College of Natural Sciences & Mathematics Newsletter

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To the Class of 2021,

Congratulations to you and your accomplishments here at CSUF, launching into your professional careers! You all have faced varying challenges, especially completing your coursework online during this pandemic. However, you have proven yourselves overcoming the obstacles to be where you are today and for that I commend you. You all should be proud of yourselves for the work you've done towards your degree. Whether you were involved in NSM-ICC, research, supplemental instruction, other student clubs, and many more things not listed. You did not just sit through your classes and take tests, but you went to office hours, SI sessions, tutoring, spending countless hours writing lab reports, solving massive math/physics problems, drawing Ochem structures, and writing more lab reports. You made connections and doors opened for many of you, especially for our first-generation students at CSUF.

You all set goals and you accomplished many of them! As you celebrate your graduation with your friends and family, know that you've achieved so much, earning your science and math degrees. I wish you all the best as you move on with your careers in the field of your choice. On behalf of myself and the NSM Student Success team, thank you for allowing us to work with you towards your success! CONGRATULATIONS TITANS!

Sam Barrozo

NSM Graduation Specialist

PUBLICATIONS/PRESENTATIONS

BIOLOGICAL SCIENCE:

New publication: Silencing Antibiotic Resistance with Antisense Oligonucleotides
by Saumya Jani, Maria Soledad Ramirez and Marcelo E. Tolmasky
Department of Biological Science and Center for Applied Biotechnology Studies, California State University Fullerton, Fullerton, CA 92831, USA

Saumya Jani contributed as an undergraduate student. Today she is in an MD/PhD program at University of Washington

Pathogens - "Human Pleural Fluid and Human Serum Albumin Modulatethe Behavior of a Hypervirulent and Multidrug-Resistant (MDR) Acinetobacter baumannii Representative Strain"

Camila Pimentel 1,†, Casin Le 1,†, Marisel R. Tuttobene 1 , Tomas Subils 2 , Jasmine Martinez 1, Rodrigo Sieira 3 , Krisztina M. Papp-Wallace 4,5,6 , Niroshika Keppetipola 7, Robert A. Bonomo 4,5,6, Luis A. Actis 8, Marcelo E. Tolmasky 1 and Maria Soledad Ramirez 1,*

"Abstract: Acinetobacter baumannii is a nosocomial pathogen capable of causing serious infections associated with high rates of morbidity and mortality. Due to its antimicrobial drug resistance profile, A. baumannii is categorized as an urgent priority pathogen by the Centers for Disease Control and Prevention in the United States and a priority group 1 critical microorganism by theWorld Health Organization. Understanding how A. baumannii adapts to different host environments may provide critical insights into strategically targeting this pathogen with novel antimicrobial and biological therapeutics. Exposure to human fluids was previously shown to alter the gene expression profile of a highly drug-susceptible A. baumannii strain A118 leading to persistence and survival of this pathogen. Herein, we explore the impact of human pleural fluid (HPF) and human serum albumin (HSA) on the gene expression profile of a highly multi-drug-resistant strain of A. baumannii AB5075. Differential expression was observed for ~30 genes, whose products are involved in quorum sensing, quorum quenching, iron acquisition, fatty acid metabolism, biofilm formation, secretion systems, and type IV pilus formation. Phenotypic and further transcriptomic analysis using quantitative RT-PCR confirmed RNA-seq data and demonstrated a distinctive role of HSA as the molecule involved inA. baumannii's response."

https://urldefense.com/v3/__https://res.mdpi.com/d_attachment/pathogens/pathogens-10-00471/article_deploy/pathogens-10-00471.pdf__;!!GF3VTAzAMGBM8A!jljpztNS_DrcOmeC0YnF9FNWSq-0h5OFc6MUa6lJrN_FYjNAQ4xQEmmuO5HEq9FfeZV7$

CHEMISTRY:

The Petit research group began 2021 with three newly published papers in peer-reviewed journals. Andrew Petit is joined by CSUF students and alumni Sophya Alamudun, Kyle Tanovitz, Lanette Espinosa, and John Galvan, along with Project RAISE alumnist April Fajardo, in "Structure-Photochemical Function Relationships in the Photobasicity of Aromatic Heterocycles Containing Multiple Ring Nitrogen Atoms" in the Journal of Physical Chemistry A, 2021, 125, 13-25. Andrew Petit and CSUF alumnist Steven Guillen are co-authors in "Chiroptical Characterization Tools for Asymmetric Small Molecules - Experimental and Computational Approaches for Synchrotron Radiation Electronic Circular Dichroism (SRECD) and Anisotropy Spectroscopy" in The Royal Society of Chemistry Advances, 2021, 11, 1635-1643. The Petit and de Lijser research groups, alongside CSUF students and alumni Wan Shin Kim, Victor Espinoza, Amanda Abiad, Michael Ko, Ashley Council, Anh Nguyen, Laura Marsalla, Vicky Lee, and Thao Tran, published "Mechanistic Investigation of the Formation of Isoindole N-Oxides in the Electron Transfer Mediated Oxidative Cyclization of 2'-Alkynylacetophenone Oximes" in the Journal of Organic Chemistry, 2021, 86, 693-708.

Dr. Maria Linder and several of her students presented some of their research at the (first virtual) annual meeting of the Societies for Experimental Biology (EB 2021), which occurred April 27-30. Graduate students, Kevan Nguyen and Brian Giolli, undergraduate Heather Carrillo, and post graduate student Theodore Roque showed a poster describing their work on a small copper binding molecule that is in the blood of mammals when they have too much copper accumulating in the body, describing how these small copper carriers (SCC) are being isolated for structure determination; the conditions that cause their release from various kinds of cells - grown in tissue culture, and how the copper in the SCCs is avidly absorbed from the fluid outside the cells. Theodros Kidane (Professor at Rio Hondo Community College and a longstanding member in the Linder lab) presented work done by him and several former students, showing new ways by which copper enters the cells of the small intestine as part of dietary absorption, using cultured models of intestinal cells (Caco2), and showing how these uptake mechanisms are influenced by the relative levels of iron available to them. Former undergraduates involved in these studies were Jonathan Azenon, Luis Corona, Alexis Jaime, and graduate student Adrian Ricarte.

Three former students (Abtin Keramati, Kimberly Hendrix, and Fred Gonzales) along with two current students (Diana Nguyen and Kim Waters) published a paper from Dr. John Haan's research lab with additional support from Dr. Ally Fry-Petit. The article "A non-precious metal ascorbate fuel cell", was published in the International Journal of Energy Research in February.

