UC SAN DIEGO

FALL 2018 NEWSLETTER



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UC San Diego JACOBS SCHOOL OF ENGINEERING

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DATES & DEADLINES

COSMOS Cluster Assistant Application Closes

29th Student

Acceptance

Warch

Teacher Fellow Application Available

Ctober

d 17th Teacher Fellow Application Deadline

Decemb;

COSMOS

Sign-Ups

Ambassador

O 15C COSMOS Application Closes

4th

COSMOS

Application

January

Opens

February

18th

COSMOS Cluster Assistant Application Opens d 12th Student Acceptance Deadline

AUQ.

November





JACK SILBERMAN

LECTURER, Mechanical & Aerospace Engineering, Electrical & Computer Engineering at UC San Diego

Jack Silberman has over 20 years experience in automation and robotics. He started working in robotics while pursuing his B.S. in electrical engineering. Dr. Silberman did robotics post graduate work in England, he holds a master's degree from PUC-Rio in mechanical engineering, and a Ph.D. from Carnegie Mellon University where his research was on mobile

field robotics reliability. Jack has worked in educational robotics, NASA sponsored mobile field robotics, semiconductor automation, biotech, and medical devices. Currently Dr. Silberman is the Commercial QA Area Manager for Canada and Latin America with Abbott Diabetes Care (ADC), and a lecturer at UC San Diego Mechanical and Aerospace Engineering.

CLUSTER 11 DESCRIPTION

In this Cluster we incorporate engineering theory and good practice in the development of scale autonomous cars that must perform on a simulated city track. The Cluster consists of lectures and incrementally more challenging projects: electrical and mechanical design and documentation, install and testing of the artificial neural network framework to enable deep learning, building the scale autonomous car, 5 autonomous laps at the indoor track, 5 autonomous laps at the outdoor track, and propose and implement a new robotics autonomous behavior.





CLUSTER 2 INSTRUCTOR



VERONICA **ELIASSON**

Associate Professor of **Structural Engineering** at UC San Diego

My first summer with Cluster 2 was amazing! The students kept on impressing me with innovative solutions for their protective devices to save water balloons from breaking upon impact when landing on a bed of nails; their kinetic sculpture designs containing everything from catapults to carousels; and smartly programmed control systems. It was a delight to work with and get to know all the students and the Cluster Assistants. I very much look forward to being part of COSMOS in the future. http://eliasson.ucsd.edu/

CLUSTER 4 INSTRUCTOR



JACQUELINE LE

Project Engineer at KPFF San Diego

Cosmos Year #1 and I'm hooked! Each time the teams put on one of their small scale structures on the shake table for testing, I could just feel the room slowly fill with anxiety and excitement as the earthquake intensified. Then, all of a sudden, "crack!!" and the structure would come crashing down, and the room would break out in laughter. These hands-on activities with Cluster 4 and these smiles were the highlights of my summer! I can't wait to play again next year!

CLUSTER 10 INSTRUCTOR



NICK GRAVISH

Assistant Professor of Mechanical & Aerospace Engineering at UC San Diego

Nick Gravish attended COSMOS at UC Irvine back in 2000. His cluster focused on Advanced Mathematics. Since then, Nick has received his B.S. in Physics from UC Santa Barbara & his Ph.D. in Physics with a minor in Mechanics of Materials from Georgia Tech School of Physics. Fast forward a few years, Gravish is now an Assistant Professor in the Mechanical and Aerospace Engineering Department at UC San Diego and an instructor at UC San Diego COSMOS for Cluster 10: Robot Inventors.

http://web.eng.ucsd.edu/~ngravish/

2018 COSMOS TEACHER FELLOW EXPERIENCE



SCOTT PATTERSON

CLUSTER 5 TEACHER FELLOW

COSMOS is a fantastic way to spend the summer for any STEM teacher. The collaboration with faculty, amazing students, and truly enjoyable environment make it something I hope to be a part of for many summers to come!



