

MAY 2018 / nsm.fullerton.edu

NSM's 35th Annual Awards Banquet

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The College of Natural Sciences & Mathematics (NSM) held its 35th Annual Awards Banquet at the Titan Student Union Pavilion on 18 April 2018. Over 420 guests were in attendance, and over 100 students, faculty, and staff were honored and recognized for research, teaching, and service. Some students were awarded scholarships as well. The NSM Awards Banquet was an amazing event where distinguished guests such as President Fram Virjee's wife, Julie Virjee, faculty, staff, students and their families were able to gather and see what our NSM students have accomplished and what they plan to do in the future. According to Dr. Marie Johnson, "It is a great joy to pause and formally celebrate the academic excellence of our students and faculty. The College has been doing this for 35 years now, and I think that's an awesome tradition!"

NSM's 35th Annual Awards Banquet



Many of our students will be attending graduate school this Fall 2018 to pursue their doctorate. These students include Isabel Serrano who will attend UC Berkeley for her Ph.D. in Computational Biology and James Shade who has chosen UC Irvine for his Ph.D. program in Mathematics.

When Isabel was asked why she wants to pursue a doctoral program, she said,

“There are two main reasons I decided to pursue a Ph.D.: 1. I feel that my undergraduate career has introduced me to techniques and principles in mathematics and biology, but I want to use my Ph.D. experience to dive into these ideas further and integrate these fields. In short, I feel that I still have so much more to learn. 2. I’ve acknowledged that I want a career that allows me to serve others, and I feel that the universal way to serve others is through education and medical advancements. Pursuing my Ph.D. in Computational Biology naturally allows me to serve in both ways.”

Both Isabel and James appreciate and value their experiences in the College of NSM, and recognize that the support they gained from the college has shaped their lives. James Shade said, “I am pursuing a Ph.D. in mathematics to further my goal of becoming a math professor - a career that merges my passions for teaching and research. Support from the Mathematics Department and CNSM have been invaluable in shaping my goals; the GRAM program, the wealth of student organizations, and the frequent opportunities to present research and view other students’ research have given me professional experience and motivated me to pursue further studies.”

Geology student Erin Boeshart was awarded the Outstanding Major Award in her department, which she thought was very unexpected. When Erin was asked how she felt about receiving such an honor, Erin said, “The award is very special to me. It was great for my parents, who have always supported me through school, to see the recognition of all the work I put into the Geology program. I hope to graduate and continue with Geology either with a job or through achieving my master’s degree.” Overall, it is awe-inspiring to see how much our NSM students have accomplished during their time here at CSUF, and from our students’ track record, there is no doubt that they will be successful in their future endeavors.



CONGRATULATIONS

CLASS OF 2018

GRADUATES!



**Best Wishes,
College of NSM**

Project RAISE



RAISE Transfer Program – End of Semester Networking and Prepping for Finals Event

RAISE Transfer Program students attended a Taco Tuesday networking event held at the Transfer Resource Center (MH-525) on April 24th. Students participated in networking activities with Peer Advisors and discussed tips on how to prepare for finals.

Project RAISE is looking for Student Peer Advisors!

Project RAISE focuses on increasing the number of Hispanic and low-income transfer students who complete bachelor's degrees and enter careers in science, technology, engineering, and mathematics (STEM). Project RAISE partners Cal State Fullerton with Citrus, Cypress, Fullerton, Golden West, Mt. San Antonio, Orange Coast, Santa Ana, and Santiago Canyon Colleges.

Peer Advisors (PA) mentor new transfer students at CSUF as part of the RAISE Transfer Program and visit partner community colleges to connect with students before they transfer. PAs work during academic semesters with optional summer work with the Undergraduate Research Experience. PAs must be either NSM/ECS or transfer students.

To apply, please send an email to raise@fullerton.edu with "Peer Advisor Application" in the subject line. Please include your resume (PDF preferred), CWID, and the name, phone number, and email for at least one reference in your message.

If you have any questions about the position, please feel free to reach out to any Project RAISE staff in MH-527 or MH-175. Applications will be considered until all positions are filled.

Transfer Resource Center Hours

The Transfer Resource Center will be open for extended hours on Finals Week.

Monday, May 14th- Thursday, May 17th: 9 a.m. – 8 p.m.

Friday, May 18th: 9 a.m. – 12 p.m.

Good luck with finals and congratulations to all the graduates!



NOW HIRING



JOIN OUR TEAM! Project RAISE is looking for Peer Advisors

- Mentor new transfer students at CSUF as part of the RAISE Transfer Program
- Visit partner community colleges to connect with students before they transfer
- Positions starting in the fall with the option of summer work with the Undergraduate Research Experience
- Compensation: \$12 per hour, plus mileage

POSITION REQUIREMENTS

- All majors encouraged to apply. Non-NSM/ECS students must be transfer students.
- Registered in at least 6 units
- Good academic standing and minimum 2.75 GPA
- Available 8-12 hours per week

To apply to work with Project RAISE, please send an email to raise@fullerton.edu with "Peer Advisor Application" in the subject line. Please include your resume (PDF preferred), CWID, and the name, phone number, and email for at least one reference in your message.



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For more information, please visit: www.fullerton.edu/projectraise

Welcome SACNAS at CSUF!



By Alexis Barrera & Elizabeth Alcalá

SACNAS (Society for the Advancement of Chicanos/Hispanics and Native Americans in Science) is a national organization dedicated to “True diversity in STEM. True diversity means that the field (including leadership positions) reflects the demographics of the population.” We envision CSUF SACNAS club as an opportunity for students from all STEM fields to build community. Members would span experience levels from first year undergraduates to graduate students. From the SACNAS website (www.sacnas.org): “The purpose of chapters is to promote the mission of SACNAS at the local and national level to offer educational and professional development resources and opportunities to students.” “SACNAS is an inclusive organization; the student chapter shall be open to any interested students regardless of STEM major, ethnicity, race, religion, economic background, gender, sexual orientation and/or disability.”

