

Students Transitioning to Engaged and Motivated Success

We had a successful third year of our STEM Discovery Academy in Summer 2019. A total of 47 incoming students (29 Freshmen and 18 Transfer) participated in our SDA Session 1 and Session 2. Our students became more familiar with our campus, developed a relationship with faculty and connected with other

STEM major students. The STEM Success staff, 8 student peer mentors and 20 faculty from College of Science worked hard to ensure our students were able to have an educational and exciting STEM Discovery Academy experience. We are so proud of each and every one of our SDA students and are confident they will continue to thrive in their respective STEM majors here at Stanislaus State.



Students race their rafts during our boat building activity



Students programming and interacting with Cozmo robots during our Computer Science activity

[More about SDA on back page]

“SDA helped me to not feel so lost and helped get me excited about my 1st day of college”

- **Moira Mendoza, Biology** | Freshman



“SDA helped me get to know campus better and be more comfortable with faculty”

- **Alex Labra, Computer Science** | Transfer



A Message from Dean Evans From the College of Science

For over eight year the STEM Success program is a signature support program for students in the College of Science. This program engages historically underserved students with year round support to persist and success in some of the most challenging majors in the university. Faculty and staff collaborate to help students become immersed

in their disciplines, understand the requirements of their majors, and transfer seamlessly to Stan State. Community college faculty and counselors are critical partners in these efforts, and we appreciate their participation and collaboration.

- Dr. David G. Evans

WOW 2 STEM

Warriors on the Way to STEM (WOW 2 STEM) is the transfer component of STEM Success Grant. Stanislaus State is seeking to expand and improve transfer articulation practices across top 10 regional feeder community colleges to promote STEM transfer pathways.

WOW 2 STEM Peer Mentors

We have two amazing WOW 2 STEM Peer Mentors, Ruben (Physics Major) and Paola (Biology Major), that assist our Transfer Specialist with outreach and student mentoring needs. They also help out with our STEM Discovery Academy in the summer. If you see their friendly faces around campus, we hope you'll wave and say "hello".

"My experience as a WOW 2 STEM Peer Mentor has been so rewarding! I really enjoy connecting with fellow students and discussing career ambitions. In addition, I also enjoy giving advice to students within my majors as well. Being a Peer Mentor has also helped me academically by realizing that a Peer Mentor is also a role model for other students. . ."

- Ruben Hernandez, *Physics* | Senior

". . .I've come to learn and know-how community colleges, its staff, faculty, advisors, and articulators work to ensure educational quality and satisfactory transferring requirements are met." - Paola Pelayo, *Biology* | Junior



Meet Our Transfer Specialist

Elizabeth Monroe is a central valley native with a passion for helping students navigate higher education. As a transfer student herself, Elizabeth understands the unique challenges faced by our valley students. She began her educational journey at Modesto Junior College and went on to receive a Bachelor's Degree in Psychology from UC Santa Barbara. She then attended CSU Stanislaus to earn a Pupil Personnel Services Credential. If you are a transfer student in the Biology, Chemistry, Computer Science, Geology, Math, or Physics majors, please feel free to reach out to Elizabeth to explore the exciting opportunities and services we offer through the STEM Success Program.



Contact our Transfer Specialist to schedule an appointment: emonroe@csustan.edu.

The Commons & STEM Collaboratory

The Commons is a resource center and study space for students. Students can use the tables and whiteboards for study sessions and group work. It also contains a wide variety of STEM textbooks and professional and academic exam preparation materials such as GRE, MCAT, etc. that are available for students to use. The Commons is located in Naraghi Hall room 124.



STEM Collaboratory provides an environment to support collaboration and cooperation among STEM students and faculty in pursuit of STEM education and research through interaction, communication, and knowledge-sharing. Students

are welcome to use the tables, chairs and whiteboard for study sessions and group work. The STEM Collaboratory space is located on the first floor of Naraghi Hall outside of the Commons (Naraghi Hall room 124).



Say Hello...



Mauricio Miranda
Computer Science | Senior

Mauricio is our STEM Success Peer Mentor and will be available as a resource for STEM students interested in learning more about navigating campus resources and learning about study strategies. He is available in the Commons (Naraghi Hall room 124) on Mondays and Wednesdays from 11:45am-1:45am and on Fridays from 3:15pm to 5:15pm.

