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Welcome

**ROBERT G. DUNDAS PH.D.,
INTERIM DEAN,
COLLEGE OF SCIENCE
AND MATHEMATICS**

*Dean's Message
Elements Magazine
2017*

I am proud to present the fifth issue of ELEMENTS magazine from the College of Science and Mathematics. The College continues to make tremendous progress in teaching, research and service to the community. Work is currently underway on a \$1M project to renovate two of our teaching laboratories, which will provide our Biology and Chemistry students with state-of-the-art learning environments in the Fall. Our research reputation continues to grow, with faculty successfully competing for prestigious grants, such as the National Science Foundation CAREER award received by Dr. David Lent, the first such award for Fresno State. Our faculty have also strengthened our community partnerships, highlighted by several new collaborations with the Fresno Chaffee Zoo.

In this issue, we highlight the Natural Science program, a vital but underappreciated major within the College that provides students with the scientific content knowledge needed to teach high school science. It is one of the few programs in California that meets state requirements for subject matter credential competency for Biology, Chemistry, Earth Science and Physics. This unique degree program is not only a vital pipeline for training science teachers in the valley, but also prepares students for successful careers in pharmacy, medical school and Ph.D. programs. We also spotlight the research program of Dr. Mamta Rawat, a Professor of Microbiology who came to Fresno State in 2003. Rawat's research group works on bacterial stress response, with particular interest in the role of low molecular weight thiols in protecting bacteria against environmental stresses. Her work has been funded by the National Science Foundation and the National Institutes of Health. In her distinguished career, she has received a number of awards including the CSU System-Wide Program in Education and Research in Biotechnology Research Award, and she was named as a National Academies Education Fellow in the Life Sciences in 2013. This year, she is serving as a Program Director at the National Science Foundation in the Division of Integrative Organismal Systems.



This year, the College successfully completed its search for a new Dean, and I am delighted to welcome Dr. Christopher Meyer, who will join us from California State University, Fullerton over the summer. It has been a privilege to serve the College as Interim Dean this year, and to have had the opportunity to work with an incredible group of faculty, staff, students, alumni and community supporters. I look forward to working with Dean Meyer and all of you as we take the College to even greater heights in the coming year.





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NATURAL SCIENCES PROGRAM

by: Angelica Cano
photos by Cary Edmondson

For the last 23 years, the College of Sciences and Mathematics' Natural Sciences program has been equipping Fresno State students for scientific success.

ESTABLISHED IN 1994 BY DR. DAVID M. ANDREWS AND OTHER COLLEGE OF SCIENCE AND MATHEMATICS COLLEAGUES, THE NATURAL SCIENCES PROGRAM IS DESIGNED TO ALLOW FRESNO STATE STUDENTS TO EARN A BACHELOR'S DEGREE AND MEET THE SINGLE-SUBJECT MATTER CRITERIA FOR CREDENTIAL COMPETENCY AT THE SAME TIME.

"It's a wonderful program to join," said Aroob Shahin Abdelhamid, who participated in the program from 2010 to 2014. "Even if you aren't sure you want to teach, this program is more than that."

THE MISSION OF THE PROGRAM IS TO PREPARE STUDENTS WITH A BROAD UNDERSTANDING OF SCIENCE AS A WAY OF THINKING, AS WELL AS A TOOL FOR LEARNING ABOUT THE WORLD. THE PROGRAM SEEKS TO PROVIDE STUDENTS WITH THE OPPORTUNITY TO INVESTIGATE NATURE AND TEST EFFECTIVE STRATEGIES FOR SHARING THEIR FINDINGS AND EXPERIENCES WITH OTHERS.



#WeHeartScience





Photo by: Kelly Aoki

Pharmacist: Jason Schroer

“Students walk away with breadth, depth, and training of sciences,” explained Dr. Andrews, who is a faculty member in the Department of Biology. “They have a much better understanding of the important linkages that exist between topics such as earth science or chemistry, and their sub-disciplines. In turn, they can help their future students better understand the world around us.”

Through the Natural Sciences program, students gain a more complete knowledge of how the sciences work together. *“It’s inter-disciplinary science, not science light,”* said Andrews, who estimates more than 1,250 students have completed the program. Many of these students have gone on to a multitude of professions, including Dr. Andrews’ own pharmacist, Jason Schroer.

“While I consider myself primarily a chemist, to complete courses in other earth sciences excited me,” Schroer said. *“I probably would have never explored geology or astronomy were it not for the program. Science is important to understand. And, understanding a little across various disciplines outside your concentration makes you a better scientist. It is important to share that knowledge with others, whether it be from the front of a classroom or from behind the pharmacy counter.”*

The Bachelor of Arts degree in Natural Sciences allows students to establish subject-matter competency without taking the California Subject Examination for Teachers (CSET). Students can also elect to major in biology, chemistry, earth sciences, or physics and take additional classes for broader understanding, as part of the program.

The Natural Science program was developed and approved in 1994 to comply with changing California standards, a process that happened again in 2009. Fresno State will resubmit the program next year to demonstrate compliance with the Next Generation Science Standards, which have been adopted by California.

Fresno State is one of only a handful of universities to offer a comprehensive program of this nature. As a result, Fresno State students have access to many unique opportunities and benefits.

One such benefit is the Fresno State Natural Sciences Club. Open to all Fresno State students, the club is known for its outreach efforts. Over the last five years, the club has hosted thousands of Valley students as part of their educational programs, Circuit Science and Stellar Science. Students in grades 3-8 learn science and math concepts by participating in hands-on activities, demonstrations, and experiments led by club members.

Overall, Abdelhamid said, she considers her time in the Natural Sciences Club and program an amazing experience. *“It helped me realize my love for teaching and it gave me a chance to serve the community with their Circuit Science and Stellar Science events,”* said Abdelhamid, who is pursuing her Ph.D. in chemistry at the University of Colorado Boulder. *“I decided the way I wanted to contribute was to become a university professor and host my own Circuit Science events in a different part of the country, perhaps make these sorts of events national.”*

“It takes our students from envisioning to reality.”

Jaime Arvizu



*Teacher: Sara Meadows
Edison High School*



*Teacher: Jamie Vargas with Student
Edison High School*

SMEC

“THE PROGRAM REALLY GIVES YOU A SENSE OF COMMUNITY AND IT REALLY GETS YOU INVOLVED,” ABDELHAMID SAID.

