

APRIL 2018 / nsm.fullerton.edu

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Celebrating NSM Week 2018



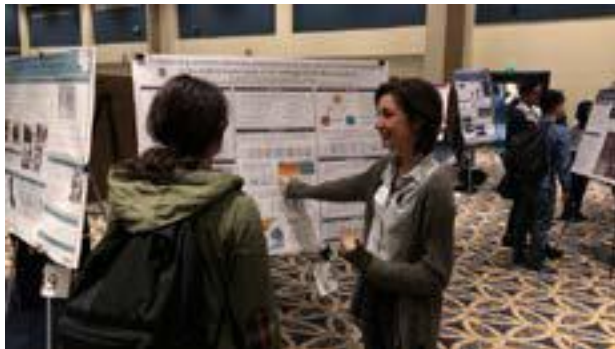
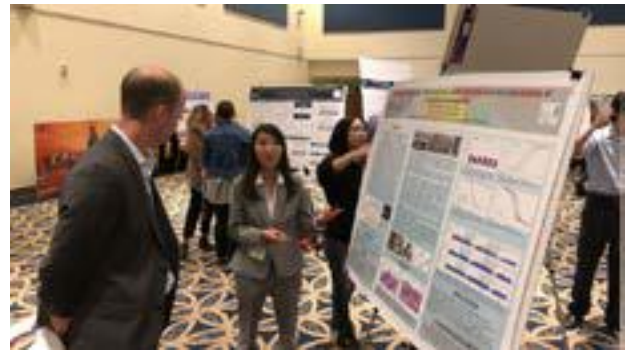
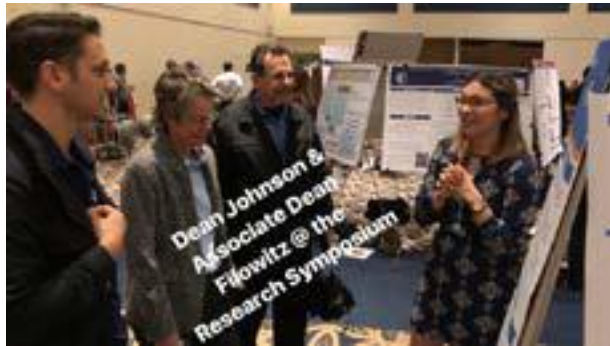
From March 20th-23rd, the College of Natural Sciences and Mathematics celebrated NSM Week 2018! The NSM Week activities were organized by Assistant Dean Colleen McDonough and the NSM-Inter Club Council (ICC). Assistant Dean Colleen McDonough said, “We are grateful for the support of students, faculty, and staff for making NSM Week 2018 a great success. From the club carnival to the research presentations, attendance was stellar and a great time was had by all.”

NSM Week kicked-off on Tuesday with an entertaining and fun carnival on Planet Walk. There were free hot dogs, popcorn, cotton candy and snow cones! Over 520 hot dogs were given out within 2 hours! Student organizations had their own booths with fun activities. PRIME Club had cups in the shape of the Sierpinski Triangle and guests would try to get the ping pong ball into a cup. Data Visualization Club’s Randall Moya gave an interactive presentation. The STEM Floor of Student Housing was also present and had a “Guess How Many Skittles?” booth. It was definitely a fun-filled packed carnival that was attended by many students, faculty and staff.

Graduate assistant Cristina Dypiangco from the Masters in Higher Education Program said, “It’s great to see science in action and the community coming together.” On Wednesday, students had evening lab tours where faculty had presentations on bioinformatics and genetics, desert plant ecology, mineralogy, nanotechnology, plasmids, and more! On Thursday, over 100 students participated in the Research Symposium Poster Presentations at the TSU Pavilions. It was a great opportunity to see what amazing research our NSM students are up to. According to Associate Dean Mark Filowitz, “It always is a good feeling to see how our students immerse themselves in research opportunities and how wonderfully that they can explain their work. Research experiences are very high impact practices that will help students learn to tackle and solve problems analytically no matter what they do in their careers.” After the research symposium, faculty, staff, and student participants gathered at the Alumni House for a reception. To close off NSM Week, the Bridges to Stem Cell Research Symposium was also held at the TSU.