SACNAS began at CSUF after several BURST-funded students that attended the 2017 SACNAS Conference in Salt Lake City, Utah realized that a SACNAS club would extend academic, personal, and professional opportunities for underrepresented CSUF students. There is usually a large presence of CSUF students at SACNAS conferences, so we thought that due to great interest, establishing SACNAS would strengthen and further diversify the STEM community on our campus. With the support and guidance of Dr. Burnaford and Dr. McDonough, the current SACNAS officers were able to take the steps required to launch SACNAS at CSUF.

As a brand new club at CSUF, we are very proud of the dedication of the club officers and members to launch SACNAS on campus as soon as possible. In addition, we are proud of the great interest that has been shown for our club in a very short amount of time. We had many of our first members come to our first informational meeting and share with us their ideas and suggestions for the club.

SACNAS at CSUF



We are excited to bring together both the STEM and cultural aspects of our SACNAS members for our future events. We plan on bringing in local Sacnista speakers, holding small group breakout discussions, hosting graduate school and professional workshops (such as CV and interview advising), having cultural potlucks, conducting local community outreach, and learning how to dance salsa! We are also excited to potentially have some of our members present their research posters at the 2018 SACNAS: The National Diversity in STEM Conference this Fall in San Antonio, Texas.

Founding members of the SACNAS club at CSUF are Alexis Barrera (Co-President), Elizabeth Alcalá (Co-President), Evelyn Alvarez (Vice-President), Melissa Wong (Co-Treasurer), Jasmine Camero (Co-Treasurer), Holly Suther (Secretary), Victoria Meza (Media and Outreach Manager), Shannon Chou (National SACNAS Liaison), Noor Sadeghi (NSM-ICC Representative) and Adriana Solis. Our advisors are Dr. Jennifer Burnaford and Dr. Colleen McDonough.

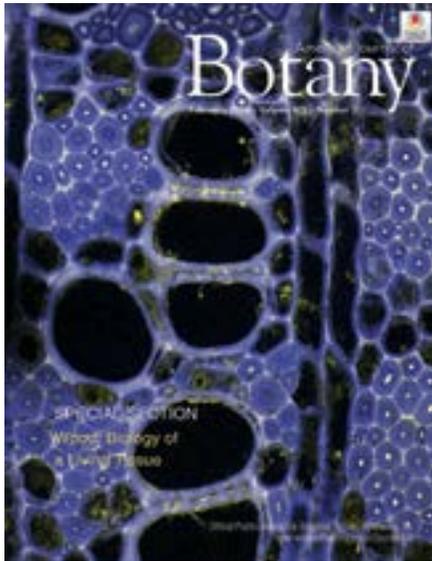
Please visit our website below to find more information about the SACNAS club:
<https://sites.google.com/csu.fullerton.edu/sacnascsf/>

Students interested in SACNAS can indicate their interest via the Google form: bit.ly/sacnascsf. Students that submit the Google form will receive updates about the club's future events. Also, starting Fall 2018, you can find SACNAS at DiscoverFest to sign up for the club.

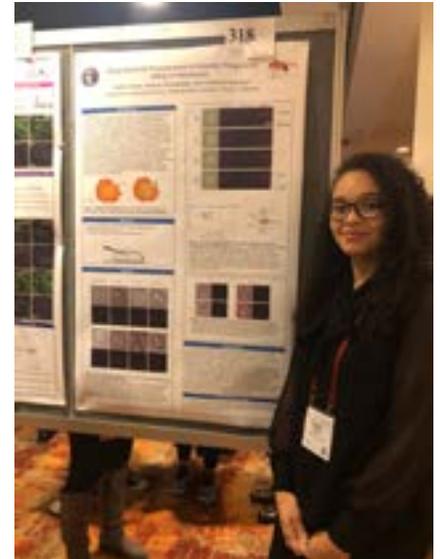
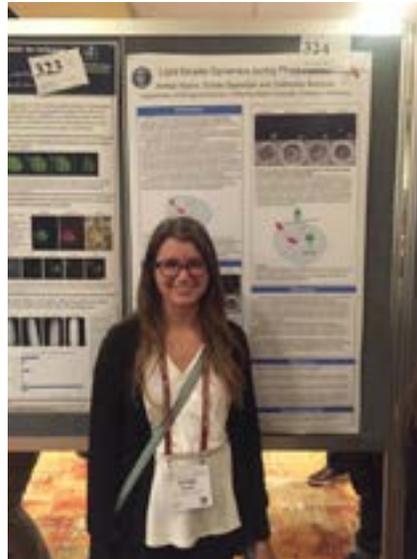
For any questions, please email s4cnascsf@gmail.com.

Department Highlights

Biological Science



The cover image of a journal that features a confocal microscopy image of the wood of Australian Willow, the trees that are growing in the C-parking lot. This image was taken by Susana Espino, formerly lab manager in Dr. Jochen Schenk's Plants & H₂O Lab, and the journal features a special section on wood biology that Dr. Schenk edited.



Graduate students Amber Myers (left) and Caitlin Harris (right) presented their work at the 59th Annual Drosophila Research Conference in Philadelphia in April 2018.