GEOLOGICAL SCIENCES:

Adam Woods and Jennifer Kirton published a paper in Global and Planetary Change entitled: "Stromatolites from the Lower Triassic Virgin Limestone at Blue Diamond, NV USA: The role of dysoxia, enhanced calcification and nutrient availability in the growth of post-extinction microbialites"

Joyce, W.G., Anquetin, E.-A. Cadena, J. Claude. I.G. Danilov, S.W. Evers, G.S. Ferreira, A.D. Gentry, G.L. Georgalis, T.R. Lyson, A. Pérez-García, M. Rabi, J. Sterli, N. S. Vitek, J.F. Parham (co-corresponding author). 2021. A nomenclature for fossil and living turtles using phylogenetically defined clade names. Swiss Journal of Palaeontology. 140(5):1-45.

Türkozan, O., Ç. Karacaoğlu, J.F. Parham. 2021. Reconstructions of the past distribution of Testudo graeca mitochondrial lineages in the Middle East and Transcaucasia support multiple refugia since the Last Glacial Maximum. The Herpetological Journal 31:10-17.

H. Shi., Wang, J., H.-Q. Chen, and J.F. Parham. 2021. China's wildlife protection: add oversight and annual reviews. Nature 592:685. [Correspondence]

Wang, J., J.F. Parham, H. Shi. 2021. China's turtles need protection in the wild. Science 371(6528):473. [Letter]

Gong, S., J. Wu, Y. Gao, J.J. Fong , J.F. Parham, and H. Shi. 2020. Integrating and updating wildlife conservation in China. Current Biology 30(16):R915-R919.

recent Memeti lab papers

**graduate student author, *undergraduate author

*Patterson, S.F., Memeti, V., *McKay, R., Lipps, J.H., Pederson-Guzman, J., 2020, Determining the basaltic source rocks of enigmatic cogged stones from southern California: California Archaeology, v. 12, n. 2, p. 197-222, doi: 10.1080/1947461X.2020.1812024

**Oppenheim, L.F., Memeti, V., Barnes, C.G., **Chambers, M., Krause, J., Esposito, R., 2021, Feldspar recycling across magma mush bodies during the voluminous Half Dome and Cathedral Peak stages of the Tuolumne Intrusive Complex, Yosemite National Park, CA: Geosphere, v. 17, https://doi.org/10.1130/GES02286.1

Barnes, C., Werts, K., Memeti, V., Paterson, S., *Bremer, R., 2021, A tale of five enclaves: mineral perspectives on origins of mafic enclaves in the Tuolumne Intrusive Complex: Geosphere, v. 17, https://doi.org/10.1130/GES02233.1

Lusk, A.D., Ratschbacher, B.C., Larrovere, M., Alasino, P.H., Memeti, V., Paterson, S.R., 2021, Upper-Crustal Architecture and Record of Famatinian Arc Activity in the Sierra de Narváez and Sierra de Las Planchadas, NW Argentina: Journal of South American Earth Sciences, v. 105, https://doi.org/10.1016/j.jsames.2020.102895

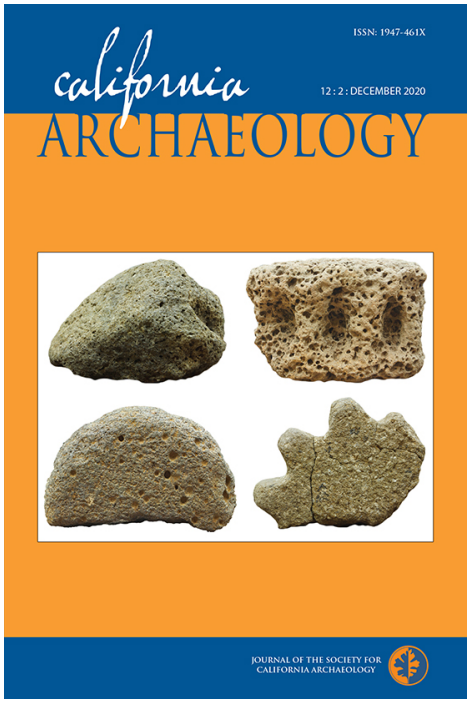
Geological Society of America Cordilleran Section meeting online (May 12-14, 2021) abstracts

*Bates, C., Memeti, V., Paterson, S.R., Wesley, A.J., 2021, The timing and magma source of the Sonora dike swarm and Standard pluton, Sonora, California, and comparison to other Jurassic dike swarms in the Sierra Nevada batholith: Geological Society of America Abstracts with Programs, v. 53, n. 4, doi: 10.1130/abs/2021CD-363319.

Martinez Ardila, A.M., Memeti, V., Paterson, S.R., Esposito, R., **Chambers, M., 2021, Using mineral forensics to determine the nature of gabbro: primitive mantle melt or crystal cumulate? Geological Society of America Abstracts with Programs, v. 53, n. 4, doi: 10.1130/abs/2021CD-363340.

Memeti, V., Barnes, C.G., **Oppenheim, L., Werts, K., **Chambers, M., and Paterson, S.R., Ardill, K., 2021, Using multi-mineral crystal-scale geochemistry to track the formation an magmatic evolution of the Tuolumne intrusive complex, California, through time: Geological Society of America Abstracts with Programs, v. 53, n. 4, doi: 10.1130/abs/2021CD-363310.

**Oppenheim, L.F., Memeti, V., Barnes, C.G., **Chambers, M., Esposito, R., 2021, Feldspar recycling across magma mush bodies during the voluminous Half Dome and Cathedral Peak stages of the Tuolumne Intrusive Complex, Yosemite National Park, California, USA: Geological Society of America Abstracts with Programs, v. 53, n. 4, doi: 10.1130/abs/2021CD-363197.



Journal California Archaeology featured on their title page research on cogged stones conducted by undergraduate students Sierra Patterson and Ryan McKay with Dr. Memeti in Geological Sciences (see also publication Patterson et al., 2020).

MATHEMATICS:

Christine Gamez, Brian Quisenberry, and Anthony Truong presented their research project titled, "Representation of Women and STEM Careers in Middle School Mathematics Textbooks," at two conferences in April 2021: the National Council on Undergraduate Research 2021 @Home Conference and the 2021 Student Creative Activities and Research (SCAR) Days. The students are mentored by Dr. Alison Marzocchi.

Alexis Di Pasqua, Evelyn Pohle, and Emily Rumaldo presented their research project titled, "An Investigation of STEM Career Diversity in High School Mathematics Textbooks," at two conferences in April 2021: the National Council on Undergraduate Research 2021 @Home Conference and the 2021 Student Creative Activities and Research (SCAR) Days. The students are mentored by Dr. Alison Marzocchi.