When asked about NSM Week, Dean Marie Johnson stated, “NSM Week was a wonderful chance to celebrate our identities as scientists and mathematicians. I loved every aspect of it from the sense of community and fun built by our Carnival to the tours of our research labs for new students to the intellectual might displayed by 113 student posters at the Symposia to the lovely food at the Golleher House reception following. I especially thank our Assistant Dean Dr. Colleen McDonough and the NSM ICC Executive Committee for their hard work and leadership which made NSM Week a huge success for all our students, faculty and staff.” So here’s another NSM Week for the books!

NSM Week 2018 Research Symposium



"My favorite part of NSM Week was seeing the 114 posters at the Research Symposium. After the first deadline for abstract submissions, my team and I were amazed that the College went beyond our expectations and we received 100 submissions, and we knew that more people were still going to submit. I have been to national and regional conferences, and I could not believe that our attendance is on the same level of some of those well-orchestrated conferences. I was overjoyed when I saw all the students, faculty, staff, and community members in the Pavilions that were there to learn about what students are doing and to support the College of NSM." **–Sean Zulueta, NSM-Interclub Council Chair**

Fern Drive STEAM Night



Fern Drive Elementary School in Fullerton hosted their annual STEAM night March 22 with first-time contributions from over 40 students from CSUF Colleges of NSM and Engineering. Fern students participated in exciting demonstrations and hands-on activities while learning about STEAM careers.

Participants: Chem Biochem Club, Mechanical Engineering (Society of Automotive Engineers, Titan Rover, Titan Racing Baja, Dr. Salvador Mayoral, Math students and faculty (Drs. Armando Cruz-Martinez and Bridget Druken), Haan Research Lab, Electrochemical Society, Dr. John Haan, Gravitational Wave Physics and Astronomy Center.

Tucker Center



Troop 3721 helps NSM Earth Sciences alumna and Tucker Wildlife Sanctuary employee Angela Castanon (background) with habitat restoration at National Girl Scout Day event.

Desert Studies



The Desert Docents are ready for Spring Semester, serving the Desert Studies Center!

Dr. Darren Sandquist, Professor of Biological Science and Director of the CSU Desert Studies Consortium, recently helped organize a group of NSM students to form the CSUF Desert Docents. These docents travel to the Desert Studies Center (DSC) to assist the large core biology courses during their busy weekend field trips to “Zzyzx,” assisting students with field projects, answering questions related to desert ecology, helping TAs and DSC staff, and participating in many other ways to ensure the trips run smoothly. The docents have already made an impact by setting up temporary wild-life cameras to document animal activity during the weekend, and by creating an iNaturalist group for collection of flora and fauna observations. The docents also contribute to desert awareness in other ways, including posts to the Desert Studies blog (<http://desertstudies.org>). Students participating in the Desert Docent program are passionate about desert systems and capitalize on this unique opportunity to educate others while enhancing their own leadership skills. If you or someone you know might be interested in the Desert Docent program please email Dr. Darren Sandquist (dsandquist@fullerton.edu) for more information.

Department Highlights

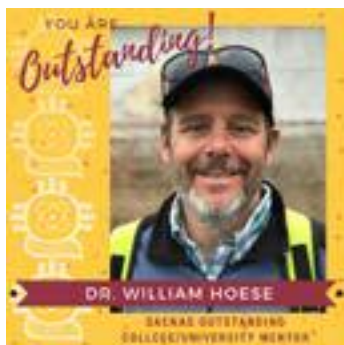
Biological Science



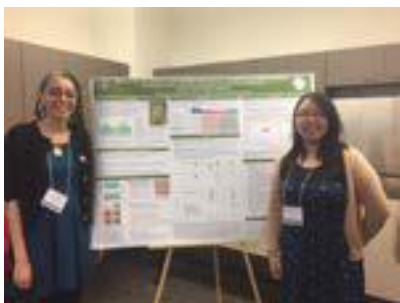
Evelyn Bond



Graduate student Alexis Barrera, MS program graduate Rachel Pound, and undergraduates Shannon Chou and Amber Jolly (Photo credit: J. Burnaford).