- Prof. H. Jochen Schenk received a new \$699,265 three-year grant from the National Science Foundation entitled "RUI: Apoplastic lipids in xylem of vascular plants: Composition, locations, origins, and possible functions." Steven Jansen at Ulm University in Germany, Ruth Welti at Kansas State, and Yi Zuo at the University of Hawaii at Manoa are co-PIs.
- Prof. H. Jochen Schenk Schenk edited a special section of the American Journal of Botany entitled "Wood" Biology of a Living Tissue", provided the cover for the February issue of the journal, and co-authored three papers in this issue:
 - Schenk, H. J. 2018. Wood: Biology of a living tissue. American Journal of Botany 105:139-141. (Open access).
 - Schenk, H. J., S. Espino, S. M. Rich-Cavazos, and S. Jansen. 2018. From the sap's perspective: The nature of vessel surfaces in angiosperm xylem. American Journal of Botany 105:174-187 (Open access funded by the CSUF Open Access Publishing Fund).
 - Morris, H., L. Plavcová, M. Gorai, M. Klepsch, M. Kotowska, H. J. Schenk, and S. Jansen. 2018. Vessel-associated cells in angiosperm xylem: highly specialized living cells at the symplast-apoplast boundary. American Journal of Botany 105:153-162.

Catalyze Science!



Amy Heil (Biology Major) teaches students about construction of evolutionary trees.



Joshua Rodriguez (Biology Major) questions students about the potential impacts of removing keystone species from a kelp ecosystem.



Vanessa (Sonia) Lugo (Biology Major) helps a group of students explore the effect of a "mutation" on their ability to hunt prey.

The first annual Catalyze Science! event, sponsored by the Catalyst Center and Educational Partnerships, was held on Friday, April 20, 2018. Students enrolled in BIOL 400 and BIOL 453 designed and led NGSS-aligned lesson plans for over 100 female middle school students from Santa Ana Unified School District. Megan Tommerup (BIOL) and Joel K. Abraham (BIOL; Director of Catalyst) supported their students throughout the development of lesson plans, which included such diverse topics as predator/prey dynamics, evolutionary trees, mitosis, and engineering design. Antoinette Linton (EDSC) assigned credential students to each lesson plan group to provide expert feedback on lesson plan design and teaching dynamic. The event concluded with a panel session, in which middle school students could ask questions of CSUF female biology majors about life on campus and in science.



Southern California Geobiology Symposium at Keizen's poster. From left to right: Jeffrey Chokry, David Hsu, Julia Ngo, Keizen Li Qian, Antonia Rizo, and Joshua Phelan.

Presentations

- Members of the Johnson Lab attended the Southern California Geobiology Symposium at UC Riverside. Master's students Antonia Rizo, Keizen Li Qian, and David Hsu presented posters:

* CSUF student presenter

CSUF M.S. student

^ CSUF undergraduate student

- Rizo, A.*#, Juarez, A.^, and Johnson, H.A. Abiotic interactions and redox analysis in manganese oxidation by MopA-hp.
- Li Qian, K.*# and Johnson, H.A. Detection of covalent heme binding in a bacterial manganese-oxidizing protein.
- Hsu, D.*#, Garoian, A.^, Silva, V.^, and Johnson, H.A. Development of a genetic system for the Mn(II) oxidizing bacterium *Erythrobacter* sp. SD21 for transposon mutagenesis and inducible protein expression.
- Two students from Dr. Jennifer Burnaford's lab presented posters at the West Coast Biological Sciences Undergraduate Research Conference (WCBSURC) at St. Mary's College of California in Moraga on April 14:
 - Blake E. Miyamoto, Melanie Espino-Canche, Scottie Y. Henderson, and Jennifer L. Burnaford. EFFECTS OF LOW TIDE EXPOSURE ON KELP TISSUE CHARACTERISTICS AND THE FEEDING BEHAVIOR OF THE SNAIL LACUNA VINCTA.
 - Amber R. Jolly and Jennifer L. Burnaford. DISTRIBUTION AND ABUNDANCE OF INTERTIDAL MACROORGANISM IN RELATION TO URBAN FRESHWATER RUNOFF

Publications

*CSUF Undergrad Students

** CSUF Grad Students

***Argentinean PhD Students

Whole genome analysis of an extensively-drug-resistance *Empedobacter falsenii* strain reveals distinct features and the presence of a novel metallo- β -lactamase (EBR-2)".

- Collins C**, Almuzara M, Saigo M, Montaña S***, Chiem K**, Traglia GM***, Mussi MA, Tolmasky M, Iriarte A, Vay C, Ramírez MS. 2018 Accepted for publication in *Current Microbiology*.
- Molecular Characterization of KPC-2 positive *Klebsiella pneumoniae* isolates from a neurosurgical center in Argentina. Montaña S***, Hernandez M*, Fernandez J**, Pennini M, Centrón D, Sucari A, Iriarte A, Ramirez MS. 2018 Accepted *New Microbes and New Infections*.
- Characterization of OXA-258 enzymes and AxyABM efflux pump from *Achromobacter ruhlandii*. Papalia M, Traglia GM***, Ruggiero M, Almuzara M, Vay C, Gutkind G, Ramírez SM, Radice M.. *J Glob Antimicrob Resist*. 2018 Apr 9. pii: S2213-7165(18)30067-5. doi: 10.1016/j.jgar.2018.03.015. [Epub ahead of print] PubMed PMID: 29649588.
- Update on susceptibility of *Corynebacterium* spp.: Comparison between disk diffusion and agar dilution methods for in vitro susceptibility. Barberis M, Sandoval E, Rodriguez H, Ramirez MS, Famiglietti A, Almuzara M, Vay CA. 2018 Accepted *Journal of Global Antimicrobial Resistance*

Geological Sciences

*Undergraduate Student Co-author

**Graduate Student Co-author

Presentations:

Akciz, S., 2018, CSUF Library "Faculty Noon-Time Talk" presentation on April 16, 2018
"New Views on the Past Earthquake History of the Southern San Andreas Fault"

Akciz, S., 2018, CSU Long Beach Geology Department Seminar presentation on April 18, 2018
"Reassessing Prehistorical Records of Earthquakes Along The San Andreas Fault in The Carrizo Plain: Integrating Geomorphological, Paleoseismological and Geochronological Analyses"

Memeti, V., 2017, CSU Long Beach Geology Department Seminar presentation on December 6, 2017, From small sheets to big blobs: Using mineral geochemistry to decipher magma chamber size and interconnectivity

Ratschbacher, B., Cawood, T., Lusk, A., Larrovere, M., Rick, C., Alasino, P., Paterson, S., Memeti, V., 2018, Strain localization mechanisms (or lack thereof) in a ~10 km wide, syn- to post-magmatic mylonite zone in the Famatinian arc: Geophysical Research Abstracts Vol. 20, EGU2018-PREVIEW, 2018 EGU General Assembly 2018
Hill**, J., Loyd, S.J., 2018, Origin of elemental sulfur in salt dome cap rocks, Gulf Coast Basin, USA: Southern California Geobiology Symposium, Riverside, CA, April 21.

Loyd, S.J., 2017, Quantification of the "global" authigenic carbonate $\delta^{13}\text{C}$ value and implications for carbon cycling: AGU annual meeting, New Orleans, CA, Dec 11-15. oral

Hill**, J., Loyd, S.J., 2017, Origin of sulfur for elemental sulfur concentration in salt dome cap rocks, Gulf Coast Basin, USA: AGU annual meeting, New Orleans, CA, Dec 11-15.

2018 AGU Ocean Sciences Meeting

Carlin, J., Schreiner, K., Dellapenna, T., Sayers, L., Swenson, J., McGuffin, A., Identifying Recent Flood Deposits within a Mid-Shelf Mud Blanket along a Low-Gradient Passive Margin. 2018 AGU Ocean Sciences Meeting, February 2018, Portland, OR, USA.

*Cortez, D., Carlin, J., *Van Orman, D., Measuring Sediment Accumulation within an Urban Estuary Over Seasonal and

Decadal Time-Scales. 2018 AGU Ocean Sciences Meeting, February 2018, Portland, OR, USA.
Joint 70th Rocky Mountain Annual Section / 114th Cordilleran Annual Section Meeting:

Avila*, S.T., Lackey, J.S., Lutz, B., Knott, J.R., Mueller, N., 2018, Paleographic Interpretation of the Fish Lake Valley/Horse Thief Hills Area Using Geochemistry of Volcanic Rocks: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, ISSN 0016-7592

Ayers*, J., Memeti, V., Oppenheim**, L., Chambers**, M., 2018, The Half Dome granodiorite on the east side of the Tuolumne intrusive complex, Yosemite National Park, CA: Big or small magma chambers?: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, doi: 10.1130/abs/2018RM-313978

Barnes, C.G., Werts, K., Memeti, V., 2018, Trace elements in hornblende reveal variations in enclave-host magma interaction in the Tuolumne intrusive complex, Sierra Nevada, CA: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, doi: 10.1130/abs/2018RM-313829

Knott, J.R., Lutz, B., Griffie, E.*, Clemens-Knott, D., Chen, N.**, Calzia, J.P., 2018, Identification of Hunter Mountain Batholith Clasts in the Furnace Creek Formation, Death Valley, California: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, ISSN 0016-7592.

Oppenheim**, L., Memeti, V., Barnes, C.G., Chambers**, M., Werts, K., Barnes, M., Esposito, R., 2018, Length scales of magma mixing and magma chamber dimensions as inferred from zoning in feldspars, Tuolumne intrusive complex, Yosemite National Park, CA: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, doi: 10.1130/abs/2018RM-314263

Scheland**, C.L., Memeti, V., Paterson, S.R., Ardill, K.E., 2018, The Jack Main intrusive complex in the Late Cretaceous central Sierra Nevada, CA: A migrating pluton within a magma focusing region: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, doi: 10.1130/abs/2018RM-314345

Walker*, A., Mueller, N. J., Lutz, B., Knott, J.R., Lackey, J. S., 2018, Geochemical Correlation of Basalts in the Sylvania Mountains, California and Nevada: Geological Society of America Abstracts with Programs. Vol. 50, No. 5, ISSN 0016-7592.

Southern California Academy of Sciences Meeting, Cal Poly Pomona

Jimenez*, E., Knott, J.R., Lackey, J.S., 2018, Geochemistry of Basalts in the White Mountains and Silver Peak Range, California and Nevada: Southern California Academy of Sciences meeting, Cal Poly Pomona.

Avila*, S., Mueller, N., Lutz, B., Knott, J.R., Lackey, J.S., 2018, Paleogeographic Interpretation of the Fish Lake Valley/Horse Thief hills area using Geochemistry of Volcanic Rocks: Southern California Academy of Sciences meeting, Cal Poly Pomona.

Knott, J.R., 2018, Geologic Perspectives on Pupfish (Cyprinodontidae) Dispersal: Southern California Academy of Sciences meeting, Cal Poly Pomona.

Publications

Attia, S., Paterson, S.R., Wenrong, C., Chapman, A.D., Saleeby, J., Dunne, G., Stevens, C., Memeti, V., in press, Late Paleozoic tectonic assembly of the Sierra Nevada prebatholithic framework and Western Laurentian provenance links based on synthesized detrital zircon geochronology: Article GSABOOKS-D-17-00062 in GSA book XX "Tectonics, Sedimentary Basins and Provenance: A Celebration of William R. Dickinson's Career".