Alexis Di Pasqua and Emily Rumaldo, recipients of the Preparing Undergraduates for PhDs in Mathematics (PUMP) Fellowship, presented their research project titled, "Racial, Gender, and STEM Career Representation in Mathematics Textbooks," at the PUMP Research Symposium in April 2021. The students are mentored by Dr. Alison Marzocchi.

Evelyn Pohle, recipient of the Edison STEM-NET Student Research Fellowship, presented her research project titled, "Racial, Gender, and STEM Career Representation in Mathematics Textbooks," at the 2021 Edison Student Research Fellowship Symposium in May 2021. Evelyn is mentored by Dr. Alison Marzocchi.

Mathematics faculty member, Dr. W. Riley Casper, has two new publications since Summer 2020:

1.The matrix Bochner problem. 2020 American J. Math arXiv preprint. (with Milen Yakimov)

2.Bivariate cont. q-Hermite polynomials and quantum Serre relations. 2020 J. Algebra Appl. arXiv preprint. (with Stefan Kolb and Milen Yakimov)

Dr. Kristin Kurianski, Mathematics faculty member, along with fellow researchers had a paper accepted for publication this year which can be found here: https://www.sciencedirect.com/science/article/abs/pii/S0362546X21000341.

Citation: Grande, R., Kurianski, K. M., & Staffilani, G. (2021). On the nonlinear Dysthe equation, Nonlinear Analysis, 207, 112292. https://doi.org/10.1016/j.na.2021.112292

Mathematics student, Madeline Ceccia, and faculty mentor, Dr. Marty Bonsangue, research article entitled "Fibonacci Gaps" was published in the Spring 2021 issue of the MathAMATYC Educator.

Dr. Druken recently earned a $6000 grant from Mathematical Association of America's Tensor SUMMA program. The grant will be applied towards her "Pilots in Math: Preparing Instructors in Learning Online Teaching, Technologies, and Social Justice for Math." This will support four future K-12 teachers of math in attending monthly workshops facilitated by CSUF math and education faculty, and piloting math tasks online that use technologies and focus on teaching math for social justice with our local community.

Mathematics student, Taylor Grimes, along with faculty mentor, Dr. W. Riley Casper, presented at the Southern California/Nevada regional Mathematical Association of America in April 2021. The researchers will also present at the CSU, Fullerton Student Creative Activities and Research Days.

Title: Battleship, Tomography, and Quantum Computing. Student: Taylor Grimes (Freshman) Abstract: The classic game of Battleship involves two players taking turns attempting to guess the positions of a fleet of vertically or horizontally positioned enemy ships hidden on a 10×10 grid. One variant of this game, commonly referred to as Battleship Solitaire, Bimaru, or Yubotu, considers the game with the inclusion of X-ray data, represented by knowledge of how many spots are occupied in each row and column in the enemy board. This paper considers the Battleship puzzle problem: the problem of reconstructing an enemy fleet from its X-ray data. We generate non-unique solutions to Battleship puzzles via certain reflection transformations akin to Ryser interchanges. Furthermore, we demonstrate that solutions of Battleship puzzles may be reliably obtained by searching for solutions of the associated classical binary discrete tomography problem which minimize the discrete Laplacian. We reformulate this optimization problem as a QUBO problem and approximate solutions via a simulated quantum annealer, emphasizing the future practical applicability of quantum annealers to solving discrete tomography problems with predefined structure.

Mathematics students, Brian Becsi and Solomon Huang, along with their faculty mentor, Dr. W. Riley Casper, presented their research at the Southern California/Nevada regional Mathematical Association of America meeting in early April 2021. They have also presented their research at the CSU, Fullerton's Student Creative Activities and Research Days.

Research Title: Orthogonal Matrix Polynomials and Nonlinear Eigenvalue Problems. Students: Brian Becsi (Senior) and Solomon Huang (Junior). Abstract: The nonlinear eigenvalue problem is to find the values of x for which a matrix-valued function F(x) is singular. We propose a new method of finding real solutions of nonlinear eigenvalue problems of non-polynomial type using a linearization method based on expansion in terms of orthogonal matrix polynomials, generalizing a Chebyshev-type expansion method of Boyd. We demonstrate that our method is able to sucessfully locate all of the singular values of a matrix valued function in a finite interval, even when the range of scales of the determinant exceeds machine precision. We also verify our method against a testbed of transcendental eigenvalue problems, demonstrating robust performance for a wide variety of problem types.

Title: Fibonacci Gaps

Authors: Madeline Ceccia, Dr. Bonsangue

Journal: MathAMATYC Educator, 2021, 12(3), pp. 42-46.

Background: Original idea by Madeline Ceccia based on an assignment in Dr. Marzocchi's Math 380 class

Abstract: The Fibonacci number sequence has been a source of fascination for both mathematicians and lay persons for hundreds of years. In this paper we look not at the Fibonacci numbers, but the numerical "negative space," or gaps, between them. These Fibonacci Gaps are based on the number of natural numbers between two successive Fibonacci numbers. In this paper we prove the relationship between the Fibonacci sequence and their related Fibonacci Gaps, and explore other mathematical relationships found in these gaps.

DEPARTMENT HIGHLIGHTS

BIOLOGICAL SCIENCE:

- Jennifer Orellana, an undergraduate student in the lab of Dr. Doug Eernisse, has received scholarship support that will allow her to participate in the Shoals Marine Laboratory (Univ. of New Hampshire and Cornell University) program for two months of this summer.

- Chelsea Bowers (MS student) received two research awards. She received the CSUF Coppel Graduate Student Science Award and also a CSU COAST Graduate student research award. Chelsea is studying microplastic pollution in commercially important food fishes (sardines).

GEOLOGICAL SCIENCES:

- Since January 2021, Dr. Groves has had 4 manuscripts accepted into peer-reviewed journals and won a NSF CAREER award to support his research over the next 5 years.

- Dr. Woods presented a talk at the European Geophysical Union 2021 Assembly entitled: "Calcium carbonate crystal fans: Geologic occurrences and controls on growth".

MATHEMATICS:

- CSUF Mathematics faculty member, Dr. Kristin Kurianski's, Massachusetts Institute of Technology faculty member, Dr. Gigliola Staffilani's, and University of Michigan Postdoctoral Fellow, Dr. Ricardo Grande's, article "On the nonlinear Dysthe Equation" was accepted for publication by the journal Nonlinear Analysis.