CLUSTER 10 TEACHER FELLOW

SECOND SUMMER WITH CLUSTER 10

The COSMOS program has given me new ways to connect learning in my classroom. I work at a project-based school, and COSMOS is entirely hands-on and project oriented in Cluster 10: Robot Inventors. We have launched a robotics class based on what I learned from my faculty and TAs in COSMOS. The students you get to work with in COSMOS are ready for a challenge, so it's wonderful to work with faculty who can really push them to the edge of their knowledge.



Cluster 1 Students on UCTV Computer Science Channel Jacobs School of Engineering Blog at University of California, San Diego



Danny Castro

COSMOS students participating in Cluster 1: Computers in Everyday Life were interviewed for this video, which highlights projects they were working on. This is a great snapshot into the academic side of COSMOS and offers a glimpse of the amazing opportunities offered in our program: "High school students from around the country spent part of their summer learning and living at UC San Diego. During the COSMOS program, they learn from professors in the Computer Science and Engineering department. Students get to create apps, robots and lifelong memories. Some even turned bananas into a piano."

> https://www.uctv.tv/computerscience/search-details.aspx? showID=33917



Kritin Karkare

Kritin is a fourth year Bioengineering: Bioinformatics major with minors in Cognitive Science and Japanese Studies at UCSD. He does research on algorithms for classifying brain activity for braincomputer interfaces, but he also cares a lot about outreach and science communication. As a result, he writes for the Jacobs School of Engineering, does K-12 STEM education projects and most importantly TAs for COSMOS (go Cluster 7!). Other hobbies include arranging and conducting music for his orchestra and cross country racing.

2018 COSMOS Week 1 Blog 2018 COSMOS Week 2 Blog 2018 COSMOS Week 3 Blog 2018 COSMOS Week 4 Blog

alumni SP@TLIGHT



RENAE CRUZ UC LOS ANGELES '15 MAJOR : MICROBIOLOGY

UC Irvine COSMOS Alum: 2010, Cluster 6: Biomedical Sciences ACADEMIC BIO: After graduating from UCLA with a degree in Microbiology, Renae is now a Microbiology PhD candidate at the University of Washington in Seattle.

How did you decide on your particular major? I really enjoy the topic of microbiology. It fascinates me how organisms we can't even see by the naked eye play a huge role in our society. From consumer goods (like yogurt or kombucha) to epidemics, microbes are everywhere, shaping the way we lead our lives. How did COSMOS help prepare you academically and professionally? COSMOS taught me how to be a better team player, which is important in a professional setting. Working in groups showed me that I shouldn't be afraid to ask for help and that delegating tasks based on a teammate's strengths was the most efficient way of getting the job done. Academically, COSMOS inspired me to be more inquisitive and to ask more questions of the world around us. My curiosity has propelled my growth as a scientist.

What are some of your future

aspirations? After I finish my PhD, I intend to pursue a career related to technology commercialization. In other words, I am interested in taking scientific ideas from the lab and turning them into commercial products or services.

Do you have any advice for your fellow COSMOS alumni who are still in high school? To high school students: when choosing a college, don't just focus on academics alone. Pick a place where you can also envision yourself enjoying the city/school for the next 4 years. Happiness is just as important as productivity!



alumni SP@TLIGHT



VASANT IYER CALTECH '17 MAJOR : ELECTRICAL ENGINEERING

UC San Diego COSMOS Alum: 2010,

Cluster 7: Biological Motivations for Tensegrity Structures **ACADEMIC BIO:** Vasant did his undergraduate studies at California Institute of Technology (Caltech), focusing on electrical engineering. He graduated in 2017 and is now a second-year doctoral student at the University of Pennsylvania in electrical engineering. In his spare time, he enjoys running, and performs vocals and violin with an Indian fusion group at Penn.

What have you been up to?

