

NATURAL SCIENCES AND MATHEMATICS

College of Natural Sciences & Mathematics Newsletter

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Dr. Marty Bonsangue Honored as 2018 Distinguished Alumnus of

Claremont Graduate Univesity School of Educational Studies

Dr. Marty Bonsangue, Department Chair for Mathematics, was honored as the 2018 Distinguished Alumnus of the Claremont Graduate University (CGU) School of Educational Studies. According to Dr. Bonsangue, "This is truly an expected honor. The professors and my experiences at CGU shaped my professional, and perhaps personal, life profoundly, and so being recognized in this way is very meaningful to me."

Dr. Bonsangue has taught mathematics at the middle school, high school, community college, and university levels. Growing up in the 1950's and 1960's, engineering was a popular field, but when Dr. Bonsangue attended college, he started working as a math tutor and discovered his passion for teaching. His tutoring experience also strengthened his knowledge of math. He recalls the moment he was explaining to a small group of students what a derivative was and thought, "Wow, I really understand this now!" Moments like these inspired Dr. Bonsangue to pursue a career in teaching math.

In 2011, he received the Outstanding Professor award at California State University, Fullerton, and presented his lecture, "America's Math Story: Where We've Been, Where We Are, Where We Could Be." He will also present this lecture on April 23, 2018 at 7:00 p.m. at CGU. According to Dr. Bonsangue, his lecture is inspired by his belief that, "every person can be successful in mathematics given the right experiences and support structures." The message he hopes individuals learn from his talk is that they and their children can be successful in math.



Dr. Bonsangue will be receiving a \$2,000 honorarium, and he plans to donate all the money to CGU to support student scholarships and give back to the community that shaped him. According to Dr. Bonsangue, he grew up in a bluecollar community in Los Angeles, where not too many students pursued higher education. Fortunately, he earned several scholarships that financially supported his college education. Dr. Bonsangue states, "It has always been a dream for me to perhaps give back in the same way. Using the OP honorarium as 'seed money' several years ago, we were able to establish the Bonsangue Family Scholarship at CSUF. I thought it might be nice to try to do something similar at CGU."

If you ask Dr. Bonsangue for career advice, he would say, "To quote Sir Winston Churchill, 'Never give up!'" So, always remember to find your passion and never give up. Congratulations, Dr. Bonsangue!

Boy Scouts spruce up CSUF's Tucker Wildlife Sanctuary



Boy Scouts from Troop 801 remove weeds along Harding Truck Trail. Scout member Cameron Abrahamson, 16, center, works with fellow troop members. The Boy Scouts of America, in honor of National Boy Scout Day, hosted a day of hikes, tours, restoration planting and trail maintenance Feb. 10 at Tucker Wildlife Sanctuary in Modjeska Canyon. (Photo by Greg Andersen, Contributing Photographer)

By Wendy Fawthrop

In honor of National Boy Scout Day, local Boy Scouts and Cub Scouts held a day of hikes, tours, restoration planting and trail maintenance Feb. 10 at Tucker Wildlife Sanctuary in Modjeska Canyon.

Tucker Wildlife Sanctuary is owned and operated by CSUF's College of Natural Sciences and Mathematics. Renowned for its birding, the sanctuary offers three nature trails, a picnic area, an amphitheater and a Natural Science Center with interactive exhibits, live animals, native animal taxidermy and children's activities. Its Native Plant nursery sells drought-tolerant plants.

The sanctuary will hold a guided bird walk led by artist and birder Julie Williams on Saturday, March 24, at 8:10 a.m. The walk is suitable for beginning and intermediate birders. Visitors will explore native habitats and learn to identify local birds. Suitable for ages 12 and older, the event costs \$5 per person. Reservations are required and may be made by calling 714-649-2760.

From OC Register: https://www.ocregister.com/2018/02/20/boy-scouts-spruce-up-csufs-tucker-wildlife-sanctuary/

CSUF Hosts American Society of Plant Biologists Western Section 2018 Meeting



Students from the Sacco lab (left to right in the photo): Samantha Acosta, Megan Anast, Elaine Nguyen, Nathan Bui and Ally Weir.

From February 3rd-4th, California State University Fullerton hosted the American Society of Plant Biologists (ASPB) Western Section 2018 Meeting at the Fullerton Holliday Inn.