- Mathematics student, Gwendolyn Lind, has been selected as the recipient of the 2021 Outstanding Undergraduate Student Scholarly Creative Activities and Research Award for the College of Natural Sciences and Mathematics for her research "A Few Strategies for the Statistical Modeling of the COVID-19 Pandemic Data". Her faculty mentor is Dr. Sam Behseta.

- Dr. Ibragimov has been recognized by the American Mathematical Society (AMS) for his efforts to advance mathematical research in his native country of Uzbekistan. He's organized three separate USA-Uzbekistan Conferences on Analysis and Mathematics since 2014. Dr. Ibragimov's work with the MathSciNet for Developing Countries, an AMS initiative to reduce global disparities in access to mathematical literature, has led for mathematicians in Uzbekistan to gain access to a vast bibliographic database of mathematical literature. Furthermore, Dr. Ibragimov has formed collaborations with the Institute of Mathematics in Uzbekistan to create an International Research Experience for Students Program in which American undergraduates have conducted research published articles in peer-reviewed journals. To read more about the good work Dr. Ibragimov is doing, please read the AMS article here https://lnkd.in/gXQFjxP.

- At the American Math Society's Spring 2021 Sectional Meeting #1167 (hosted virtually by the American Mathematical Society), which took place on May 1-2, 2021, a group of CSUF faculty members hosted a Special Session on Differential Geometry and Geometric PDE. This group of scholars consists of Drs. Alfonso Agnew, Nick Brubaker, Tommy Murphy, Shoo Seto, and Bogdan Suceavă. The event can be seen here:https://www.ams.org/meetings/sectional/2282_program.html

- The Spring 2021 issue of the 'International Electronic Journal of Geometry' is dedicated to the memory of the late geometer Aurel Bejancu (1946-2020), who was affiliated during his career with the Technical University in Iași (Romania) and the University of Kuwait. The obituary and the opening article of this commemorative issue is written by Dr. Bogdan Suceavă (Math Department, CSUF): https://dergipark.org.tr/en/pub/iejg

- Through Dr. Kristin Kurianski's efforts, CSUF now officially has a Society for Industrial and Applied Mathematics (SIAM) Student Chapter! Dr. Kurianski is the faculty advisor for the Chapter and worked with several students to make this possible. Mathematics students can now get a free SIAM Student Membership which makes them eligible for a 30% discount on SIAM books; free subscriptions to SIAM News, SIAM Review, and Unwrapped; and gives them access to career and research information. We can also apply for $500 of funding for the Chapter to invite speakers and host events each year.

- Mathematics FERP faculty member, Dr. Martin (Marty) Bonsangue, and co-researcher/daughter, Jennifer Clinkenbeard, assistant professor of mathematics and statistics at CSU, Monterey Bay, surveyed thousands of students and professors who took math classes at CSU, Fullerton to understand what worked in the shift to fully online teaching and what pandemic-driven changes are worth keeping.

  Their research showed that instructors put enormous effort into professional development that focused on learning tools and teaching strategies. In particular, faculty members mentioned that they would keep around recorded video lessons, virtual office hours, smaller and more frequent assessments, and synchronous class teaching.

  Students research showed that they appreciated the effort of teachers to become acquainted to virtual learning. Some students surveyed preferred the virtual environment such as virtual office hours. Students also showed to have engaged often and regularly and online discussion boards getting help from classmates.

  For more information, please refer to the following link: https://www.chronicle.com/newsletter/teaching/2021-03-18.

- Mathematics students Gwendolyn Lind, Seth Arreola, Caleb Peña, Cameron Abrams, alongside faculty mentor, Dr. Sam Behseta conducted a study of COVID-19 pandemic data and found that the rate of spread of COVID-19 is significantly slower in the more prosperous counties across the United States, while the rate of spread of COVID-19 is significantly higher in counties with lower average income.

- Awarded a "Square" grant by the American Institute of Mathematics to collaborate with leading mathematicians on a project entitled "Kaehler geometry of foliations". The grant enables particpants to gather for a week this year and next, to work together intensively.

  Christine Gamez, Brian Quisenberry, and Anthony Truong won a Student Creative Activities and Research Days Outstanding Poster Award for their presentation titled “Representation of Women and STEM Careers in Middle School Mathematics Textbooks.”

  Mathematics faculty members Dr. Kristin Kurianski, Dr. Roberto Soto, Dr. Alison Marzocchi, and Dr. Shoo Seto presented at a workshop titled “Show and Tell (and Experience): Online teaching, learning, and assessment tools for mathematics” through the CSU Mathematics Council Colloquium. Dr. Kurianski and Dr. Soto co-organized the event with Dr. Chris Rasmussen of San Diego State University as part of the Communities for Mathematics Inquiry in Teaching Network in California and Nevada (COMMIT-CaN). Dr. Marzocchi’s presentation featured CSUF student presenters Andrew Doan and Sarah Richer-Hernandez. Dr. Soto’s presentation featured CSUF student presenters Grant Barksdale and Sergio Rios.

DESERT STUDIES

CSU Desert Studies leads national efforts to promote inclusion and safety in field sciences

"The allure of scientific fieldwork has inspired many young people to become scientists. Jane Goodall, Steve Irwin, David Attenborough, John Muir, and even Indiana Jones have moved students to lace up a pair of boots and get a science degree. Field and ocean research is critical to understanding our environment, and the pursuit of crucial data drives scientists to travel the world.

Field experiences for students and young scientists can be hugely influential on their futures: a good or bad field trip can make or break a student's career in science. Field and ocean sciences have maintained a rugged culture that amplifies the #MeToo problem, and unfortunately the majority of field researchers experience bullying, harassment, or worse during the course of their fieldwork. As part of the mission of the CSU, the Desert Studies Center is leading nationwide efforts to improve access, equity, and inclusion for students and researchers in field sciences.

CSU Desert Studies, in collaboration with the Consortium for Ocean Leadership, recently held a workshop to develop best practices and recommendations for preventing and responding to harassment in remote field locations. Led by Dr. Anne Kelly (CSU DSC) and Dr. Kristen Yarincik (COL), this National Science Foundation-funded workshop brought together over 70 experts from field stations, ocean platforms, psychology, sociology, law, and university policy. The workshop focused on the particular issue of sexual harassment, with attention to the intersectionality of race, ethnicity, and queerness in field experiences. Over three days in March, these experts developed policies, recommendations, and tools to improve field research culture and make the experiences safer and more engaging for everyone in the science community. These findings will be compiled, refined, and shared with our academic communities in the coming months and years.

