VOLUME 3 ISSUE 1 SUMMER 2016

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ELEMENTS Magazine

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ELEMENTS Magazine *is published twice each year by the College of Science and Mathematics at Fresno State for alumni and friends. Publishing, editorial and sponsorship offices are located within the Dean's Office of the College of Science and Mathematics, Fresno State, 2576 East San Ramon Avenue, MS 90, Fresno, CA 93740-8039.*

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Welcome

ANDREW B LAWSON, PH.D.,
INTERIM DEAN,
COLLEGE OF SCIENCE AND MATHEMATICS

Dean's Message
Elements Magazine
Summer 2016

I am proud to offer the fourth issue of ELEMENTS magazine from the College of Science and Mathematics. Over the last year, the College has continued to make bold progress in promoting student success, including launching a new First Year Experience for incoming freshmen, continuing our work in redesigning our introductory courses and expanding the role of the advising and resources center. We just had the ribbon cutting for the new 30,000 square foot Jordan Agricultural Research Building and are excited about the research opportunities the facility will afford our faculty and students.

In this issue, we highlight the College's student success efforts, with a feature article describing our First Year Experience, designed to ease the transition from high school into the freshmen year, creating a sense of belonging in our students and building on their sense of self-efficacy. We explore the advising and resources center, which the College established to help support all our students by professionalizing academic advising and to provide a single location where students can go to get all of their questions answered. To help our students achieve their dreams of pursuing doctoral degrees, we have launched an NIH funded program in cooperation with UC Merced to closely mentor groups of graduate students preparing them for entry into a PhD program at UC Merced upon completion of their master's degree. Finally, we explore the research program of Dr. Matthew Sharps in Psychology, where he involves his students in research in the cognitive processes of memory, visual integration and interpretation – with some fascinating real world applications of his work.

As this issue is published, I will be entering a new chapter in my career as Dean of Science at CSU Monterey Bay, but I am pleased that Dr. Robert Dundas will serve as Interim Dean as we continue our national search for a permanent Dean. I would like to thank all of the faculty, staff, students, and community members who have contributed so much to make the College of Science and Mathematics so successful!!

FRESHMEN THRIVE IN FIRST YEAR EXPERIENCE

BY CYNDEE FONTANA-OTT
Photos by Cary Edmondson

Nearly 150 freshmen in the College of Science and Mathematics (CSM) are navigating the road to success in a new program that cultivates fundamental academic skills and a sense of belonging at Fresno State.

The CSM "First Year Experience" is one way that the college is working to improve student success and help freshmen make the sometimes-difficult transition from high school to university life. In part, the goal is to improve retention and grade point averages for students in the program as well as create a connection to faculty in the college early in their first year.

Statistics show that about 30% of freshman CSM majors leave the University or switch to majors outside the college before their second year, and the fall-off is most pronounced for under-represented minority students.

"First-year retention is a national issue particularly in the science fields," says Dr. Andrew Lawson, Interim Dean in the College of Science and Mathematics. Students may change majors or leave a university for family or financial reasons – or because they feel disconnected or under-prepared.

First-generation college students – about 70% of Fresno State's enrollment – can struggle more because they often lack a role model for the higher-education experience. The CSM First Year Experience (FYE) employs proven strategies, such as a common learning experience and classes that stress active learning, to reach all students, particularly first-generation and under-represented minority students.

"The idea is that it is a learning community, so it's a consistent community that they are part of throughout their first year," says Dr. Mara Brady, an assistant professor in the Department of Earth & Environmental Sciences and lead faculty member on the project. FYE works to "build their sense of community, to build their self-efficacy to be confident college science and math majors and to build the foundational skills that they'll need in their respective majors," she says.

The program is part of a California State University effort to retain students in science, technology, engineering and mathematics, or STEM majors.

Eight CSU campuses, including Fresno State, are spearheading those efforts as CSU STEM Collaboratives. The campuses are working to boost the number of STEM graduates through a $4.6 million grant to the CSU from The Leona M. and Harry B. Helmsley Charitable Trust.

At Fresno State, the College of Science and Mathematics views student success as one of its central goals and also supports the issue through its Advising and Resource Center, workshops and a redesign of some introductory classes, for example.

Retention is particularly important in science and math disciplines. In 2012, the Department of Commerce estimated that the nation will need 1 million more STEM professionals over the next decade than are projected to graduate.

"You can try to recruit more people into STEM fields," Dr. Lawson says. "But you also have people who already want to be STEM majors – they're already at institutions. If you can do something to help those students graduate, that's a direct route to getting more graduates in the STEM fields."

WITH ROUGHLY **3,440** UNDERGRADUATE MAJORS, THE COLLEGE IS ONE OF THE LARGEST AT THE UNIVERSITY AND DRAWS CLOSE TO **700 FRESHMEN EACH YEAR.**

CSM10: THE SCIENTIFIC METHOD
(Fall 2016, GE Area A3)

CSM15: EVIDENCE BASED DECISION MAKING
(Spring 2017, GE Area E)

As part of the CSU Stem Collaboratives project, Fresno State's College of Science and Mathematics received a $375,000, two-year grant for its FYE program. With roughly 3,440 undergraduate majors, the college is one of the largest at the university and draws close to 700 freshmen each year.

More than 450 freshmen were eligible to participate in FYE last year based on a declared major such as biology or chemistry. The college sent invitations to those incoming freshmen to create the first cohort of nearly 150 students.

In summer of 2015, the group spent four days on campus to participate in team based research projects on campus and to learn about resources such as the library and financial aid office, meet faculty, advising staff and others.

"Part of it is trying to create some social bonds and sense of community early on," Dr. Lawson says. "And we try to build some basic skills that they really need in that first year to help them succeed."

Dr. Brady says she's passionate about helping build the capacity of new CSM students. "I feel like it's important to keep our high standards – it's not about lowering our standards, but recognizing that our students need a lot of support their first year."