Another facet of the College of Science and Mathematics' focus on student learning is the Science and Mathematics Education Center (SMEC). SMEC has played an important role over the years in helping to implement funded projects in support of science and math teachers, including those that are natural science majors. SMEC provides students with training workshops and comprehensive early-field experience, placing Fresno State students in local math and science classrooms to gain hands-on experience.

Dr. Jaime Arvizu, associate director of SMEC, is proud of the Center's distinctive programming. *“Gaining this valuable experience helps students to understand the realities of science and math teaching, allowing them to see how younger students learn,”* Arvizu explained. *“It takes our students from envisioning to reality.”*

For both Schroer and Abdelhamid, the Natural Sciences program and its wide range of opportunities has made a lasting impact.

“My daily life has been made fuller by my participation in the Natural Sciences program,” Schroer said. *“I have encouraged and inspired more than a couple of pharmacy technicians to return to school and at least a couple passed through the program. While neither went on to pharmacy school, one switched to nursing and the other finished the program and is now an outstanding chemistry teacher for Selma High.”*

“The program really gives you a sense of community and it really gets you involved,” Abdelhamid said. *“A lot of people have this desire to change the world and make it a better place, this is one great way to do that. You don't have to want to teach to be a part of this group. If you just want to make a difference in your community, this program provides that opportunity.”* □



DR. MAMTA RAWAT PROFESSOR Biology Dept.

By, Angelica Cano

**“I DO SCIENCE
BECAUSE I WANT TO
FIND THINGS OUT.”**

What would appear to be a mind-boggling career to many is all in a day’s work for Dr. Mamta Rawat, whose life-long research is helping to develop antibiotics to fight super bugs and formulate new vaccinations.

Born in the foothills of the Himalayas, Rawat’s family moved to Canada when she was just nine years old. Growing up in the suburbs of Montreal, she demonstrated an unquenchable desire to ask questions and find answers – a curiosity that has stuck with her throughout her career. A noted professor in the biology department of Fresno State’s College of Science and Mathematics, Rawat’s research focuses on bacteria and their response to environmental stress. She works with *Staphylococcus aureus*, *Mycobacterium smegmatis*- a model organism for *Mycobacterium tuberculosis*, and the photosynthetic cyanobacteria, responsible for oxygen in the environment.

Rawat completed her undergraduate degree at the University of Toronto, where she earned a bachelor’s degree in biochemistry and researched the structure of certain proteins in sea lamprey. She attended graduate school at Louisiana State University, earning her Ph.D. in plant physiology and biochemistry where her work focused on algae, photosynthesis, and the role of carbon dioxide.



L to R: Dr. Rawat, Megan Cornell, Bethany Hazen

**HOW DO BACTERIA SURVIVE
AND PROTECT THEMSELVES,
EVEN WHEN THE HUMAN
IMMUNE SYSTEM IS
FIGHTING AGAINST THEM?**

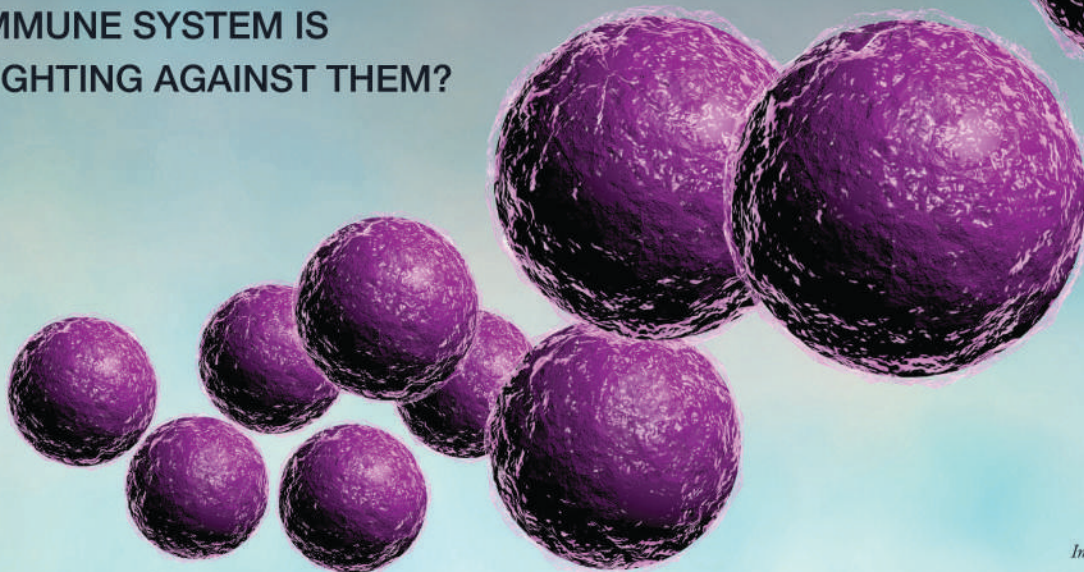
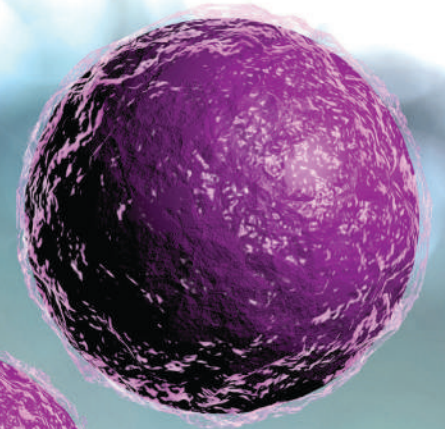


Image from Adobe Stock: Staph Bacteria



Jason Thomas



Megan Cornell



Bethany Hazen



Dr. Rawat and Megan Cornell

In the spring of 2016, Rawat was selected to serve as a program director for the prestigious National Science Foundation (NSF) where she plays a pivotal role in ensuring that impactful ideas are funded for research. Though on leave from Fresno State, Rawat effortlessly travels between the two worlds. She maintains an active lab with undergraduate and graduate students on the Fresno State campus - experimenting, researching, and peer-reviewing at the same time she is working as a program director for NSF.