The Desert Studies Center is also working to become more inclusive of all genders. In collaboration with several other field stations from across the U.S., Dr. Kelly is leading a working group within the Organization of Biological Field Stations to develop infrastructure standards for inclusive field stations. DSC staff are implementing some simple but important changes to improve the inclusiveness of the Center. In addition, Site Manager Jason Wallace and Dr. Kelly have received Safe Zone training to provide better support to our LGBTQ+ community at the DSC.

If you are looking for resources on providing more safety and inclusion in your field courses or research groups, or you wish to learn more about resources for support in dealing with harassment, please reach out to Dr. Kelly (ankelly@fullerton.edu). The AdvanceGEO Partnership offers trainings on bystander intervention and developing codes of conduct, and hosts a variety of resources on preventing and responding to harassment in STEM."

You can also access the article here: https://desertstudiesorg.wordpress.com/2021/04/09/csu-desert-studies-leads-national-efforts-to-promote-inclusion-and-safety-in-field-sciences/

STUDENT SPOTLIGHT

Jose Gonzalez Jimenez

Department of Chemistry & Biochemistry

Q: Please describe your specific area of research.

A: I work in the Fry-Petit Lab, where I study oxygen transport membranes. These are materials that can be used to obtain oxygen from air.

Q: If you could thank anyone on campus, who would you thank and why?

A: I want to thank Dr. Fry-Petit. She really is the reason why I am getting a PhD because she told me one time that she didn't spend the time and energy on me for me to not do anything with my life. But on a more serious note, she has given every opportunity that I think I could have gotten, from taking me to Oak Ridge National Lab to allowing me to be a Student Employee. I never thought that I would be in the position to even seriously think about a doctorate degree, but those opportunities and the care that she takes in molding her students, whether they're in the lab or not, has reassured me that I will succeed in that venture

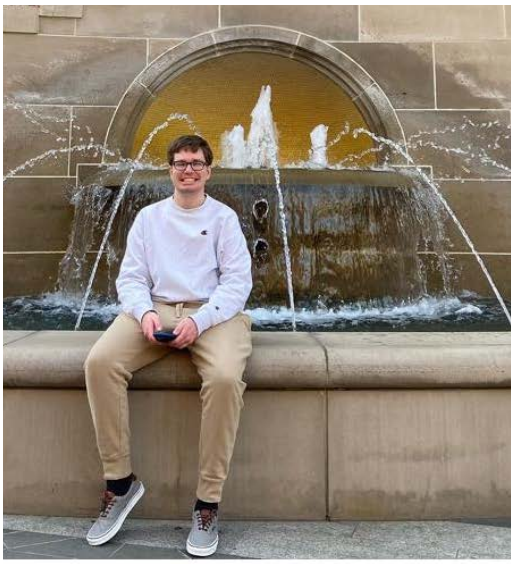
"Jose found his love for solid-state chemistry at CSUF and will continue exploration of the field during his PhD at Rutgers." - Dr. Fry-Petit

Q: What are your future career plans?

A: I am going to get a doctorate degree from Rutgers, where I hope to work with Dr. Weiwei Xie on quantum materials, more specifically superconductors and magnetic materials. I would prefer to work at a national lab after that, but I am open to other opportunities. My most wildest dream would probably be to have my own multi concentration research lab where I can find ways to fix the world's many problems through science and technology.

Q: What advice would you give current students?

A: If you're a chemistry student join Dr. Fry-Petit's lab. Also Dr. Petit's Lab, he's cool too.



Kyle Tanovitz

Department of Chemistry & Biochemistry

Q: When and how did you first get involved in research?

A: I have been a member of Dr. Andrew Petit's theoretical chemistry research laboratory at California State University, Fullerton since January 2019. I attended a seminar hosted by the Department of Chemistry and Biochemistry at CSUF during the Fall 2018 semester. During this seminar, the chemistry and biochemistry faculty presented research projects that they were currently working on to students that were interested in joining a research group. I was very interested in Dr. Petit's work on photobases and so I talked with him at the end of the seminar. After talking more in depth with Dr. Petit about his research on photobases, he asked me if I would like to join his research group.

Q: What are your future career plans?

A: I will be pursuing my PhD in theoretical chemistry at the University of California, Irvine beginning this Fall.

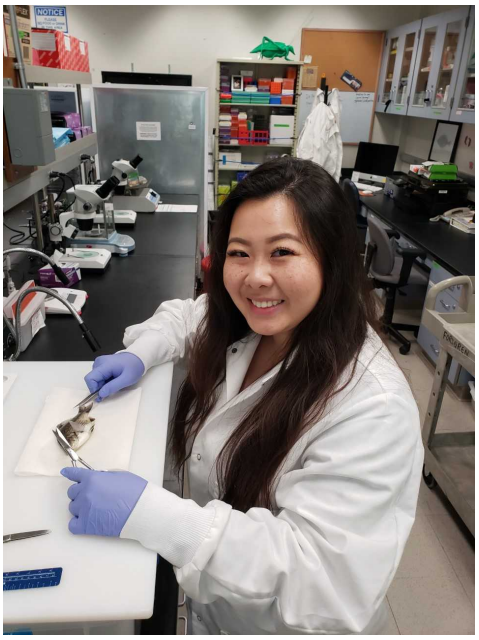
"As part of the Petit lab, Kyle Tanovitz used computers to shine light onto structure-function relationships in photobases."

- Dr. Petit

Q: Please describe your specific area of research.

A: During my time in Dr. Andrew Petit's laboratory, I have mainly worked on a project that is focused on developing structure-photochemical function relationships in photobases. Photobases are compounds that are weak bases in the ground state but transform into strong bases after absorbing light and becoming electronically excited. My work has been primarily focused on aromatic heterocycles that contain a single nitrogen atom like quinoline and isoquinoline and aromatic heterocycles that contain multiple ring nitrogen atoms like azaindole and carboline. I use density functional theory to understand how the strength of photobasicity depends on the identity and position of the substituent groups placed on the molecule. The structure-function relationships identified in my work provide significant background for the development of new photocatalysts that utilize photobasicity. I am listed as a coauthor on a paper that was published by the Petit laboratory titled "Structure–Photochemical Function Relationships in Nitrogen-Containing Heterocyclic Aromatic Photobases Derived from Quinoline". My role in this project was focused on strictly data collection. I am also listed as a coauthor for my contribution to the data collection, data analysis, and the writing process for the paper published by the Petit laboratory entitled "Structure-Photochemical Function Relationships in the Photobasicity of Aromatic Heterocycles Containing Multiple Ring Nitrogen Atoms". I am currently collaborating with Dr. Kelvin Billingsley's laboratory at California State University, Fullerton on a project that is focused on understanding the Cu(I) catalyzed oxidation of amino acid derivatives. My role in this project is to identify possible reaction pathways and to identify any potential intermediates.

