FOOTHILL COLLEGE
SCIENCE LEARNING INSTITUTE

SLI STEM Internships Summer 2024: Project Catalog

CHECK BACK PERIODICALLY BECAUSE THIS DOCUMENT MAY BE EDITED (PROJECT WILL BE ADDED AND THERE MAY BE EDITS TO EXISTING PROJECTS).
We will make note of edits here and on the SLI internship website.

Updated Friday, 4/19/24

- *Added project **38: R&D Intern with Validation Teams at Rambus Inc.***
- *Added project **39: Marketing initiatives for demand generation and funnel management at Rambus Inc.***

Updated Tuesday, 4/9/24

- *Added project **36: Development of a microfluidic platform for high throughput genomic analysis at Standard BioTools***
- *Added project **37: Frontend, Backend, or Data Analyst Intern at CCPathways***

The following are the possible internship projects you will be working on this summer if selected. In your application, you will be asked to mark all that you are interested in. You may select no more than 5 to apply to.

There are two parts of this catalog:

- **Quick Links Table of Contents** – contains key information about each project. Click on the hyperlink to go to the full description below.
- **Project Full Descriptions** – read each project's full description to make sure this is a project you are interested in. In your application, you will want to explain your interest in each of your selected projects.

You will see that some projects are listed multiple times because they are interdisciplinary or cross disciplinary.

Read through each description carefully to see if

1) You have the skills that the mentor/ supervisor is asking for.
2) You have an interest in the project.
3) The modality works for you – several of these are in-person, either fully or partially. You will need to provide your own transportation to the institution and some have parking fees.
4) Use this as a guide as you fill out the application. READ IN FULL DETAIL!

If you have any questions, please reach out to the SLI Director, Sophia Kim at kimsophia@fhda.edu or Amanda Carbajal at acarbaj3@gmail.com We may be able to provide support with the application process. Find out more at the website: https://foothill.edu/sli/internships/summer.html

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QUICK LINKS TABLE OF CONTENTS

BE SURE TO REVIEW THE FULL DESCRIPTION BELOW THIS TABLE OF CONTENTS!
****Some projects are cross-disciplinary and may appear under multiple disciplines***

BIOLOGY/CHEMISTRY

Project Title	Keywords	Required Skills	Modality	Institution/ Company
1. Feeling salty: discovering how San Francisco flies have evolved to live in extreme environments	**Biology**	Strong candidates will have an introductory understanding (and enthusiasm!) of genetics and evolutionary biology. Previous experience in a basic molecular biology lab (e.g. Biology Lab Course) and fundamental skills such as pipetting and sterile technique are preferred. All students studying brine flies are expected to spend ~1 day/week in the field (around the Bay Area, usually a drive <2 hours) assisting in specimen collections.	Fully in-person/ Mostly hands-on/ in-lab experience	Stanford University, Department of Biology
2. Evolution of pigment patterns in swordtail fish	**Biology**	Interest in evolution, behavior, or fish is the only requirement. Some background in biology—particularly evolution and genetics—is useful, but willingness to learn and ask questions is more important.	Fully in-person/Mostly on the computer/computational research/ Mostly literature search, background research in-lab experience	Stanford University, Department of Biology
3. Invasive plant success in a changing climate	**Biology**	An ideal student researcher for these projects will have enthusiasm for learning new things, be reliable, detail-oriented, well-organized, have good communication skills, and will be comfortable working outdoors, including in adverse weather conditions typical of California. This project is well-suited to beginning researchers and no prior experience is necessary, though experience with plant identification, data management and analysis, or basic machine shop skills may be beneficial.	Mostly hands-on, in-lab experience/The work is mostly hands-on, including work in the lab/ at an outdoor experiment, and at local field sites	Carnegie Institution for Science, Department of Global Ecology
4. Building PDBCleanV2, a Python library to curate molecular structures	**Biology, Chemistry, Computer Science, Data Science**	Basic knowledge of Python (completion of CS 3A) and general chemistry/ biochemistry (completion of Chem 1A) is preferred but not required. It would be good to have some comfort using the terminal (Unix/Linux systems). But also, if this project excites you, you don't have the exact courses, but you have a desire to learn more, then select this project!	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, Mostly literature search, background research computational research	Stanford University, Department of Structural Biology
5. Discover the world of digital infrastructure and understand how the internet works behind the scenes	**Biology, Chemistry, Computer Science, Data Science, Engineering, Mathematics, Physics, STEM Education/ Empowerment**	Good hands on ability and the willingness, enthusiasm and passion to learn.	Fully in-person	Evocative-Marketing
6. Utilizing Machine Learning to Create Non-Invasive	**Biology, Chemistry, Computer Science, Data**	Ideally the student has taken at least one quarter or equivalent of computer science in python, ideally used colab before for classes or fun.	Fully in-person/ Mostly on the computer, computational research, Mostly	Stanford University, Department of