I'm in my second year of grad school now, focusing on developing miniaturized, affordable "lab-on-chip" devices that can help us improve healthcare monitoring, especially in the developing world. I'm really excited about this work because it will help a lot of people if it works, but also because its a fusion of so many different fields into one project. I'll be here for a while, so hopefully I can realize part of that goal.

How did you decide on your particular major?

Funnily enough, my goal when I started college was actually to become a doctor (or do an MD/PhD). I started to become interested in technology after taking a few classes at Caltech, and talking with my graduate student mentors helped me figure out a way to pursue that without losing sight of the big-picture goal I had of having an impact in healthcare. Electrical engineering was a great fit for crossing the bridge between healthcare and technology.

How did COSMOS help prepare you academically and professionally?

My cluster was focused on understanding the mechanical properties of the red blood cell, both from a protein perspective and with mechanical models. COSMOS was my first time doing lab work, and I learned so much in those few weeks. Dr. Carlos Vera, Dr. Robert Skelton, and the graduate students were happy to help us and teach us. It really gave me a positive picture of academia and science; I ended up doing biology research throughout high school and, even though I switched fields in college, COSMOS was the springboard that started all the stuff I do now.

What are some of your future aspirations?

Right now I'm strongly considering staying in academia full-time: after I get my PhD, I'll do a post-doctoral fellowship and then apply to faculty jobs. Companies like Microsoft, IBM, Google, and Facebook are big enough now that they have research divisions that do awesome nextgeneration science, so I'm curious about that scene as well.

Do you have any advice for your fellow COSMOS alumni who are still in high school?

As best as you can, try not to let your COSMOS experience be a one-off encounter with the lab. Get in touch with people at a college nearby to where you live and try to get a project in a lab. Even if it's a small one, you can learn a lot from it, and it will help a lot come time for college applications.

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SARAH URATA UC SAN DEIGO '13 MAJOR : BIOCHEMISTRY & CELL BIOLOGY

UC San Diego COSMOS Alum:

2008, Cluster 3 : Living Oceans and Global Climate Change

How did you decide on your particular

major? I applied to colleges as a (general) biology major with the goal of becoming a marine biologist. I was accepted to UCSD, Revelle College as a general biology major in the Department of Biological Sciences. After taking numerous required chemistry courses, I ended up in a rigorous but wonderful course: organic chemistry. While taking this course series, I fell in love with biochemistry and how chemical interactions can impact structure and function on the biological (cellular) level. It took a lot of encouragement from close friends and family to switch my major at the end of my second year at UCSD. That's how I decided to major in Biochemistry and Cell Biology in the Department of Biological Sciences at UC San Diego!

How did COSMOS help prepare you academically and professionally?

COSMOS helped prepare me both academically and professionally. The work and projects for the cluster required intellect and efforts that are on par with beginning college courses. In addition to the cluster coursework at COSMOS, it is a time when you are away from home and in control of your own time (when to study, when to take breaks, when to go to sleep). I think having experienced both of these helped me transition from high school to college life during the first couple of years. In my view, the most impact professionally is the networking that came out of COSMOS. From peers to RAs to cluster advisors, you are surrounded by bright, brilliant, and ambitious individuals who are also kind and generous. These networking options help open up many professional opportunities.

What are some of your future aspirations?

My future career desires are to work in the biotech industry; this industry moves fast and inspires change in order to continually better the world through science. I also aspire to work with kids one day because it's not enough to invest in the technology of the future; we must also invest in the people of our future.

Do you have any advice for your fellow COSMOS alumni who are still in high school?

Don't be afraid to live out your unique story! It's okay to know what you want and go after it full force. It's also okay to not know exactly what you want to be when you grow up. And it is definitely okay to change your mind as you grow and mature. We are all continually learning more about the world, others, and ourselves. Be confident in your abilities, but never be afraid to ask for help. We live in a connected world with many talented individuals. Something that is difficult for you comes easily for another. In addition, we would like a short academic bio or your work after COSMOS. In the last ten years since participating in COSMOS, I attended UC San Diego for my undergraduate studies as well as a Master's program. I completed my MS in Biology in 2014. Since graduating, I have worked as a part time tutor, part-time church worker, and full time work in a lab at UCSD.