Rawat believes mathematics, as well as the ability to communicate, are both critical components of science and stresses these points to her students. *"The best thing we can do as teachers and professors is to try to help our students think critically and analytically by using numbers,"* Rawat said. *"You must look at the numbers and see what they mean, but students should also be able to explain what they are doing in writing and orally."*

Her Fresno State career began in 2003, and though splitting time can be taxing, Rawat said getting to share her love of science with students is incredibly rewarding. Her advice to those students? *"Do things only if you're interested in them - not just because it looks good on a resume,"* Rawat said. *"If you like what you're doing, you'll work hard and you'll be good at it."*

Rawat truly practices what she preaches. She is most interested in structure and how it impacts function, so the overarching theme throughout her career has been researching mechanisms with an emphasis on how organisms respond to stress. Because of this, her work holds resounding medical and environmental implications. Her research on microorganisms such as MRSA and *M. smegmatis* seeks to identify how bacteria survive and protect themselves, even when the human immune system is fighting against them. Looking at pathways present in the bacteria, Rawat hopes to find more effective treatments to combat these bacteria.

Overall, Rawat said, she deeply appreciates the universal foundation that centers the world of scientists. According to Rawat, no matter where you travel within the spheres of the scientific community – whether the United States, Japan or the Ukraine – you find that scientists are trained in the exact same manner, to be logical and evidence based, allowing numbers and results to stand on their own.

When asked why she's chosen the life of a scientist, her answers recalls that same curiosity that has continued to serve her well, *"I do science because I want to find things out."* □

"THE BEST THING WE CAN DO AS TEACHERS & PROFESSORS IS TO TRY TO HELP OUR STUDENTS THINK CRITICALLY AND ANALYTICALLY..."

Dr. Rawat





SCHOOL PSYCHOLOGY PROGRAM

Psychology graduate students, as part of their regular coursework have been consulting with community based organizations about their needs and capacity for effective program evaluation. Organizations partnered with Psychology include Blue Sky Wellness Center, a division of Kingsview Behavioral Health Systems; the Learning About Parenting Program at Exceptional Parents Unlimited; the Community Leadership Academy at Resources for Independence, Central Valley; and the Holistic Cultural Education and Wellness Center. For example, the Holistic Cultural Education and Wellness Center provides culturally appropriate mental health promotion and prevention services to several ethnic communities who do not typically access more traditional mental health services. Graduate students will be working with this organization to collect and quantify "success stories" and present them to decision-makers in the county. This important work will not only help support continued funding for the center's services, it will also educate mental health professionals throughout Fresno about how these communities take care of their own mental health in a way that complements services traditionally offered by the county.

EARTH DAY

Earth Day was celebrated with the annual fair sponsored by the Fresno State Sustainability Club on April 29, 2017. Booths included food trucks, the Fresno State Food Recovery Network, the San Joaquin River Parkway and Conservation Trust, Fresno State Food Security Project, student posters and DIY tips and tricks.



Maria Cruz, Wendy Garica, Robert Dundas, Janisa Grisom



Dana Maraach, Jonpaul Moschella, Maria Cruz, Kaithyn Terry, Wendy Garcia, Marianne Jackson, Janisa Grisom



Samantha Hernandez-Tapia

RUN WITH THE HEROES

The College of Science and Mathematics helped sponsor the Valley Children's Hospital 2017 Run with the Heroes 5K and Family Walk on Saturday, April 22. All proceeds from the event went to the George's Pass Program at Valley Children's Hospital to improve care and provide a better, more individualized experience for children with Autism Spectrum Disorders. Volunteers from the College and Science and Mathematics and Focused Behavioral Services served pancakes to participants and hosted an information booth about college programs.





SAN JOAQUIN RIVER PARKWAY

The College of Science and Mathematics hosted a Party for the Parkway dinner on April 8, 2017. The Progressive Dinner Party: Supper with Science, allowed guests to get an up close look at today's university classrooms and laboratories. Guests sipped Fresno State wine and tasted delicious Fresno State food as they progressed through the Science I building and explored different labs and listened to college faculty members and students about their programs and research. The evening was concluded with homemade ice cream from our Physics Outreach team.



PHYSICS OUTREACH

March 13th, KMPH Channel 26's Wendi Lane and the Physics Outreach Team had fun with experiments to demonstrate a wide range of physical concepts. Wendi and CSM Director of Development, Javier Morales, had fun learning about pressure, mass and weight and atmospheric pressure.

AUTISM CENTER – TRICK OR TREATING

On October 31, 2016, the children at the Autism Center made their annual visit to the halls of the Science II building to trick or treat at faculty and department offices. Youngsters and grown-ups alike were all grins and laughs as candy and treats were shared.



COLLEGE FACULTY AND STAFF DONATE TO FRESNO STATE STUDENT CUPBOARD

College faculty and staff generously donated food and hygiene items at the Annual Holiday Celebration on December 9, 2016 to be shared with the Fresno State Student Cupboard. The Fresno State Student Cupboard is a free food and hygiene pantry for current Fresno State students. The Cupboard is one of the part of the multi-initiative Fresno State Food Security Project program to support students who may be experience food insecurity or other challenges that might inhibit their academic success at Fresno State.



FACULTY RESEARCH



Dr. David Lent

DEPARTMENT OF BIOLOGY

In summer of 2016, Dr. David Lent, assistant professor in the Department of Biology, received the Faculty Early Career Development (CAREER) award from the National Science Foundation. The award, totaling \$668,835, will support Lent's project, which seeks to determine how animals navigate in complex environments.

The CAREER Program gives the National Science Foundation's most prestigious awards to junior faculty who embody the role of teacher-scholars, excelling at impactful research, exceptional education, and the integration of the two. To date, no other Fresno State professor has received this prestigious award.

The objective of the project is to advance what is known about the perceptual, learning, and memory mechanisms underlying navigation, while providing new learning and research opportunities for Fresno State students.



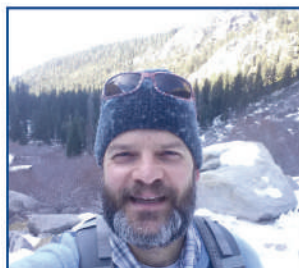
Dr. John Constable

DEPARTMENT OF BIOLOGY

Dr. John Constable, faculty in the Department of Biology, is exploring the connection between bacteria and drought tolerance in a new species of sunflower. The unusual characteristics of this sunflower were noted by several early botanists, but it remained undescribed. In 2011, Constable and colleagues, including a student, examined the plant and published its formal description two years later naming it *Helianthus winteri* (Winter's sunflower).

The species is only found in nine sites on rocky south-facing slopes in the foothills of the southern Sierra Nevada of California – an area known for its long, dry summers. In response to limited water availability, some plants complete their life cycle early in the year or become dormant before the summer drought. This species, however, remains active, growing and flowering throughout the summer. While it is unknown how the species tolerates these hot, dry conditions, a suspicion is that it may benefit from the bacteria, fungi, and other microbes that live on and within it.