Hines, R., Paterson, S.R., Memeti, V., and Chambers, J.A., in press, Nested incremental growth of zoned upper crustal plutons in the Southern Uplands Terrane, UK: fractionating, mixing, and contaminated magma fingers: Journal of Petrology

Knott, J.R., and Garcia, A.L., in press, Replicate photography and stability of the Death Valley landscape: 10th Death Valley Natural History Conference, November 6-8, 2015, Furnace Creek, CA. Muessig, S.J., Pennell, W.M., Knott, J.R., Calzia, J.P., in press, Geology of the Monte Blanco Borate Deposits, Furnace Creek Wash, Death Valley, California: U.S. Geological Survey Open-File Report 2018-XXXX, 42 pp.

Reynolds, L.C., Simms, A.R., Ejarque, A., King, B., Anderson, R.S., Carlin, J.A., Bentz, J.M., Rockwell, T.K. and Peters, R., 2018. Coastal flooding and the 1861-2 California storm season. Marine Geology, 400, pp.49-59.



From left to right: Jenifer Leidelmeijer, Otto Figueroa, Sabrina (Green) Gonzales, Nick Inserra, Desiree Lucas, Ben Lewis, Alejandra Angulo, and Austin Poncelet at the 9th Annual Research Day.

9th Annual Research Day

On Friday, April 13th the Geology Department hosted their 9th Annual Research Day at the CSUF Arboretum where students presented posters of their ongoing Undergraduate & Graduate Thesis work. The posters were judged by the South Coast Geological Society (SCGS) and winners were awarded with certificates and cash prizes, there were 45 student poster presentations in total.

Jenifer Leidelmeijer: SCGS Secretary & CSUF Department of Geological Sciences Masters Student

Otto Figueroa: SCGS Judge & CSUF Department of Geological Sciences Alumni

Sabrina (Green) Gonzales: "Most Outstanding Undergraduate Thesis" Award
Advisor: Dr. Vali Memeti

Nick Inserra: "Most Outstanding Graduate Thesis Proposal" Award
Advisor: Dr. Sinan Akciz

Desiree Lucas: "Most Outstanding Undergraduate Thesis Proposal" Award
Advisor: Dr. Vali Memeti

Ben Lewis: SCGS President, Judge, & CSUF Department of Geological Sciences Alumni

Alejandra Angulo: "Most Outstanding Undergraduate Thesis Proposal" Award
Advisor: Dr. Vali Memeti

Austin Poncelet: "Most Outstanding Graduate Thesis" Award
Advisor: Dr. Adam Woods

Mathematics



CSUF teams take a photo break after presenting at DataFest. Front row (Left-Right): Shaina Sta. Cruz (HHD), Yinghong Lin (MCBE), Mengsha Xu (MCBE), Han Yin (NSM). Middle row: Rico Palafox (NSM), Michael Alcalá (MCBE), Ricardo Figueroa (NSM), Kristy Le (Long Beach State). Back row: Guillermo Hernandez (MCBE), Dwight Wynne (faculty mentor), Cesar Dones (NSM). Not pictured: Jose Toledo (NSM).



Flyer for Dr. Martin Bonsangue's presentation at Claremont Graduate University

- Five math undergrads (Rico Palafox, Jose Toledo, Han Yin, Ricardo Figueroa, and Cesar Dones) were among ten CSUF students competing at ASA DataFest at Chapman University on April 27-29. Teams of 3-5 students had less than 48 hours to derive insights from 14.5 million rows of data provided by Indeed.com. Ricardo and Cesar's team was recognized for Best Use of External Data, for demonstrating that a city's poverty rate was a major indicator of local interest in Indeed job postings in California.
- Dr. Martin Bonsangue presented "America's Math Story: Where We've Been, Where We Are, Where We Could Be," on April 23, 2018 at Claremont Graduate University as the Sally Casanova Distinguished Alumni Lecturer.
- Dr. Adam Glesser presented a talk, "Standards Based Grading: Enhancing Learning Through Assessment" at the Mihaylo Assessment Conference at CSUF on April 20th.
- Dr. Thomas Murphy's undergraduate research student Ted Alexander has been invited to attend a week-long conference ("The d-bar problem in the 21st century") at the Mathematics Science Research Institute in Berkeley, CA, this summer, on the strength of research he has completed with Dr. Murphy in the field of complex analysis, and has been awarded full funding. The conference is aimed at PhD students and young researchers.
- The Math Department received a Tensor-SUMMA grant. Press release can be read here: <https://www.maa.org/news/maa-announces-145000-in-tensor-foundation-funding-to-encourage-women-and-historically> . The project description for PRIME can be found here: <https://www.maa.org/node/1378448>.

Mathematics

Publications

- Dr. Thomas Murphy co-authored a publication with former CSUF student and former president of Math Club Brian Laverty. Optimal Rectangle Packing for the 70-square has been accepted for publication in the Recreational Mathematics Magazine.
- Nicholas D. Brubaker, Jasmine Camero, Oscar Rocha Rocha, Roberto Soto, and Bogdan D. Suceavă, *A Curvature Invariant Inspired by Leonhard Euler's Inequality $R \geq 2r$* , Forum Geometricorum, 18 (2018) 119--127.
<http://forumgeom.fau.edu/FG2018volume18/FG201819index.html>

Abstract: It is of major interest to point out natural connections between the geometry of triangles and various other areas of mathematics. In the present work we show how Euler's classical inequality between circumradius and inradius inspires, by using a duality between triangle geometry and three-dimensional hypersurfaces lying in the four-dimensional Euclidean space, the definition of a curvature invariant. We investigate this invariant by relating it to other known curvature invariants.