Dr. William Hoese



Brittany Cook and Shannon Chou

- Jesus Magallon works with Dr. Marcelo Tolmasky in the Biological Science department. Jesus studies strategies to overcome the problem of antibiotic resistance, with specific attention to the role of zinc ions.
- Graduate student Alexis Barrera was awarded a 2018 Graduate Student Research Fellowship from the CSU Council on Ocean Affairs, Science and Technology, for her project titled “Does temperature affect aggressive behavior in aggregating anemones?”
- Evelyn Bond, who is pursuing her MS degree with Dr. Kristy Forsgren, was awarded a National Science Foundation Graduate Research Fellowship (NSF GRFP). This award provides stipend and funds to cover academic costs for up to 5 years of graduate support. Evelyn was a Southern California Ecosystems Research Program Scholar at CSUF (SCERP 2014-2016).
- Biology faculty Jennifer Burnaford and Steve Murray (emeritus) were authors on a new paper in PLoS One: Miner CM, Burnaford JL, Ambrose RF, Antrim L, Bohlmann H, Blanchette CA, Engle JM, Fradkin SC, Gaddam R, Harley CDG, Miner BG, Murray SN, Smith JR, Whitaker SG, and PT Raimondi (2018) Large-scale impacts of sea star wasting disease (SSWD) on intertidal sea stars and implications for recovery. PLoS ONE 13(3): e0192870. <https://doi.org/10.1371/journal.pone.0192870>
- Dr. Jennifer Burnaford and members of her research lab participated in the annual meeting of the Multi Agency Rocky Intertidal Network (MARINE) in San Pedro CA, March 23 and 24.
- Professor Bill Hoese, who was named 2017 Outstanding College / University Mentor by the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), was featured on the SACNAS webpage as the ‘Outstanding Mentor of the Month’ in April 2018.
- SCERP scholars Brittany Cook and Shannon Chou and faculty mentor Jennifer Burnaford attended the Tri-Beta Biological Honor Society Pacific District Conference at Concordia University in Irvine on March 17. Brittany and Shannon both presented posters based on research conducted during the Biology 301 course in summer 2017:
 - Chou, S., Jolly, A.R., Cook, B., Jaques, D., Javier, J., Suther, H., Hoese, W.J., and J.L. Burnaford (March 2018). Effects of low tide exposure on photosynthetic potential of intertidal seaweed *Silvetia compressa*.
 - Cook, B., Jaques, D., Chou, S., Javier, J., Jolly, A.R., Suther, H., Hoese, W.J., and J. Der (March 2018). A comparison of pollination ecology in native *Calystegia macrostegia* and non-native *Convolvulus arvensis*.

Geological Sciences



Shayna Avila



Sabrina Green

- Shayna Avila and Sabrina Green, both seniors who will earn a B.S. in Geology in August, were awarded a \$750 National Association of Geoscience Teachers field study scholarship. They will use the scholarship to attend Geol 481A field camp this summer. The award is based, in part, on educational and career goals as well as need. Shayna and Sabrina are two of 18 students selected from 80 applications from across the U.S. They are the 5/6th CSUF students to receive the award and the 1st since 2014. https://nagt.org/nagt/students/field_scholarships.html

Mathematics



Dr. Bogdan Suceava presenting at Karlstad University in Sweden.



MAA Student Poster Session in San Diego: (From left to right) Cameon Hooper, Freddy Nungaray, Roberto Hernandez, Isabel Serrano, Jasmine Camero, Oscar Rocha Rocha, Alexandro Luna and Daniel Zelaya.