Biopsy for Early Detection of Cancer	**Science, Engineering, Medicine, Physics**	Students should have an interest in learning machine learning models.	literature search, background research, Mostly hands-on, in-lab experience	Structural Biology
7. Oligopeptide Models of Biological Protein Action	**Biology, Chemistry, Engineering, STEM Education/ Empowerment**	Mostly biology/chemistry basic skills: pipetting, preparing solutions, measuring pH, handling small items (glass capillaries, cover slides). Good vision, hand dexterity. Good to have, but we can train: calculate molarity, make dilutions, use a balance to weigh.	Fully in- person, Mostly hands-on, in-lab experience	Stanford University, Department of Chemistry
8. Biochemistry and structural biology of human chromosomes	**Biology, Chemistry, Medicine**	Should have taken a biology or chemistry lab class. Prefer if you have skills in pipetting, preparing solutions, sterile technique (cell culture), understanding of basic units in chemistry (e.g., mole, gram, liter, molar, pH)	Fully in- person, Mostly hands-on, in-lab experience	Stanford University, Department of Structural Biology
9. Investigation for Protein Stabilizing Compounds in Liquid and Hydrogel Solutions at Intact Therapeutics	**Biology, Chemistry, Medicine, Biotech, cell culture**	At least one quarter of Biology and/or Chemistry with Lab Required. Student should have a basic understanding of lab safety and how to document experiments. Basic data analysis/visualization using spreadsheets is helpful as well.	Hybrid - remote/ online with some in-person opportunities/ Mostly hands-on, in-lab experience	Intact Therapeutics/ UCSF Rosenman Institute
10. Developing tools to purify polluted waters using structural biology	**Biology, Chemistry, Public Health**	Interest in biology related fields (biochemistry, structural biology, microbiology) is sufficient.	This work is mostly in-person, but data-processing, literature reading, and meetings can be done virtually/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Biology
11. Behavior of Social Caterpillars	**Biology, Computer Science, Mathematics, Physics**	Willingness to learn computational skills, read scientific papers, and search for caterpillars in trails!	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Applied Physics
12. Research assistant for study on the impacts of salmon aquaculture in Newfoundland, Canada	**Biology, Ecology**	Basic biology/ ecology knowledge is helpful though not required. Intern must be able to commit to one in-person meeting per week with 3-5 additional in-person days for fieldwork. Otherwise, work hours and location are flexible. Desirable skills include being well-organized and having good communication skills, everything else can be learned! Fieldwork will be accessible for all abilities and no previous	Hybrid - remote/ online with some in-person opportunities/ Mostly literature search, background research, Fieldwork (no previous experience required), graphic design (optional)	Carnegie Science, Stanford, Department of Global Ecology