The meeting was co-organized by California State University faculty Dr. Melanie Sacco (CSU Fullerton), Dr. Judy Brusslan (CSU Long Beach) and Dr. MariaElena Zavala (CSU Northridge). The ASPB Western Section 2018 Meeting was an opportunity for plant biologists at all career levels to meet, present their work, and network. The meeting was attended by nearly 100 people, and included an oral presentation from Dr. Sacco titled, "Understanding Roles for the Polerovirus P0 Protein in Virulence and Plant Defense Evasion and Elicitation."

Dr. Sacco's presentation described the work of a team of former undergraduate and graduate students who performed systematic mutagenesis of the Polerovirus protein called PO. These mutants are in the process of being tested to identify regions of the protein that are important for helping the virus to have a successful infection in host cells, and for regions that are responsible for the plant cells to detect the virus' presence and to mount a defensive attack.

The following CSUF poster presentations were also featured in the ASPB Western Section 2018 Meeting:

Allyson Weir, Joshua Der & Melanie A. Sacco-"Identifying Genes that are Differentially Expressed in Nicotiana Glutinosa Defense Responses Against Polerovirus Infection"

Nathan Bui, Elaine Nguyen, & Melanie A. Sacco-"Identifying Critical Ubiquitin Linkages in Polyubiquitin Modification of Proteins Targeted by PO, a Viral Suppressor of RNA Silencing"

Pedro Anguiano, Laura Arce, & Amybeth Cohen-"Analysis of the CPH1 Cryptochrome-Binding Partners in Chlamydomonas Reinhardtii"

The feedback from the meeting was very positive and the organizing committee is planning to host the ASPB Western Section meeting again in Southern California three years.

The organizers of the meeting would like to thank the following:

- Karen Lau, Department of Biological Science, for assistance with booking the venue and procuring the many poster easels needed for the two poster sessions.
- Students who helped in the set-up, registration and tear down of the poster easels.
- Students from the Sacco lab who helped to make the meeting a big success

Department Highlights

Biological Science



SCERP student Daniel Jaques and research mentor Dr. Joshua Der attended the California Native Plant Society's annual Conservation Conference in Los Angeles from Feb 1 – 3. At the conference, Dr. Der presented an oral paper coauthored by Nathan Vega, a CSUF Biological Science alumnus and former SCERP scholar, titled "Rapid development of population genetic resources for California rare plants using next-generation sequencing." Daniel also met CSUF Biological Science alumna and former SCERP scholar Cheryl Sevilla, who now works as the Seed Conservation Program Manager at Rancho Santa Ana Botanic Garden. Photo: Cheryl Sevilla and Daniel Jaques at the CNPS Conference.

- Drs. Jennifer Burnaford (Biology), Joe Carlin (Geology) and Misty Paig-Tran (Biology) participated in the Ocean Studies Institute Marine Faculty Multidisciplinary Research Workshop at CSULB.
- Ryan Walter co-authored a publication: Lisi PJ, Childress ES, Gagne RB, Hain EF, Lamphere BA, Walter RP, Hogan JD, Gilliam JF, Blum MJ, McIntyre PB (2018) Overcoming urban stream syndrome: trophic flexibility confers resilience among Hawaiian stream fishes. Freshwater Biology. DOI: 10.1111/fwb.13091
- Biology undergrad, Kelsey Nannini, was awarded the 2018 Best Student Poster Award by the Division of Invertebrate Biology at The Society for Integrative and Comparative Biology annual meeting in San Francisco in January. Her poster, "DNA Barcoding of Diverse California Polyclads Has Global Implications for These Hard-To-Identify Flatworms," was co-authored by her research mentor, Dr. Doug Eernisse.



Five representatives from CSUF Biological Science participated in a "Design Thinking: Mitigating Climate Change" workshop at Cal Poly Pomona on Feb 8th. This workshop, sponsored by CSUPERB, trained participants in new techniques for group problem solving and collaboration. Participants: (L-R in photo) Alexis Barrera (MS student), Tilly Duong (undergraduate), Elizabeth Alcala (undergraduate), Ariel Heyman (MS student) and Dr. Jennifer Burnaford (not pictured). (Photo credit: Dr. Jennifer Burnaford)