- Dr. Bogdan Suceava delivered a talk at two conferences on March 28, 2018 at Karlstad University in Sweden. The first one was titled 'Geometry in the Dark Ages' and it is based on joint works with Isabel M Serrano, Lucy H Odom and Anael Verdugo. The second conference was titled 'Geometric Inequalities: From a question of S.-S. Chern to B.-Y. Chen's Curvature invariants.'
- January 11, 2018 - CSUF Students gather after the MAA Student Poster Session at the Joint Math Meeting in San Diego, CA.
- Math undergrads Isabel Serrano and Wesley Whiting have been selected as the recipients of the Outstanding Undergraduate Student Scholarly and Creative Activities Award in the CNSM.
 - Isabel Serrano works with Drs. Bogdan Suceava and Anael Verdugo in the Mathematics department. Isabel's research uses complex mathematical models to describe the Zika virus' transmission properties within the Puerto Rican population. Isabel has co-authored three articles, two of which were selected for the anthology Best Writings on Mathematics in 2016 and 2018.
 - Wesley Whiting works with Dr. Zair Ibragimov in the Mathematics department. Wesley conducted research in Leibniz Algebras in the International Research Experience for Students program in Uzbekistan. He has presented his work at multiple conferences and published in a prestigious mathematical journal.

Physics



Dr. Jocelyn Read's message in the March 2018 issue of LIGO Magazine



Dr. Geoffrey Lovelace's article, "What is Numerical Relativity" in LIGO Magazine

- The March 2018 issue of LIGO Magazine, edited by Dr. Jocelyn Read, showcases Dr. Geoffrey Lovelace's work: <https://www.ligo.org/magazine/LIGO-magazine-issue-12.pdf>

Student Spotlight

"Wesley's record in the Putnam Competition includes two scores above 30 points. Only three students in our school's history managed to score so well, and Wesley's average per participation places him on the top spot in our school's Hall of Fame. From this standpoint, Wesley may be the best problem solver our program ever has seen so far."

—Dr. Bogdan Suceava



Student:
Wesley Whiting

Major:
Mathematics

Expected Graduation:
May 2018

Please tell us more about your research project.

Hyperbolic geometry is a useful tool in complex analysis, but can only be applied in certain limited contexts. We examined a new method to extend hyperbolic geometry to more general domains by averaging metrics together, and show that this method succeeds while preserving more information from the boundary.

How would you describe your undergraduate experience in the College of Natural Sciences and Mathematics (NSM)? What advice would you give current NSM students?

Personal interaction and support from my professors, especially my mentor Dr. Zair Ibragimov, has been key to my development as a mathematician. I recommend that any student interested in graduate school should get to know their professors and look for opportunities to do research.

What are your future career plans?

I will be entering the PhD program in mathematics at UCI this Fall.

Student Spotlight

*“What is truly remarkable about Isabel is that her academic interests evolved over the last five years from history and pure mathematics to the history of sciences and computational biology. Everything she pursued was accomplished very well. I co-authored five papers with her, and our first paper was selected to appear in the anthology *Best Writings on Mathematics 2016*, published by Princeton University Press.” –Dr. Bogdan Suceava*



Student Name:
Isabel Serrano

Major:
Mathematics

Expected Graduation:
May 2018

Please tell us more about your research project.

I work with Dr. Anael Verdugo in the Department of Mathematics, where we aim to mathematically describe the Zika virus's transmission during the 2016 outbreak in Puerto Rico. As simple models graze over the unique behaviors diseases exhibit, this work aims to create a robust model that analyzes disease transmission from an evolutionary perspective. We are inspired by the compartmentalizing techniques in the Susceptible-Infected-Recovered (SIR) model, where a population is categorized into subpopulations based on their health status: susceptible, infected, or recovered. We intertwine the SIR model's categorization and assumptions with the ordinary differential equations of the Replicator-Mutator (RM) model to describe the interactions between the three subgroups. While the RM model is typically used to assess three interacting and competing groups, we contextualize the RM model into an epidemiological context. Applying the RM model to the Zika virus, we analyze the model's dynamics and assess its ability to describe the Zika infection's transmission within a population. We use numerical and analytical methods to identify and classify the model's fixed points, which allow us to assess the subpopulations' long-term behavior. Ultimately, by mathematically examining this model's dynamics we aim to gain predictive power and give insight into the Zika virus infection.

How would you describe your undergraduate experience in the College of Natural Sciences and Mathematics (NSM)? What advice would you give current NSM students?