Constable is working with Dr. Mamta Rawat of Fresno State, Dr. Carolin Frank of UC Merced, and several undergraduate and graduate students. By studying the effect of bacteria on the growth and development of the species, Constable and his colleagues hope to determine if bacteria contributes to the apparent drought tolerance of the species and the potential impact on crop production.



Dr. Tamás Forgács

DEPARTMENT OF MATHEMATICS

Dr. Tamás Forgács, faculty in the Department of Mathematics, is currently engaged in research studying the zero distribution of entire functions. Within the class of entire functions are special subclasses of functions - including those whose zeros lie on a prescribed geometric curve, such as a circle or a line.

The historical motivation behind research of this nature – dating back to 1859 - is one of the most famous open problems in mathematics, the Riemann Hypothesis. It stipulates that all zeros of the Riemann zeta function lie on a vertical line, except for the trivial ones. Forgács' research focuses on two distinct approaches to the study of zero distributions of entire functions.

The first approach aims to understand which linear operators map the set of polynomials with only real zeroes into itself. A total of 17 undergraduate students have been involved in this line of research to date, eight of whom are Forgács' coauthors on peer-reviewed publications. The second approach seeks to understand the ways one can generate large families of polynomials with only real zeroes.

Forgács became involved in the second strand of research at the invitation of Dr. Khang Tran, another faculty member in the Department of Mathematics. Forgács and Tran are currently working on the third paper in a series, hoping to understand how these two approaches may lead to synergies and new developments in this classical area of mathematics research.





Dr. Rosa Toro

DEPARTMENT OF PSYCHOLOGY

Dr. Rosa I. Toro was born and raised in the San Fernando Valley of Southern California and is the daughter of Mexican immigrants. She attended the University of Southern California and University of California, Riverside for her B.A in Psychology and Ph.D. in Developmental Psychology, respectively. Presently, Dr. Toro is an Assistant Professor of Psychology and does research on understanding how the multiple and dynamic contexts in which immigrant children and families

are embedded influence their development. She was a Robert M. McNair Scholar and MacArthur Foundation Postdoctoral Fellow.

Current projects of the IFACES Lab include:

Longitudinal Examination of the Parent-Child Acculturation Gap Among Immigrant Latino Families on Family Functioning and Adolescent Development - In conjunction with local school districts (Sanger, Fresno, and Cutler-Orosi), this study is examining the influence of the parent-child acculturation gap on family functioning and adolescent development. This study recently received funding for the next three years from the National Institute of Health.

The Influence of Cultural Values in the Relationship Between Filial Responsibilities and Health Outcomes for Latino Young Adults - Current health disparities research reports that Latino youth are at a disproportionate risk for experiencing negative health outcomes (e.g. depression). The goal of this project is to examine how perception of filial responsibilities, a practice of children taking on various adult caregiving tasks, as being unfair influence well-being and whether cultural values serves as a buffer. Findings indicate that as perception of unfairness increases so do reports of depressive symptoms, but high endorsement of cultural values buffers this effect. Results have been submitted for review to be published in the Journal of Family Psychology.

The Role of Acculturative Family Distancing (AFD) Among Latino College Students - This project is interested in looking at how college students' reports of feeling distanced from their parents because of acculturation-related reasons (i.e. cultural values incongruences and communication difficulties) is linked to parent intergenerational cultural conflict and health-related outcomes (e.g. depression and anxiety). Dr. Toro will be presenting these findings, as part of an invited Special Collaborative Session on the Mental Health Needs of Immigrant, Refugee and Asylum seeking Women and Girls in the U.S.A, at the 145th American Public Health Association (APHA) Annual meeting.



Dr. Mihai Gherase

DEPARTMENT OF PHYSICS

While 26 elements are essential to human life, 15 trace elements – named for their minute concentrations – make up just 0.5% of all the 26 elements. Found within these trace concentrations are nonessential elements, such as arsenic and lead, both of which have known adverse health effects from long-term exposure.

X-ray fluorescence (XRF) is a noninvasive and nondestructive technique used to detect trace concentrations of elements. In his microbeam XRF lab, Dr. Mihai Gherase, faculty in the Department of Physics, explores novel x-ray optics instrumentation to develop new techniques for measuring certain trace elements, such as arsenic and lead. This research will address problems related to the monitoring, prevention, diagnostic, or treatment of negative health effects associated with human exposure to toxic elements.

In parallel, Gherase will target the development of XRF techniques at the sub-cellular level – possibly leading to studies of biochemical and biophysical mechanisms involving trace elements.



Dr. Spee Kosloff

DEPARTMENT OF PSYCHOLOGY

Dr. Spee Kosloff, faculty in the Department of Psychology, has embarked on the link between personality and conformity.

During his research, Kosloff asked participants to rank a series of unfunny cartoons. To monitor how they may conform, Kosloff positioned participants to answer either on their own or with three confederates – all poised to rank the cartoons as highly humorous. Following this analysis, participants completed an assessment of the five-factor model (FFM) of personality: neuroticism, extraversion, openness, agreeableness, and conscientiousness.

Kosloff's findings indicate that when participants answered alone, their ratings were below the scale midpoint. When confederates were present, however, ratings increased by 56%. The presence or absence of confederates accounted for a 44% variance in judgment with personality accounting for 23% of the variance. This effect was driven by low neuroticism, high agreeableness, and high conscientiousness. When combined, according to the FFM, these components are associated with the meta-trait of stability: the motivation to maintain stability in social relationships.

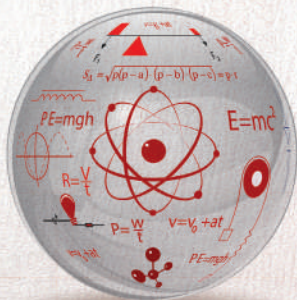
Overall, Kosloff's findings suggest that conformity is not a passive activity of group pressure, but may reflect a tendency to maintain group cohesion. Kosloff plans to advance this research and its impact on behavioral decision-making including alcohol and drug use.



STUDENTS AND TEACHERS ALIKE LEARN FROM MATHEMATICS SUMMER PROGRAMS

In the summer of 2016, **more than 90 students participated** in the Summer Academy in STEM.

BY: ANGELICA CANO



For the last five years the Department of Mathematics has hosted summer programs for Valley students and teachers. The Summer Academy in STEM, as well as the Teaching Mathematics with Common Core Mathematical Practices programs happen side-by-side during one week each summer – one focused on helping students learn math concepts through hands-on activities, the other by allowing teachers to observe just how those students learn best.