- Nicholas D. Brubaker and Bogdan D. Suceavă: *A Geometric Interpretation of Cauchy-Schwarz Inequality in Terms of Casorati Curvature*, International Electronic Journal of Geometry, 11 (2018), pp. 48-51.
<http://www.iejgeo.com/matder/dosyalar/makale-249/2018-1-5-suceava.pdf>

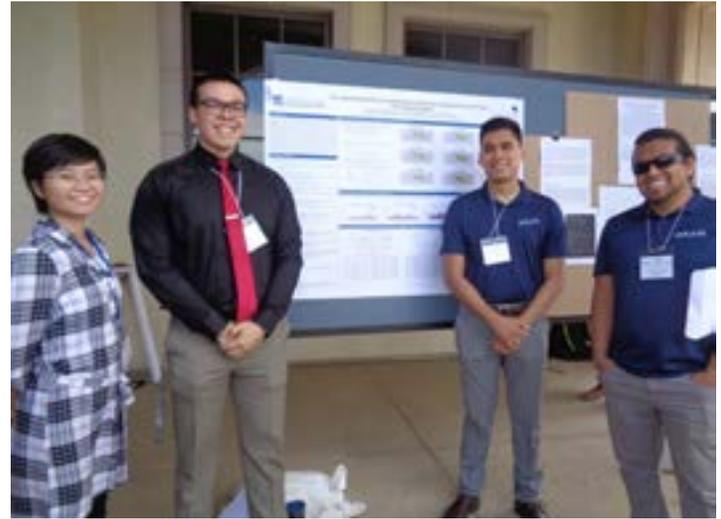
Abstract: In a visionary short paper published in 1855, Ossian Bonnet derived a theorem relating prescribed curvature conditions to the admissible maximal length of geodesics on a surface. Bonnet's work opened the pathway for the quest of further connections between curvature conditions and other geometric properties of surfaces, hypersurfaces or Riemannian manifolds. The classical Myers' Theorem in Riemannian geometry provides sufficient conditions for the compactness of a Riemannian manifold in terms of Ricci curvature. In the present work, we are proving a theorem involving sufficient conditions for a smooth hypersurface in Euclidean ambient space to be convex, and the argument relies on an application of Cauchy-Schwarz inequality. This statement represents, in consequence, a geometric interpretation of Cauchy-Schwarz inequality. The curvature conditions are prescribed in terms of Casorati curvature.

- Bogdan D. Suceavă: *A Geometric Interpretation of Curvature Inequalities on Hypersurfaces via Ravi Substitutions in the Euclidean Plane*, to appear in the 'Mathematical Intelligencer'. The article is available through Springer Online First system at:
<http://link.springer.com/article/10.1007/s00283-017-9766-2>

Math Association of America Meeting



Dr. Scott Annin with GRAM Scholars



Thi Ho, Cameron Hooper, Roberto Hernandez, and Gabriel Martinez

The Spring 2018 Math Association of America Meeting (So Cal Nevada Section) took place Saturday, April 21-22, at the University of San Diego. Among the events hosted at this meeting, there was also the MAA Student Poster Session, where 9 out of 53 posters were authored by Cal State Fullerton students. The poster exhibit is visited by many participants and are assessed by MAA evaluators, and the most successful posters are recognized by a title of MAA Outstanding Poster. At the Junior/Senior category, there were 8 MAA Outstanding Posters, 5 of which were presented to CSUF students, a performance that represents an unprecedented success for our Math program. The themes approached in these posters reflect a large diversity of active research programs among our mathematical community at CSUF, from algebra and geometry to statistics and applied mathematics. The five MAA Outstanding Posters presented by our CSUF students and presented with this important MAA recognition are:



Thi Ho answers questions regarding her research.

Jasmine Camero, A Ladder of Curvatures in the Geometry of Surfaces
Research mentors: Dr. Nick Brubaker and Dr. Bogdan Suceavă

Christian Do and James Shade, Generation of 2-Generator Groups by Alternation
Research mentor: Dr. Adam Glesser
GRAM Program Coordinators: Dr. Scott Annin and Anael Verdugo

Cameron Hooper and Roberto Hernandez, Investigating the Relationship between Marijuana Dispensaries and Crime in Portland, Oregon
Research mentor: Laura Smith
GRAM Program Coordinators: Scott Annin and Anael Verdugo

Gabriel Martinez and Freddy Nungaray, Investigating the Mortality Rate in the United States through an Age-Structured Population Model
Research mentor: Laura Smith
GRAM Program Coordinators: Scott Annin and Anael Verdugo

Breanna McBean and Angelica Arredondo, The Shape of Large Soap Bubbles
Research mentors: Nick Brubaker
GRAM Program Coordinators: Scott Annin and Anael Verdugo



Breanna McBean and Angelica Arredondo explaining their research.

Physics

- Two of Dr. Wylie Ahmed's students Paris Blaisdell-Pijuan and Monika Tadrous were accepted to a very prestigious international Research Experience for Undergraduates (iREU) and will be spending 12 weeks in Grenoble, France this summer doing world-class research.

Student Spotlight

“Liz has made a wonderful impact on Project RAISE students and staff as both a participant and as a peer advisor.”

–Project RAISE Team

“Liz approaches each day with the best attitude, is a leader in the lab, and has an incredibly bright future.”

–Dr. Allyson Fry-Petit



Student Name:
Elizabeth Hitch

Major: Molecular Biology
Minor: Chemistry

Expected Graduation Date:
May 2020

Please describe your specific area of research.