I have absolutely enjoyed my experience in CNSM. Words cannot describe how thankful I am for the mentors I have gained during my time at CSUF; they have continuously pushed me to grow and reaffirmed my abilities to be a scientist. I have had immense support from the faculty in various departments, who have shown that they are devoted to helping their students reach their goals. In addition, I have sensed this support from my peers who have met constantly outside of class to study, have offered to share their notes if I missed class, and who have been my cheerleaders and shoulders to cry on. There is an incredible support system within the CNSM that I have been privileged to have. To students in NSM, I advise that you talk to professors and students in class because these are the people that will help you in the most stressful of times and celebrate your successes, as well.

What are your future career plans?

My short-term goals include completing a PhD program in Computational Biology at the University of California, Berkeley. I aim to get further training in statistics, computer science, and biology – specifically, molecular genetics. I am particularly interested in understanding how biological systems are deregulated in the presence of disease. Thus, I aim to participate in optimizing and diversifying therapeutic development. Given my interests, I intend to work in industry for a period of time. Ideally, after gaining experience in industry, I would like to return to the CSU system as a professor and mentor students seeking a career in industry or research.

Student Spotlight

“Steve has a track record of excellence in the classroom and leadership in the research lab that I expect will carry him to success in the PhD program in physical chemistry at UC Berkeley.” –Dr. John Haan



Student Name:
Steven Saric

Major:
Chemistry and Physics

Expected Graduation:
May 2018

Please tell us more about your research project.

The purpose of my project is to develop an alternative energy storage device using fuel cell technology. With climate change as an ever-present threat to our planet, the interest in alternative energy sources such as solar and wind has increased exponentially in the last decade. While solar and wind technology have come a long way, they are intermittent in nature and it is not possible to produce power when the sun is not shining or the wind is not blowing. In addition, there are not many options for storing this energy on the home scale, and the only option that existed before a few years ago was to use several (10-15 in a single-family home) lead acid car batteries. This lack of clean and efficient ways to store alternative energy has been a major barrier for many people that want to switch to wind and solar.

Our research group proposed an idea a few years ago to use an electrolyzer that will convert carbon dioxide into formate. The electrolyzer is connected to an alternative energy source in order to drive the reaction forward. The formate produced is a fuel that can later be used in a fuel cell to regain the energy that was stored and regenerate the carbon dioxide. This whole process takes place in a central liquid reservoir and is overall carbon neutral. In 2015 our group was able to show a proof of concept of this device and we have been optimizing it ever since focusing mainly on the carbon dioxide to formate reaction which has many other potential uses such as for carbon sequestration.

Congratulations on your acceptance to UC Berkeley's PhD program in Chemistry! What motivated you to pursue your doctorate degree, and what are your future career plans?

I am actually a fair bit older than the average student. I first stepped foot on campus in 2004 directly out of high school. It turned out that I was not yet ready for the pressure that college and real life would place on me and I ended up dropping out around 2008, still a long way away from finishing my degree. While I was on my break, I spent most of my time working and did not have another opportunity to come back until 2014. My first intention when I returned to CSUF was to finish my degree and get out as quickly as possible; however, upon returning I realized how much I enjoyed learning and I finally had developed the maturity and life skills I needed to be successful in college. In addition, I took

Student Spotlight

one class in particular that absolutely captivated my imagination (Physical Chemistry) and made me decide that I needed to pursue a career in science.

At this point, I also decided to join a research lab, which was both a requirement for my Biochemistry degree and an opportunity to see what real scientific research was like. I instantly fell in love with research, it combined many of the exciting concepts that I had learned about in my classes with the ability to run real experiments and solve real problems. Research gave me the ability to learn something new every day, even if most days that something is what not to do. These small collections of knowledge compound and eventually lead to real progress on problems that no one has ever solved before. Shortly after joining my lab I decided what I wanted to do, I wanted to be a Chemistry Professor. I had a major problem though, my previous time at CSUF had left me with a barely eligible GPA and a lot of failed classes. These things were major hurdles on my way to pursuing a Ph.D.

