have never met in the traditional higher-education framework will be side by side, encouraging creative interdisciplinary research, projects, collaborative curriculum, and the technical skill sets that all 21st-century students need for any career.

Exposing future teachers to the challenges and excitement of research will also have a direct impact on how they approach science in the classroom. Even at the elementary school level, which does not require specialty knowledge of a particular science subject, experiencing coursework through the lens of STEM can help teachers to conduct lessons with deeper content knowledge and more confidence — and spark students' interest in science earlier. “The CIRCLe Project is designed to advance interdisciplinary research and collaborative learning in STEM — it is

a STEM teaching and learning incubator,” explains College of Science Dean Michael Leung. “We have a responsibility to promote STEM careers for our students in all areas.”

Similarly, science faculty and students will benefit from increased awareness of both innovative and proven instruction methods, and how to implement a variety of learning experiences, such as problem and discovery based classes, and peer teaching exercises. “Although I had some experience teaching in graduate school, I wasn’t trained to teach,” says Danika LeDuc, PhD, associate director, Institute for STEM Education and associate professor, Department of Chemistry & Biology. “Graduating wasn’t contingent on your teaching ability, but on publishing your research. Having the opportunity to work with faculty whose expertise is in teaching and learning, and with K-12 teachers who have rich experience in teaching every day, has allowed me to connect my discipline

knowledge with effective teaching strategies to create a more dynamic and engaged environment in my classes.”

## BUILDING THE FUTURE

An eighth-grader like Maria Padilla is a great example of how STEM is finally reaching home. “But her story is far from complete,” adds Leung. “She must go on from K-12 to complete the continuum in higher education, so that one day she can become that scientist who builds robotic arms.”

As Cal State East Bay continues to offer students opportunities for research and hands-on learning, bring diverse perspectives to collaborate at a common table, and enhance STEM awareness throughout the region, the door is being pushed open wider and wider for unprecedented innovation — for students like Padilla to walk through it. ■



# STEM MATTERS

DEAN NELSON & DEAN LEUNG DISCUSS WHAT MAKES CSUEB DISTINCTIVE — AND SHARE THEIR VISION FOR THE FUTURE.

Stephanie Couch (far left), Bayer Executive Director, Institute for STEM Education, and Director, Gateways East Bay STEM Network, moderates a conversation with College of Education & Allied Studies Dean Carolyn Nelson and College of Science Dean Michael Leung. Cal State East Bay's Institute for STEM Education brings together all four colleges to assess research and data, identify where and how the University can have the biggest impact on STEM teaching and learning, and pursue grant funding to implement new, transformative strategies for students at the University and throughout K-12.

**COUCH:** Now, sometimes I hear the word STEM and sometimes I hear the word STEM education. Is there a difference between those two things?

**NELSON:** I would say that STEM is the practice of deepening one's knowledge within the disciplines (of Science, Technology, Engineering, and Math). STEM education is understanding how you actually teach those disciplines — knowing science and teaching science concepts to someone else are two different things. The beauty of the way they work together is the interdependence between knowing and doing.

**COUCH:** Now, one of the things that's very prominent on this campus is bringing the two (STEM and STEM education) together. Can you say more about how science, for example, might have been taught in the past and how (we) are teaching it now, and what really makes this campus distinct?

**NELSON:** I would say one of the really distinctive features of this campus is that (we) take

responsibility for the entire pipeline. And in doing that, it allows our institution and faculty to engage with the community in ways that aren't traditional. That is to say, we bring kids on campus, K-12 populations of children and students, to work alongside our University faculty. We also have our undergraduate students working with the K-12 students in their schools. It shows them, 'As I'm teaching, I'm also learning this better.' One of the best ways to learn something in a deeper way is to teach it.

**LEUNG:** I would like to add (that) in the past, scientists were always taught that teaching is somebody else's responsibility. And at Cal State East Bay, in a very unique sense, we really have a group of scientists who are passionately involved with a group of educators, (and they are) working together to enhance STEM education, everything from K-18.

Because when people meet scientists, they generally will say, 'What have you discovered? What have you done in your lab?' And very few people will ask them,

'What is your contribution toward educating the next generation?' But the truth is that science education is no different than cancer research. It's an area for us to explore. It's an area for us to discover. There are new things that we can learn and we can tell other people, and that's what we like to encourage — to use science education as a forum to explore and to discover and to find out new things; how (we) can make teaching and learning in STEM better.

**COUCH:** As you know, we have a very diverse student population here at East Bay and a lot of the students are the first in their families to go to college. And a lot have faced a lot of challenges in order to get here. What are we doing to engage our students and help retain them and get them to graduation?

**LEUNG:** You know, talking about minority education in STEM, that's really one of the truly most difficult areas to overcome — (STEM is) a concept that we have to really work hard to introduce. What we do for (underserved

students) goes beyond just educating them in a classroom. (We) introduce the concept of STEM, role of STEM in society, and how they can benefit, and how they (can) contribute.

**NELSON:** Now, where we approach it with our teachers and our teacher preparation program is (to) start flipping the expectation that traditionally and historically schools have had (for underserved students). The traditional perspective is first you have to learn to read and then you have to learn to do numbers. And then, if there's time left over, you get to do STEM.

What we're doing with our teachers right now is saying, 'When you teach science and engineering, you are teaching the kinds of thinking skills that enhance the learning of the disciplines themselves.'

So, it becomes a vehicle through which you can teach literature. It becomes a vehicle through which you can teach writing and language arts.

**COUCH:** Engaging students in research is a high-impact practice

in terms of the types of things we need to do for retention and graduation of students from diverse backgrounds. (There are plans for) a CIRCLe building and it's part of a larger CIRCLe Project — the Center for Interdisciplinary Research and Collaborative Learning. Where did this idea come from?

**LEUNG:** There's not one problem that we encounter today that can be solved by one single discipline. We want scientists of all disciplines to come together to provide an environment where students and once again, I want to emphasize students from K-18, can gain some experience in how research is being done and how to develop an interest in exploration. And the collaborative learning area is really an area where we allow faculty and students to interact in doing hands-on things, in solving problems together.

**COUCH:** Okay. So, who will benefit from this new space? Who will be using the space?

**LEUNG:** I will say everybody in K-12. Obviously, the undergraduate and the graduate (students) will be involved with our faculty in doing research. But teachers and students from K-12 will also be brought in to interact with them. We (will) also have a core facility with the most advanced scientific instruments so that (students) get a chance to see

how new research is being done. I am seeing it as a facility that will benefit STEM education in a continuum from K-18.

**NELSON:** I think that the collaboration part can't be underestimated . . . oftentimes we talk about collaboration, but our current facilities make it challenging to actually do that — because facilities do make a difference. Do they cultivate that collaborative culture or do they foster separation of disciplines because it's convenient and easier that way? I think what this building will do is create the environment that enables and fosters collaboration.

(The) second piece to that is, it will demonstrate for students and model what collaboration looks like . . . here, they'll actually get to see professors (from different disciplines) working together alongside multiple kinds of majors and students. That's a beautiful model because it is an authentic model for how research is done in the real world. And it also creates the kind of environment in which students can build those 21st-century skills that we know employers really want.

**COUCH:** Well, you have both described the work taking place all along the education continuum; if we are wildly successful in our work at all of those stages of

students' lives, what does the future look like?

**LEUNG:** If we look at the term collaborative learning within the CIRCLe Project, collaborative learning (goes) beyond just the campus. What we learn, we hope to disseminate to other people. And we know (speaking to Couch) that you're also very important (within the) STEM network (because) that's the mechanism to communicate what we learn and to disseminate best practices to other people.

By the same token, we also want to learn from other people. So, in our organized effort, we hope to collaborate, to interact so that people within the learning community can learn from each other.

**NELSON:** I would say that the future would look like the following: We would have a massive and very exciting increase in the numbers of STEM majors produced by this campus. We would have students from all over the country and beyond wanting to come here because of the powerful ways in which our campus and our faculty teach science, math, engineering, and technology, and use it in a collaborative way.

I would say the future looks like having the opportunity to develop the kinds of science educators that already know how to

collaborate as a team, that already know what powerful science education means because they've had the opportunity to practice it while in their program(s) and then become change agents for that in their schools. I would say it looks like (the students of the teachers we produce) then saying, 'I want to be like that person,' and increasing the pipeline, enhancing the quality and the quantity of people wanting to come to this campus because of the powerful practices that we have, and the powerful faculty that we have in STEM education.

**COUCH:** The only thing I would add to the wonderful things that you two just captured in your vision is that we are one of 23 CSU campuses and already, I think we are helping to play a catalytic role, if you will, in collaborations with our fellow campuses. And I'm excited that . . . (our efforts) are infecting the work across all 23 campuses and we are now having conversations about how we connect the learning from this campus and that of others and bring it together. ■



# HIRING POWER

THREE YOUNG ALUMNI AND ONE UNDERGRADUATE  
DEMYSTIFY STARTING A CAREER IN STEM

BY KRISTA DOSSETTI  
PHOTOGRAPHY GARVIN TSO

For many college students in the process of completing their degrees, the career they want can seem a lifetime away. Sure, big-name companies are dreamy possibilities down the line, but first there will be years of grunt work, poor-paying jobs, and fierce competition. Then maybe — just maybe — with the right connections, a stroke of luck, and a dash of good fortune, a student might be able to crack the door open to the job of his/her dreams ... right?

Wrong.

More and more Cal State East Bay graduates are proving sooner and faster that gaining entry to the jobs and companies of their choice isn't a matter of career roulette, or waiting for that golden opportunity. It's about taking an interdisciplinary approach to your own future — combining education with relevant work and research experience. According to a January 2015 survey of 400 employers by the Association of American Colleges & Universities, "Employers overwhelmingly endorse broad learning as the best preparation for long-term career success," and "they are more likely to consider hiring recent college graduates who have completed an applied learning or project-based experience." In layman's terms, your college resume shouldn't be a transcript — it should be a rich portfolio of exploration and discovery.

In this article, three young alumni and a current undergraduate student share how they've leveraged dynamic hands-on learning opportunities to catapult careers in Science, Technology, Engineering, and Math (STEM). Hard work is a requirement, but you can leave the magic wand at home.

## KHOA NGUYEN (BS '07) OPTICS HARDWARE ENGINEER

Khoa Nguyen (BS '07, Physics) can't say much about his work as an optics hardware engineer at the highly secretive GoogleX labs — but it's clear he has the inventive spirit needed for the job.

Nguyen's interest in science began as a teen, with time-travel fiction and other sci-fi scenarios that "sparked my imagination," he says. Bending his mind to the futuristic quickly led Nguyen to question his own path, which for a would-be physicist in Vietnam was limited: "There is not enough infrastructure in Vietnam for work and research," he explains. ►

“If you study science like physics, you need to feel things ... what I learned from hands-on research gave me broader knowledge. It's absolutely why I was hired at GoogleX.”

