

Jesse Cisneros Solis

University of Michigan, Ann Arbor (323) 320-0499
500 S. State Street jeci@umich.edu
Ann Arbor, MI 48109 jcisner6@gmail.com

RESEARCH INTERESTS I am interested in applying my physics knowledge to complex biological systems. Using an interdisciplinary approach, I would explore and understand fundamental processes in biology to improve the ability for scientists to develop new techniques for diagnosing and curing diseases.

EDUCATION

JUN 2024 Ph.D. Biophysics, University of Michigan, Ann Arbor
JUL 2019 Postbaccalaureate Research Education Program (PREP), University of Michigan, Ann Arbor
JUN 2018 B.S. Physics, University of California at Santa Cruz (UCSC)
DEC 2015 A.S. Physical Sciences, El Camino College
DEC 2015 A.S. Mathematics, El Camino College

RESEARCH EXPERIENCE

JUN 2018 - PRESENT PREP, University of Michigan, Ann Arbor
As a PREP scholar, I am fully fund for one year of research experience as well as gain career and professional development. During my time in PREP, I joined the Yang Lab. The lab focus in biochemical oscillations and self-organization in early embryo development. Currently, I am working on an Image Processing project using MATLAB to automate the cell segmentation and cell tracking. This will provide a tool to analyze data much more efficiently. I am also working closely with a biologist in the lab to develop a mathematical model of coupled biochemical oscillators in zebrafish somitogenesis.
Advisor: Dr. Qiong Yang; Department of Biophysics

JUN 2016 - JUN 2018 UC LEADS, University of California, Santa Cruz
In the Kubby lab, we were using adaptive optics microscopy to provide excellent spatial and temporal resolution, allowing us to image the calcium dynamics of neurons at a biologically interesting depth within an intact organism. We were investigating brain wave synchronization or phase-locking in the *Drosophila melanogaster* (fruit fly). Transgenic flies with the calcium-indicator labeling (GcAMP or RcAMP) in the mushroom body will allow us to image the activity of individual neurons. Two-photon and Three-photon laser microscopy with adaptive optics will enable high-resolution structural and functional imaging of the mushroom bodies, structures that play a role in insect learning and memory. We have already developed a robust method for visualizing the baseline fluorescence signal in our GAL4 line. I learned and did all the husbandry and maintenance of *Drosophila* stock as well as performed all the crosses suitable for the experiments. I also prepare dissection and mounting of imaging samples and helped analyze data in order to suggest an improvement to the microscope.
Advisor: Dr. Joel Kubby; Department of Electrical Engineering

JUL 2017 - SEPT 2017 SPUR UC LEADS REU, University of California, Los Angeles
The Wong Lab focuses on understanding the early stages of biofilm formation. My project was to determine the effects of the stator complexes in flagellar motility of bacterium. These complexes are implicated in repression or stimulation of swarming which is important in the early stages of biofilm formation. Flow-cell experiments and fast frame imaging were conducted using *Pseudomonas aeruginosa* PA14 strains wild type as well as MotAB and MotCD related mutants in order to observe the hydrodynamic effects of the bacterium. I analyzed complex 3D hydrodynamic trajectories of single cells and compared computational reconstructions with detailed hydrodynamic calculations from the experimental data using image processing tools in MATLAB. By understanding biofilm formation, it will allow for the development of removal and prevention techniques. While in the lab, I was able to learn basics wet lab techniques as well as how to culture bacteria.
Advisors: Dr. Gerard Wong; Department of Bioengineering

Electrodynamics I and II	Classical Mechanics
Mathematical Methods I, II, and III	Fluid Mechanics
Biophysics	Cell and Molecular Biology
Development and Physiology of Organisms	Genetics

WORK EXPERIENCE

JAN 2018 - JUN 2018 **Tutor:** STEM Diversity Programs; UC Santa Cruz, Santa Cruz, CA
Tutored a course on Calculus which covered topic in derivative, double and triple integrals, and its applications. I also tutored a course on Introductory Physics which cover topics in geometric optics, fluids, thermodynamics, and waves. Focused on a strong interactive experience; in order for students to develop the ability to visualize and understand problems. Hours: 3 hrs/week

AUG 2014 - MAY 2015 **Physics Grader:** El Camino College, Torrance, CA
Grading physics homework and providing constructive feed back to students. Graded for physics courses: Introductory to Physics, Mechanics of Solid (Calculus Based), and Fluids, Heat, Sound. Hours: 10 hrs/week

JAN 2012 - JAN 2013 **Corps Member:** Los Angeles Conservation Corps, The Sea Lab, Redondo Beach, CA
Responsible to learn and teach about marine biology and conservation to students pre-k to college level. I would also teach on their outreach programs in the community. Hours: 40 hrs/week

PROFESSIONAL MEMBERSHIP

AUG 2018-Present Member: Society for the Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) Student Chapter; University of Michigan, Ann Arbor

SEPT 2017- JUNE 2018 **Vice-President:** Society for the Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) Student Chapter; University of California, Santa Cruz

MAY 2016-JUNE 2018 Member: STEM Diversity Member; University of California, Santa Cruz