I set a plan into action in order to accomplish my goal, I switched my major from Biochemistry to a double major in Chemistry and Physics which would allow me to take more classes and repair my GPA as well as learn more about the area of Chemistry that fascinates me the most, Physical Chemistry. Also, I made a plan to spend more time in the research lab trying to put in between 20 and 30 hours a week. This plan was not easy to implement for the first year and a half, I was going to school full-time taking all upper division Chemistry and Physics classes, working 45 hours a week as a manager, and trying to make time for my research commitment. Needless to say, I did not sleep very much. However, in the end my hard work paid off and now I have accepted an offer to pursue a Ph.D. at the highest ranking Physical Chemistry program in the United States.

If you could give advice to current CSUF NSM students, what would you tell them?

Don't be ashamed to ask for help. When I first came to CSUF I was far too afraid to ask for help. I did not know how to be a successful student and when I began to struggle I was ashamed to talk to people about it. After returning I was no longer shy, every time I struggled or had questions I asked someone and if I looked hard enough there was never a shortage of people willing to help with any problem that I had.

Schedule your study time like it's a class itself. This is the most important thing you can do to be successful in your classes. If you are taking a 3-unit science course you should spend 4-6 hours a week studying for that course. If you have assignments due, use that time to work on them, if not use that time to get ahead, but get in a habit of sitting down at the same time every week and studying for that class. If you do not have time in your schedule to put in 4-6 hours a week you need to lighten your class load. Trust me your GPA and sanity will thank you.

Go to office hours. This is important, but you will only get something out of it if you go in prepared. If a homework is due Thursday and your professor is holding office hours on Tuesday, you need to make sure you have at least attempted every homework problem and compiled a list of questions that you have by Monday. Coming in prepared will ensure that both you and your Professor get the most out of the time. Don't be shy, this is time set aside specifically to help you succeed, use it, but make sure you are using it wisely.

Take the time to find out what you are passionate about. Very few people in this world get to actually go to work every day and enjoy what they do. You owe it to yourself to try and find your passion. There have been times when I have been in lab late at night with no one else around and smiled because I know that I am exactly where I belong. You can find that bliss as well, but from my experience it doesn't just fall in your lap you have to look for it.



NOW HIRING

JOIN OUR TEAM!



Project RAISE is looking for Transfer Student 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

- Valid driver's license, vehicle, and insurance
- Registered in at least 6 units
- Transfer student
- Available 8-12 hours per week

APPLY BY WEDNESDAY, APRIL 11TH

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.

 **RAISE**
PROJECT

Project RAISE is a program that 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.

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



GRADUATION REMINDERS!

[HTTP://WWW.FULLERTON.EDU/COMMENCEMENT/](http://www.fullerton.edu/commencement/)

GRADUATION TICKETS AVAILABLE APRIL 2

[HTTP://WWW.TITANBOOKSTORE.COM/SITETEXT.ASPX?ID=27048](http://www.titanbookstore.com/sitetext.aspx?id=27048)

GRADFEST: APRIL 3-5 AT TITAN SHOPS

GRADFEST: APRIL 18 AT IRVINE CAMPUS

**NSM STUDENT SPEAKER APPLICATION
DUE APRIL 6TH**

[HTTP://WWW.FULLERTON.EDU/NSM/GRADSPK18/](http://www.fullerton.edu/nsm/gradspk18/)

GRAD BBQ: APRIL 19 @ ALUMNI HOUSE

**UNIVERSITY COMMENCEMENT CEREMONY
MAY 18 - 5PM**

**COLLEGE COMMENCEMENT CEREMONY
MAY 19 - 5PM**

[HTTP://WWW.FULLERTON.EDU/NSM/STUDENT_RESOURCES/COMMENCEMENT_2018.PHP](http://www.fullerton.edu/nsm/student_resources/commencement_2018.php)

COLLEGE OF NATURAL SCIENCES & MATHEMATICS

STUDENT *Moments*



WANT TO BE FEATURED ON OUR SOCIAL MEDIA?

SUBMIT YOUR POST HERE:

[HTTP://BIT.LY/CNSMSTUDENTPOSTS](http://bit.ly/cnsmstudentposts)



[FB.ME/CNSMCSUF](https://fb.me/cnsmcsuf)



[@CSUFCNSM](https://www.instagram.com/csufcnsm)

#CSUFCNSM #YOURMOMENT

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 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

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