When it began, the goal was to provide professional development training for teachers. The idea of having students attend to run through activities came secondary.

While not the original intention, the Summer Academy in STEM has grown –expanding from one age group to four. When the program began in 2012, it only offered programming for students in grades 6-9. Five years later, the academy offers unique curriculum for grades 3-4, 4-6, 6-9, and 6-12.

The Summer Academy in STEM is used as a lab to provide a real-life showcase for elementary, middle school, and high school teachers to observe and learn from. Offering the Teaching Mathematics with Common Core Mathematical Practices training during summer months allows teachers to focus in a very concentrated amount of time, said Dr. Rajee Amarasinghe, chair of the Department of Mathematics.

Previously, the department attended different districts, instructing on-site. The current platform, however, allows teachers from multiple districts to observe and work together. The training aspect of the summer program is based on Lesson Study, a professional development method used in Japan. According to Amarasinghe, this method works well in this environment because teachers can learn, not by someone telling them how to teach, but by observing how it's done.

In the summer of 2016, more than 90 students participated in the Summer Academy in STEM. Overall, the program aims to teach students that learning math is just not plugging in formulas but much more – that mathematical concepts can be fun and engaging.

The lesson plan for each day incorporates five consistent components. Through a mathematical lens, students delve into problem solving, engage in debate, work in a computer lab, participate in outdoor activities, and tie it all together to summarize what they've learned each day. Teaching mathematics through debate is a unique technique developed by Daniel Jones, a University High School teacher. It's also a main focus of the program. Establishing the programming has truly been a community effort, Amarasinghe said, citing the help of, Dr. Agnes Tuska, professor of Mathematics at Fresno State, and Tina Setser, a high school teacher from Tulare, among many others, with making both programs a reality.

The best part, Amarasinghe said is the effect it has on the students. "This is changing the future. We thought it would make a huge difference for students too. The experience the students take from this makes lasting changes in their future learning." □



WE LOVE NUMBERS





**T
O P
D O G
A W A R D**



**COLLEGE OF SCIENCE AND
MATHEMATICS TOP DOG
DR. RICHARD WHITTEN**

Dr. Richard Whitten was named the College of Science and Mathematics 2016 Recipient at the Top Dog Alumni Awards Gala in October. The gala is a signature event where alumni are honored for accomplishments in their fields and commitment to service in the community.

Dr. Whitten is a very active participant with Fresno State. He is a past member of the Fresno State Alumni Association and currently active with their budget committee, past member of the Capital Campaign Development Committee and a member of the Fresno State Foundation Board of Governors. He and his wife, Kay, are donors to the President's Circle of Excellence as well as many other scholarships and campus funds. Rick attended Fresno State in 1964 and 1965 and then completed his undergraduate degree in Humanities at the University of California at Berkeley. His medical degree is from the University of California at San Francisco. He stayed on at UCSF for an ophthalmology residency and a Heed Fellowship in oculoplastic surgery. Rick joined the Eye Medical Center in 1976 as the first fellowship trained oculoplastic surgeon in the central valley. With his wife Kay, an RN, he volunteers with Health Vision International, a national organization that provides free eye care to the needy in developing countries. □

NEWS

OUR NEW DEAN

Dr. Christopher Meyer

Dr. Meyer has been appointed Dean for the College of Science and Mathematics, effective summer 2017. Dr. Meyer, a biochemist, is a native of the Central Valley (Sacramento), and has extensive leadership in the CSU and as a program officer at NSF.

Dr. Meyer earned a BA degree in Chemistry from Chico State in 1985 and his Ph.D. in Biochemistry from the University of California Riverside in 1990. He served as a postdoctoral scholar (1990-93) and a Visiting Research Assistant Professor (1993-94) at Michigan State University. Dr. Meyer joined the faculty at Cal State Fullerton in 1994 and served as Chair of the Department of Chemistry and Biochemistry from 2010 to 2015. His many experiences at Fullerton included service as the Acting Coordinator for the Health Professions Committee, Acting Director of the NIH Minority Scientist Development (MSD) Program, Liaison for Research and Faculty Grant Writing, and as a Governing Board member of the CSU Program for Education and Research in Biotechnology. He has also served as a mentor for the HHMI program and is a past member of a GRE Committee and currently serves on the national American Chemical Society Committee on Professional Training which leads discussions on curriculum innovation and certification of nearly 700 programs. In 2008-2009, he served as a rotating Program

Director at the National Science Foundation (NSF) in BIO MCB where he convened review panels, helped manage a large and diverse research portfolio, and participated in policy discussions on interdisciplinary, collaborative, and transformative research, Primarily Undergraduate Institutions (PUIs), and broader impacts. He also participated in Working Groups across directorates, including Engineering and Undergraduate Education, as well as with other funding agencies. He returned to NSF as a rotating Program Director in the Division of Biological Infrastructure (DBI) in August 2015 where he participates in management of the Research Experience for Undergraduates (REU) program, leads the Research Coordination Network (RCN) for Undergraduate Biology Education (UBE) program, and serves as the BIO representative for the NSF I Corps, HBCU UP, and INCLUDES (Inclusion Across the Nation of Learners of Underrepresented Discoverers in Engineering and Science) programs. He also participates in the Graduate Research Fellowship Program (GRFP), the NSF Research Traineeship (NRT), Innovations in Graduate Education (IGE) programs, and the IUSE (Innovations in Undergraduate STEM Education) program.

Dr. Meyer has developed and taught innovative lab, lecture courses to diverse undergraduates and masters students, and successfully integrated research into his courses. His NSF funded lab at Cal State Fullerton focuses on the generation of biodegradable and renewable carbon sources. Dr. Meyer has been successful in obtaining millions of dollars in external funding and has published and presented his work with students at many regional, national, and international meetings.

He has a vision for collaborative and synergistic scientific research, and an interest in initiatives related to water, food and energy. Please join us in congratulating and welcoming Dean Meyer. □



Dr. Mamta Rawat DEPARTMENT OF BIOLOGY



Our very own Dr. Mamta Rawat, Professor in the Department of Biology, is serving a two-year appointment was a Program Director at the National Science Foundation. We look forward to her return to campus in Fall 2018.

Department of Mathematics Day (DMD)

NOVEMBER 18, 2016



The Department of Mathematics hosted its second annual Department of Mathematics Day Friday November 18, 2016. All of the activities were open to students, faculty and staff and was attended by local high school math students. The day included Ignite Talks, Math board games and concluded with Math Jeopardy, a Talent Show and awards.

The event was well attended.