Khoa Nguyen (BS '07)  
OPTICS HARDWARE ENGINEER



“The only possibility is to teach.” And so he looked for a place in the world that was not simply consuming technology but creating it — Silicon Valley.

With family in California that could sponsor him, Nguyen applied for a foreign student visa and began studying physics at Cal State East Bay in 2002. “My focus on optics is actually circumstantial,” he says. “Derek (Jackson) Kimball (associate professor, physics) was doing a research project on light-matter interactions during my bachelor program and invited me to join him.”

The mentorship was — and still is — essential to Nguyen’s success. After graduating from Cal State East Bay he was quickly hired by Intelesense, a startup collaborative between NASA and Stanford for global integrated monitoring products. After working a year there, he decided to pursue his master’s in physics at San Jose State.

There was just one problem. At the time, San Jose State did not have the same research-based opportunities as CSUEB that Nguyen had learned so much from. After obtaining permission to do his research here, again under Jackson Kimball, Nguyen resumed work on light-matter interactions. “If you study science like physics, you need to feel things ... what I learned from hands-on research gave me broader knowledge. It’s absolutely why I was hired at GoogleX.” Nguyen graduated from San Jose State with an M.S. in physics in 2012.

The 30-year-old is just getting started — “I love the people I work with and I’m constantly learning,” he says. However, the ironclad labs of GoogleX, where Nguyen’s optics tasks range from how fast webpages load to helping a self-driving car “see,” aren’t his ultimate passion. “It’s farfetched, but someday I want to work on energy and energy transfer via a beam of light.” Returning to Vietnam to see his family is also a goal, as he hasn’t been back since first coming to the U.S. in 2002.

## NATALY PEREZ (MS ’13) ASSISTANT PROJECT MANAGER

On Nataly Perez’s (MS ’13, Construction Management) second full day in California, she went straight to the DMV and applied for a driver’s license. Having just arrived from the Dominican Republic, “I wanted my residency to start as soon as possible so I could afford to go to school,” the 27-year-old says. “I spent the entire first year in the U.S. working at the Cal (Berkeley) Student Store, barely making enough to live on, studying for the GRE and TOEFL, and applying for master’s programs and financial aid.”

She didn’t get the financial aid until her second year in the master’s program, but Perez managed to scrape together enough to get started. “I saw a lot of my colleagues leave the program because they had to work, but you have to persevere — it opens so many doors down the road.”

Perez obtained her B.S. in civil engineering from the Instituto Tecnológico de Santo Domingo (INTEC), where she began the work that she would eventually continue at Cal State East Bay: “(At INTEC) I did an investigation on asphalt using a recycled rubber base that I wanted to continue; I wanted to try different bases in concrete.” After she applied to different universities in the region, Perez chose CSUEB for its pragmatic reputation and the possibility to continue her research.

The “green concrete,” which she pursued as her master’s thesis under Associate Professor Cristian Gaedicke, went on to win an honorable mention for best conference paper from the Associated Schools of Construction (ASC) in 2014. Perez was also a part of the first CSUEB team to compete in the construction management category at ASC in 2013, winning second place. The results of the green concrete study, however, mean more to her than any award: “We were successful in showing that terrazzo (a composite material that typically show pieces such as quartz, granite, or glass in the final product) improves resistance in concrete, and other recycled materials like granite and marble work just as well. This (research) would be especially important in my home country, where the use of concrete is extensive.”

Although her thesis is noteworthy, it was a partnership between Cal State East Bay and Webcor Builders — the general contractor behind projects such as the California Academy of Sciences and San Francisco’s new Transbay Transit Center — that has been most instrumental to Perez’s career. “Lecturers from Webcor would come to campus and invite us (to) interview or submit resumes. I did the interview and was hired as an intern.” Perez worked for Webcor as a paid intern for nine months before being recruited by Commercial Construction Improvements (CCI) as an assistant project manager. “There was more learning potential there because of the smaller size of the company and less delineation between departments and tasks,” she explains.

At CCI, Perez is currently working on renovating Hotel California in San Francisco, a boutique property with a 100-year history, and building the new Union Pacific offices on Van Ness Avenue.

“It’s been less than five years since I’ve been in California, and I am where I am because of CSUEB” she says. “(The program) really prepared me for my professional life — I can now step forward and do what I want.” ▶

“It’s been less than five years since I’ve been in California, and I am where I am because of CSUEB.”

**Nataly Perez (MS ’13)**  
ASSISTANT PROJECT MANAGER



## AMANDA LIEN (MS '14) COMMUNITY COLLEGE MATH INSTRUCTOR

Amanda Lien (MS '14, Applied Mathematics) and math have a tumultuous past. Although she was the type of kid who took summer courses to get ahead, the numbers didn't always stick. Lien recalls going to the Jose Valdes Math Institute in San Jose during her middle school years to get credit for high school classes. However, when she got Cs and Ds in the courses, which took a toll on her GPA, a pattern soon developed: Lien committed herself to repeating the same courses until the Cs and Ds became As and Bs.

And then things finally clicked.

Driven by the idea that she might be able to finish the college requirements for math altogether, Lien signed up for yet another summer math course — trigonometry/pre-calculus at Evergreen Valley College. Lien's professor took the class outside to use clinometers and showed the students how they could measure the height of a building from a distance. The lesson was an instant eye-opener for Lien on the real-world applications of math: "This understanding of being able to measure a building without even touching it opened up so many possibilities to me ... architecture, engineering ... I started to realize I would need math for any career."

The "aha" moment spurred Lien to continue taking complex math courses in college at UC Berkeley, until her career path was all but cleared before her: The girl who used to repeat course after course not only wanted to pursue a math degree, she wanted to teach it at the college level. When Lien heard through a friend that hands-on teaching experience was available through Cal State East Bay, she quickly zeroed in on moving to Hayward.

"Even before the first quarter I was emailing professors, asking how I could get involved in teaching. It was summer, but Professor (Donald) Wolitzer was super responsive. I had an interview and was able to start teaching right away — the first quarter."

Lien would eventually be invited by the woman she calls her mentor, Associate Professor Julia Olkin, as well as Acting Chair of the Department of Math and Computer Sciences, Kevin Callahan, to participate in a grant-funded research project called Changing Remedial Math (CHaRM). Because Lien had already taught remedial math, she was the ideal choice to help restructure learning strategies to be more active, which she says is especially important for international students with language barriers.

In January 2015, Lien was offered a full-time, tenure-track position at De Anza College, winning out over candidates with more experience for the coveted position. "The teaching opportunities while going to school and the work with CHaRM, that's really why I had a competitive edge. Diversity is also a big deal at De Anza, and there was a connection there with Cal State East Bay too." ►

“The teaching opportunities while going to school ... that's really why I had a competitive edge.”

**Amanda Lien (MS '14)**  
COMMUNITY COLLEGE MATH INSTRUCTOR



# ANTHONY BECKER GAME DEVELOPER

While most children were learning the ABC song, Anthony Becker was memorizing the periodic table. It was the idea of his grandfather, a former optical scientist at NASA: “He was always stoking that passion (for science), even when I was very little, by telling me how things work,” Becker says.

It was a gift that would keep on giving. Becker’s grandfather instilled a deep curiosity in his grandson — one that drove him to seek knowledge outside of his hometown of Ridgecrest, Calif. “I was home-schooled in a small community, and so I wanted to find out about other ways of thinking,” Becker explains. Ironically, it was this instinct that almost made him miss his freshman year of college: “I initially wanted to major in journalism to learn about other people, but then I changed my mind at the last minute. Luckily, Cal State East Bay was still accepting and had the science major I wanted.”

Becker is actually double majoring in biochemistry and computer science with plans to graduate in 2017, but he’s already putting his longtime interest in game programming to work in the local indie scene.

“I got a hobbyist programming game from a friend for my birthday when I was 10,” Becker recalls. “I could move two guys around a screen and that was it.”

Still, it was the start of something bigger. After arriving to Hayward in fall 2012, Becker started joining online game jams — intensive coding sessions typically lasting 24-72 hours — as a hobby. And then he saw a poster for a live game jam taking place on campus.

One thing led to another. Becker met local indie game developers brought in as mentors for the game jam and boldly began networking, while at the same time showing off his practical skills. Eventually, the connection went off campus and resulted in an introduction to MidBoss, a company that focuses on games with LGBT characters. Becker was able to leverage his CSUEB contacts into a part-time job: He has been working on flavor text, a hybrid of content writing and programming that accounts for the logical outcome of interactions, for *Read Only Memories*, a click-and-point adventure game set in “cyberpunk San Francisco” in the year 2064. The game is set to release this summer.

Becker continues to work with MidBoss while pursuing his dual degrees. Although there’s no telling what he’ll do next, programming is a constant: “It would be cool to work in the indie game scene for a while after I graduate ... but Plan A is to get a PhD in computer science and work for a top company like GoogleX. Plan B is to work for NASA or SpaceX on life-support systems, particularly ones that recycle nutrients, which is an idea for a game I have that I want to try out, like in a cartoon-ized way before working on the real thing ....”

## CLEARING THE WAY

There’s no doubt that the achievements of these young Pioneers are impressive, and their ability to enter the career world so quickly corresponds to widely published statistics on the demand for STEM workers: 1.1 million by 2018. Yet the global reputation of the Bay Area as a technology epicenter ensures that employment will remain toughly competitive and require candidates to differentiate themselves clearly — a feat made possible for these alumni through the experiential and collaborative learning at CSUEB. They’ve cleared the way — now go ahead and blaze your own trail. ■



“It would be cool to work in the indie game scene for a while after I graduate ... but Plan A is to get a PhD in computer science and work for a top company like GoogleX.”

ANTHONY BECKER  
GAME DEVELOPER



Multimedia graduate students (clockwise from left) Sian Geraghty, Christine Ho, and Robert Foster capitalized on the power of STEAM with their master’s thesis, Project Daffodil — a pop-up book that twists the classic princess paradigm to teach young girls about electronics and science. The team currently tours with Project Daffodil to Maker Faires across the country.

# STE(A)M

The crossover between technology and the arts is putting the ‘A’ in STEM — and building the evolution of the acronym into what many call “STEAM.” Covering a range of integrated career fields, from video game design, to mapping the human body (pg. 34), or building computer-simulated engineering models, there is potential in nearly every job sector to leverage the power of technology. As for fun and games, electronic entertainment represents a substantial chunk of STEM-related job possibilities. According to *Video Games in the 21st Century: The 2014 Report*, published by the Entertainment Software Association (ESA), the video game industry grew four times faster than the national economy from 2009-2012 and contributed \$6.2 billion to the 2012 U.S. GDP. California’s production alone (ranked No. 1 of 26 states surveyed) amounted to \$2.78 billion, with nearly 65,000 employees, and an average salary of \$103k.



Dynamic Duo: Earth & Environmental Science Professor Jeffery Seitz and sixth-grade teacher Linda Preminger work together to give educators both hands-on science experience and effective teaching strategies.