		experience is need. Gear and safety resources will be provided. Additional opportunities to explore science communication if that is of interest!		
13. Study of Viral Glycoproteins for Vaccine Discovery	**Biology, Medicine**	Coursework in biology and chemistry not required, but some basic biochemistry and molecular biology knowledge can be helpful, and we can teach them what they do not know.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University, School of Medicine
14. Isolation of Extracellular vesicles from Mesenchymal stem cells	**Biology, Medicine**	Proficiency in basic laboratory techniques, including pipetting, centrifugation, and sample preparation. Ability to follow laboratory protocols and safety guidelines. Knowledge of cell culture principles and practices, including cell maintenance, passaging, and sterility (preferred). Strong written and verbal communication skills for documenting experimental procedures, results, and conclusions. Ability to effectively communicate with team members and present findings in meetings or presentations.	Fully in person/ Mostly hands-on, in-lab experience	Stanford University, Department of Radiology
15. Improving paired immunotherapies through T cell genome engineering	**Biology, Medicine**	Students should be motivated and excited to conduct research in the lab. Students will be expected to have good communication skills and work well as part of a team. Although no prior lab experience is required, knowing the basics, like using a micropipette or being familiar with lab equipment such as centrifuges and laminal flow cabinets, will greatly accelerate the progress of the project and is a plus. An understanding of molecular biology fundamentals would be helpful, as well as some familiarity with cancer immunotherapy.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University-Stanford Cancer Institute
16. Designing High-Energy-Density Zinc Batteries	**Chemistry**	This project will require 1 quarter of general chemistry or some background in electrochemistry – this is a plus but not necessary.	Fully in-person/ Mostly literature search, background research, Mostly hands-on, in-lab experience	University of California Santa Cruz, Department of Chemistry
17. Preventing rust while heating rare extraterrestrial materials to understand their magnetic properties	**Chemistry, Computer Science, Engineering, Physics, Geological science; geology; geophysics; planetary science**	Necessary coursework is 1 quarter of electromagnetism (Physics 2B or 4B – this can be in progress spring 2024) Preference will be given to applicants with a demonstrated interest and even some experience in geological or planetary sciences.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University, Department of Geophysics
18. Broadening Accessibility & Training To Emerging Researchers for	**Chemistry, Engineering**	Prospective Interns should have completed their coursework in General Chemistry (Chem 1 series) with lab. Overall, curiosity and a desire to get in	Fully in-person/ Mostly hands-on, in-lab experience	San Jose State University, Chemistry

Innovative Energy Storage (BATTERIES)		the lab and gain experience conducting research are the key prerequisites. Strong preference will be for students transferring to SJSU in fall 2024, studying chemistry, biology, or chemical engineering. You will also need to have a social security number for student employment, this includes for undocumented and international students		
19. Process engineer assistant in a semiconductor company	**Chemistry, Engineering, Physics, STEM Education/ Empowerment**	Awareness of lab safety and basic computer proficiency. Coursework in chemistry or physics will be helpful but not necessary. Just a desire to learn more about how computer chips are made.	Fully in-person/ Mostly hands-on, in-lab experience	EMD Electronics - Operations
36. Development of a microfluidic platform for high throughput genomic analysis	**Biology**	At least one quarter of introductory biology or equivalent. At least one quarter of science with a lab is preferred.	Fully in-person, Mostly hands-on, in-lab experience	Standard BioTools: Research and Development