- During the January Intersession, Dr. Doug Eernisse and his Master's student, Shawn Wiedrick, participated as invited guests at the Muséum National d'Histoire Naturelle (MNHN) in Paris for a two-week long workshop to investigate the biodiversity of chitons collected from recent MNHN expeditions at various worldwide worldwide localities, including Papua-New Guinea, New Caledonia, Western Australia, Tasmania, Madagascar, Martinique, and Guadelupe.
- Drs. Misty Paig-Tran and Jennifer Burnaford participated as Featured Scientists in the Girls in Ocean Science conference at the Dana Point Ocean Institute on Saturday, Feb 24th. This conference was designed to inspire middle school girls to pursue careers in marine biology fields.
- Jeff Chokry, M.S. student, and Kesean Diamond, an undergraduate BSCR student, presented their posted at CSUPERB in January: "Pseudomonas putida GB-1: Manganese coat of armor." Jeffrey Chokry, Kesean Diamond, and Hope A. Johnson

Geological Sciences

 Sinan Akciz and Lisa Grant Ludwig, Geomorphic and Paleoseismic Investigation of a Prominent Secondary Strand of the San Andreas Fault in the Carrizo Plain: Implication for Rupture Complexity: 8th International Workshop on Paleoseismology, Active Tectonics and Archeoseismology, 13th - 16th November.

Mathematics



Edward Zeng is a high school student in Arcadia who attended for over 6 years the sessions of the Fullerton Mathematical Circle, the outreach program of the Department of Mathematics at CSUF. In this image Edward discusses problems from the American Invitational Mathematical Examination at the Fall 2017 Western Section conference of the American Mathematical Society.



Freddy Nungaray and Gabriel Martinez presenting their work at the Joint Mathematical Meetings in San Diego. They are GRAM students and their research mentor is Dr. Laura Smith.





Isabel M. Serrano, Lucy H. Odom & Bogdan D. Suceavă



- Dr. Thomas Murphy's paper, "Complex Riemannian foliations of open Kaehler manifolds" (with P.A. Nagy) was recently accepted by the Transactions of the American Mathematical Society. In addition, his paper, "Random manifolds have no totally geodesic submanifolds" (with F. Wilhelm) was accepted by the Michigan Mathematical Journal.
- The paper Quadrivium: The Structure of Mathematics as Described in Isidore of Seville's Etymologies appears in the December 2017 issue of Mathematical Intelligencer, a publication of Springer Nature. See attached the cover of the paper's preprint. The authors are: Isabel M. Serrano (CSUF undergraduate student), Lucy H. Odom (CSUF alumna, currently teaching at the Santa Monica College), and Bogdan D. Suceavă (Department of Mathematics, CSUF). This essay is selected to be included in the anthology Best Writings on Mathematics 2017, currently in preparation with Princeton University Press. The paper can be accessed here: https://link.springer.com/article/10.1007/s00283-017-9762-6

Mathematics



October 21, 2017 - Dr Bogdan Suceavă presented one of the Invited Addresses at the Fall 2017 SoCal Nevada Meeting of the Mathematical Association of America at Chapman University.

AMS Special Sessions Co-Organized by Cal State Fullerton Faculty

- Zair Ibragimov AMS Special Session on Advances in Operator Theory, Operator Algebras, and Operator Semigroups
- Bogdan Suceavă AMS Special Session on Differential Geometry

Cal State Fullerton Faculty Presentations

- Nicholas D Brubaker 'A Continuation Method for Computing Capillary Surfaces', delivered in the AMS Contributed Paper Session on Applied Mathematics.
- Zair Ibragimov 'Quasi-Isometric Extensions of Quasisymmetric Mappings of the Real Line Compatible with Composition', presented in
- AMS Special Session on Advances in Operator Theory, Operator Algebras, and Operator Semigroups.
- Thomas Murphy 'Complex Riemannian foliations of Kaehler manifolds', delivered in the AMS Special Session on Metric Geometry and Topology.

- Thomas Murphy 'Bounding the invariant spectrum of toric Kaehler manifolds', in the AMS Special Session on Differential Geometry.
- Laura M. Smith -'Developing Applied Mathematics Research Projects for Undergraduates', presented in the AMS Special Session on Open and Accessible Problems for Undergraduate Research.
- Roberto C. Soto 'Versal Deformation Rings and Symmetric Special Biserial Algebras', presented in the AMS Special Session on If You Build It They Will Come: Presentations by Scholars in the National Alliance for Doctoral Studies in the Mathematical Sciences.
- Sam Behseta 'Bayesian Modeling of Neuronal Spike Trains', in the MAA Invited Paper Session on Differential Equations and Their Applications to Neuroscience.
- Charles Peter Funkhouser (Discovering Undergraduate Mathematics in American Indian Culture), in the MAA Session on Attracting, Involving, and Retaining Women and Underrepresented Groups in Mathematics --Righting the Balance.
- Jessica Jaynes 'Using Design of Experiments to Determine Consumer Preference with Applications to Health Science', MAA General Contributed Paper Session on Probability and Statistics.
- Charles Funkhouser and Harriet C. Edwards

 'Native American-based Mathematics Materials for Integration into Undergraduate
 Courses', presented in the MAA Poster Session: Projects Supported by the NSF Division of
 Undergraduate Education
- David Pagni On Cal State Fullerton Outreach Programs, in the Mathematical Outreach Programs.