# AFTER HOURS

**CAL STATE EAST BAY GIVES TEACHERS CONFIDENCE TO SHARE STEM IN THE CLASSROOM**

**BY FRED SANDSMARK '83**  
**PHOTOGRAPHY GARVIN TSO**

**I**t's 4:30 p.m. on a Wednesday in Science Lab 2 at Bohannon Middle School in San Lorenzo. A dozen middle school math-science teachers gather around five lab tables; on each table are two shoebox-like plastic containers. Inside every container is a brick-shaped lump of modeling clay and a few inches of water. Carrying a cooler of oversize ice cubes, co-instructor Linda Preminger moves from group to group.

She places ice on top of the clay in one box, and into the water in the other. She then asks the teachers — who, this afternoon, are her students — which container will experience a greater rise in water level as the ice melts.

The experiment demonstrates to the teachers how and why melting land and sea ice, caused by climate change, raises global sea levels. (The teachers will eventually lead their own students in the same experiment.) But water in a plastic box is not the only thing inching up in this room. The STEM fluency of middle school science teachers in the East Bay is steadily rising, thanks in part to programs like this one, and to individuals like Preminger.

The need is great. Only 20 percent of California students were proficient on the eighth-grade National Assessment of Educational Progress (NAEP) science exam in 2009, according to research published by Bay Area education think tank WestEd, which cited inadequate teacher background or preparation as a contributing factor.

Helping students connect science lessons to the world around them means more work for teachers in after-hours classes, but to Preminger — a veteran sixth-grade math-science teacher at San Lorenzo's Washington Manor Middle School — it's worth the effort. "Science, for me, is about opening windows for kids to look at things that they've never really examined before," she says. "We want them to be literate in scientific ideas."

The after-school session is offered through Cal State East Bay's Integrated Middle School Science (IMSS) partnership, and helps teachers prepare to take the Foundational Level ►





Professor Jeffery Seitz introduces an experiment to the teachers on climate change, the theme of the evening, showing how heat promotes the spread of CO<sub>2</sub> in the atmosphere.

“Linda brings a real ‘ground truth’ to our course. In the science activities that we teach, she can help teachers make them more successful for their students by examining different instructional strategies, barriers to student learning, and classroom management issues.”

**Jeffery Seitz**  
CSUEB PROFESSOR, EARTH &  
ENVIRONMENTAL SCIENCES



General Science (FLGS) credential test. Not long ago, Preminger was one of the students huddled around a lab table, but now she co-leads the 10-week class with CSUEB Earth & Environmental Sciences Professor Jeffery Seitz and Anna Newman, science coordinator in the Alameda County Office of Education. “Our partnership in the classroom is really powerful because we bring different strengths and perspectives,” Seitz explains. “Linda brings a real ‘ground truth’ to our course. In the science activities that we teach, she can help teachers make them more successful for their students by examining different instructional strategies, barriers to student learning, and classroom management issues.”

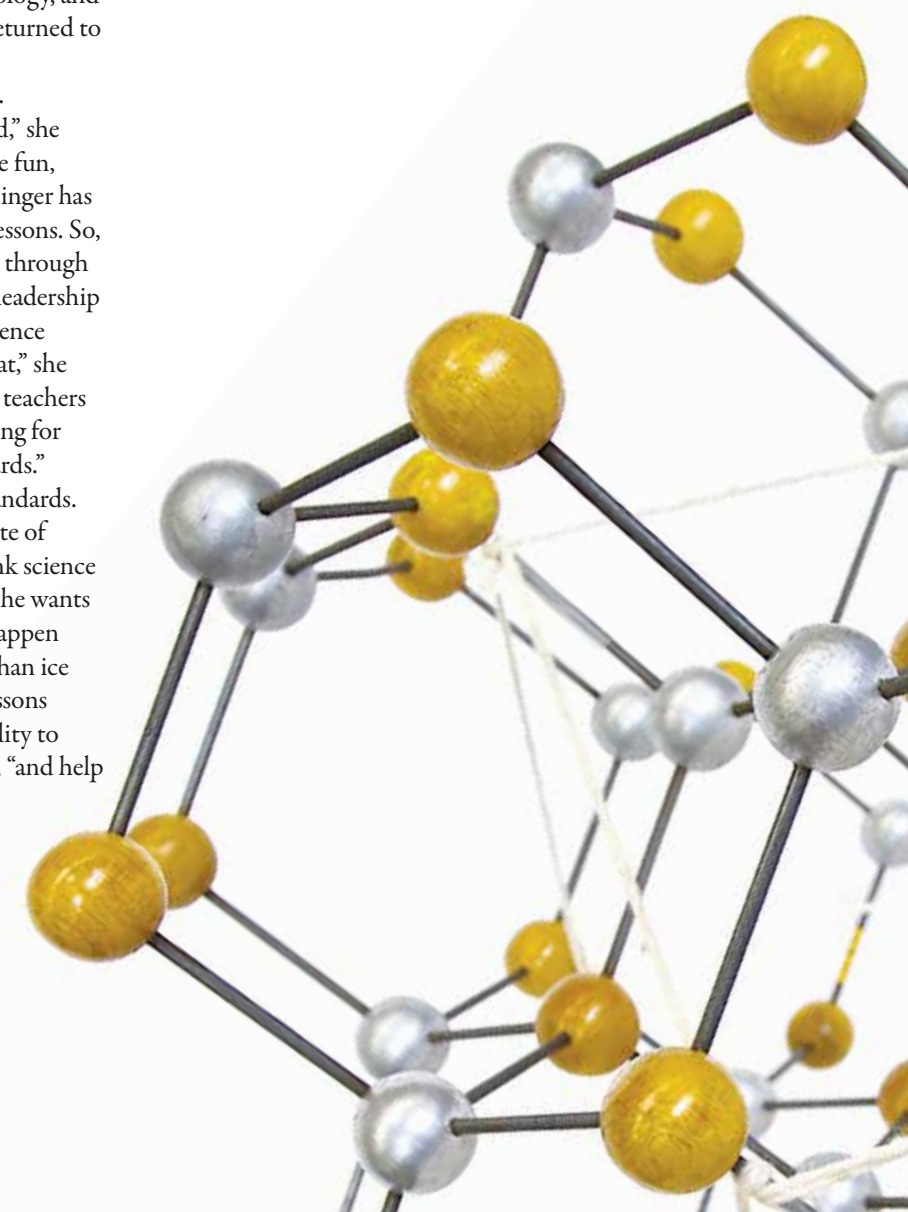
Preminger’s own path to teaching science and math was circuitous. She moved from Cincinnati to the Bay Area in the mid-1970s to study theater at Mills College, with hopes of working in costume and production design. But a summer outdoors in Glacier National Park — and the realization that theater production required endless hours in windowless rooms — soured Preminger on life behind the stage. Instead, she pursued jobs in industry, technology, and civil service for more than two decades until she returned to Mills for a multiple subject teaching credential.

Preminger found her calling in the classroom. “Teaching has been the hardest career I’ve ever had,” she says, “but the rewards are really there — and I have fun, because I get to explore science all the time.” Preminger has also learned how middle schoolers connect with lessons. So, she is sharing that knowledge with fellow teachers through IMSS while also pursuing an M.S. in educational leadership from Cal State East Bay. “I would like to coach science teachers, and this provides the legitimacy to do that,” she explains of the master’s degree. “It will let me help teachers take all the wonderful content they’ve been teaching for years and make it more relevant under new standards.”

But relevance means more than education standards. It’s about the role of science in everyday life. In spite of Preminger’s theater background, she does not think science class should be “a series of magic shows.” Instead, she wants teachers and students to understand why things happen — why ice melting on land raises sea levels more than ice melting in water, for example — to give science lessons relevance and context. “I think now I have the ability to take that approach to science — and life,” she says, “and help teachers make more sense of it all.” ■

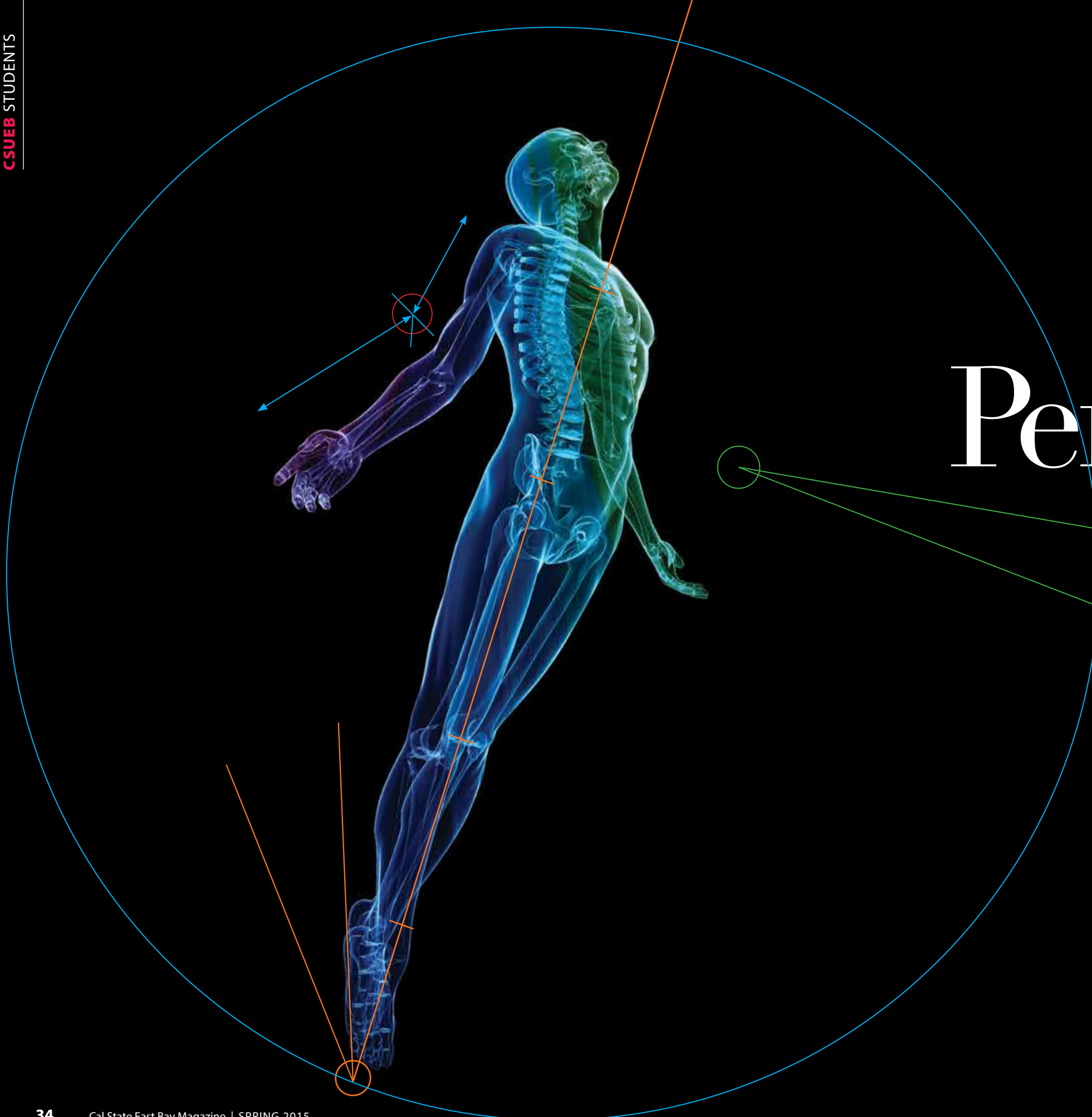
“Teaching has been the hardest career I’ve ever had, but the rewards are really there — and I have fun, because I get to explore science all the time.”