Shereen Lam
Biological Science



Q: Please describe your specific area of research:

A: For the past two years, I worked in the fish reproductive biology lab of Dr. Kristy Forsgren. My research project and Maximizing Access to Research Careers (MARC) thesis focused on characterizing the female surfperch ovary and offspring development. These fish are viviparous meaning they reproduce via internal fertilization and offspring are held within the ovary until birth. The female surfperches are unique in that they have only one ovary instead of two that are commonly seen in other organisms. Unfortunately, little else is known about female surfperch reproductive anatomy. In order to gain more insight on the female surfperch ovary and offspring development, we used diffusible iodine-based contrast-enhanced computed tomography (diceCT) scans and paraffin wax histology to visualize the ovary and developing young of five individual samples in three different surfperch species: the black perch (Embiotoca jacksoni), the dwarf perch (Micrometrus minimus), and the shiner perch (Cymatogaster aggregata).

Q: If you could thank anyone on campus, who would you thank and why?

A: I would like to thank Dr. Esther Chen and Dr. Joel Abraham for guiding me onto the path of research; without you, I may have never found my way here. I am especially thankful to my MARC directors, Drs. Amybeth Cohen and Math Cuajungco, for providing me a nurturing home for the past two years and encouraging me to become this confident scientist. I would like to give a special shoutout to Dr. Jennifer Burnaford for being the most amazing adult and validating my mental health. A profound thanks to Dr. Kristy Forsgren for being my exceptional mentor and integrating me into the world of fish penises and vaginas. Lastly, I am eternally grateful to all of the friends that I have made at CSUF for being my greatest support system and for being there for me when I needed them.

Q: What are your future career plans?

A: In Fall 2021, I will be attending the Animal and Comparative Biomedical Science PhD program at the University of Arizona. As my interest lies in animal reproduction and physiology, I hope to expand my skill set and work on projects with/on other animals. My ultimate career goal would be to get a position at a zoo to help with species conservation. I believe it is really important to conserve species diversity as all animals present in our world are important for our ecology. If that path were to not work out, I want to become a professor at Cal States to closely work with other students and share my passion for science and research. After having been a part of programs like Think Like Einstein and MARC, I want to help guide students (specifically minorities) into the world of STEM. Overall, I hope to become a resource for individuals looking to go into research, provide advice, and continue to advocate for mental health in STEM.

"Shereen is an outstanding student and researcher. She never gives up and is always smiling and willing to help a fellow lab mate." - Dr. Kristy Forsgren

Karen Walsh

Biological Science

Q: Please describe your specific area of research:

A: I am a graduate student in Dr. Parvin Shahrestani's lab and lead an experimental-evolution study, which uses laboratory natural selection to create long-lived and short-lived fruit fly populations. On a monthly basis, I raise roughly 100,000 flies. One of the goals of project is to identify genes that are associated with lifespan, using a powerful 10-fold replicated evolve-and-resequence approach. This project has the potential to benefit many research labs in the future, because I plan on freely sharing the populations that I have created as a resource for future experiments.

Q: When and how did you first get involved in research?

A: I first got involved as a researcher in Dr. Shahrestani's lab as a graduate student, however, I did have some prior exposure to this research field as an undergraduate prior to joining her lab. I first met Dr. Shahrestani as a CSUF undergraduate when I enrolled for her Principles of Evolution course in 2016. Dr. Shahrestani taught evolutionary concepts with such enthusiasm and appreciation of the subject that it played a role in my decision to concentrate on Ecology and Evolutionary Biology. As I progressed through the courses required for my Biological Sciences degree, I arrived at my final semester during which I enrolled for Dr. Shahrestani's Evolution of Aging course in Spring 2018. This course provided a detailed history of the evolutionary theories of aging and a unique perspective on how this research field has progressed over the past decades. Some of the assignments for this course involved reading primary literature about experimentally evolved fruit fly populations paired with genomic analysis to study aging. I soon came to find out that this was Dr. Shahrestani's research field and that she had her own evolutionary genomics lab on our CSUF campus. By the end of the semester, I was enchanted by this research field and reached out to Dr. Shahrestani about my research interests and graduate school aspirations. Without hesitation, Dr. Shahrestani happily encouraged me to apply for a graduate position in her laboratory. After graduating in Spring 2018, I was granted acceptance into the M.S. Biology program at CSUF and began my journey as a graduate researcher in Fall 2018.

Q: If you could thank anyone on campus, who would you thank and why?

A: I would like to thank my thesis advisor, Dr. Parvin Shahrestani, for her tremendous support over the many years I have known her. As a faculty member, Dr. Shahrestani has inspired me to grow academically throughout my undergraduate and graduate career. Dr. Shahrestani's love for research and brilliance as a scientist has undoubtedly inspired my own growth as a researcher. Additionally, Dr. Shahrestani's constant belief and motivation have helped me achieve incredible grand-scale experiments. Raising a young three-year-old daughter while attending graduate school has prompted hardships that Dr. Shahrestani has helped me navigate through understanding and encouragement. Most importantly, Dr. Shahrestani leads with kindness and prioritizes inclusivity to provide a safe learning space for our diverse student body. I am honored to work closely with someone as exceptional as Dr. Shahrestani to provide advancements in our understanding of adaptation and aging. On a lighthearted note, I also thank her lab for all of the confused looks I get at the grocery store on a weekly basis when I go in to buy 80 bananas at a time, which are needed to maintain the flies in our lab.

"Karen Walsh is an exceptionally talented and resourceful person whom I am proud to call my colleague. "
-Dr. Parvin Shahrestani

Brandon Quintana

M.S., Biological Science

Q: What advice would you give current students?

A: The biggest piece of advice I would give is to advocate for and believe in yourself. Navigating academia can be so difficult - there is a hidden rulebook on how to succeed in this space that is not available to everyone. Starting off as an undergraduate it can be very hard to even walk into the professor's office hours or to get to know your TA. I had trouble myself with raising my hand in the classroom and clarifying a confusing topic. They are people just like you - talk to them. When you believe in yourself, others begin to believe in you. Find mentors that will support you along your academic career. The mentors I gained have exponentially advanced my trajectory as a scientist and human. Seek out opportunities that will bring you closer to your goals and where you want to be by the time you graduate. Advocate for yourself and try your best when it comes internships and scholarships - some of them might feel out of reach, but in the act of applying you are already doing more than enough. Whether the application ends well or not it is a learning experience and you are a better scholar because of it. To my fellow BIPOC scholars, navigating this space is so much harder because it was not built for us. We are systematically oppressed and it tries to push us out. When things get hard, just remember you being at this institution and taking up the space that you deserve is enough. To anyone reading this, do not be afraid to reach out to me even if it feels like a small or random question. I will do my best to advocate for you. I believe in you.