She's also involved because of the thread of environmental sustainability that runs through the program. During the summer experience, students collected temperatures on a variety of campus surfaces to look at how those surfaces may store heat or have a cooling effect.

"It was a relatively simple experiment that they could do in two or three days, but it has really interesting and important implications," Dr. Brady says. In addition, the exercise was designed to "get them involved in authentic research to help build their confidence."

Jaime Arvizu, director of the college's Advising and Resource Center, says surveys taken after the summer experience were overwhelmingly positive.

"Students were showing a high-level sense of belonging and achievement," he says.

This year, FYE students are moving as a group through two general education courses: "The Scientific Method" (CSM 10) in fall, and "Evidenced Based Decision Making" (CSM 15) in spring. The large group is divided into two sections, with students meeting in a newly redesigned classroom.

Using money from the grant, the college transformed the room from a traditional lecture space to a collaborative learning environment with round tables.

The room is "physically set up where students are engaged with each other," Dr. Lawson says.

The active learning style is becoming more common on university campuses, and most employers are looking for employees who can work as a team, he says.

continued on next page...

Aileen Bautista, a FYE biochemistry major and first-generation student from Corcoran, says the summer program and collaborative class have helped her learn to work in a group.

"I've never really been involved in that, so it was a new experience for me," she says.

Bautista says she applied for FYE because she thought it would allow her to develop new skills, work with others and perform research. She says the program has been helpful, and remains committed her biochemistry major.

"The research I have done in class has shown me exactly why I chose this major," Bautista says.

Both inside and outside the classroom, FYE freshmen can call on instructional student assistants with questions. Trent Sherman, a senior from Tehachapi and geology major, is one of those student leaders.

Sherman is a first-generation student who struggled to make the transition from a small area to a big city and from his freshman to sophomore year.

He believes FYE "is a really good program because it offers so many resources."

In part, the student assistants answer questions, offer supplemental instruction outside the classroom and lead some discussions in class. Sherman says freshmen may sometimes be too intimidated to approach a faculty member.

KaBao Thao, another instructional student assistant and a senior majoring in chemistry, agreed that she and her peers may seem more approachable. Thao, a first-generation student from Fresno, says the student assistants are helpful partly because "we have all been through that pathway before."

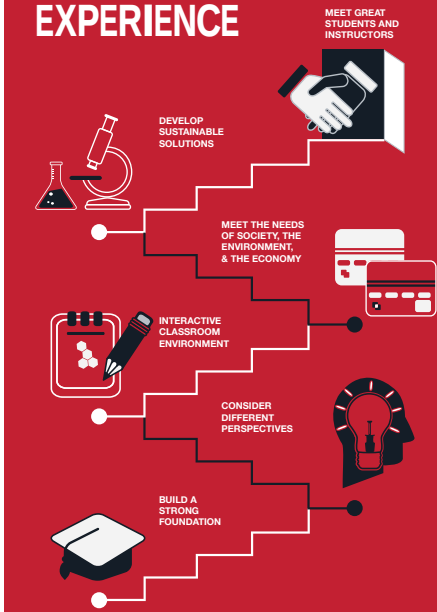
The biggest challenge for freshmen in CSM majors is adapting to fast-paced classes such as chemistry, biology or physics and even the community learning process, she says. In addition, "the ability to really let the college feeling sink in is always hardest for the first semester," Thao says.

While this is the first year the FYE is being offered, Sherman says he thinks the students are responding. In addition, the program "shows students that science is applicable to everyday concepts that anyone can relate to," he says. "It's not all about rigorous study at the far ends of our universe."

In the fall, students examined the global coffee system and elements such as production, shipping, waste and quality of life for those involved. It was a chance to apply critical-thinking skills to a problem and provide recommendations to the campus.

"We want to do everything we can do to make sure students are successful in their goals"
~Dr. Lawson

GAIN REAL WORLD EXPERIENCE



INVEST IN YOUR FUTURE

"The program shows students that science is applicable to everyday concepts that anyone can relate to."
~Dr. Lawson

In the spring, students are looking at sustainability issues related to campus.

FYE students were surveyed about the program throughout the year. That information, coupled with data on students' academic performance, will be used to help evaluate the program.

The college plans to admit 300 students to the program next fall. With the infrastructure now in place, Dr. Lawson says the college believes it can sustain FYE once the grant funding runs out.

Beyond this program, the College of Science and Mathematics works to improve student success in other ways. The new CSM Advising and Resource Center (ARC), which formally opened in early 2015, engages all students in the college.

ARC Director, Dr. Jaime Arvizu, says the center advises students, works with faculty and provides services such as student success workshops. The staff also offers information on a GPA calculator that students can use to monitor whether they are reaching their goals.

In addition, students receive a customized and balanced academic plan, or road map, to help guide them through their college career. The plan goes beyond the classroom to include options such as internships and undergraduate research opportunities.

When students understand that the college is interested in their progress and well-being, "it alleviates the imposter syndrome that many students go through," Dr. Arvizu says.

Those are feelings of inadequacy, of being a fraud or of simply not belonging, for example.

The college also is using a National Science Foundation grant to expand evidence-based teaching practices in the classroom. The project known as FLOCK, or Faculty Learning for Outcomes and Knowledge, focuses on professional development for faculty, improving student success in introductory courses and increasing the number of majors graduating in STEM disciplines.

Through all of these programs and efforts, the College of Science and Mathematics is working to help students achieve their degrees and help meet the national demand for STEM graduates.

"We want to do everything we can do to make sure students are successful in their goals," Dr. Lawson says.

ADVISING & RESOURCES CENTER

SPURS STUDENT SUCCESS

BY JILL WAGNER

Photos by Claire Takahashi

Students who select the rigorous majors offered in the College of Science and Mathematics (CSM) need not navigate their academic path alone. The Advising and Resources Center (ARC) is dedicated to student success, offering dozens of services from academic advising and support services to identifying scholarships to ensure that all students can succeed.