**Linda Preminger**  
SIXTH-GRADE MATH-SCIENCE TEACHER,  
WASHINGTON MANOR MIDDLE SCHOOL



OPPOSITE PAGE: Linda Preminger guides fellow teachers through an experiment that will demonstrate the impact of melting ice caps to their students.





# Perfect Form

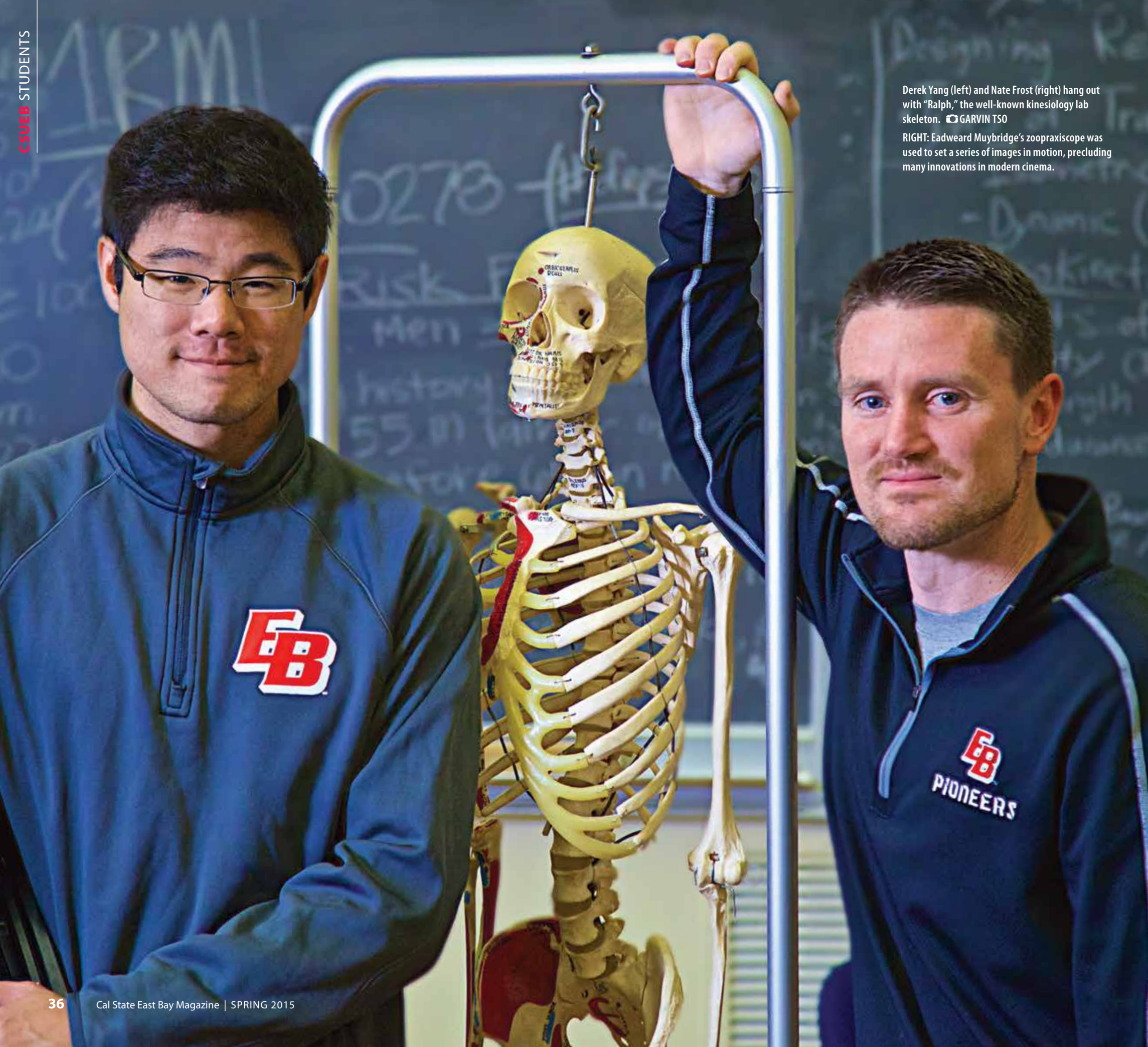
Grad students go high-tech to help the U.S. Fencing Team sharpen its game.


**BY TODD PREPSKY**

Long before U.S. Olympic fencers hear their first “En garde!” at the 2016 Games in Rio de Janeiro, they will see Nate Frost and Derek Yang — both graduate students studying kinesiology at Cal State East Bay — huddled behind a video camera and laptop computer, watching their every move. This summer, the two men will travel to the U.S. Olympic Complex in Colorado Springs, Colorado, to help the nation’s best fencers train for the next Summer Olympic Games.

Frost and Yang are two of Cal State East Bay’s resident experts in the use of Dartfish, a popular video analysis software program that lets those using biomechanics — kinesiologists, physical therapists, occupational therapists, coaches, athletes, and others — perform assessments with visual precision, a perfect example of the old adage “Show, don’t tell.” It’s also what led to their collaboration with the U.S. Olympic Fencing Team, which was seeking out experts in the use of the software to help them. ▶





Derek Yang (left) and Nate Frost (right) hang out with "Ralph," the well-known kinesiology lab skeleton.  GARVIN TSO

RIGHT: Eadweard Muybridge's zoopraxiscope was used to set a series of images in motion, precluding many innovations in modern cinema.



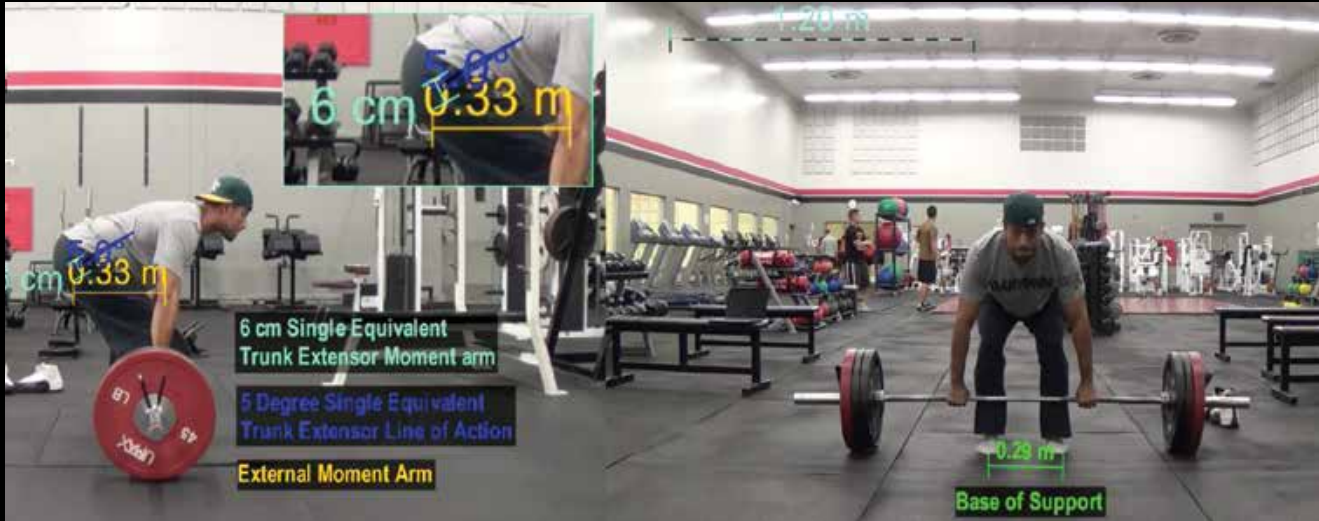
Video analysis of human movement dates all the way back to the 1880s when photographer Eadweard Muybridge took time-lapse still photos of animals and men in motion. He then ran them through his "zoopraxiscope," widely considered to be an early precursor to the movie projector. Muybridge also photographed sports such as baseball, cricket, boxing, wrestling, and discus throwing.

Fast-forward 100-plus years: Frost and Yang are using Dartfish to record fencing movements that can be played back in a number of ways to coach the athletes. "Depending on what the coach wants to work on, we can use different features of Dartfish," Frost said. "For instance, we can use StroMotion to play back a recorded video in a series of staggered images to show one movement to the next. We can also tag segments in a video to highlight parts of the motion. If the coach wants to work on footwork, we can film the fencer going through the motion and isolate that segment of the video for review."

But that's not all Dartfish can do, according to Yang. "We can take an image and measure angles right on screen. If a foot is at a particular angle, we can get an exact measurement and show a comparison image of where the foot is supposed to be. We can also overlay the two images so the coach and athlete can see a before-and-after shot," he said. "Dartfish also lets you place two videos side by side and sync them up so the motions happen at the same time. That way you can compare two images of the same person, or you could compare yourself to a professional athlete who might have better form."

Before Frost and Yang head to Colorado, however, they are hoping to use Dartfish in their final graduate project — an experiment in "social facilitation." The pair want to test whether a runner's gait changes if they know they are being watched, so they set up their equipment at the track prior to their subjects' arrival. While Frost and Yang pretend to set up their equipment, the participants are instructed to do a warm-up run, not knowing that the researchers are already filming them. After the warm-up, the runners are then told that they will be filmed. The two runs are compared later to see if there is a difference in biomechanics. The experiment brings together sports psychology — Frost's focus of study — with technology, Yang's forte. (As of press time, Frost and Yang were still running trials of the experiment and formulating their hypothesis for approval of further research.) ▶





The use of Dartfish in CSUEB's kinesiology program is a fairly recent advancement. "Nate and Derek are good examples of how we're incorporating Dartfish into the kinesiology curriculum. Bringing it into the biomechanics labs adds a new dimension that goes beyond theory," said Assistant Professor Vanessa Yingling, Yang's advisor. "Students are required to use video to describe biomechanical concepts they learn in class. It also forces them to collaborate and problem solve on their own. We don't give them answers that we know they can figure out themselves."