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LUZANNE BATOON

UC San Diego '17 MAJOR : ELECTRICAL ENGINEERING

UC Irvine COSMOS Alum: 2012, Cluster 2: Astrophysics

ACADEMIC BIO: Graduated from UC San Diego with a BS in Electrical Engineering. Was involved in projects with UCSD's IEEE (Institute of Electronic and Electrical Engineers) branch. Halfway through college, Batoon realized she hated her major, but it was too late to switch. She started taking computer science classes and landed a Software Engineering Internship with Amazon and soon after a full-time position after graduation Batoon also served as a COSMOS RA at UC San Diego for two summer.

What have you been up to?

I recently moved to the Bay Area for my career in Software Engineering with Amazon. Outside of work, I try to take hip hop classes and hang out with friends to maintain a healthy work-life balance.

How did you decide your particular

major? In high school, math and physics were my best and favorite subjects. After doing COSMOS, I knew I wanted to pursue something in STEM. I figured engineering had the perfect mix of math and physics. After that I did a lot of Googling to pick my major.

How did COSMOS help prepare you academically and professionally?

COSMOS gave me research project experience that was more substantial than the types of projects we did in high school. I learned better science writing, communication, and presentation techniques.

What are some of your future aspirations?

I hope to work as a Software Engineer for the next couple of years. My ultimate goal is to do a career switch later on and begin working with high school students in some capacity. My dream is to work with low-income/less-privileged students to provide them with resources and give them hands-on STEM experience.

Do you have any advice for your fellow COSMOS alumni who are still in high school?

Getting hands-on technical experience early (in high school or beginning of college) not only looks better on your resume/applications but also gives you the opportunity to decide whether or not you actually like it. It's okay to not know what you want to do. However, it's up to you to make the effort to explore your options and make educated decisions on what major/career to pursue.

alumni TESTIMONIES



ANDREW ANSELL

UC BERKELEY '19 DOUBLE MAJOR : MECHANICAL ENGINEERING & BUSINESS ADMINISTRATION

COSMOS ALUM: 2014

ACADEMIC BIO: Andrew is double majoring in Mechanical Engineering and Business Administration at University of California, Berkeley. He interned at Apple as an Engineering Program Manager on Apple Watch in Summer 2018 and last semester studied abroad at Trinity College Dublin in Ireland. In Summer 2017, he did a mechanical design internship at Tesla.

COSMOS is the reason I decided to study engineering! Before COSMOS, I had minimal exposure to engineering, so I am incredibly grateful for participating in the program and being shown what engineering was at a young age. I also regularly keep in touch with some of my friends from my COSMOS cohort and a few actually interned at Apple during the same time I did. 99

MOMENTUM SPEAKER SERIES @ UC Berkely:



MARK ANSELL

UC BERKELEY '19 DOUBLE MAJOR : MECHANICAL ENGINEERING & BUSINESS ADMINISTRATION

COSMOS ALUM: 2014

ACADEMIC BIO: Mark is double majoring in Mechanical Engineering and Business Administration at University of California, Berkeley. He was a Program Manager Intern at Microsoft Surface in Redmond, Washington (Summer 2018) and an Engineering Project Manager intern at Apple Macintosh in Cupertino, California (Spring & Summer 2017). He was also Invited to be a member of Pi Tau Sigma (international Mechanical Engineering honor society) and co-founded Momentum Speaker Series at UC Berkeley College of Engineering. Finally, Mark studied abroad at Trinity College Dublin in Ireland in Spring 2018.

 COSMOS significantly impacted my decision to study Mechanical Engineering. I grew up in a suburb of Los Angeles and did not have much exposure to engineering before attending COSMOS. The experience opened my eyes to the tremendous impact I could have on the world through engineering, and I am grateful to have had the opportunity to participate.