Comprised of professional advisors and counselors, counseling interns, peer advisors, and clerical staff, the ARC team is available year-round to all majors in the CSM.

The most popular service ARC offers is academic advising, ensuring students are taking the right coursework and are on-track for their degree program. The advisors have expertise in CSM's degrees and major requirements as well as prerequisites and nuances in any of the degree programs.

Each semester, hundreds of students access ARC services, whether it's finding a tutor, meeting with an academic advisor, discovering internships or preparing for job interviews.

In addition to academic guidance, ARC staff can connect students with needed resources including tutoring, supplemental instruction, academic skills workshops, the on-campus food pantry, health and wellness workshops and more.

Through the ARC, students can access information on scholarships, internships, research and service learning opportunities and future employment.

"We strive to maintain a positive environment in which students are comfortable to approach us with any academic or personal challenge they may be facing," says Center director Dr. Jaime Arvizu. "We will bend over backwards in order to make sure that all our students have equitable opportunities to succeed."

Students entering the university learn about ARC during Dog Days, and they also receive targeted emails and hear about ARC's services through their departments.

For students majoring in computer science, earth and environmental sciences, natural sciences, and physics, it's a requirement of their department to get advising through ARC. Freshmen majoring in biology, mathematics and chemistry must visit ARC in their first year. ARC services are open to all CSM majors anytime.

The ARC prides itself on the partnerships it has created within the college and throughout the university for the benefit of its students to provide the most comprehensive advising service possible. ARC works in concert with departments so that students can easily access needed information.

The collegial partnership between ARC and CSM department advisors and professors gives students a network of support to ensure they meet their goals while at Fresno State.

"Our goal is to use a holistic approach not only to refer students out to other services they may need, but to also see what positive attributes students bring and highlight these as assets so that students are empowered to succeed," Arvizu says.

Many free services are available for students who are facing academic challenges, but first the student must reach out for help. That's where the college theme of "we are family" factors in. The ARC team is warm and welcoming, sensitive to students' cultural and socioeconomic backgrounds.

Arvizu says, "We use many lenses to see where and what challenges students bring to the University in order to help them plan how they are to approach these challenges."

The first path of assistance for struggling students is a conversation to see if the students are accessing tutoring or supplemental instruction. They are encouraged to meet with their professors, and ARC staff makes sure students know where to find each professor's office hours and how to make appointments with them.

The focus of ARC services is the whole student, not solely their academic journey. The ARC team addresses any barriers the student faces, including their interest in their major.

Arvizu says, "For students who are struggling, we discuss their passion because it could be that they just are not passionate about the major they selected. We have the student go through a lot of reflecting to see what it is that they are doing right and what they can do better."

For every student, ARC develops personalized academic plans we call roadmaps designed to ensure students take the right courses and get the number of units needed to meet their graduation goal.

There's more to success in career and in life than simply an academic game plan. ARC guides students to participate in extracurricular activities and student organizations to develop confidence, work in teams and explore opportunities beyond their major which will help students adjust to any working environment.

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"For students who are struggling, we discuss their passion because it could be that they just are not passionate about the major they selected. We have the student go through a lot of reflecting to see what it is that they are doing right and what they can do better." Arvizu says

The ARC also provides valuable information and guidance on how to land research opportunities and internships.

CSM faculty members are involved in dozens of projects involving theoretical or experimental research. This hands-on involvement in discovery not only advances the research project but also often boosts a student's passion and quest for knowledge in their major.

Internships give students the chance to apply classroom learning in career situations and help them to gain valuable academic and career-related experience. Perhaps the best outcome of internships are the relationships students create with professionals who can advise and mentor them.

The ARC has proven popular among students, with surveys indicating overwhelming satisfaction with the ARC, its staff and helpfulness.

Says one survey respondent, "I walked in skeptical about the necessity of my mandatory major advising, but within less than 30 minutes, my advisor provided me with a plethora of documents that outlined exactly what I needed to do to graduate with flying colors, including a road map of my future schedule until my graduation date. I have gained much confidence in my ability to succeed with my path figuratively laid out in front of me. My advisor exhibited an exceptional ability to empathize with me, especially when he mentioned his own college experiences and used that to broaden my career path and collegiate endeavors. I am excited for my next semester's advising." ❐

ARC SERVICES:

ACADEMIC ADVISING

HELPING STUDENTS ACCESS ACADEMIC RESOURCES SUCH AS TUTORING AND SUPPLEMENTAL INSTRUCTION

ENHANCING COORDINATION OF COLLEGE AND CAMPUS SERVICES

CAREER PLANNING

UNDERGRADUATE RESEARCH OPPORTUNITIES

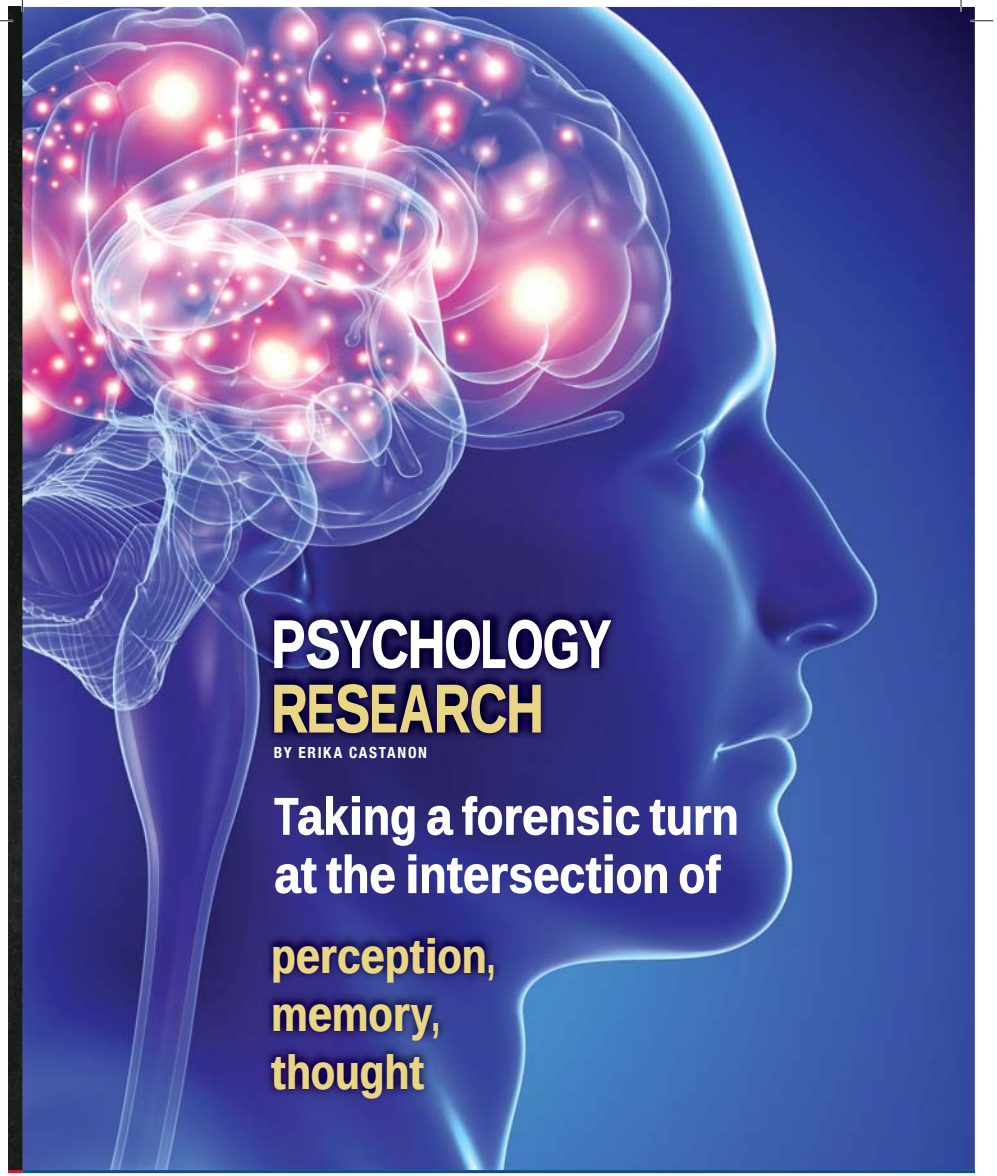
INTERNSHIPS

SERVICE LEARNING

SCHOLARSHIPS

STUDENT ORGANIZATIONS

DEVELOPING PROGRAMS TO ENHANCE STUDENT ACADEMIC EXPERIENCE AND CAREER PREPARATION (E.G. WORKSHOPS, STEM CAREER FAIRS, CONFERENCES)



PSYCHOLOGY RESEARCH

BY ERIKA CASTANON

Taking a forensic turn at the intersection of perception, memory, thought

A team of Fresno State psychologists is designing experiments to test the way the brain interprets and remembers. The research has implications for our understanding of eyewitness memory, shoot and no-shoot decisions in law enforcement and training for the detection of explosive devices.

The research is being led by Fresno State psychology professor Dr. Matthew Sharps with Dr. Devin Kowalczyk, a forensic clinical psychologist; Dr. Schuyler "Wei" Liao, a part-time psychology instructor; and a team of undergraduate and graduate student researchers.

Sharps, who has been with the University for 25 years, is often contracted as an expert consultant in eyewitness criminal cases. His work led him to study the underlying cognitive processes — vision, visual integration, memory, attention and interpretation.

The act of remembering, he says, is the act of thinking about a memory someone believes to have happened.

"Most people know that eyewitness memory isn't very accurate, and that mistakes in such things as suspect appearance are common," Sharps says. "However, we found that the second most common mistake witnesses make, after suspect appearance, are errors of the imagination.

"In other words, witnesses typically make things up, often pretty elaborate things, in any given crime situation, and they don't know they're doing it."

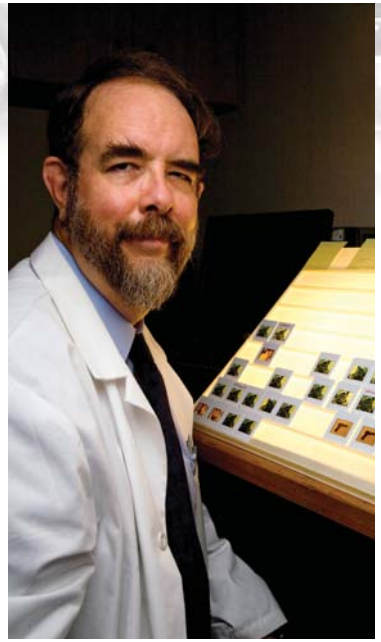
Sharps' research shows the cognitive process of interpretation is a factor in shoot or no-shoot decisions. He says experiments show people make the decision to shoot at a person pointing a power tool just as often as they do if the person is pointing an actual gun.

The human tendency, Sharps says, is to see what we expect is problematic while things like IEDs can go unnoticed because someone would not expect it to be there.

"People often see what they expect to see, whether it's really there or not," Sharps says. "They often fail to see things that are, in fact, right in front of their eyes."

Paranormal perception and beliefs have also been studied in Sharps' lab, including the latest research on why some people are predisposed to see a flying saucer while others see a helicopter.

"A lot of people seem to think that all those who believe they've seen these things are lying or mentally disturbed," Sharps says. "The same principles that operate in eyewitness memory of crimes operate in eyewitness memory of things perceived as paranormal.