Yang and Frost have taken that collaborative spirit to heart. They recently started the Dartfish Club at CSUEB, acting as mentors for undergraduate and graduate students who want to learn the software. "Running the student club challenges them to utilize critical thinking and leadership skills," said Assistant Professor Jenny O, a member of the kinesiology faculty and Frost's advisor. "It also demonstrates that kinesiology is a STEM discipline, and in fact, within our kinesiology program our students are challenged to develop and demonstrate proficiency in science, technology, engineering, and math-related content knowledge and practical skills. And real-world projects like helping the Olympic team keep students interested and increase student learning and retention."

For Frost and Yang, the Dartfish Club is also a chance to share the knowledge they've learned. "The club creates opportunities for students to help their peers with their projects. One of our colleagues is doing a study with the baseball team, and three club members are helping him use Dartfish," Frost said. "We hope to add more members in the next year to give students more exposure to the software."

As they look forward to working with the Olympic fencing team this summer, both Yang and Frost feel fortunate to be able to use their Dartfish expertise in a real-world setting. "The professors at Cal State East Bay are giving the students so many great resources and opportunities to put them to use. Taking Dartfish on this trip is a great example," Yang said. His friend and colleague agrees. "What I love about East Bay's kinesiology department is that they are helping students get started in careers while they're still in school," said Frost. "Dartfish can be used in so many ways that it's opened up lots of possibilities beyond just physical therapy."

Frost and Yang's work with the U.S. Fencing Team will certainly be proof of that. And when the recording light goes on in Colorado, the Olympic athletes won't be the only ones sharpening their skills. ■

Moving Pictures (clockwise from top left): Dartfish software captures part of a runner's gait cycle; helps a weight lifter ensure proper form; and determines the trajectory of a "bend" ball.  
CSUEB DEPARTMENT OF KINESIOLOGY



Nate Frost and Derek Yang (foreground) set up shots for their master's thesis experiment using Dartfish at the CSUEB track. GARVIN TSO

“What I love about East Bay’s kinesiology department is that they are helping students get started in careers while they’re still in school. Dartfish can be used in so many ways that it’s opened up lots of possibilities beyond just physical therapy.”

**Nate Frost**  
GRADUATE STUDENT, KINESIOLOGY



A data visualization of interactions between a particular content group on Twitter. © ANDREW LAMB

# GO BIG

Big data analytics comes of age in new Cal State East Bay graduate program

BY TODD PREPSKY

© ERIC MILLETTE



**I**N THE 2011 FILM *MONEYBALL*, OAKLAND A'S GENERAL MANAGER BILLY BEANE FOREGOES TRADITIONAL BASEBALL SCOUTING REPORTS IN FAVOR OF STATISTICAL ANALYSIS TO FIND UNDERVALUED PLAYERS. IN A BATTLE BETWEEN HARD DATA AND GUT FEELINGS, DATA WON THE DAY. BEANE EXAMINED FACTORS LIKE ON-BASE PERCENTAGE AND DEFENSIVE EFFICIENCY — THINGS HE COULDN'T GET FROM A BOX SCORE — AND FIELDLED A SUCCESSFUL TEAM ON A LEAN BUDGET, MUCH TO THE CHAGRIN OF HIS SCOUTS. THE A'S HAVE MADE THE PLAYOFFS EIGHT TIMES SINCE BEANE BECAME THE G.M. IN 1997.

What Beane didn't know was that he was using a rudimentary version of "big data" analytics. There's lots of speculation about who coined the term and when, but what's important is that big data has arrived as a business tool. Professional sports, financial services, social media, entertainment, fossil fuel industries — all of these and more are analyzing data to lift their organizations.

"Businesses are at a transition point where instead of just talking about the potential results that can be achieved ▶

“For many companies, big data has become even more valuable than hard assets. The problem is finding people with the skill set to interpret the data.”

**Mark Miller (BSBA '84)**  
ENTERPRISE ARCHITECT,  
CHEVRON CORPORATION

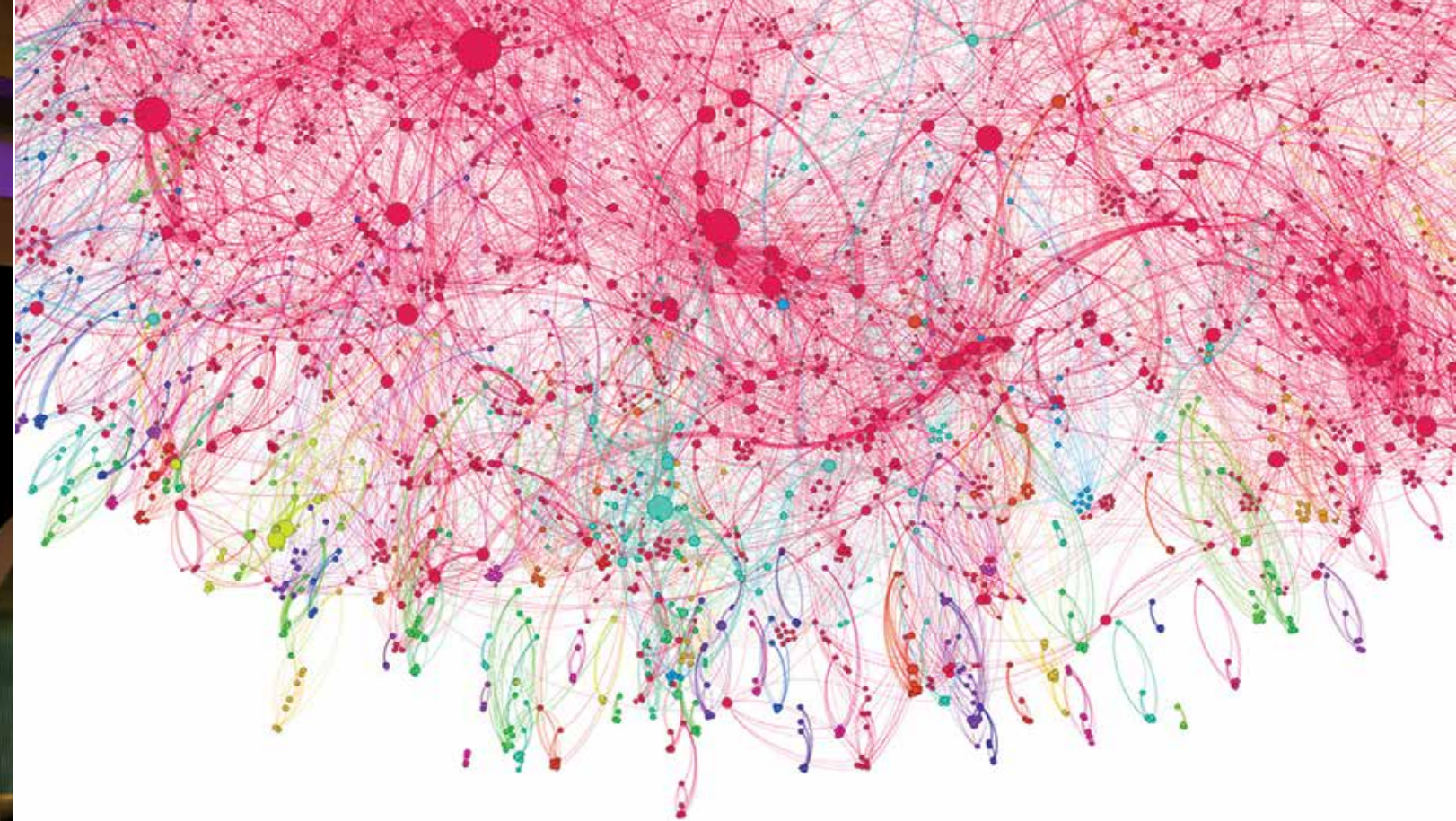


Bryan Neider, Chief Operating  
Officer of Electronic Arts.  
ERIC MILLETTE

OPPOSITE PAGE: A data  
visualization of the number of  
doctors and scientists publishing  
on hepatitis C between 2008-2012  
— nearly 60,000.

“This kind of talent is in high demand from every major industry and it’s a relatively new discipline, so there are more jobs than there are candidates. It’s a great time for a skilled data analyst to get in on the ground floor.”

**Bryan Neider (MBA '89)**  
SENIOR VICE PRESIDENT  
AND COO, ELECTRONIC ARTS



from big data, they are realizing actual benefits, including increasing revenues, a growing base of loyal customers, and more efficient operations,” said Narendra Mulani, senior managing director of AccentureAnalytics, a leading management consultancy and technology services corporation. “They’re recognizing that big data is one of the cornerstones of digital transformation.”

Now, big data analytics has found a home at Cal State East Bay. Starting in fall 2015, the Management Department in the College of Business & Economics (CBE) will offer a new graduate degree — the Master of Science in Business Administration (MSBA) Business Analytics Option — one of the first of its kind in the California State University system.

So what is big data analytics? Simply put, it’s taking lots of raw data and turning it into information. Contrary to popular belief, they aren’t the same thing. Without context, data is just “stuff.” But with data analytics, sifting through virtual oceans of data becomes a search for knowledge you can’t get from a traditional database — hidden patterns, market trends, and customer preferences. Take pro basketball: Almost every arena has placed cameras around the court that can record 25 pieces of data per second. Every movement a player makes is tracked. Instead of just counting points or rebounds, a coach can determine the exact spot where a particular player has the best chance

of scoring, how fast he runs, and how far. And that doesn’t even begin to plumb the depths of what can be done. Data analysis is everywhere, and you’re part of it whether you know it or not. When social networks like LinkedIn and Facebook suggest people you may know, it’s because they have analyzed your field of expertise, the pages you look at, your list of connections, and more. For better or worse, big data is becoming more and more entrenched in our lives.

The idea for the business analytics program at CSUEB began to take shape when the management faculty saw a need that wasn’t being filled. “Data analysis is becoming so popular in industry that we felt it was an area that could open a lot of doors for our graduates. There aren’t enough people yet who can do this kind of work,” said Associate Professor Jiming Wu, who co-directs CBE’s program with Associate Professor Chongqi Wu.

According to several prominent alumni — Mark Miller (BSBA ’84), Enterprise Architect at Chevron; Bryan Neider (MBA ’89), Senior Vice President and COO at Electronic Arts; and Saad Hameed (MBA ’06), former head of marketing technology at LinkedIn and current director of marketing operations, analytics & technology at Sumo Logic — the data analytics field is an untapped mine of possible careers for East Bay students, since virtually every industry is now relying on data analysis to make sound business decisions. ▶



Miller said that Chevron regularly collects petabytes (one million gigabytes) of data from their “digital fields.” With oil reserves getting harder to find, Chevron uses its high-velocity data to find new sources of untapped oil, control plant operations, and monitor equipment to detect malfunctions before they happen. “For many companies, big data has become even more valuable than hard assets. The problem is finding people with the skill set to interpret the data,” Miller said. To combat that problem at Chevron, Miller is working with CSUEB to create an internship program for data analytics students. “My goal is to bring in East Bay students to work on real projects, such as determining customer sentiment about a product or developing an algorithm to predict equipment failure.” Miller also hopes to create a different kind of pipeline, one that connects Cal State East Bay students to jobs at Chevron. “Big data analysis is a skill set we desperately need, and East Bay’s new program is tailor made for us,” he said.