Mathematics



Since Summer 2015, Dr. Chris Lyons began supervising Bora Olcken, who was then an Mathematics undergraduate and is now in the Master's program for Teaching Math. Together, they continued this work over the following school year, and Dr. Lyons is happy to say that the outcome of that project was a joint paper that has just been accepted for publication in the well regarded peer-reviewed *Kyoto Journal of Mathematics*. The paper is called "A simple formula for the Picard number of K3 surfaces of BHK type." In this photo, Bora was presenting the project in the 2015 NSM Summer Symposium.

Undergraduate Student Posters Presented at Mathematical Association of America

- Saul Lopez (Mentor: Scott Annin) -'Economical Generating Sets of the Monoid of Order-Preserving Partial Permutations.'
- James Shade and Christian Do (Mentor: Adam Glesser) - 'Generation of 2-Generator Groups by Alternation' (Recognized as MAA Outstanding Poster).
- Roberto Hernandez (Mentor: Roberto Soto) -'Using Differential Equations to Model a Zombie Apocalypse.'
- Cameron Hooper (Mentor: Laura Smith) 'Math Meets Chemistry: Modeling Dicarboxylic Acids Spectra in the Infrared Region' (Recognized as MAA Outstanding Poster).
- Kyle Kishimoto (From Fairmont Preparatory Academy and Fullerton Math Circle; mentor: Anael Verdugo) - 'Computational Analysis of Ventricular Oscillations Using the Van der Pol Equation.'
- Gabriel Martinez and Freddy Nungaray (Mentor: Laura Smith) - 'Investigating the Mortality Rate in the United States through an Age-Structured Population Model.'

- Trini Nguyen (Mentor: Charles Lee) -'Mathematical Model to Noninvasively Detect Dry-Eye Diseases.'
- Isabel Serrano (Mentor: Anael Verdugo) -'Analyzing the Spread of the Zika Infection in Puerto Rico through the Replicator-Mutator Model.'
- Jasmine Camero and Oscar Rocha Rocha (Mentors: N.D. Brubaker and B.D. Suceava)
 'A Ladder of Curvatures in the Geometry of Surfaces.'
- Sushanth Sathish Kumar (From Jefferey Trail Middle School and Fullerton Mathematical Circle; mentor: Bogdan Suceava) - 'The Orthocentric Distances.'
- Alexandro Luna (Mentor: Roberto Soto) 'Rational and Irrational Distances.'
- Charles Hesketh (Mentor: Matt Rathbun) -'Characterizing a Physical Embedding of a Loop as the Unknot.'

Student Spotlight



Student Name: Oscar Rocha Rocha Major: Mathematics and Computer Science Expected Graduation Date: May 2020

What is your research project about?

For two hundred years all the investigations on the differential geometry of surfaces have been focused on two geometric quantities, called the Gaussian curvature and the mean curvature. These quantities are describing the shape of any surface in the three dimensional world that surrounds us. However, are there any other geometric quantities that we should investigate, and we should think of as curvature quantities? This was the original question that motivated our research project, which was presented as a talk and as a poster at the Joint Math Meetings 2018, as well as to the Fall 2018 Mathematical Association of America (MAA) So Cal Meeting. In our paper we investigated one such quantity, that we called *tangential curvature*. We compared it with other known geometric quantities and we investigated its behavior on some classical examples.

Student Name: Jasmine Camero Major: Mathematics Expected Graduation Date: May 2019

What inspired you to conduct research on this topic?

One interesting detail about this project is the historical detail that the very concept of curvature of surfaces was not clear in the 18th century. Originally there was some confusion about the whole idea. Leonhard Euler believed that one cannot define a good curvature measure for surfaces. He actually wrote in a famous paper from 1760 that one cannot clearly define curvature for surfaces. If one of the most inspired and gifted mathematicians that ever lived experienced a hesitation about this problem, isn't this an interesting starting point of inquiry for us? We have looked at the mathematical motivation as well at the historical motivation.