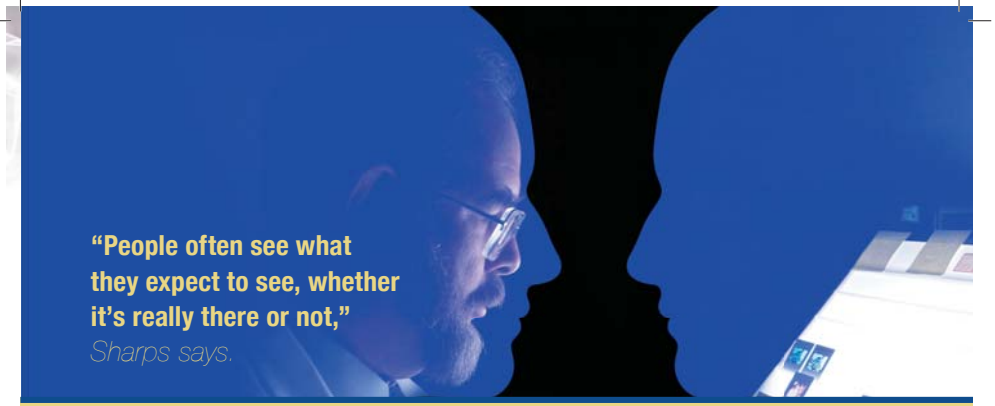


"Such sightings can simply arise from the interaction of normal human psychology with aspects of the external world."

Senior psychology major Amanda Briley of Fresno began working with Sharps in fall 2015 after hearing about his work in a summer course. Since then, she says her beliefs and perceptions have been challenged.

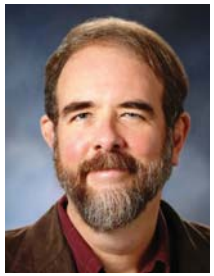
"The idea that many people can see the same things, but their perceptions can vary so widely has helped me understand the world and our Fresno State culture more clearly," Briley says. "This has made me a more patient learner both in and outside of the classroom."

For psychology students, the opportunity to conduct research demands more engagement than typical coursework. Students reap benefits such as co-authoring in professional publications and the chance to present at conferences.



"People often see what they expect to see, whether it's really there or not," *Sharps says.*

"They often fail to see things that are, in fact, right in front of their eyes."



Fresno State psychology professor Dr. Matthew Sharps

Sharps, who has been with the University for 25 years, is often contracted as an expert consultant in eyewitness criminal cases. His work led him to study the underlying cognitive processes — vision, visual integration, memory, attention and interpretation.

"I was determined to join in on his research," Briley says. "For students who are interested in joining a project, it is important to remember that professors are here to teach us, and they need students to work with them. Students are critical to research on campus."

Briley says

this has been the "best part of my college experience."

"While I take my required classes, some of which pertain to my future goals, many of which do not, the privilege of working in a lab, to conduct research that I enjoy, pushes me through the hard days," she says.

Briley's long-term goal is to obtain her doctorate and become a university professor so she can conduct her own research.

Sharps says the lab training provides a way for many students to pursue graduate programs in psychology and further their success in their respective fields.

"The professional records students achieve here are certainly helpful in their careers," Sharps says. "But I think it's also important to realize that these students have participated in the active process of increasing human knowledge in some fairly important fields.They've participated in finding out things that nobody knew before, and are presenting these things in scientific literature.

"Those are important achievements for our students, of which they can be justly proud." ❐

KRISHNAN SAYS

"Given the close geographic proximity of Fresno State and UC Merced, it is a natural step for these institutions to strengthen a collaborative academic environment and develop a matriculation culture between the two institutions."

BRIDGES PROGRAM Opens Doors to PhD

BY JILL WAGNER

Photos by Cary Edmondson

Photos by Cary Edmondson

Boosting the number of Fresno State graduate students who pursue doctoral degrees is the goal of the Bridges to Doctorate Program (Bridges) in the College of Science and Mathematics, funded by a grant from the National Institutes of Health.

Bridges is a partnership between Fresno State and UC Merced to enhance the participation of students from underrepresented groups in master's degree work at Fresno State and in PhD programs at UC Merced in biomedical and behavioral sciences through an intensive research, coursework, and mentoring experience.

The collaboration between the two campuses is a natural gateway for students in the valley and key to the program's success.

Bridges program director and Fresno State chemistry professor Dr. Krish Krishnan says, "The long term goals are to increase the competitiveness, skills and interests of students and faculty in areas of biomedical and behavioral research, and to sustain a thriving collaboration between the Valley's major feeder institution for PhD programs (Fresno State) and the Valley's leading PhD-granting institution (UC Merced).

While the college has a strong graduate program, the need was recognized to help more students access a doctoral degree, particularly in biomedical and behavioral sciences. Research conducted by the college found that students identified a number of barriers in pursuing PhD programs, specifically, the cost of the program as well as a need for understanding more about the PhD pathway through mentoring, education and research. The Bridges program was specifically designed to address these barriers.

Students chosen to be Bridges Scholars are provided:

- TUITION AND FEES
- STUDENT STIPENDS ANNUALLY FOR TWO YEARS
- PAID SUMMER RESEARCH INTERNSHIPS AT UC MERCED
- INDIVIDUALIZED FACULTY MENTORING AND COACHING
- PARTICIPATION IN PROFESSIONAL CONFERENCES AND MEETINGS
- LINKS TO RESEARCH AND PROFESSIONAL OPPORTUNITIES
- ENRICHED ACADEMIC SERVICES AND SUPPORT BY DEDICATED FACULTY
- STEP-BY-STEP MENTORING FOR A SUCCESSFUL TRANSITION

Photo by Cary Edmondson

BRIDGES PROGRAM

NEW CAREER OPTIONS

MANY STUDENTS ARRIVE ON CAMPUS WITH PRE-PROFESSIONAL PATHS IN MIND, SUCH AS MEDICINE, DENTISTRY OR VETERINARY AND THAT FEW STUDENTS THINK OF SCIENCE CAREERS.