COMPUTER SCIENCE/ DATA SCIENCE				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**
4. Building PDBCleanV2, a Python library to curate molecular structures	**Biology, Chemistry, Computer Science, Data Science**	Basic knowledge of Python (completion of CS 3A) and general chemistry/ biochemistry (completion of Chem 1A) is preferred but not required. It would be good to have some comfort using the terminal (Unix/Linux systems). But also, if this project excites you, you don't have the exact courses, but you have a desire to learn more, then select this project!	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, Mostly literature search, background research computational research	Stanford University, Department of Structural Biology
5. Discover the world of digital infrastructure and understand how the internet works behind the scenes	**Biology, Chemistry, Computer Science, Data Science, Engineering, Mathematics, Physics, STEM Education/ Empowerment**	Good hands on ability and the willingness, enthusiasm and passion to learn.	Fully in-person	Evocative-Marketing
6. Utilizing Machine Learning to Create Non-Invasive Biopsy for Early Detection of Cancer	**Biology, Chemistry, Computer Science, Data Science, Engineering, Medicine, Physics**	Ideally the student has taken at least one quarter or equivalent of computer science in python, ideally used colab before for classes or fun. Students should have an interest in learning machine learning models.	Fully in-person/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Structural Biology
11. Behavior of Social Caterpillars	**Biology, Computer Science, Mathematics, Physics**	Willingness to learn computational skills, read scientific papers, and search for caterpillars in trails!	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, computational research,	Stanford University, Department of Applied Physics

			Mostly literature search, background research, Mostly hands-on, in-lab experience	
17. Preventing rust while heating rare extraterrestrial materials to understand their magnetic properties	**Chemistry, Computer Science, Engineering, Physics, Geological science; geology; geophysics; planetary science**	Necessary coursework is 1 quarter of electromagnetism (Physics 2B or 4B – this can be in progress spring 2024) Preference will be given to applicants with a demonstrated interest and even some experience in geological or planetary sciences.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University, Department of Geophysics
20. Towards reliable and explainable visual assistance using data science	**Computer Science, Engineering**	At least one course or background in python preferred but not required (you will be given some training materials for self-study if no coursework), interests in data science.	Fully remote/ online/Mostly on the computer, computational research	University of California, Santa Cruz, Department of Computer Science
21. Advancing Satellite Machine Learning Foundation Models for Disaster Preparedness, Response and Recovery Use Cases	**Computer Science, Data Science**	• Programming skills in Python and/or PyTorch (3A and 3B completion preferred) • Prior knowledge of machine learning and GNU/Linus is preferred • Prior experience with multispectral remote sensing data products and geospatial information systems (GIS) is a plus but not required • Excellent problem-solving skills and ability to work independently If you have some programming and AI/ ML skills and interest, please do apply!	Fully remote/ online/ Mostly on the computer, computational research	USRA's Research Institute for Advanced Computer Science (RIACS)
22. Project 1: Machine Learning: Video-to-Text / Project 2: Machine Learning: Speech-to-Text	**Computer Science, Data Science**	Very good computer sciences background in Python - completion of 3 course series (or taking 3C in spring). Some exposure to introductory level Machine Learning or Deep Learning classes very helpful. Linear Algebra and statistics coursework required - either at Foothill or elsewhere.	40% onsite minimum with encouragement to spend more time in person if possible/ Mostly on the computer, computational research	Esperanto Technologies – AI Group
23. Predicting novel 2D materials with large-scale simulations and machine learning	**Computer Science, Data Science, Mathematics, Physics, Materials Science**	Coding/ scripting background in Python – completion of CS or equivalent self study, trigonometry. In addition, basic physics (forces, energy, electrostatics) – either a course at Foothill (up to Physics 2B or 4B) or high school physics – is preferred and basic chemistry (atomic structures, chemical bonds) – up to Chem 1B preferred.	Fully in-person/ Mostly on the computer, computational research	Department of Material Science and Engineering
25. Textsmith: Harnessing the Power of AI for Text Classification	**Data Science**	Preferences will be given to applicants who meet the following criteria: - Cumulative GPA of 2.5 or above - No prior internship experience - Demonstrated Financial Aid needs - Computer Science major or a course in the Python series, or basic python programming skills (e.g., completion of the several programming courses)	Hybrid - remote/ online with some in-person opportunities/Mostly on the computer, computational research	Stanford University