For Neider, who previously established an accounting scholarship at CSUEB and sits on CBE’s advisory board, big data plays an invaluable role at video game maker Electronic Arts. “We couldn’t function without big data analysis,” Neider said. “For our online and mobile games, we’re getting real-time information from our players — how long they play, whether levels are too difficult or too easy, and how they engage with new features. For instance, when we released *The Simpsons* mobile game, people blew through it at a faster pace than we designed it for. Real-time data told us we had less time to create new levels because it was so popular.” Echoing Miller, Neider said there is a dearth of people with data analysis skills. “This kind of talent is in high demand from every major industry and it’s a relatively new discipline, so there are more jobs than there

are candidates. It’s a great time for a skilled data analyst to get in on the ground floor.”

Social media sites like LinkedIn also rely heavily on big data to create and market products, said Hameed, former head of the marketing technology department at the business-oriented social networking service. “Our challenge was to leverage data to inform the sales team about what would and wouldn’t work. To do that, we examined behaviors of companies as they interacted with LinkedIn marketing messages.” But getting from point A to point B is where the real challenge lies, he added. “The first thing you have to do is articulate the goal you’re trying to achieve. Then the data analyst has to take you from your goal to the solution by interpreting the collected data. Currently there aren’t enough people who have the skill to do that, which is what makes East Bay’s program so relevant.”

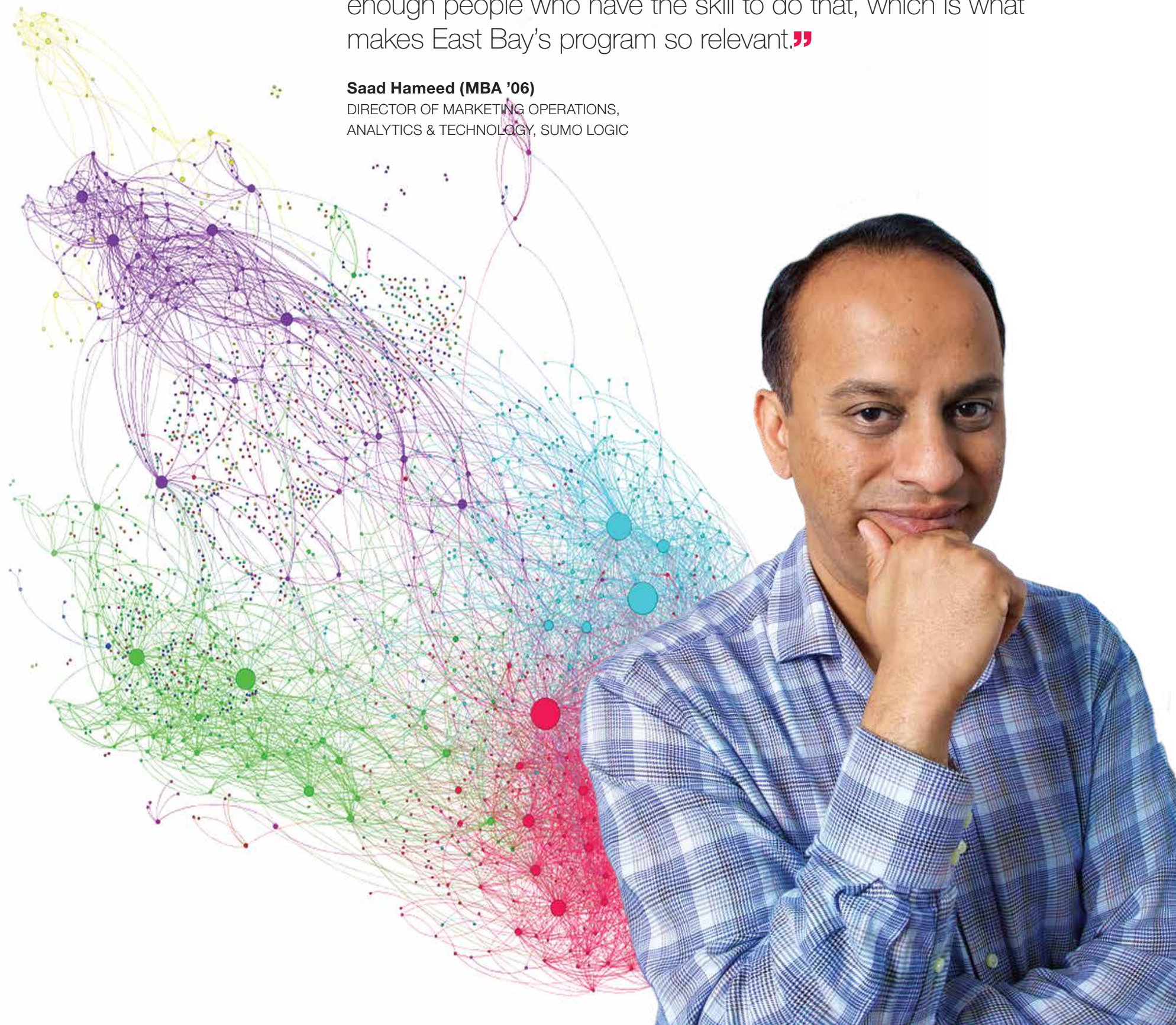
That’s the skill that alumna and returning grad student Kristi Jochimsen (BS ’88, MBA ’93) hopes to acquire when she begins the data analytics program in the fall. As a senior business analyst at Valent, a leading agricultural firm, Jochimsen helps her company interpret market research data. But she admits she is behind the curve in this area. “If you’ve been in a business for a while, you have your own way of doing things. While that may have worked in the past, it may not be the best way going forward. I want a perspective on how other companies handle and use data. I want to know how to take a chunk of data that comes in from the field and make actionable decisions from it.”

Wherever it comes from — an oil well, the basketball court, a video game — big data is here to stay and it’s only getting bigger. As it does, so will the demand for skilled data analysts. Starting in fall 2015, Cal State East Bay’s data analytics students will be more than ready for it. ■

“... the data analyst has to take you from your goal to the solution by interpreting the collected data. Currently there aren’t enough people who have the skill to do that, which is what makes East Bay’s program so relevant.”

**Saad Hameed (MBA ’06)**

DIRECTOR OF MARKETING OPERATIONS,  
ANALYTICS & TECHNOLOGY, SUMO LOGIC



Flying Data: The artistic motion of this data visualization belies the nature of the content — the connections between a group of influential scientists, journalists, and activists calling for the removal of Russian President Vladimir Putin.

✂ COURTESY OF NODUS LABS 📷 GARVIN TSO



# DARK New World

CSUEB Professor Carol Lauzon's co-discovery inside "Dead Man's Toe" could help unravel the origins of Earth

BY JENNIFER PITTMAN

To walk a mile in someone else's shoes takes on special meaning for biological sciences Professor Carol Lauzon, a co-lead scientist on a groundbreaking research grant to study the origins of the earth.

"If I was a microbe struggling inside this fungus, what would I need?" she asks herself. Lauzon is thinking about the physiology of what feeds the microbial bacteria that has been newly discovered inside the dark, sulfurous membrane of the foot-size fungi *Pisolithus tinctorius*, also known as "Dead Man's Toe." She compares it to being inside a mini-planet, seeing unseen worlds.

Not only is this groundbreaking news for scientists delving into the esoteric realm of earth's beginnings and its evolution, but, if Lauzon can identify how these microbes create self-sustaining energy from the chalky, acidic landscape of Yellowstone Park geysers and the

similarly thermal lands of New Zealand that they thrive in, it could open up untold possibilities — like what kind of life might live on other planets, and how to grow food in outer space. Here on Earth, the fungi's inhospitable natural habitat creates questions as to whether it holds detoxifying properties that could be used to remediate hazardous waste sites.

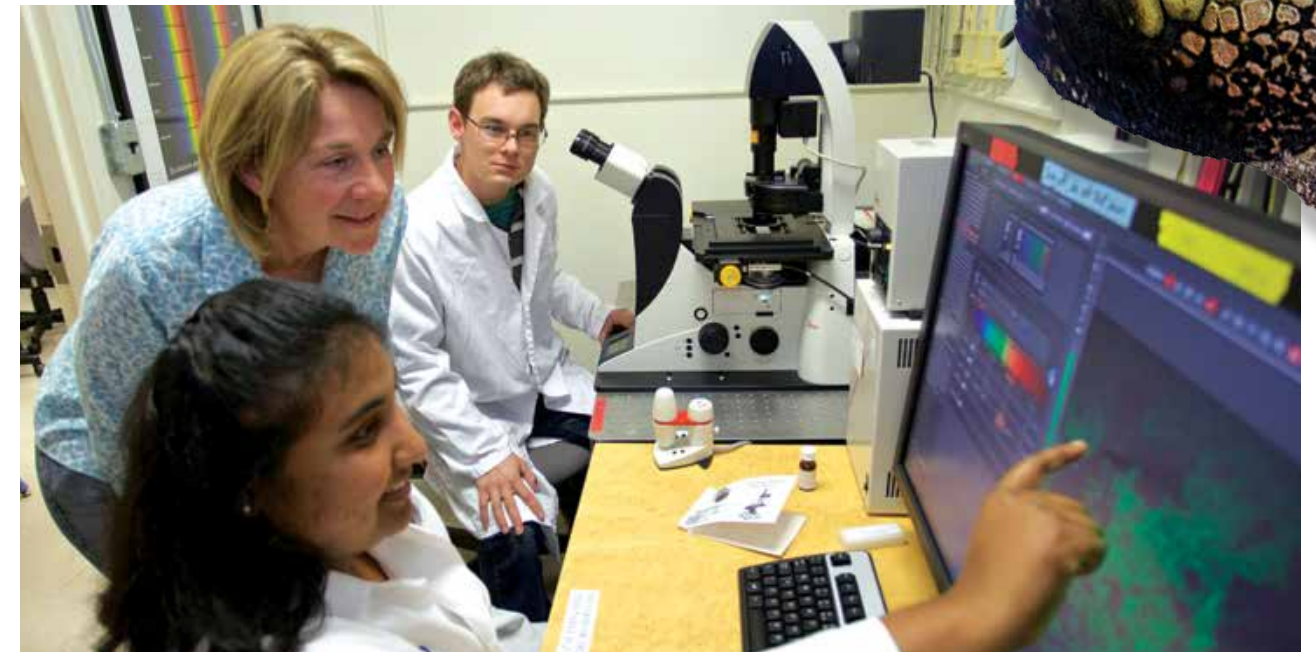
Lauzon is partnering with NASA biologist Ken Cullings to study the mysterious inner oily world of the primitive fungi. Cullings was the first to look inside Dead Man's Toe for answers as to its survival in such nutrient-deficient environments and identify "novel and deeply divergent lineages," meaning that the family tree of these biological organisms has never been seen before — and some of them don't appear to have evolved from any other biological organism recorded to date.