THE BRIDGES PROGRAM IS BUILDING UP THE VALLEY AS A CENTER OF RESEARCH.

Bridges Scholars must maintain at least "B" grades in all graduate courses, with at least one of these courses being a graduate-level course required for the PhD programs at UC Merced.

Fresno State and UC Merced are the valley's major Hispanic Serving Institutions and each has demonstrated growth and capacity in the sciences.

Fresno State has been recognized by the National Institutes of Health for its dedication to student success in higher education, while the biomedical research capacity of UC Merced has been expanding rapidly. In the last four years, UC Merced has recruited several new assistant professors in the area of biomedical and behavioral research and there are clusters of faculty conducting exciting research led by internationally-recognized scientists.

"Given the close geographic proximity of Fresno State and UC Merced, it is a natural step for these institutions to strengthen a collaborative academic environment and develop a matriculation culture between the two institutions," says Krishnan.

Each year four students are selected as Bridges Scholars. They have two years to complete their master's degree in biomedical or behavioral sciences. The program goal is for 75% of the Bridges Scholars to be accepted into a PhD program within two years of completing their master's program, and that 50% will matriculate to doctoral programs upon their acceptance at UC Merced.

Dr. Jason Bush, a Fresno State biology professor serves as a faculty lead and mentor in the Bridges program. He has enjoyed seeing students get involved in research projects and strengthening Fresno State's partnership with UC Merced.

Bush noted that many students arrive on campus with pre-professional paths in mind, such as medicine, dentistry or veterinary and that few students think of science careers. He enjoys introducing them to other career options.

"The opportunity to provide students with hands-on laboratory exposure is often a defining experience that switches them on to a research path," says Bush. "Because I am such a biology junkie and went through a similar kind of 'awakening' about science research, to be able to facilitate that switch for others is especially rewarding. To be part of building up the biomedical research profile and capacity of our university and region is a personal mandate and one of the reasons that I came to Fresno."

Another goal of the program is to build up the valley as a center of research. The Bay Area, Los Angeles basin and San Diego are known areas for research in California, but there is room for more.

"I would like the Central Valley to be considered as another hotbed of research productivity and prowess," Bush says. "To get there, we need to leverage our strengths and develop strong collaborations and partnerships within the region. The Bridges program is the first step in creating a strong pipeline of talent from our unique student/community demographics with the hope that the student trainees will one day return as faculty and researchers to further build the investment in science. I feel privileged to know that our students have tremendous potential and can be great contributors to science no matter where they decide to go." ❐

CHEM CLUB

Chem Club Students

Science mascot Nick L Mole

ANNABELLE SAYS

"I get to meet some of the coolest people around through our club, and it's amazing."

CHEM CLUB'S FORMULA Produces Fun & Success

BY JILL WAGNER

The Fresno State Student Affiliate Chapter of the American Chemical Society (ACS), more commonly referred to as the Chemistry Club, celebrated its 65th anniversary on campus and is a model for student organizations on campus.

The active members of this dynamic club conduct outreach activities on campus and throughout the community to increase scientific literacy and shine a light on the fun and purpose of science, technology, engineering and mathematics. They also participate in career and networking activities with professionals.

The Chemistry Club welcomes chemistry students and also those who may not be majoring in the subject, but have an interest in chemistry or science education. The result is a very active club that offers myriad activities year-round.

The club has a formula that helps it stand out among student clubs: a mascot named Nick L Mole (a mole is a unit of measurement in chemistry). His presence always draws a crowd and creates interest in the club's activities. The ACS has a mole mascot as well – Professor Moleium – that club members claim was inspired by Nick L Mole.

Annabelle Lolinco of Fresno, who graduated as a biochemistry and communications major, served as the club's president during its 65th anniversary year. She learned about the Chemistry Club when its officers visited her chemistry classroom to promote membership. She attended an outreach event on campus for middle school students that featured a demonstration on how to extract iron from cereal. She was hooked.

The club's Success is due to DYNAMIC ACTIVIES AND HARD-WORKING OFFICERS

Chem Club Officers

"The club let me be engaged at the university, local community and even national levels," says Annabelle. "I've gotten to go to three national ACS meetings to represent our student chapter and university as well as a leadership institute held by ACS where I got to meet some of the most amazing people around the nation."

The club annually conducts activities to promote National Chemistry Week in the fall, and Chemists Celebrate Earth Day in the spring.

One of Annabelle's favorite club activities was National Chemistry Week. "The different activities the club hosts are fun and interactive with everyone on campus, plus we've had some really cool themes for the last few events," Annabelle says. "I get to meet some of the coolest people around through our club, and it's amazing."

Junior biochemistry major Brandi Mason attributes the club's success to dynamic activities and hard- working officers as well as club and community members who keep the club active and engaging. "The club has a lot of momentum from being around for so long, too," says Brandi.

Often the star of the show is mascot Nick L Mole. Not everyone gets the "mole" joke right away, but these future scientists use the contact to teach what his name means. He's a constant presence at Chemistry Club and college events and was even outfitted in formal attire for the club's 65th.

"We like to use him in a big way on our outreach events and anytime we're representing our department, college or university," says Annabelle. "He's definitely prominent on Facebook. I've even seen him a couple of times on Tumblr from science bloggers I follow. He's our perennial 'face', and he's great at pumping people up at events."

The club has exceled at showcasing careers in the chemistry field. "You get great opportunities for networking with other students, professors and professionals outside of school," says Brandi. "We have something for people of all ages, majors, and lifestyles."

THE STAR OF THE SHOW IS MASCOT NICK L MOLE.
Not everyone gets the "mole" joke right away,
but these future scientists
use the contact to teach what his name means.

LIFE IS A ZOO for Top Dog SCOTT BARTON

Photo by Cary Edmondson

AFTER 25 YEARS WORKING WITH ANIMALS AROUND THE WORLD, SCOTT BARTON RETURNED TO THE PLACE THAT LAUNCHED HIS CAREER — FRESNO CHAFFEE ZOO.