MAY 2016- JUNE 2018 **Scholar:** University of California Leadership Excellence through Advance Degrees (UC LEADS), University of California, Santa Cruz

SEPT 2015- JUNE 2018 Member: Society for the Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) Student Chapter; University of California, Santa Cruz

AUG 2014-MAY 2015 **President:** Society for the Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) Student Chapter; El Camino College

AUG 2013-MAY 2015 Member: TRIO Student Support Services for STEM Program; El Camino College

APR 2009-MAY 2015 Member: Mathematics, Engineering, and Science Achievement (MESA); El Camino College

EXTRA-CURRICULAR ACTIVITIES

OCT 5, 2018 **Scientist Spotlight;** Michigan, Ann Arbor
The event was an opportunity from the University of Michigan scientist to demonstrate to the public some of the cutting-edge science they perform. By taking zebrafish, showing video of embryo development, and demonstrating Briggs-Rauscher reaction, we were able to explain why and how the Yang Lab studies biochemical oscillation in early embryo development.

OCT 5, 2018 **1st Annual SACNAS Sault Tribe Science Spotlight;** Michigan, Ann Arbor
Led booth were we share resource and our experience as a scientist to young children. Using a bingo game, I introduced many fields of science that the they may not have been expose to as well as field of science that were represented throughout the event.

APR 11, 2018 **El Camino College Outreach;** UC Santa Cruz, Santa Cruz, CA
My community college came to UCSC as part of their Northern California Tour. During the tour, students from El Camino College visited many universities in the Northern California area. I was invited by a mentor/advisor at El Camino College to share my experience as a transfer student during their visit.

APR 6, 2018 STEM Transfer Day; UC Santa Cruz, Santa Cruz, CA

Voluntary to be part of a transfer student panel in an event hosted by STEM Diversity Programs at UCSC. The event hosted students, staff, and parents from community colleges all over California. As a panelist, I was asked to share my experience as a transfer student and an undergraduate researcher.

APR 6, 2017 Genentech Tour; San Francisco, CA

With the help of the profession SACNAS chapter at Genentech, we were able to organize a tour of the Genentech campus in South San Francisco. We were able to expose our members in the UCSC SACNAS chapter to the career opportunity that Genentech has to offer. It also provided a network opportunity with researcher in the biotech industry. Three member were accepted to be interns at Genentech that summer.

NOV 17, 2017 STEM Transfer Day; UC Santa Cruz, Santa Cruz, CA

Voluntary to be part of a transfer student panel in an event hosted by STEM Diversity Programs at UCSC. The event hosted students, staff, and parents from community colleges all over California. As a panelist, I was asked to share my experience as a transfer student and an undergraduate researcher.

APR 21, 2017 San Jose City College SACNAS Student Panel; UC Santa Cruz, Santa Cruz, CA

UCSC SACNAS student chapter hosted the San Jose City College SACNAS student chapter. As a panelist, I shared my experience and resource that would be helpful for students to know as they start making the transition from a community college to a 4-year university.

APR 12, 2017 El Camino College Outreach; UC Santa Cruz, Santa Cruz, CA

My community college came to UCSC as part of their Northern California Tour. During the tour, students from El Camino College visited many universities in the Northern California area. I was invited by a mentor/advisor at El Camino College to share my experience as a transfer student during their visit.

APR 7, 2017 STEM Transfer Day; UC Santa Cruz, Santa Cruz, CA

Voluntary to be part of a transfer student panel in an event hosted by STEM Diversity Programs at UCSC. The event hosted students, staff, and parents from community colleges all over California. I gave tour of my research laboratory at UCSC. I presented the research the I was working on at the time and demonstrated the equipment that is used for the experiments.

MAR 27 - APR 4, 2017 STEM Diversity Interviews; UC Santa Cruz, Santa Cruz, CA

Participated in interviewing student for the new cohort in the STEM Diversity Programs

NOV 2, 2016 Delta High School Outreach; Santa Cruz, CA

As part of the UCSC SACNAS student chapter, I volunteered in a event were I went to Delta High School and presented the research that I was conducting at UCSC.

APR 15, 2016 Scientist Beyond Borders; Santa Cruz, CA

As part of the UCSC SACNAS student chapter we participated in an event at the Museum of Art and History. During the event, I assist the young children with a Strawberry DNA Extraction Experiment. Through the different demonstrations, the goal is to change the public perception of science.

FEB 28, 2015 Gardena High School STEM Outreach; Gardena, CA

As president of SACNAS Student Chapter at El Camino College, I helped organize an outreach event at Gardena High School. Through the coordination with all the STEM clubs at El Camino College, we were able to setup demonstrations that represent various STEM fields: Computer science, chemistry, biology, and physics. High school students were engaged and we shared our experiences as we pursue

these fields of study.

OCT 19, 2013 National Chemistry Week; Los Angeles, CA

Along the theme of Chemistry Week that year's, "Energy: Now and Forever!", we setup an interactive experiment at The California Science Center that the general public can use to learn about some of the different forms energy: chemical, mechanical, gravitational, and electrical energy. Through the experiment, we demonstrated how energy can be converted to turn on a light bulb. I helped to explain what is going on in every step of the demo. Also answer any questions that people may have about energy.