RISE Research



Various faculty at Stan State coordinate research projects that our STEM students are able to participate in as well. The research lab of Dr. Andrew Gardner in Biology is working on questions about the evolution of plants and plant communities in California and beyond. The team's work involves several interrelated projects that connect plant collection in the field, herbarium curation and data management, DNA sequencing, phylogenetic analysis, and niche modeling. Dr. Gardner also has ongoing projects related to morphological evolution in a South American group of succulents (*Oxalis*) and floral shape evolution among Australian wildflowers (*Goodeniaceae*). Dr. Gardner's research team is enthusiastic about outreach, as well as research, and works diligently to share its work with the public as well as with the botanical community.



Dr. Andrew Gardner
Biology Faculty

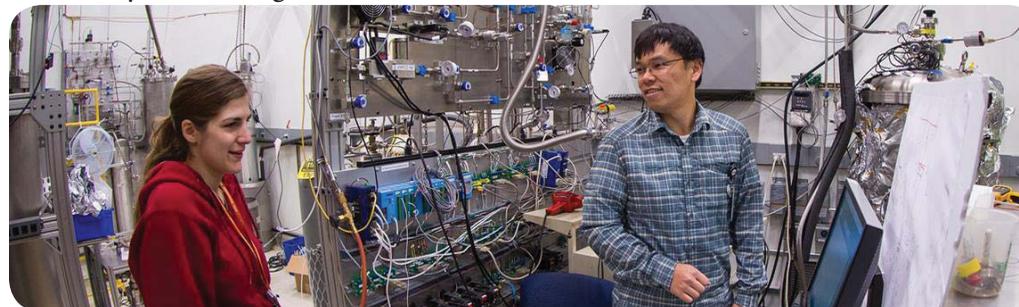
Research with Dr. Scales

Dragonflies are among the most successful flying animals and are known for their incredibly acrobatic flight capabilities. One characteristic that helps determine flight abilities in these insects is wing shape, which in turn, is influenced by behavior. Therefore, I am examining the relationship between behavior and wing morphology of dragonflies in California. By exploring the wing morphology-behavior relationship, we can further understand the evolution of variation in the flight performance of these acrobatic fliers. – Eric Andrade RISE Research Associate



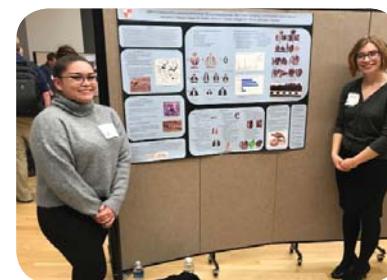
Research with Dr. To and Dr. Ignarra

Science has brought humankind an understanding of atoms through chemistry, life through biology and the cosmos through astronomy. Surprisingly, all of sciences so far only brought us the knowledge of only ~ 15% of the matter (stuff we're made of) of the Universe. The other 85% remains a mystery known as Dark Matter. The LUX and LZ experiments are collaborations of scientists from all over the world who aim to understand Dark Matter using the most sensitivity detectors and



Research with Dr. Alemán

In our group, we investigate the photophysical and electrochemical properties of corrole molecules and how solvent molecules can influence the ability of this molecule to capture light and mimic photosynthesis. A detailed understanding of the photophysical, electrochemical and spectroelectrochemical properties of these molecules is important in order to use porphyrins and corroles in molecular, electronic and photonic devices. We also perform calculations and molecular modeling analysis to identify possible sites where solvent molecules can interact with corrole and to predict the formation of tautomeric forms. We compare molecular orbital energies and electrostatic potential energy surfaces with several conformational properties of the macromolecule and the photophysical properties obtained in the laboratory. A proper understanding of corroles interaction with solvents and how they affect corroles light absorbing-emitting capabilities are necessary to develop potential uses of corrole in artificial photosynthetic devices, petroleum explorations, cancer diagnosis, and tumor treatment.



The research students in the Sankey Paleobiology Research Lab are currently working on the dinosaurs and other vertebrate fossils from the latest Cretaceous of North Dakota. This is from right before the mass extinction that wiped out the dinosaurs 66 million years ago. In this photo, the students (Amanda Chavez and Abigail Dalton) are presenting their scientific poster at the Western Association of Vertebrate Paleontology annual conference at the University of Oregon last spring. Their big discovery is the first (indirect) evidence of nesting dinosaurs in this area.