BARTON WORKED AS A ZOOKEEPER UNDER PAUL CHAFFEE, THE FIRST DIRECTOR OF THE ZOO, WHILE HE ATTENDED FRESNO STATE. BARTON GRADUATED IN 1982 WITH A BACHELOR'S DEGREE IN BIOLOGY AND A PASSION FOR CONSERVATION THAT LED HIM TO PROJECTS IN SOUTH AMERICA, THE CARIBBEAN AND AFRICA.

UNDER SCOTT'S LEADERSHIP,
the Fresno Chaffee Zoo experienced a 40 % increase in attendance

After stops at zoos in Tucson, Arizona, Seattle, Melbourne, Australia, and Salt Lake City, Barton helped open Disney's Animal Kingdom in Orlando, Florida. With a resume full of valuable experience, he decided to return to Fresno Chaffee Zoo in 2009 as executive director and CEO and was tasked with implementing Measure Z funding — the tenth-of-a-cent sales tax to support zoo projects and programs. That investment from taxpayers included $70 million in capital improvements.

As busy as 2015 was, as the zoo opened its 13-acre African Adventure experience designed to emulate natural plains and savannas, Barton still takes time to enjoy the little things.

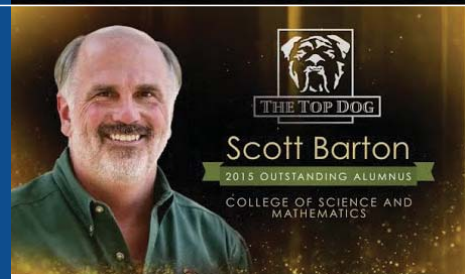
For his many achievements, including his work in conservation, Barton earned the 2015 Top Dog Outstanding Alumni award from the College of Science and Mathematics at Fresno State — the highest honor presented by the Fresno State Alumni Association.

"I love to step back and just watch how children and families interact around Sea Lion Cove," Barton says.

"Watching the children stand in front of that huge acrylic panel with their noses pressed up against the glass, and enjoying that as though they were diving in Monterey, it's just an amazing feeling. It's very rewarding."

"It's incredibly rewarding to see that we're sparking that interest in animals and science, in children but also in adults of all ages — people of all ages that we help to inspire passion for wildlife and for conservation," Barton says.

Barton's own interest in animals was sparked at a young age. He and his older brother kept snakes and lizards as pets, and he says his parents encouraged it. "Even though they weren't scientists, they certainly encouraged an interest and a curiosity about the natural world. And so I think those times really began to shape what I was interested in."



During his first semester at Fresno State, Barton recalls seeing a flier for a program called "Man and the Natural Enviornment," which combined biology, geology and anthropology. He signed up and took trips to Owens Valley, the Grand Canyon and Mexico to study science and was hooked.

"That whole experience really shaped my college career and focused me on natural sciences," he says.

Under Scott's leadership, the Fresno Chaffee Zoo experienced a 40 percent increase in attendance, a figure expected to increase with the opening of the African Adventure that nearly doubles the zoo's footprint. The exhibit offers intimate views of lions, elephants and rhinos, as well as educational and recreational spaces.

Scott says it is the largest and most complex project of his career, but one that is poised to elevate the Fresno Chaffee Zoo to being among the best in the nation. ❐

NEWS

Faculty News

PHYSICS PROFESSOR DOUG SINGLETON
was elected as Chair of the Far West section of the American Physical Society and will go to the ICTP-SAIFR in Sao Paulo Brazil on a Fulbright Fellowship to do research this summer.

PSYCHOLOGY ASSISTANT PROFESSOR CARLOS CALDERON
won the 2016 Junior Faculty Award from the Trainers of School Psychologists

BIOLOGY PROFESSOR MAMTA RAWAT
will start as a rotating Program Officer at NSF in late summer 2016 for a one year appointment.

CHEMISTRY PROFESSOR DERMOT DONNELLY
received an Outstanding Reviewer Award in April at the American Educational Research Association conference in Washington, DC. The award is recognition for his reviews completed for the Review of Educational Research journal, the #1 ranked education journal internationally.

Student News

BIOLOGY UNDERGRADUATE STUDENTS
Jason Thomas and Karina Hernandez won the Howell-CSUPERB Scholars Award established to fund promising undergraduate student research projects in topics related to women's health.

MYRKA MACEDO, undergraduate student in Chemistry, received the American Chemical Society award in Analytical Chemistry.

UNDERGRADUATE MATH STUDENT, Summer Al-Hamdani, has been chosen to participate in PUMP (Preparing Undergraduates through Mentoring towards PhDs) Summer Program. Summer is the first participant from Fresno State. PUMP is an intensive four-week program that immerses students daily in the mathematics that they need to succeed in their upper division courses.

MATH UNDERGRADUATE STUDENTS Andrew de la Pena and Sarah McGahan won the Outstanding Poster Presentation award from the Mathematical Association of America.

CSM ALUMNI: WE WOULD LOVE TO HEAR FROM YOU!
Submit your personal or professional news to csm@csufresno.edu

Student News

PHYSICS UNDERGRADUATE STUDENT TEAM
In November 2015, Aaron Bassill, Andres Zumba Quezada, and Shoji Hishida won the bronze medal in the international University Physics Competition sponsored by the American Physical Society and American Astronomical Society.

CONGRATULATIONS to all the outstanding students who won awards at the 2016 Central California Research Symposium. Of the 22 awards given, 15 were awarded to Science and Mathematics students!

AN INTERDISCIPLINARY TEAM of students in our Society for Industrial and Applied Mathematics (SIAM) chapter led by Dr. Adnan H. Sabuwala shared the top prize along with teams from Harvey Mudd and University of Nebraska in the Collaborative Research Project created by Wake Forest University. The Fresno State team consisted of four students, Samuel Barretto (Mathematics), Chih-Chiun Jamie Chang (Biology), Dylan Manning (Chemistry, and Andres Zumba Quesada (Physics). The team completed a project on tropical mathematics and its applications to phylogenetics.