I have been conducting research in Dr. Ally Fry-Petit's inorganic chemistry lab since Summer 2017. I am studying oxygen transport membranes, which are solid materials capable of filtering oxygen out of the air. Pure oxygen is important for many applications in the medical and fuel industries, however current separation methods are very expensive. During my time in lab, I have established a new method in which to synthesize these materials. My results indicate that these compounds are structurally flexible, meaning that they are capable of repeatedly taking in and removing oxygen.

How would you describe your undergraduate experience in the College of Natural Sciences and Mathematics (CNSM)?

My experience in CNSM has been great because of the continuous support from my faculty mentor, the staff at Project RAISE, and my professors. I have had opportunities to present my research at several conferences, the most recent for the Emerging Researchers National Conference in STEM in Washington, D.C. Additionally, my involvement with Project RAISE has been rewarding because it has allowed me to assist with transfer students and their success at CSUF.

What advice would you give current students?

For current students, I would encourage them to follow their dreams on their own timeline. I would also advise students to find a support network or someone they can rely on. STEM can be stressful, and I think it is important to surround yourself with people who know how you feel.

Student Spotlight

“Andrew is not only an incredibly gifted research student, he is also a talented teaching assistant.”
– Dr. Misty Paig-Tran



Student Name:
Andrew Lowe

Major:
M.S. in Biology

Expected Graduation:
May 2019

Please describe your specific area of research.

My research in the Functional Anatomy, Biomechanics, and Biomaterials (FABB) Lab under Dr. Misty Paig-Tran focuses on fish biomechanics - specifically the armor of small catfishes and the bite forces of piranhas. I look at how tough the armor is in comparison to the bite of the voracious piranha. Eventually, I hope to parlay this knowledge into a career in a field called biomimetics - using nature's adaptations for human technology. The idea with the armor is to create a protective "armor" from sharp objects like thorns and knives. My research is exciting because of all of the different areas of science I work in and learn about - biomechanics, material science, engineering, animal behavior, and predator-prey interactions. Right now, I am using a high-speed camera to film piranha bites. How cool is that?!? Fish are amazing creatures and we have so much more to learn from exploring their world and researching them, which is what makes our lab produce cutting edge research. Oh yeah, and I get to work with piranhas!!

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

I would be remiss if I did not thank Dr. Paig-Tran for taking a chance on me and accepting me into her lab. She has been instrumental in my development as a person and student. I don't think I can fit all that she has done for me in this. But to sum it up briefly, she once spent 20 hours with me in the hospital despite having a two-month old baby to take care of! She has always believed in me and pushes me to constantly be better. I am truly grateful for having her as my mentor. Dr. Sean Walker, Dr. Kathryn Dickson, Dr. Ryan Walter, and Dr. Kristy Forsgren have also been immensely helpful during my time at CSUF for their kind words, advice, and guidance. I want to thank my friends in the Biology Graduate Program who have also been a joy to hang out with, learn from, and work with. They have been crucial in times of need and in times of celebration. Finally, I want to thank Karen Lau for all the remarkable work she does for the Biology Department. She is Superwoman!

What advice would you give current students?

Try to learn as much as you can about yourself to see what you value most and that will translate to a job, relationship, home, and your ultimate happiness. You're constantly learning and you should take time to reflect on what you learn about yourself as often as you can. Develop your skills and in particular learn to take constructive criticism, take a step back, and evaluate and reflect on your work and make necessary adjustments. And be able to establish relationships and connections with other people because those are what will last long past your time at CSUF.

Student Spotlight

“Nyah exhibits remarkable ability in research and curiosity, which is an essential skill in research. I want also so highlight that Nyah is a positive influence in the lab. She is a cheerful person, always with a positive attitude and generates a pleasant work environment.”

–Dr. Maria Soledad Ramirez



Student Name:

Nyah Rodman

Major:

Molecular Biology & Biotechnology

Expected Graduation Date:

May 2018

Please describe your specific area of research.

I've worked in Dr. Maria Soledad Ramirez's molecular microbiology lab since 2016. My research focuses characterizing *Acinetobacter baumannii* in two areas: antibiotic resistance via mechanisms of natural transformation and persistence upon exposure to human products.

What has been your favorite experience at CSUF?

I play softball here on campus, and my favorite memory was watching my teammate, Mickeala Francis, hit the game-winning home run against UC Davis for us to take the series.

What are your future career plans?

I plan to pursue a Master of Science in Biological Science. I hope to engage in a thesis-based degree focusing on bacterial pathogenesis, host-microbe interactions, and molecular immunology. By completing my project as a master's student on the pathobiology of *Acinetobacter baumannii* under influence of the immunological protein HSA, I will have prepared myself to become more versed in the field of infectious disease. Once finishing my Masters, I plan to apply to Medical Scientist Training Programs so I can achieve my ultimate goal of MD/PhD.

With this goal, I hope to become a specialist in infectious disease. Mechanisms of disease, and the human bodies response to it, has always been the most fascinating type of phenomenon to me. I find the complexity of the body's immune system fascinating, but what really catches my attention are pathogenic microbes' capability of overcoming the very system put in place to protect the body from them. Learning about genome plasticity, adaptive resistance, and immunoevasion in various species of microbes has taught me that there is much more to the world than I originally thought. With this in mind, I want to understand the depth of the pathogenic microbial community and asses the human body's varying responses, not just now but also in the evolutionary future.

My aspiration to specialize in disease will entail earning my Ph.D. in a field related to Molecular Microbiology and Immunology, and pursuing a medical fellowship in Infectious Disease. Pursing a medical degree is necessary to me so I may better understand the clinical side of the subject I want to pursue. Bacterial pathogenesis and the human body's reaction to such a phenomenon is my main area of scientific interest. I would like to consult in clinical cases, and obtain isolates of pathogens infecting the host so I may characterize the mode of pathogenesis. I am aware that this career path is both intense and extensive; however, I have gained enough experience both in the clinical setting and in microbial pathobiology to know I am pursuing the right path. Both my undergraduate degree and my research experience have prepared me for the road that is to come, and I truly believe that becoming an ASM Research Capstone fellow will significantly increase my likelihood of attaining my goals.