The Momentum Speaker Series is a TED-style student speaker series designed to help Berkeley Engineering students gain momentum in their career searches and professional lives through advice from their peers. The goal of Momentum is to crowdsource information from peers who have experience in certain fields and make that available and applicable to other students. Each event of the series brings six speakers together and focuses on a common theme that will help the Berkeley Engineering community. More information Click Here: engineering.berkeley.edu/momentum

alumi TESTIMONIES



BERNICE GUDINO

SDHS OF INTERNATIO NAL STUDIES

COSMOS Alum: 2018

BIO: I am a part of many organizations outside school some which are upward bound, Hermanitas/MANA of San Diego, Barrio Logan College Institute, and reality changers

 As a first generation student this program opened my eyes about STEM FIELDS and I felt that I made many friends/connections that are going to help me on the long run, I was also exposed to music and technology and hope to have that as an option when I get into university. Finally, I grew a lot as a person and look forward to strive in the future.



SANTIAGO RODRIGUEZ

HARVEY MUDD COLLEGE **MAJOR:** COMPUTER SCIENCE

COSMOS Alum: 2017 **BIO:** President of Super Smash Bros. Club, 9 day service trip to Haiti, choir camp counselor

COSMOS is what allowed me to identify which major I wanted to choose. I met many friends who changed the way I think about life.



AMMERICA BARRAZA SAUCEDO

JOHN H. FRANCIS POLYTECHNIC HIGH SCHOOL

COSMOS Alum: 2018

BIO: I am president of Magnet Council which aids magnet students academically and socially. I also volunteer in my local community by cleaning up parks and inland costal cleanups.

Being a part of COSMOS, I was able to grow as a person in ways I couldn't imagine. I became more outgoing and less shy. Professionally, I learned about a career I am taking into serious consideration.



ELIZABETH WANG

BROWN UNIVERSITY '21 MAJOR : COMPUTER SCIENCE

COSMOS Alum: 2016

BIO: Interning at a local startup as Technical Liaison, built app coinED at Hack@Brown, Brown Women in CS Mentorship Chair, and Brown Office of Global Engagement Student Ambassador, Undergrad Council of Students

I was first introduced to coding at COSMOS, and my experience solidified my decision to major in CS. I built by first CS project (musical dragon robot) using what I learned in lectures and through previous projects.

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JULIA PICKER CANYON CREST ACADEMY COSMOS Alum: 2018

66 Before COSMOS, I thought of college as a sort of destination. I think a lot of high schoolers (especially from my school) suffer from this same perspective, and it creates a culture of students who work incredibly hard to make it to the prestigious university of their dreams, without much of a thought as to why they want to go there, and why they've chosen to study what they've chosen. For me, COSMOS showed me what my high school, despite having been named the best in California recently, has failed to do. It inspired me to think about why it is I want to study science. It made me think about why I want to go to college. It made me think about what I wish to do with an education in science. It made me think. COSMOS has made me see college as a beginning, as an opportunity to learn, and as a stepping stone in my pursuit of knowledge, and finding myself. COSMOS has made me look to the future with excitement about the impact that I now plan to make.



BIO: Base Isolation Project at COSMOS. Watson Award at COSMOS. Academic Block D at high school. Water Filtration project in Ningxia, China.

MEGAN FANNIN DUBLIN HIGH SCHOOL COSMOS Alum: 2018

66 After the first week of camp, my mindset completely changed. I was surrounded by people who enjoyed STEM like me but were also from different backgrounds, which made for such interesting conversations because the camp was so diverse. I was a part of Cluster 4 which is earthquake engineering, and I will never forget my time in this cluster. I was surrounded by college professors and teaching assistants who wanted me to succeed and helped me every step of the way. From the final project we worked on to the fieldtrips we took to the outdoor shake-table, I realized how interested I was in structural engineering and how fun STEM could truly be. I'm personally a hands-on learner so COSMOS was perfect for me because I was able to build structures and actually see how they reacted during earthquakes. The most important thing that I gained from COSMOS however was personal confidence and leadership skills. My professors truly helped me grow and taught me I am capable of so much and that I should not be afraid to work for what I want. I can really see the change and growth that I experienced in 1 month of COSMOS transferred to my everyday life at school. Without this experience I would not have the passion, confidence, or life-long friends that have had such a huge impact on my life. I'm so thankful for every moment I had at camp and it was truly an unforgettable summer! 99