"I am beyond thrilled to have Brandon in my laboratory. He's an extremely talented and productive scholar with infinite potential." -Dr. Zacherl

Q: Please describe your specific area of research

A: At CSUF, I am working on a living shoreline project in Southern California alongside Dr. Danielle Zacherl. Living shorelines are a solution to rising sea levels caused by climate change. Living shorelines projects include strategic placement of natural resources along the coast to reverse coastal degradation, restore habitat, and protect local communities. In Southern California, a multi-habitat living shoreline was created including Olympia oysters and eelgrass restored together and in isolation. Both Olympia oysters and eelgrass used to dominate the U.S. West Coast, providing myriad ecosystem services, but have declined severely. Currently, there are an estimated 187 million people that will be displaced by rising sea levels and that number continues to increase. This multi-habitat living shoreline will serve as a model for other living shorelines that urgently need to be built over the next decades. This restoration project aims to increase the threatened species and protect coastal communities from turning into climate refugees. I will use biomass and organism health of filter feeders as proxies for deliverable ecosystem services. The goal of my thesis is to use these proxies to increase restoration benefits from living shorelines and inform their future management. Additionally, I will create an effective way to predict biomass of filter feeders, to estimate filtration services and its economic valuation. In collaboration with Orange County Coastkeeper, a non-profit, I will train undergraduate students and invite the local community to participate in the upkeep of the restored habitats and active protection of our coast.

Q: What are your future career plans?

A: My career goal is to become an interdisciplinary conservation biologist for a non-profit. I want to continue applying research to conservation efforts while simultaneously contributing to meaningful environmental education and justice efforts. Coastal habitats are already feeling impacts of climate change and by the end of the century they could be altered catastrophically, displacing millions of people, especially the low-income and underrepresented. I seek to be on the front lines and fight against climate change through an interdisciplinary lens. In my career, I will contribute to work that will help to protect coastal habitat and communities. I am committed to devoting my career to develop strategies for the preservation of our urbanized coastal ecosystems.

NSM Student Success Center

Welcome College Advisor, Natalie Mir:

The NSM Student Success Team would like to welcome our newest member of the team, Natalie Mir as the new College Advisor. Natalie has a Master's in Instructional Design and Technology and a Bachelor's in Child and Adolescent Studies from CSUF and two Associate of Science degrees (Administration of Justice, and Corrections) from Rio Hondo. Natalie is joining us from EIP where she spent her time advising students in the University Semester Abroad and Exchange Programs. Natalie has experience working with students who must sort out living in a new country, understanding the U.S. Educational System and CSUF, and find courses to take while here. Prior to that, she worked as a Student Exchange and Visitor Services (SEVIS) in EIP. She comes to us with a strong commitment to helping students and a lot of experience with international students. Welcome to NSM, Natalie!

Early Start STEM "Early Einstein" Program

The CSU Chancellor's Office has awarded the College of NSM a $24,000 grant to support first-year students taking early start math the summer before they begin their freshman year at CSUF. Dr. Al Agnew serves as the grant PI, and the NSM Student Success Team is implementing a cohort model program to support our first-year students. This program will consist of peer-mentorship, tutoring, and programming to support student success in NSM and prepare students for their first year at CSUF.

NSM CAREER SPECIALIST

CAREER SERVICES:

NSM Career Specialist:
Chanda Ishisaka
cishisaka@fullerton.edu
Students make appointments online:
www.fullerton.edu/career
Career Workshops:
http://bit.ly/cc-work
Instagram: @csufcareer

RECENT GRADUATES:

Did you know recent graduates get 1 year of career advisement after they graduate?
Encourage recent graduates to visit our Career Specialist.

OPEN FOR SUMMER

Our NSM Career Specialist is available for student appointments and class workshops during the summer.

Career Appointments include:

- career exploration, finding jobs/internships, practice interviewing, applying to graduate school

Students make appointments online:
www.fullerton.edu/career

CALIFORNIA STATE UNIVERSITY FULLERTON

Louis Stokes Alliance for Minority Participation

LSAMP is a statewide program with the goal of increasing the number of graduates with Science, Technology, Engineering & Math (STEM) degrees, especially for individuals who have faced or face social, educational, or economic barriers to careers in STEM.

Participant Benefits

- Receive up to $300 scholarship to present at a conference
- Receive up to $200 scholarship towards purchasing a required STEM textbook.
- Waived graduate school application fee for most graduate programs.
- Eligible to apply and receive up to $3,500 scholarship to participate in a fully funded, summer international REU
- Eligible to apply for the BD Masters and BD Ph.D. programs that award students an annual scholarship and additional academic support throughout their graduate school education.
- Exposure to additional research opportunities within LSAMP and beyond
- Ability to attend LSAMP workshops both here and throughout California
- Guidance and mentorship through program director, Dr. Ibragimov

Research Scholar Benefits

In addition to the benefits listed for participants, research scholars receive the following benefits:

- $2,000 scholarship per Academic Year for research
- Priority Registration
- Eligible to apply for free or reduced cost GRE prep course

Eligibility Information

- Must be a US citizen or Permanent Resident.
- Must be working on ***FIRST*** baccalaureate degree.
- Must be enrolled at California State University, Fullerton, or be transferring to CSUF from a community college.
- Must have a ***DECLARED SCIENCE*** (biochemistry, biology, chemistry, geology, microbiology, natural science, or physics), ***ENGINEERING*** (civil, computer science, electrical, mechanical, or other) or ***MATHEMATICS MAJOR***
- Must be an individual who has faced or faces social, educational, or economic barriers to careers in STEM

How to Apply

- Obtain an application online: http://fullerton.edu/lsamp
- Completed applications should be submitted in person to our mailbox in MH-166.

Research scholar: submit a letter of support from a faculty member or research mentor at CSUF in a sealed envelope. Alternatively, faculty mentors may email the letter directly to LSAMP@fullerton.edu. The letter of support is only required for Research Scholar applicants.

We accept Participant applications year-round.
Application submission window for Research Scholars is between
August 20 and September 16.

Visit our website for the most current information about the program.
www.fullerton.edu/LSAMP
Have questions or concerns?
E-mail: LSAMP@exchange.fullerton.edu

NSM Clubs and Organizations

Contact any of the organizations below to find out their meeting and activity information.