Natural Sciences & Mathematics, March 2018

Student Spotlight



October 21, 2017 - Oscar Rocha Rocha and Jasmine Camero presenting their work on 'A Ladder of Curvatures in the Geometry of Surfaces' at the Fall 2017 SoCal Nevada Meeting of the Mathematical Association of America, at Chapman University.

What are your future career plans?

Jasmine: I plan on continuing my journey, as a woman of color in the area of mathematics, to reach the highest potential that mentors along my academic career have always reminded me that I have in me. I want to be that role model for the little girl that might be intimidated by her male peers, a role model for all underrepresented groups, and a role model to all who might be intimidated by its complex, but intriguing nature. To reach these goals, I am striving to earn my Ph.D. in Mathematics and immediately plunge into spreading my admiration of the subject by serving as a positive figure to students as a professor at a university. I would like to continue to partake in activities that work to enhance the academic development of future mathematicians.

Oscar: After I graduate in 2020, I plan on pursuing my educational career. I want to attain a Ph.D. in mathematics. This is my plan. I do this because of the unconditional support I've had from my past teachers, current professors, and family members saying that I can achieve what I put my mind to. On the path to graduation and getting a Ph.D., I also want to keep on doing research with my mentors.

How has the College of Natural Sciences and Mathematics prepared you for your future career plans?

Jasmine: My last three years as a member of the College of Natural Sciences and Mathematics have been filled with productive encounters alongside inspiring mentors, professors, and faculty that have exposed me to a variety of experiences. It is because of the constant and overflowing amount of support I have received from NSM that I have chosen to attend graduate school and pursue a doctorate degree. These ideas always seemed so farfetched, but as soon as I enveloped myself in the magic of mathematics and into the inviting atmosphere of the College of Natural Sciences and Mathematics, I knew that anything was possible.

Oscar: The College of Natural Sciences and Mathematics has created an environment in which anyone person can have an opportunity to make a name for themselves. The support NSM is unbelievable and is unmatched. I want to thank the College of Natural Sciences and Mathematics for giving me a place to meet great friends, mentors, and faculty. All of these people have brought out the best in me. With all the available support from NSM, I know that going to graduate school is not a dream, but an attainable goal.



AND MATHEMATICS

Center for Computational

and Applied Mathematics



Big Data Discovery & Diversity THROUGH RESEARCH EDUCATION ADVANCEMENT AND PARTNERSHIP



"INTRODUCTION TO PROGRAMMING, DATA VISUALIZATION, & MODEL FITTING WITH PYTHON"

DR. ARJANG FAHIM UNIVERSITY OF CALIFORNIA, IRVINE

ABOUT THE INSTRUCTOR

Dr. Arjang Fahim received his B.S. in Computer Software Engineering with an emphasis on designing large-scale LANs. During this time he was working in various positions such as software developer, software architect and project manager. He completed his PhD in computer science at the University of South Carolina with a thesis in computational biology and bioinformatics. Currently he is a post-doctoral researcher at the University of California Irvine working on computational analysis of gene methylation pattern for cancer in Dr. Tim Downing's Lab.

DATE: FRIDAY, APRIL 6, 2018

TIME: 1PM-5PM

LOCATION: SGMH (MIHAYLO HALL) 1502

REFRESHMENTS WILL BE SERVED

REGISTRATION IS REQUIRED TO ATTEND

REGISTER HERE: HTTP://BIT.LY/CCAMPYTHON

FOLLOW US ON FACEBOOK:

WWW.FACEBOOK.COM/CSUFCCAM



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. <u>AMSA@fullerton.edu</u>

Biology Graduate Club (BGSC): Offers opportunities for association and interaction between CSUF students, faculty, and administration. <u>bgsc.csuf@gmail.com</u>

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. <u>csuf.cbc@gmail.com</u>

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

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! <u>Imsa.plus@exchange.fullerton.edu</u>

Math Club: Encourages students to start joint research projects with faculty and attend conferences nationwide for observation and/or presentation. <u>csufmathclub@gmail.com</u>

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. <u>nsmicc.csuf@gmail.com</u>

Physics Club: Organizes lecturers 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. <u>csufsmartgirls@gmail.com</u>

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! <u>csufmentor1@gmail.com.</u>

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. <u>SUCCESS@CSUF@gmail.com</u>