Homecoming Tailgate

OCTOBER 14, 2016



The College of Science and Mathematics hosted its Annual Homecoming Tailgate October 14, 2016 in Fresno State Red Lot. The event was well attended by Alumni, Donors, Faculty, Staff and friends of the College. Over 75 people attended. The Chemistry Club entertained everyone with their hands-on experiments.

Faculty and Staff Fresno Chaffee Zoo Night

SEPTEMBER 9, 2016



Dean Dundas and the College hosted a faculty and staff Family Fresno Chaffee Zoo Night on September 9, 2016.

The event was attended by over 250 faculty and staff members and their families. Everyone enjoyed a bbq dinner under the stars in the new Africa Adventure exhibit and wandered the zoo throughout the evening.



Annual ABA Conference

NOVEMBER 18, 2016



Speakers, faculty, and club officers

The 18th Annual Applied Behavior Analysis Conference at Fresno State was held November 18, 2016. The annual event included invited speakers that discussed ethics training and supervision and addressing complex verbal and relational behavior in research on autism treatment. This year's event was attended by over 170 professionals, students and faculty members. The conference included 2 keynote speakers, 4 break-out session speakers, a student poster session and a reception include Fresno State award-winning wines. The annual conference was sponsored by the Fresno State ABA Club under the direction of Dr. Marianne Jackson, the College of Science and Mathematics, and the Department of Psychology.

Art Scientifique Fresno Art Hop

MARCH 2, 2017



The 8th Annual Art Scientifique opening reception was held at Fresno Art Hop on Thursday, March 2, 2017. Many college faculty, staff and students displayed their many talents at the Chris Sorenson Studio.





FOURTH ANNUAL SONIA KOVALEVSKY MATHEMATICS DAY FEBRUARY 25, 2017

On February 25th, the Mathematics Department celebrated their 4th Sonia Kovalevsky Mathematics Day for girls in grades 7-12.

The annual event seeks to nurture and inspire girls to recognize their potential and continue their study of mathematics and related fields! This year's event had 185 students and 27 teachers participating!



FEBRUARY 1, 2017

The university celebrated the College of Science and Mathematics at the Fresno State's Men's Basketball College Night on February 1, 2017.

The Fresno State Bulldogs took on the Air Force Academy Falcons. Approximately 120 faculty, staff and their families attended the game. The college was highlighted in a video that spotlighted our programs, faculty and students. Ms. Sheri Osborn, Department Assistant in the Department of Psychology, served as the Honorary Coach for the evening.





**RONNA CREWS THROWS
FIRST PITCH FOR
BREAST CANCER AWARENESS!**

MARCH 24, 2017

Ronna Crews, Department of Mathematics, staff member and breast cancer survivor, threw the first pitch at the women's softball game on Friday, March 24, 2017. Ronna is a two-year cancer survivor and is involved in the Komen Cure for Cancer the Art of Life to raise awareness for breast cancer.

ACTION FOR CHEETAHS IN KENYA

AUGUST 29, 2016

In late August of 2016, the College of Science and Mathematics, along with the Department of Biology hosted the an afternoon presentation of the Action for Cheetahs in Kenya (ACK) project. Initiated through support from the Cheetah Conservation Fund in affiliation with the Kenya Wildlife Services (KWS), this long-term project focuses on promoting the conservation of cheetahs. The presentation focused on the value of several pilot studies, as well as the national cheetah survey.



**COLLEGE OF SCIENCE AND MATHEMATICS 2016
HOLIDAY CELEBRATION**

DECEMBER 9, 2016

The College of Science and Mathematics started the holiday season with its annual Holiday Celebration on December 9, 2016. More than 125 faculty, staff, emeriti faculty, and guests joined in the festivities at the annual event, held at the beautiful Downing Museum on the Fresno State campus.



CSM ALUMNI: WE WOULD LOVE TO HEAR FROM YOU!

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**GRADUATE
DEAN'S MEDALIST**

CARLOS IGNACIO MORENO, COLLEGE OF SCIENCE AND MATHEMATICS

M.S. COMPUTER SCIENCE

Carlos Moreno, of Fresno, completed his M.S. in Computer Science with a GPA of 4.0. After graduating from Fresno State as a member of the Smittcamp Family Honors College, Carlos enrolled as a graduate student with a research focus on real-time streaming of Kinect based point cloud data. That research has already resulted in three published journal articles and presentations at multiple conferences. Known in his department as compassionate and caring, Carlos gives back to his college, campus and the community. He serves as a camp instructor in the department's summer exploration program for middle and high school students and as a teaching associate helping undergraduate students. "I was able to connect with the students on a more personal level. This sense of comfort fostered a learning environment in the classroom that allowed students to ask more questions and explore their ideas and solutions," he says. Carlos is also a member of Fresno State's Symphony Orchestra.



**UNDERGRADUATE
DEAN'S MEDALIST**

ANNABELLE LOLINCO, COLLEGE OF SCIENCE AND MATHEMATICS

B. S. BIOCHEMISTRY + B.A. COMMUNICATION

Annabelle Lolinco, of Fresno, completed a B.S. in Biochemistry and a B.A. in Communication with a GPA of 3.87. Driven by a passion to engage the public with the world of science, the first-generation student combined the realms of science and communication in her studies. Early in her college career she got involved with faculty research of the chemical composition of particulate matter in the atmosphere and how it affects human health. Growing as a scientist and leader, she presented and was recognized in national chemical conferences. Annabelle also developed an active-learning classroom that empowers students and the way they study chemistry. Her work in communication research analyzed the rhetoric of science used in entertaining educational shows. Throughout her years at Fresno State, Annabelle's dedication to science and her family kept her focused on her goal of pursuing graduate education. She will be attending Iowa State University in the fall to pursue her doctorate in chemistry as she continues to make science more accessible to the public.

NEW HIRES



STEPHANIE COVACEVICH
ACADEMIC COUNSELOR
ADVISING & RESOURCE CENTER

Stephanie graduated from Fresno State in 2013 with a Bachelor of Arts in Psychology and recently completed her Master of Science in Counseling: Student Affairs and College Counseling option. While completing her master's degree, Stephanie interned with the College of Science and Mathematics Advising and Resources Center from June 2016-December 2016. She also interned with the Learning Center in the Supplemental Instruction and SupportNet programs. While a master's student, Stephanie was a Division of Student Affairs and Enrollment Management Graduate Dean's Medalist Nominee.

Stephanie likes helping others, taking walks, and watching a good game of football.