American Medical Student Association (AMSA) - Committed to improving health care and healthcare delivery to all people. Promotes active improvement in medical education. Involves its members in the social, moral and ethical obligations of the profession of medicine. Assists in the improvement and understanding of world health problems. Contributes to the welfare of all pre-health professional students. AMSA@fullerton.edu

Beta Psi Omega Professional Biology Fraternity is a student organization with the primary purpose of helping students help themselves. Our overarching mission is to provide a supportive brotherhood for students pursuing the biological sciences professionally and academically and to further the advancement of biology as a science and as a profession. It is committed to serving the needs of students and thereby the community. Beta Psi Omega aims to provide passionate students with opportunities, insights, and guidance to success. beta@bpsiomega.org

Biology Graduate Club (BGSC) - Offers opportunities for association and interaction between CSUF students, facul-ty, and administration. bgsc.csuf@gmail.com

Chemistry and Biochemistry Club (CBC) - Provides information pertaining to opportunities and careers with the fields of Chemistry and Biochemistry. Familiarizes students with department opportunities. Conducts community outreach. csuf.cbc@gmail.com

CSUF Pre- Dental Society - Through general club meetings, guest speakers, dental school visits, and much more, our pre-dental members can gain the knowledge they need as well the necessary tools to be a competitive dental applicant and apply to dental school. csuf.predentalsociety@gmail.com

CSUF Pre- Optometry Club - Aimed accommodate students interested in the field of Optometry in order to educate themselves more about the healthcare profession and network with other students and professionals with similar interests. csufpreoptometryclub@gmail.com

Dermatology and Aesthetic Medicine Organization (DAMO) - To provide opportunities for association and interaction with the field of medicine that is Dermatology and/or Aesthetic medicine as well as provide networking opportunities with other students with similar goals and interests. Contact: https://www.instagram.com/csufdamo/

Flying Samaritans - Our purpose is to provide health care to people living in the rural areas outside of Tecate, Mexico. Volunteers have the opportunity to assist in administrating, translating, taking vital signs, shadowing health care providers, and working in the pharmacy. Also, our members get the opportunity to experience medicine and another culture first hand. flyingsamselhongo@gmail.com

Geology Club: Unites geology majors and others by providing related information and volunteer activities on and off campus. geologyclub@fullerton.edu

Latino Medical Student Association Pre-Medical Latino - Undergraduate Society (LMSAPLUS) - Anyone interested in medical school can join LMSA, you do not need to be of Latino/Latina heritage! lmsa.plus@exchange.fullerton.edu

National Society of Black Engineers; California State University, Fullerton Chapter (NSBE) - The purpose of the National Society of Black Engineers (NSBE); California State University, Fullerton (CSUF) Chapter is to stimulate and develop student interest in engineering, strive to increase the number of students studying engineering at both the undergraduate and graduate levels; and to endeavor in the advancement of the ethnic minority engineer within the professional industry. Email: presidentcsufnsbe@gmail.com

NSM Inter-club Council (NSM-ICC) - NSM clubs and students collaborate with each other and Associated Students (ASI) to provide events and travel funding to all NSM and CSUF students. The NSM – ICC organizes the NSM Sympo-sium, Meet and Eat with the Deans and Chairs. nsmicc.csuf@gmail.com

Physician Assistants Coming Together (PACT) - The purpose of this organization is to serve those who are pre-PA or those who are interested in learning more about the profession. This club will provide an outlet and be a resource in opportunity and progression towards the Physician Assistant profession. The California State University, Fullerton's Physician Assistants Coming Together (PACT) Club will be open to all students who have interest in the profession and the field of healthcare. The main objective for this club is to expand upon the knowledge of a Physician Assistant profession and bring in different perspectives, provide opportunities related to the profession/non-related, and promote a healthy affable community for students. This will consist of Physician Assistant speakers, those who are currently in the schooling itself, admissions staff from PA schools, and other meetings to help prepare students for the road to becoming a Physician Assistant. Ultimately, we hope to bring a caring community of students and strive to give them our best to succeed within the Physician Assistant profession. Email: pact.csuf@gmail.com

Physics Club - Organizes lecturers from guest speakers as well as several events a year. All CSUF students are wel-come. Physicsclub.csuf@gmail.com

Pre- Veterinary Club - The Cal State Fullerton Pre-Veterinary Club is an organization on campus that is open to all students who have interest in pursuing veterinary medicine. The club provides exposure to various aspects of veterinary medicine including hands-on experience, veterinarian speakers, social events, and community service opportunities throughout the semester. prevet.csuf@gmail.com

PRIME Club - PRIME (Pursuing Research In Mathematical Endeavors) Club is a space for students who are mathematics majors to partake in activities that work to enhance the academic development of future mathematicians. Students will be encouraged to explore different fields of mathematics through research opportunities and through participating in active discussions with members in the club in hope of sparking a potential interest in various areas of the vast subject. Apart from research experiences, members will be given the support to have this research shared with others of the group and those of the mathematical community, such as at conferences, through presentation. These presentations will initiate public speaking skills and encourage professionalism, both vital skills of success. Such abilities are those that will assist in the academic and professional development of our scholars. PRIME Club will also participate in serving as a support system to its members, something that is often absent in the setting of academia. This will assist in expanding the diversity, authenticity, and amount of mathematics majors that walk the halls of CSUF. Email: Csufprime@gmail.com

S.M.A.R.T. Girls Support Group - Functions to increase mentoring and advisement at the undergraduate level. This entails monthly meetings with students to introduce them to each other, establish collaborative study sessions, and provide consistent access to advisors. SMART GirlsFocus of meetings will include learning how to be successful in math courses, strengthening content knowledge, relating undergraduate courses to successful high school teaching, connecting to tutoring in schools, and networking. Email: csufsmartgirls@gmail.com

Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Chapter - SACNAS is a national organization devoted to increasing and supporting true diversity in STEM. The organization and the campus chapter work to support students from ALL backgrounds to help them develop as whole persons who are successful in their chosen field. Our goal is to improve and expand opportunities for students in all aspects of the scientific workforce and academia. The campus chapter holds regular member meetings and professional development workshops, hosts guest speakers, and organizes an annual student poster session on the CSUF campus which is open to students in all STEM fields. In addition we are active on social media to communicate opportunities and highlight CSUF student successes @SACNASCSUF on Instagram. Email: s4cnascsuf@gmail.com

Student Health Professions Association (SHPA) - Informs students about the opportunities available in the various health professions. Furthermore, the club provides volunteer opportunities for students to get involved in the community, campus life, American Red Cross blood drives, and work closely with the Health Professions Advising office which is dedicated to assisting students in getting admitted to health profession graduate schools. Email: csufshpa@gmail.com