BIOLOGY GRADUATE STUDENT April Booth was named a Trustee Emeritus Peter Mehas Scholar for her academic achievement and commitment to community service in spite of adversity. Booth, who received her bachelor's degrees in biology and chemistry, is currently completing a master's in biology. Her research is focused on testing the effects of caffeine on the memory and lifespan of fruit flies expressing Alzheimer's symptoms.

CONGRATULATIONS

2015-2016 CSM COLLEGE AWARD WINNERS

OUTSTANDING TEACHING AWARD
Dr. David Lent, Biology

OUTSTANDING TEACHING AWARD, LECTURER
Ms. Karen Chooljian, Biology

OUTSTANDING FACULTY RESEARCH
Dr. Qiao-Hong Chen, Chemistry

DISTINGUISHED FACULTY SERVICE
Dr. Christine Edmondson, Psychology

DISTINGUISHED STAFF SERVICE
Dr. Jaime Arvizu,
Advising and Resources Center

DISTINGUISHED ALUMNI
Dr. Michael Lynch BA Zoology '74 and MA Biology '77

2015-16 PROVOST AWARD WINNERS

DISTINGUISHED ACHIEVEMENT IN RESEARCH, SCHOLARSHIP OR CREATIVITY ACCOMPLISHMENTS
Dr. Carmen Caprau, Mathematics

INNOVATION AWARD
Dr. Joseph Ross, Biology

PROMISING NEW FACULTY AWARD
Dr. David Lent, Biology

A sampling of the 177 Faculty & Student Publications from 2015-16

JOURNAL OF BIOLOGICAL CHEMISTRY
Gunasekara, SM, Hicks, MN, Park J, Brooks CL, Serate J, Saunders, CV, Grover, SK, Goto JJ, Lee JW, **Youn H.** (2015) "Directed evolution of the Escherichia coli cAMP receptor protein at the cAMP pocket," Journal of biological chemistry, vol. 290, no. 44, October 2015, pp. 26587-26596.

INTERNATIONAL JOURNAL OF BIOCHEMISTRY AND CELL BIOLOGY
Renault TT, Teijido O, Missire F, Ganesan YT, Velours G, Arokium H, Beaumatin F, Llanos R, Athane A, Camougrand N, Priault M, Antonsson B, **Dejean LM**, Manon S (2015) "Bcl-xL stimulates Bax relocation to mitochondria and primes cells to ABT-737", International journal of biochemistry and cell biology, vol. 64, 2015, pp. 136-146.

INTERNATIONAL JOURNAL OF COMPUTER AND COMMUNICATION ENGINEERING,
Yogesh Bansal and **Jin H. Park** (2015) "Multi-hashing for protecting web applications from SQL injection attacks," International journal of computer and communication engineering, vol. 4, no. 3, May 2015, pp. 187-195.

AMERICAN MINERALOGIST
Lessel, Jerrod and **Putirka, Keit**h (2015) "New thermobarometers for martian igneous rocks, and some implications for secular cooling on Mars. American Mineralogist, 100, 2163-2171.

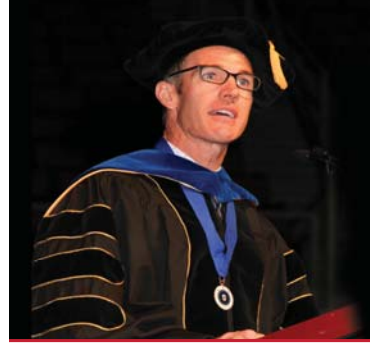
METHODS FUNCTION ANALYTICAL TOPOLOGY
Markin, Marat V. (2015) "On the Carleman ultradifferentiable vectors of a scalar type spectral operator," Methods function analytical topology, vol. 21, no. 4, 2015, pp. 361-369.

JOURNAL OF PHYSICS
Benjamin White, Duygu Yazici, **Pei-Chun Ho**, Noravee Kanchanavatee, Naveen Pouse, Yuankan Fang, Alexander Breindel, Aaron Friedman, Brian Maple (2015) "Weak hybridization and isolated localized magnetic moments in the compounds CeT2Cd20 (T = Ni, Pd)," Journal of physics: condensed matter, vol. 27, 2015, pp. 1-10.

APPLIED ANIMAL BEHAVIOR SCIENCE
Fay Porritta, **Martin Shapiro**, Paul Waggonerc, Edward Mitchelld, Terry Thomsond, Steve Nicklina, Alex Kacelnikd (2015) "Performance decline by search dogs in repetitive tasks, and mitigation strategies," Applied animal behavior science, vol. 166, 2015, pp. 112-12

New Faculty

We would like to welcome our new faculty who will join us this summer:



Michael Bishop, PhD
MATHEMATICS
University of Arizona
General Mathematics

Marat Markin, PhD
MATHEMATICS
National Academy of Sciences of Ukraine
General Mathematics

Laura Grow, PhD
BEHAVIOR ANALYSIS
Western Michigan University
Applied Behavior Analysis

Kalyani Maitra, PhD
CHEMICAL BIOLOGY
University of Nevada, Reno

Joshua Reece, PhD
POPULATION GENETICS
Washington University

We are Family

Family believes in you, even when you doubt yourself.
Family tells you to dream big, while reminding you that it will take hard work.
Family is there for you.
You will come here to learn and our family will help you discover yourself and realize your dreams.
We will help you find your path in life.

We are bigger than you think, in more ways than one.
We are devoted teachers, active researchers, caring advisors, and strong supporters.
We work side-by-side with you in the classroom, in research labs, and in the community.
We take hundreds of students into our laboratories and out into the field,
to research conferences and to teach children, because real world experience matters.

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the students they teach, the patients they heal, and the differences they make in their communities.

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That is the point.
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