Research with Dr. Sankey

sophisticated data analysis techniques. Our group at Stanislaus State participate in both of these collaborations by working on experimental techniques and developing software to improve our chance detect Dark Matter.

Dr. To and Dr. Ignarra working on the Krypton Removal System for the LZ experiment at SLAC National Laboratory funded by Department of Energy and Stanford University.

Research with Dr. Youngblom

Our lab is trying to determine the types and sizes of mutations that can be produced in E. coli plasmids using CRISPR. We (and many others) have shown that CRISPR can reliably mutate the E. coli chromosome; but CRISPR effects on plasmids have not been documented. We have constructed a plasmid that directs CRISPR to sever another plasmid. However, with the addition of a short, single-stranded DNA fragment with similarity that overlaps the target region, severed plasmids are rescued (repaired) while simultaneously being mutated.



Research with Dr. Cooper

Dr. Cooper recruits new RISE students each year to join her research group. Lab members conduct independent or collaborative scientific research projects in evolutionary biology, using the California ground squirrel as a model. Dr. Cooper's



research team employs combined ecological, behavioral, microbiological and molecular approaches to address a very broad question: "How do mammals adapt to human-altered landscapes?" RISE students can expect to gain experience in trapping and handling live squirrels, and they will develop skills in data collection, analysis and interpretation.



"My experience in the STEM Rise Program has been one of the best here at Stan State. Since participating in the RISE program, I have been given the opportunity to do paid research with my mentor Dr. Alemán, attended nine conferences/symposiums and gained confidence in my ability to continue as chemistry major. I definitely am grateful and appreciative of the program for supporting me and opening many more doors for me and my future."

- Aliz Leon, *Chemistry | Senior*

I was born in Mexico City, 64 years ago, and spent my happy childhood in Monterey (northern Mexico) and Mexico City. In 1978, I came to California, to Stanford University, where I got a Master in Science degree (1980), and a PhD degree (1984) in Applied Earth Science. Shortly thereafter I obtained my licenses as a Professional Geologist and a Certified Engineering Geologist in California, and started building a broad portfolio of professional geologic, geotechnical, hydrogeologic, and environmental experience. For the last 20 years, then, I have led the Applied Geology concentration of the CSU Stanislaus Geology program. My role is to provide our students with the preparation they need to succeed in the professional practice of geology, so I teach courses in Hydrogeology, Geophysical Exploration, Environmental Geology, Geochemistry, and Applied Geology.



Dr. Horacio Ferriz
WOW 2 STEM Faculty

I have chosen to remain active in professional practice as my way to remain fresh and up to date, contribute to the body of knowledge of my profession, convey to the students the applicability of what they study, and help them find jobs. I write dozens of professional reports and professional opinions in the course of a year (I am the Stanislaus County Geologist), and in this way considerably influence public decisions in the areas of environmental protection, management of water resources, and construction of civil works.

SUMMIT



The STEM Success Summit is designed to initiate a joint effort within key stakeholders from CSU Stanislaus and community colleges to explore how to improve STEM transfer student success and seamless transitions from community colleges to CSU Stanislaus. The 2019 STEM Success Summit will be taking

place on October 12, 2019 at Stanislaus State.

STEM Discovery Academy

The STEM Discovery Academy is a program that combines a residential summer academy (dormitory living, 7 days a week, free room and board) for incoming freshmen with a non-residential summer academy (commuters, meals provided) for incoming transfers from community colleges. If you attend SDA, you will share learning experiences with other students, engage with faculty, receive peer support, and be immersed in several STEM disciplines. This is a great opportunity for students to become familiar with our STEM faculty and discuss undergraduate research opportunities in the various STEM disciplines.



SDA participants on a trail in Calaveras Big Trees State Park



Student examining freshwater invertebrates in the lab



Students testing their saliva during our Genetics lab

A message from the Director, Iqbal Atwal:

The STEM Success program provides year-round programming dedicated to improving retention, persistence, and graduation of undergraduates in math and science disciplines at Stanislaus State. We have a great team of faculty and staff who are highly committed to helping our Hispanic/underserved and low-income students engage and succeed in STEM!



Stanislaus State is located in the heart of the Central Valley at the half-way point between Sacramento and Fresno



CONTACT US!

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www.csustan.edu/stem-grant

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