JAVIER MORALES
DIRECTOR OF DEVELOPMENT
COLLEGE OF SCIENCE AND MATHEMATICS

We are excited to introduce Javier Morales as Director of Development in the College of Science and Mathematics. Javier has served as the Assistant Director of Business Development at the Fresno State Alumni Association since 2015. In his alumni association role, he increased revenue by engaging new partners and created new sponsorship opportunities as well as developed advertising plans and strategies.

Javier received a Bachelor of Science degree in Business Administration - Marketing at California State University, Fresno and has worked in marketing, business relations and communications for over 17 years.

We are thrilled to have Javier as part of our CSM team and excited to have him serve in this new role as a DOD!



Celebration of Research

MAY 12, 2017

The College of Science and Mathematics hosted its Celebration of Research, Achievements and Awards on May 12, 2017. The event showcased 90 student authored posters across the seven disciplines in our Colleges – Biology, Chemistry, Computer Science, Earth and Environmental Sciences, Mathematics, Physics and Psychology. The celebration also recognized scholarships recipients, outstanding students in the departments and faculty and staff members who have exemplified service to the college and the university.



NEW FACULTY

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

RORY TELEMECO, PH.D.
BIOLOGY
 Iowa State University
 Ecological Physiologist

KRISTINA CLOSSER, PH.D.
CHEMISTRY
 University of California, Berkeley
 Computational/Theoretical Chemist

HUBERT CECOTTI, PH.D.
COMPUTER SCIENCE
 University of Nancy 2, France
 Computer Science

ARIC MINE, PH.D.
EARTH AND ENVIRONMENTAL SCIENCES
 University of Chicago
 Biogeochemistry

MORGAN ROGERS, PH.D.
MATHEMATICS
 University of Colorado Denver
 Applied Mathematics



BIOLOGY AND CHEMISTRY LAB REMODEL FUND

In the fall of 2015, the college began a campaign to remodel two science laboratories. A chemistry and a biology lab were both selected for remodel. With the generous \$950,000 by the university, the college had a goal of raising \$50,000. This goal was met and the labs are current being remodeled and are scheduled to be open by the fall 2017 semester.

We would like to thank our generous supporters!

Dr. David M. Anderson

Mrs. Diane Anderson

Mrs. Carol S. Banks

Mr. Scott Ray Barton

Dr. Christopher D. Bencomo

Mr. Robert A. Biggers

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Ms. Nhuthuy Can

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Mrs. Gloria Takeda Takahashi

Dr. Bert A. Tribbey

Amy E. Tuzon

Mr. Daniel L. Waterhouse

Ms. Judy Watson

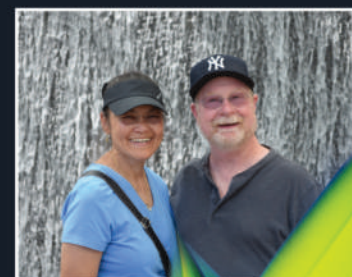
Dr. Lynnette C. Zelezny

Dr. Michael Andrew Zimmerman

COLLEGE RECEIVES GIFT TO FUEL STUDENT SUCCESS IN THE SCIENCES

The College of Science and Mathematics was the benefactor of a \$200,000 scholarship endowment this year from Don and Doris Sullenger. Funds from the scholarship will support deserving science students demonstrating overall excellence and accomplishment and need in the pursuit of microbiology, chemistry and/or mathematics.

Doris graduated from Fresno State in the Department of Chemistry in 1976 and has most recently worked at Community Hospitals as a medical technologist. She was passionate about empowering women in the field of science and her alma matter. Mrs. Sullenger passed away in March 2017. Through the Sullenger's gracious gift, their legacy will live on through the many generations of students that benefit from their generosity.



In Memoriam



DR. SEYMOUR MACK
SEPTEMBER 15, 2016
Department of Geology
1957-1985

Professor Emeritus of Geology, died September 15, 2016, at the age of 94 years old. Dr. Mack was born in New York City, NY and worked for

two years as a courier in Manhattan before enrolling in City College of New York. During World War II, he enlisted in the United States Army Corps and was stationed in Brazil. After returning from the war, he returned to school and graduated from University with a Ph.D. in Geology from Syracuse University. In 1952, he married his wife Linda and they moved to California where he began work for the United States Geological Survey. In 1957, he began his career at Fresno State. Through his years in the Department of Geology, he inspired many generations of students and mentored faculty mentors before retiring in 1985. He continued his research long after his retirement. He is survived by his wife Linda, his daughter, Sarah Mack and her husband Tom Bartholomew; daughter, Nancy Mack and her husband Bill Geissert; son, David Mack and his wife Priscilla as well as his beloved grandchildren.

*It is the supreme art of the teacher
to awaken joy in creative expression
and knowledge.* *Albert Einstein*



DR. RICHARD HAAS
MAY 23, 2017
Department of Biology
1969-1992

Professor Emeritus of Biology, died May 24, 2017. Dr. Haas started his Fresno State career in 1969. Throughout his teaching career, he was able to teach thou-

sands of students and make a positive and lasting impact on many of them long after their college years. After retirement, he remained active teaching zoo docents, leading nature trips all over the world and teaching class on campus. Dr. Haas was a gifted artist, sculptor and photographer and is well known for his sea lion mom and pup at Sea Lion Cove at the Chaffee Zoo and The Column sculpture in the Science II lobby at Fresno State. He was married to the love of his life, Vicki, for close to 70 years, who preceded him in death by one year. Dr. Haas is survived by his daughters Danielle and Tracy and his beloved granddaughter.



PHILLIP KIMBLE
OCTOBER 22, 2016
Department of Psychology
1972-2015

Mr. Kimble, retired Lecturer in the Department of Psychology, died October 22, 2016, at the age of 81 years old. Mr. Kimble grew up in

West Virginia and attended West Virginia University, graduating with a Bachelor's of Science Degree in 1957. He then attended the University of Chicago Divinity School and received a Master of Divinity in 1961. He served as a minister throughout the 1960's and 1970's. He served as director of the Friendship Center for the Blind from 1980 to 2002. Starting in 1972, he held positions as instructor and adjunct professor at California State University, Fresno, where he specialized in the psychology of physical disabilities, until his retirement in 2015. Writing poetry was one of Phillip's great joys and every important family event, holiday, and many other occasions both public and private were feted by him in rhyme. He is survived by his sons, Devin Kimble, and Talley Kimble and his beloved grandchildren.