The pair, introduced by a former student of Lauzon's

"We know so little about the microbial life on this planet, less than one percent. The microbes have really shaped the planet since the beginning."

**Carol Lauzon**  
PROFESSOR, BIOLOGICAL SCIENCES

Dead Man's Toe  
KEN CULLINGS



Professor Carol Lauzon brings the excitement of her co-discovery to CSUEB graduate students Charles Richard (back) and Kaushalya Tillakarantha (foreground), who are studying the ancient bacteria with the University's confocal microscope. GARVIN TSO

who went on to work at NASA, has launched a three-year joint research project funded by a \$1 million grant from NASA's Astrobiology Science and Technology for Exploring Planets division. Cullings is an expert in fungal ecology and phylogenetics, the study of evolutionary relationships among biological species. Lauzon's expertise is the microbial world of insect and plant microinteractions.

Cullings uses polymerase chain reaction (PCR), an advanced genetic technology, to amplify copies of a single gene several billion times for study. He estimates the microbes they've found are 3.5-4 billion years old. Since Cullings' initial discovery of a new biological tree, he and Lauzon have gone on to discover additional novel microbial lines. So far, they have identified two entirely new phyla and seven new classes. For the layperson, consider that a single phylum includes all invertebrates — everything on the planet with a spine; a new class is equivalent to discovering all of the birds.

CSUEB grad students Kaushalya Tillakarantha and Charles Richard and NASA technicians Nicole

Marinkovich, Tina Turong, and Julie DeSimone are working on the project as well. A third student, Candace Cole, is studying tangentially the use of microbes, either from the fungus or from contaminated soils, to bioremediate soils and waters.

"Now we have the daunting challenge of taking what (Cullings) found, and turning it into life to really study them," Lauzon says of the organisms. So, she and her students have taken to the lab, where they are teasing out information and imagining what the microbes might need to live where they do — walking in the shoes of Dead Man's Toe. Lauzon compares the research with discovering one's ancestral lineage on Ancestry.com — tracing the fungi forward from its microbial roots to potentially uncover a greater dialogue about evolution. "We know so little about the microbial life on this planet, less than one percent," she says. "The microbes have really shaped the planet since the beginning. (This discovery is) going to give us this audit of life on our planet that we haven't known about." ■



# ClassNotes

## 1960s

### Nadine Anderson

(BA '66, Psychology) works as a school psychologist for the Phillipsburg School District in Phillipsburg, N.J. Before deciding to focus on adolescents in the public school system, Anderson spent 16 years working in psychology at the university level, and obtained her doctorate in social psychology from the University of Washington.

### Carol Putman

(BA '68, Social Science) is an independent fine art professional. Putman is listed



in Marquis' *Who's Who in America*, is a member of the California Art Club, and is showing at the Valley Art Gallery in

Walnut Creek, Calif. in 2015. Putman paints in the studio and also *en plein air* — in the open air.

## 1970s

### Greg Blankenship

('72) was named to the city of Vallejo's sports Hall of Fame. Blankenship was a standout athlete at Vallejo High as a champion hammer-thrower for the track and field team, and he also played baseball

and football. Blankenship went on to play football for both the Oakland Raiders and Pittsburgh Steelers. After the 1976-77 NFL season, Blankenship took up a 32-year career with UPS, where he retired from two years ago.



### August (Augie) Caires

(BS '71, Business; MPA '78) is an elected Board Member of the Padre Dam Municipal Water District in San Diego County. He retired from his 38-year public service career in 2006 and was appointed to his board member position in 2007. Caires was officially elected in 2008, and reelected in 2012. Caires lives with his wife, Leslie; they have two daughters, April and Amy, and one granddaughter, Krissy.



### Marion Coleman

(MS '78, Counseling) is an artist with commissioned

works throughout the Bay Area, as well as an accomplished quilter, whose quilts have exhibited throughout Europe, and in Japan and Costa Rica. She currently has a quilt on display at the U.S. Consulate in Jerusalem. Coleman recently completed a quilt series about Russell City, Calif. (now incorporated into Hayward, Calif.), commissioned through the Hayward Historical Society, which is also currently on display there. In addition to her art, Coleman previously worked as a counselor with the Alameda County Social Services and Regional Center of the East Bay for more than 20 years.

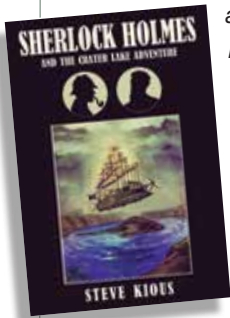


### Connie Hubbard

(BS '73, Psychology) retired from her position as superintendent of Piedmont Unified School District last year and will take on a new challenge as the principal of Holy Names High School in July. Holy Names, an all-girls Catholic school, is Hubbard's own alma mater. Hubbard served as superintendent for 15 years. Of her many accomplishments, she saw the district through tough economic times and a \$56 million seismic renovation. Hubbard lives in Oakland with her husband, a voice-over artist and musician.

### Steve Kious

(BA '76, Mass Communication) retired after a 24-year career as a caseworker for the Child Welfare Department in Oregon, and published his first novel, *Sherlock Holmes and the Crater Lake Adventure*, by Sunbury Press. During his time at the University, Kious was editor-in-chief of *The Pioneer*.



### Nancy O'Malley

(BA '77, Political Science), Alameda County District Attorney, received the 2015 Irvine Foundation Leadership Award for her work to end child sex trafficking. In 2005, O'Malley created the Human Exploitation and Trafficking (H.E.A.T) Watch program, the first of its kind in California. The Irvine Foundation Leadership Awards recognize Californians who are advancing innovative solutions to critical state issues — awards are accompanied by a \$200,000 grant to support a program of the recipient's choice, which O'Malley intends to use to fund an institute to end child sex trafficking.

### Paul Reddick

(BS '78, Business) is the owner of Smoking Pig Barbecue, a Michelin-recommended restaurant in

San Jose for the past three years. Reddick recently opened a second location of the Smoking Pig in Fremont. Previously, Reddick worked as a semiconductor sales manager in Silicon Valley for 31 years before returning to his native restaurant trade — he waited tables while working his way through college. Reddick is also a veteran of the Vietnam War, and served in the U.S. Navy for four years aboard the U.S.S. Kitty Hawk.

## 1980s

### Peter Bauer

(BA '85, History) was honored with the Silver Beaver Award, a council-level distinguished service award of the Boy Scouts of America. Recipients of this award are registered adult leaders who have made an impact on the lives of youth through service to the council. Bauer is also the Region 9 State Health Insurance Information Counseling and Assistance Program (SHIP) Liaison for the Centers for Medicare and Medicaid Services.

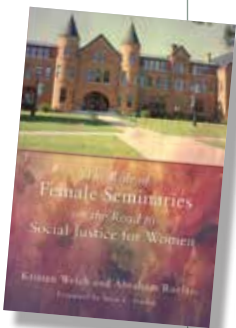
### Kent Kelley

(BS '83, Business Administration) is the chief financial officer of PowerPlan in Atlanta, an enterprise software company. Previously, Kelley was vice president of Oracle's North America tax global business

unit, in addition to a variety of other roles with Oracle.

### Abraham Ruelas

(BA '80, Mass Communication) is coauthor of *The Role of Female Seminaries on the Road to Social Justice for Women*, a historical study on the women's educational opportunities that developed in the 1800s. This is Ruelas' third book on women and higher education.



He is dean of campus and professor of communication and psychology at Patten University in Oakland, Calif.

### Al Simmons

(BS '87, Business Administration; MS '91, Physical Education) was named cornerbacks coach at the University of New Mexico. Previously, Simmons coached at Colorado State University for three years, and has held numerous coaching positions over the years in college and professional football, including work with the San Francisco 49ers, Los Angeles Raiders, San Diego Chargers, Arizona Cardinals, and Dallas Cowboys. Simmons got his start on the field at then-Cal State Hayward as a defensive-backs coach.



**Toni Anne Tullys** (BS '85, Health Sciences) was named head of the newly created Department of Behavioral Health Sciences of the County of Santa Clara. Previously, Tullys was the deputy director at the Alameda County Behavioral Health Care Services Department. Tullys has more than 20 years' experience in executive and senior management roles.

1990s

**Mike Abary** (BA '98, Business Administration) is now vice president of North American Consumer Business for Lenovo. Previously, Abary was the senior vice president of



the mobile computing and consumer business division at Samsung Electronics, and held various senior management roles with Sony Electronics.

**Rich Cline** (BA '95, Mass Communication) was reelected to the Menlo Park City Council in November 2014. Previously, Cline served two terms as mayor of Menlo Park, eight years on the council, and six years as the parks and recreation commissioner. Cline cofounded

Voce Communications in 1999, which has helped build multiple leading global brands, such as Google, Yahoo!, eBay, Intel, Dolby, and others.



**Tiffany Cooper** (BA '94, Mass Communication) was named vice president of development, western region for Starwood Hotels & Resorts Worldwide, Inc., in March. In this role, Cooper is responsible for franchise development and all project types for seven of the nine Starwood brands, including Four Points by Sheraton, Aloft, Element, Sheraton, Westin, Le Meridien, and Luxury Collection in the United States. Cooper has also recently founded her own social media site focused on inner reflection



and inspiration, [www.realsoulful.com](http://www.realsoulful.com).

**Lisa (Davis) Gentile** (MS '97, Education) earned the Certified Professional in Learning and Performance credential. Gentile is the founder of Moxie Mavericks LLC, a provider of evidence-based transition and performance coaching. She is also a learning consultant for The Mosaic Company, a training and workforce consultancy firm.

**Steve Hendee** (BA '91, Music) won the prestigious Bandworld's 2014 John Philip Sousa Foundation Legion of Honor Award, and was also named the California State Music Educator's Association (CMEA) Outstanding Educator in 2015. The John Philip Sousa Foundation award was established in 1989 to honor band directors who have maintained school

concert band programs of excellent musical quality for at least 20 years, and who have held important positions of leadership in their professional organizations. Hendee, who has taught music for 23 years and worked in the Castro Valley Unified School District



for the last three, is currently the state vice president for the California Music Educators Association. He was honored with the Legion of Honor Award at a ceremony in Chicago in December 2014.

**Derek Jones** (BA '95, Sociology) was named regional president of Wells Fargo & Co. in Central Florida. Jones is a 20-plus year veteran of the company, and previously served as the area president for East Central Florida.

**Dan McIntyre** (MPA '97) was appointed senior engineering services manager for the Dublin San Ramon Services District. Previously, McIntyre was the public works director for the city of Livermore, Calif.

**Rebecca Roudman** (BA '99, Music) was featured in the January issue of *Strings* magazine. Roudman is the front-woman for Dirty Cello and plays the namesake instrument with her five-piece band that includes



fiancée **Jason Eckl** (BA '01, Music; Single-Subject Teaching Credential '02). Dirty Cello

played "cello like you've never heard before" to audiences in China in 2013 and 2014, and in Europe in 2014. Roudman is also a cellist in the Santa Rosa Symphony and Oakland East-Bay Symphony.