SAMANTHA LEON

SANTA ANA HIGH SCHOOL

COSMOS Alum: 2018

66 COSMOS personally impacted me because it helped me be more open and it helped me get out of my comfort zone because it had us socializing with the other COSMOS students. 99

AARON LEE

ALISO MIGUEL HIGH COSMOS Alum: 2018

BIO: President of Math Olympiad and Second Harvest Food Bank Club. I also perform piano for seniors at local senior homes and Mission Hospital.

66 I learned how to convey scientific principles to others while working in group projects and experienced college life. Personally I enjoyed the field trips the most, especially to Glider Port. 99

SUSHOVAN PYNA

TROY HIGH SCHOOL

COSMOS Alum: 2018

 It gave me lots of background and the ways I can contribute to industry and society.

alumni IN COLLEGE



Jesus Estrada Williams College Mathematics



Esmeralda Lugo Yale University Chemical Engineering



Arsh Mehta UC San Diego Structural Engineering



Kaitlyn Gunadhi UC Berkeley Computer Science



Joy Suh UC Berkeley Public Health



Andy Cai UC Los Angeles Electrical Engineering



Vaishnavi Dornadula UC Santa Cruz **Robotics Engineering**





Annie Ma University of Michigan Undecided



Rohith Kodukula UC Los Angeles Mathematics & **Economics**

Audrea Huang

Wellesley College Computer Science &

Mathematics

Jennifer Drew-Bear University of South Florida Cell & Molecular Biology



Saehui Hwang CalTech Electrical Engineering & Computer Science



Jaeyoung Choi UC Berkeley Mechanical Engineering



Andrew Lenz **UC Berkeley** Bioengineering



Victoria Liu UC Los Angeles Psychobiology & Cognitive Science Minor



Hadley Klein Cal Poly San Luis Obispo Environment Management & Protection

alumni IN COLLEGE



Ingrid Ren Gap Year AmeriCorps NCCC- 10 month Brown University (Fall '19)



Ken Tanaka Yale University Global Affairs & Economics



Alina Luk UC San Dlego Pharmacological Chemistry



Tiana Thich UC Berkeley Molecular & Cell Biology



Anysia Deák UC Santa Cruz Astrophysics



Julianne Bartz UC Berkeley Molecular & Cell Biology



Sabrina Tian University of Pennsylvania Undecided



COSMOS STUDENT AMBASSADOR PROGRAM

If you are interested in holding a meeting at your school to share your experience, please fill out our 2019 Ambassador form and we will provide you with an Informational Packet.

AMBASSADOR SIGN-UPS https://goo.gl/forms/aXBQsqyomCPfQbtu2

If you would just like some information for your school, email us at cosmos@ucsd.edu for the 2019 flyers & information.







In Loving Memory of Jennifer Dutton



Jennifer (Jen) Dutton served as a COSMOS RA for Summer 2017. She was in charge of Cluster 1: Computers in Everyday Life and Suite 400. Jen, only 23, passed away from fighting a courageous battle with a rare immunodeficiency called HLH. She touched so many lives with her warm and cheerful presence and she will be greatly missed. We would like to dedicated this newsletter in her memory.

A U U Meny

Sign up to receive quarterly newsletters and be featured in the next issue. Send us your photos, accomplishments, or stories for the next issue!

https://goo.gl/forms/HT7DmAqYhyr p5zxK2

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