In Memoriam



DIANA HERRINGTON
MAY 17, 2017

Department of Mathematics
2013-2017

Diana Herrington, Lecturer in the Department of Mathematics, died May 17, 2017. Diana came to Fresno State following a dis-

tinguished 30 year career as a mathematics teacher at Clovis High School. Diana was a critical component of our Liberal Studies program, teaching mathematics to hundreds of future elementary school teachers. She was a member of the California Teacher Advisory Council (CalTAC), which is a part of the California Council of Science and Technology (CCST). She was also the state coordinator of mathematics for the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) until 2014. She was also involved with the California Mathematics Council Central Section, and recently published a book, "Teaching Math with Google Apps" with her Fresno State colleague, Alice Keeler. Diana is survived by her husband Ken and her daughter Kendia.

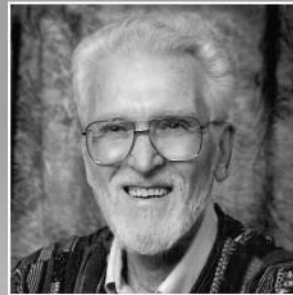


DR. KEITH WOODWICK
NOVEMBER 1, 2016

Department of Biology
1955-1994

Professor Emeritus of Biology, died November 1, 2016, at the age of 89. Dr. Woodwick's childhood was spent in a small mid-western

town where he met his wife, Betty Lou, in the sixth grade. After receiving his Ph.D. from University of Southern in California as a marine invertebrate zoologist, he began his 40-year career with Fresno State. He served as chair of the department, received many research grants, and was one of the founding members and chairperson of the Moss Landing Marine Laboratory. He was always learning and very engaged with current events and culture. Besides playing the saxophone, he enjoyed painting, followed many sports teams, golfed, and enjoyed traveling and playing with his grandchildren. He is survived by Betty, his wife of 67 years, his daughter and son-in law, Colleen Torgerson and Paul Beare, his son and daughter-in-law Kevin Woodwick Diane Hanson, daughter Kelli Woodwick, and his beloved grandchildren.

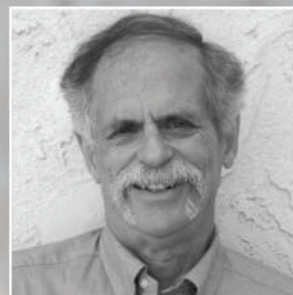


DR. RONALD EVANS
DECEMBER 28, 2016

Department of Biology
1963-1999

Professor Emeritus of Biology, died December 28, 2016, at the age of 84 years old. Dr. Evans was born in Toronto, Canada. He began playing violin in elementary school

and continued studying violin in the Royal Conservatory, playing with Mission orchestra and the University of Toronto orchestra all while studying at University and conducting research on the influence of insulin on the metabolism of alcohol. He moved to San Francisco in 1959 for a research position and began teaching at Fresno State in 1963. In 1969, Dr. Evans was awarded a National Science Foundation summer fellowship to travel to Drew University and in 1980, he was awarded a Fulbright Fellowship that allowed him to teach at the University of Lagos Medical School in Nigeria, Africa for one year. He served as Chairman of the Department of Biology prior to retiring in 1999. He was preceded in death by his wife of almost 45 years, Ruthann. He is survived by his son and daughter-in-law, Richard and Laraine Evans, and his daughter and son-in-law, Anna and Marty Amseier and his beloved grandchildren.



DR. ROBERT MERRILL
MAY 1, 2016

Department of Earth and Environmental Sciences
1970-2004

Professor Emeritus of Geology, died May 1, 2016, at the age of 74. Dr. Merrill was born in south Cali-

fornia. He had a long career as a geologist, earning a Bachelor of Arts at University of California, Riverside, a Master of Science at University of Massachusetts, and his Ph.D. at the University of Texas. During his 35 years as a professor of geology at California State University, Fresno, he taught and mentored both undergraduate and graduate students preparing many students for careers in geology and related fields. Bob traveled and practiced civic activism relating to water, land use, and energy by stressing the ethic of using knowledge of geology to protect the public interest. He is survived by his wife Diane, son, Cyrus Merrill and wife Mindy Morton; son, Than Merrill and wife Cindy Phillips; step-son, Alex Martinez and his beloved grandchildren.



A sampling of the

186

FACULTY AND STUDENT PUBLICATIONS FROM 2016-17

BIOLOGY

Ross JA, Howe DK, Coleman-Hulbert A, Denver DR, Estes S (2016) "Paternal mitochondrial transmission in intra-species *Caenorhabditis briggsae* hybrids," *Mol Biol Evol*, 33:3158-3160. DOI: 10.1093/molbev/msw192.

CHEMISTRY

Movahedin M, Brooks TM, Supekar NT, Gokanapudi N, Boons GJ, Brooks CL (2017) "Glycosylation of MUC1 influences the binding of a therapeutic antibody by altering the conformational equilibrium of the antigen," *Glycobiology*, 1-11 DOI: 10.1093/glycob/cww131.

COMPUTER SCIENCE

Angiuli C, Harper R, Wilson T (2017) "Computational Higher-Dimensional Type Theory," *Proceedings of the 44th ACM SIGPLAN Symposium on Principles of Programming Languages*, 680-693. DOI: 10.1145/3009837.3009861.

EARTH AND ENVIRONMENTAL SCIENCES

Brady M (2016) "Middle To Upper Devonian Sketel Concentrations From Carbonate-Dominated Setting Of North America: Investigating The Effects Of Bioclast Input And Burial Rates Across Multile Temporal And Spatial Scales," *Palaios* 31(6), 302-318. DOI: 10.2110/palo.2015.076

MATHEMATICS

Forgács T, Tran K (2016) "Polynomials with rational generating functions and real zeros," *J. Math. Anal. Appl.* 443(2), 631-651. DOI: 10.1016/j.jmaa.2016.05.041.

PHYSICS

Chun Ho PC, Singleton J, Goddard PA, Balakirev FF, Chikara S, Yanagiwawa T, Maple MB, Shrekenhamer DB, Lee X, Thomas AT (2016) "Fermi-surface topologies and low-temperature phases of the filled skutterudite compounds $CeOs_4Sb_{12}$ and $NdOs_4Sb_{12}$," *Physical Review B* 94, 205140, DOI: 10.1103/PhysRevB.94.205140.

PSYCHOLOGY

Calderón-Tena, CO (2016) "Mathematical Development: The Role of Broad Cognitive Processes." *Educational Psychology in Practice*, 32(2), 107-121. DOI: 10.1080/02667363.2015.1114468.



We are Family

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