**Thomas Sher** (BS '91, Business Administration) was named vice president of finance at Silvaco, a leading provider of technology computer-aided design (TCAD), circuit simulation, and other software tools. Sher is a certified public accountant with 20 years' experience. Previously, he served as controller at Univar, a global chemistry distribution company, and has worked at other software development and manufacturers in Silicon Valley.

**Philip Sykes** (BS '99, Kinesiology) is the head field hockey coach at the University of Albany, New York, and was named the National Field Hockey Coaches Association Northeast Region Coach of the Year in 2014. His Division I team is the first in the America East Coast Conference to



make it to the Final 4, picking up the program's first NCAA win on the way, and beating an ACC Champion, a Big Ten Champion, and the #1 team in the country during their historic 2014 season.

**Brandon Yee** (BS '94, Business Administration) joined The Toro Company in November 2014 as the district sales manager for the company's underground business. Toro is a global turf, landscape, rental, and construction equipment company. Yee has extensive experience with Horizontal Directional Drilling (HDD) rigs and the underground marketplace throughout the world, including work in India, South Korea, the Philippines, and Thailand.

2000s

**Michael Byrnes** (MBA '05) is the new chief financial officer of Ocera Therapeutics in Palo Alto, Calif., a clinical-stage biopharmaceutical company focused on acute and chronic orphan liver diseases. Previously, Byrnes served as corporate controller for Maxygen, Inc., in San Mateo, Calif.



**Christina Grossenbacher** (BS '06, Computer Science) was named principal in Stantec's transportation practice, and vice president of the local Women's Transportation Seminar, San Francisco Bay Area chapter. Stantec Consulting Services, Inc., is a public company with 15,000 employees



in 250 locations providing planning, engineering, architecture, design, environmental sciences, and project management

for projects around the world.

**Michelle C. Guintu** (BFA '06, Traditional Arts) is an artist whose work was once described as "kindercore" — part kindergarten, part hardcore. Her recent exhibition at the New Image Art Gallery in Los Angeles, *Obsession*, featured cartoonish multimedia works of 80s



and 90s icons like Cyndi Lauper, Prince, Tupac,

Missy Elliot, Madonna, and more. The show was highly anticipated in the media, and received critical praise from industry publications such as *Juxtapoz*, *Complex*, *LockerDome*, *Platinum Cheese*, and *Widewalls*.

**Becky Machetta** (BA '09, Liberal Studies) has joined the Newark Library as the teen librarian. Machetta was recently featured in the *Contra Costa Times* for her efforts to increase the library's visibility and literacy among teens in Newark through volunteer opportunities, a lunchtime book group for teens, a "tween" book club for fifth and sixth-graders, and a teen advisory board to promote direct feedback on the library's teen programs. Previously, Machetta worked for the Hayward Public Library and the San Jose Public Library.

**La Nell Martin** (BA '14, Music) is the Oakland Youth Choir (OYC) artistic director. Martin, who sang in the choir as a teenager, recently led the OYC in its 40th anniversary concert at First Presbyterian Church in Oakland. Martin has taught voice for several local institutions.

**Joseph Wypych** (MBA '06) is the general manager of CMC

Biologics' Seattle facility. CMC Biologics is a fully integrated biopharmaceutical development and manufacturing solutions company. Previously, Wypych was the plant manager at Baxter Bioscience in Hayward, Calif.

## 2010s

**Scott Baggett** (BS '13, Justice Administration) and **Brandon Cobler** (BS '13, Criminal Justice) have both joined the Pleasanton Police Department. Baggett transferred to Cal State East Bay after obtaining his associate's degree in social science from Ohlone Community College. He received his Basic Police Academy Certificate from the South Bay Regional Public Safety Police Academy in San Mateo. Cobler was hired as an entry-level recruit officer and was assigned to the Alameda County Regional Academy in 2014 prior to being hired.

**Brian Edwards** (BA '09, Art; MPA '13) was appointed the new branch manager of the Albany Library. Edwards has worked as the circulation manager with the Albany Library since September 2014, and previously served as the acting

branch manager at the Newark Library for four years.

**Joan McLoughlin** (Cert. in Art-Museum Studies, '11) is the owner of The McLoughlin Gallery, a contemporary gallery in San Francisco focused on social conscience. In December



2014, McLoughlin presented at CONTEXT Art Miami, which is the sister fair to Art Miami, one of the most well-known

contemporary art fairs in the United States.

**Rita Szollos** (MA '14, History) has created a website for the city of Dublin, which stemmed from her master's thesis work at Cal State East Bay. The interactive



website allows viewers to be a part of the metamorphoses of the region from swampy wetlands to the modern landscape of the Tri-Valley city we know

today. Szollos' website can be accessed at [www.ghostsofdublin.com](http://www.ghostsofdublin.com) or through the city's website, [www.ci.dublin.ca.us](http://www.ci.dublin.ca.us).



Pioneer alumni joined President Leroy M. Morishita (center) and CSU Chancellor Timothy P. White (MS '72, top row, far right) at the 5th annual New York/Tri-State CSU Alumni reception on February 26. BOTTOM ROW, LEFT TO RIGHT: Mrs. Barbara Hedani-Morishita, Natali Morris (BA '00), Tanya Hauck (CSUEB vice president, University Advancement), President Morishita, Eileen Karp (MS '09), Anthony Caldwell (BA '70), Christopher Criswell (BA '75). TOP ROW, LEFT TO RIGHT: Derek Aitken (CSUEB chief of staff), Joseph Monks (BS '83), Chancellor White. © JOHN DE LA TORRE



Former Associated Students presidents meet at the University's first Associated Students reunion as part of Homecoming, February 7. LEFT TO RIGHT: Stan Hébert III (BSBA '76, CSUEB associate vice president & dean of students, Student Affairs), Kamar O'Guinn (BA '06), Daryl Thomas (BA '74), D. McKinney, (BSBA '05), and Damone Hale (BA '83; MPA '91). © GARVIN TSO

## Submit Class Notes

**Share news about your career, accomplishments, and life changes with fellow alumni.** Include your address, phone number, degree earned, major, and graduation year.

Mail:  
Cal State East Bay Magazine  
Attention: Alumni Relations  
25800 Carlos Bee Blvd., SA 4800  
Hayward, CA 94542

Or email: [penny.peak@csueastbay.edu](mailto:penny.peak@csueastbay.edu)





## Cal State East Bay Alumni Around the Globe

### Fellow Pioneers provide international support and community

BY PENNY PEAK

The Pioneer Alumni Network includes over 122,500 alumni around the world — and counting. Increasingly, Pioneers are connecting through Cal State East Bay alumni events, and finding how important these relationships can be: Fellow alumni help each other and students with networking, and share career information, the latest news from the University, and advice about neighborhoods and community life.

This year, alumni have met at regional networking events throughout California and the Pacific Northwest, and bonded over two days of events in the Bay Area during homecoming at Cal State East Bay in February. Alumni have also expanded their networks at large California State University events in Hollywood, New York, San Francisco, Seattle, and Washington, D.C. Outside the United States, CSUEB alumni have even gathered in Moscow and Shanghai. And, Pioneer graduates frequently roll up their sleeves to volunteer at community service activities on the CSUEB campus, at food banks and at local parks.

The Pioneer Network is also active with career programs, such as industry job panels, career fairs, and workshops on resume writing and job-search strategies. Services through the University's career office, Academic Advising and Career Education (AACE), are now free to alumni, and videos of several job panels have been posted

online. Learn more about Alumni Career Services and find videos at [www.csueastbay.edu/alumni-careers](http://www.csueastbay.edu/alumni-careers).

Take advantage of the Pioneer Alumni Network and join us at a future event. You can keep up with Alumni Network and event news on our Facebook page ([www.facebook.com/CSUEBAlumni](http://www.facebook.com/CSUEBAlumni)) and private LinkedIn group ([linkd.in/XhBQTp](https://www.linkedin.com/groups?gid=11111111)). Not getting our emails? Sign up for Alumni E-News at [www.csueastbay.edu/update](http://www.csueastbay.edu/update). Have an idea for a future program? Email us at [alumni@csueastbay.edu](mailto:alumni@csueastbay.edu).



Say Cheese: Interim Athletic Director Don Sawyer (far right, third row), poses with coaches and alumni at the Homecoming Wine & Cheese Social in the new PE Room above the Pioneer Gym in February. GARVIN TSO

## Introducing Pioneer Alumni Networks

### New groups help alumni stay engaged

BY PENNY PEAK

The Cal State East Bay Alumni Association invites our alumni to stay connected with fellow Pioneers and the University through the new Pioneer Alumni Network program, which brings together alumni in a particular geographic area (such as Seattle, Los Angeles, or Marin/Sonoma) or through a particular affinity, major, or cultural group identity (such as MBA for Global Innovators, Pioneer Athletes, or the Black Alumni Network).

In 2014-2015, the Alumni Association Board of Directors worked to streamline the guidelines for Alumni Networks in response to alumni feedback. Under the new guidelines, the Alumni Association will now provide administrative and (limited) financial support for recognized Networks that create

at least two events or programs per year. Each group will have designated organizers, who gain valuable leadership experience and connections through their involvement. Members of Networks are able to expand their relationships with other alumni and also provide support for current students, while staying informed and engaged with the University.

Have an idea for a new Pioneer Network? Contact Lisa Unangst at [lisa.unangst@csueastbay.edu](mailto:lisa.unangst@csueastbay.edu) or 510.885.4836 to begin exploring a first group meeting and next steps. Learn more about these programs online at [www.csueastbay.edu/alumni](http://www.csueastbay.edu/alumni).



## PARTING SHOT

President Morishita helped graduates from the Class of 2015 capture the moment after the Honors Convocation Ceremony on May 16. Here, Health Sciences major and *cum laude* graduate Cecelia Ly-Peh grabs a snapshot with brother Cody (left) and friend Alex Tam. JESSE CANTLEY



# The Gift of Sustainability

Provost James L.J. Houpis and his wife, Valerie, make an impactful gift.

“We are delighted to know our gift will support a range of student-centered sustainability programs, which provide the skills needed to ensure a healthy planet for generations to come.”

**James L. J. Houpis**  
PROVOST AND VICE PRESIDENT,  
ACADEMIC AFFAIRS

**Think of the difference you can make** not only in the lives of Cal State East Bay students, but in the region and beyond, as we produce graduates who are ready to leverage the power of science, technology, and education to promote sustainability and solve global challenges. If you are interested in making a gift, call 510.885.3183 or email Kathleen.Brady@csueastbay.edu.

Provost James L.J. Houpis with Director of Sustainability Jillian Buckholz (left, center) and Pioneers for Change students (clockwise from left) Ryan Tayahua, Geneva Easton, and Mercedes Ruiz.