Student Spotlight

“Sean is an outstanding student and researcher. Sean always has a smile and is willing to help a fellow student.”
–Dr. Kristy Forsgren



Student Name:
Sean Zulueta

Major:
Biological Science
(Concentration in Ecology and Evolutionary Biology)

Expected Graduation Date:
May 2018

How would you describe your undergraduate experience in the College of Natural Sciences and Mathematics (NSM)?

I would describe my undergraduate experience as fulfilling, unique and fun. When I transferred from a community college, I did not expect to become part of a close-knit community in the College of Natural Sciences and Mathematics. My favorite part of being an NSM student is that we can all make nerdy jokes or puns related to our major and only the people in your classes or have a general background in your concentration would be able to get. I found it easy to distinguish an NSM student in a crowd because it is someone who is usually slouching when they walk since they have textbooks in their backpack and are probably holding a laptop in one hand and a coffee cup in another. Plus, they are quickly passing by you on the fourth floor as you transition from the escalators to the stairs in McCarthy Hall. If you can't find them in McCarthy Hall, you would probably see them at Carl's Jr., Starbucks, or Dan Black Hall.

The College of NSM had given me several unique opportunities throughout my time here. I would never have thought I would have worked with dragonfish gonads, meet the Mythbusters, go to a national conference to present my research two years in a row, figure out how to correctly say “Zzyzx,” publish my senior thesis, and swim with whale sharks. All the experiences I have gone through have driven me down a career I look forward to pursuing. I cannot thank my faculty mentors enough for all of these opportunities they have given me. I am fortunate to have them support me through the challenges of being an undergraduate and continued to push me to become a better student.

What has been your favorite experience at CSUF?

One of my favorite moments was not really at CSUF but with CSUF students studying abroad. I went on a study abroad trip down to Baja California Sur this past January and learned about conservation and restoration techniques. We had the opportunity to apply our knowledge to real-world problems. The unique part of it was that it felt more like a vacation than a class even though we had presentations and daily discussions. Also, I was with a fantastic group of people who shared my interests in natural sciences, and we were learning from each other and asking questions of our tour guides. We were fully immersed in the culture and understood the difficulties of conservation and restoration. I also got the opportunity to swim with whale sharks and help with a turtle monitoring program. The experience was unforgettable, and people are probably tired of me talking about it.

What advice would you give current students?

First, build a support group. College students, especially NSM and ECS majors, will face a variety of challenges throughout their academic career and need to maintain their mental and physical health. There were several instances where I wanted to give up and quit because I had several tasks I needed to complete and assignments due all at the same time. I would not have made it through the stressful and challenging times without the support of my family, friends, and faculty members.

Next, step out of your comfort zone and explore the CSUF campus. NSM students are known not to leave McCarthy Hall or Dan Black Hall. The two buildings provide us with internet, air conditioning, printing, quiet study areas, microwaves, and cheap snacks. I understand why we don't leave the comfort of our second home. Being the Chair of the NSM-ICC forced me to attend meetings and events outside of McCarthy Hall and Dan Black Hall. The students I have met through ASI informed me of other events around campus that had FREE food. Some weeks, I planned my weekly meals based on events happening on campus. The network that I have made also informed me about several services and organizations on campus that students do not utilize. For instance, the library not only loans out daily laptops but also projectors. Get out there!

Finally, get to know your faculty and staff. They are people too. It is their job to educate you! I understood that they come off as intimidating because they virtually know everything and students do not want to come off as knowing nothing. But, their advice, constructive criticism, and thoughtful nature helped me become a better student. They not only want you to succeed in your academic career, but they can further assist you in your professional career. All faculty and staff members have a story before CSUF, and they have an extensive network of people. As you build a strong rapport with them, they can guide you and help get your foot in the door of your desired career.



Have a Great Summer!

FALL CLASSES BEGIN AUGUST 25, 2018



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

Biology Graduate Club (BGSC): Offers opportunities for association and interaction between CSUF students, faculty, 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

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 (LMSA PLUS): Anyone interested in medical school can join LMSA, you do not need to be of Latino/Latina heritage! lmsa.plus@exchange.fullerton.edu

Math Club: Encourages students to start joint Sciences research projects with faculty and attend conferences nationwide for observation and/or presentation. csufmathclub@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 Symposium, Meet and Eat with the Deans and Chairs. nsmicc.csuf@gmail.com

Physics Club: Organizes lectures from guest speakers as well as several events a year. All CSUF students are welcome. [Physicsclub.csuf@gmail.com](mailto:physicsclub.csuf@gmail.com)

SMART Girls Support Group (Sisters in Mathematics and Academic Relations in Teaching): Holds monthly meetings, study sessions, and provides access to advisors. Learn how to be successful in math courses, relate undergraduate courses to high school teaching connect to school tutoring in schools and networking. Males may join as associate members. csufsmartgirls@gmail.com

STEM Outreach Club: Builds a community with your peers. Forms study-groups. Gets involved in the community. Helps promote science. And much more! ALL MAJORS WELCOME! csufmentor1@gmail.com.

SUCCESS (Students United with Community Collaborators to Enhance Success in Science): Consists of students from all STEM disciplines who are interested in undergraduate research and collaborate together to hold workshops and events for CSUF students. SUCCESS@CSUF@gmail.com

COLLEGE OF NATURAL SCIENCES & MATHEMATICS

STUDENT *Moments*



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