		- Ability to follow instructions and incorporate feedback		
27. Medical Device Intern	**Data Science, Engineering, STEM Education/ Empowerment**	Desire to learn about medical devices, ultasound breast screening, robotic components and accessories. Good hands on ability. Good mechanical and spatial abilities. Experience with 3D CAD software is a plus.Good hands-on, mechanical and spatial abilities.	Fully in-person/Mostly hands-on, in-lab experience	iSono Health
35. Designing and validating sound diffusers and acoustic metamaterials	**Computer Science, Engineering**	Some programming background in e.g. MATLAB, Julia, Python preferred, such as a CS 3A or another programming course. If limited programming background, you will be trained and will be expected to do some self study.	Hybrid - remote/ online with some in-person opportunities, Mostly hands-on, in-lab experience, computational research (preferably) with hands-on experiments	San Jose State University: Mechanical Engineering Department
37. Frontend, Backend, or Data Analyst Intern	**Computer Science, Data Science**	Prospective interns should have a basic understanding of computers and programming concepts, with coursework in programming being a plus. Additionally, strong problem-solving skills and a willingness to learn are essential for success in our apprenticeship programs. *To be eligible for this internship, you need to have completed financial aid paperwork for Foothill and have demonstrated financial need (i.e. "unmet need" in your financial aid package). This is a requirement for the payment for this partnership. If you are not sure if you have unmet need, go ahead and express your interest in this project and SLI will look up your need*.	Fully remote/ online, Mostly on the computer, computational research	CCPathways: Apprenticeship Program
38. R&D Lab Intern for Validation Teams	**Computer Science, Engineering**	**Project 1:** Computer science major with experience using Python. **Project 2:** Computer science or Electronic Engineering major with experience using Python. **Both projects:** Awareness of lab safety and computer proficiency. Coursework in computer architecture would be helpful. The intern should have enthusiasm for learning new concepts and technologies, be detail-oriented, and have good communication skills. *For these projects, only students with demonstrated financial need will be placed – this is a requirement of the funding source for the stipends.*	In-person, mostly hands-on experience	Rambus Inc.

ECOLOGY/ ENVIRONMENTAL SCIENCE				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**

3. Invasive plant success in a changing climate	**Biology**	An ideal student researcher for these projects will have enthusiasm for learning new things, be reliable, detail-oriented, well-organized, have good communication skills, and will be comfortable working outdoors, including in adverse weather conditions typical of California. This project is well-suited to beginning researchers and no prior experience is necessary, though experience with plant identification, data management and analysis, or basic machine shop skills may be beneficial.	Mostly hands-on, in-lab experience/The work is mostly hands-on, including work in the lab/ at an outdoor experiment, and at local field sites	Carnegie Institution for Science, Department of Global Ecology
12. Research assistant for study on the impacts of salmon aquaculture in Newfoundland, Canada	**Biology, Ecology**	Basic biology/ ecology knowledge is helpful though not required. Intern must be able to commit to one in-person meeting per week with 3-5 additional in-person days for fieldwork. Otherwise, work hours and location are flexible. Desirable skills include being well-organized and having good communication skills, everything else can be learned! Fieldwork will be accessible for all abilities and no previous experience is need. Gear and safety resources will be provided. Additional opportunities to explore science communication if that is of interest!	Hybrid - remote/ online with some in-person opportunities/ Mostly literature search, background research, Fieldwork (no previous experience required), graphic design (optional)	Carnegie Science, Stanford, Department of Global Ecology
33. Assessing Temperature and Water Constraints on Growing-Season CO_2 Uptake in Arctic and Boreal Ecosystems	**Ecology**	Basic programming skills (e.g., R, Python, Matlab, Julia), prior background knowledge or completion of CS 3A strongly preferred. Basic data analysis skills (e.g., reading .csv files, filtering data based on conditions, making plots, linear regression) - prior coursework in statistics recommended. Interest in ecology and climate change is preferred.	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, computational research	Carnegie Institution for Science, Department of Global Ecology

ENGINEERING/PHYSICS				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**
5. Discover the world of digital infrastructure and understand how the internet works behind the scenes	**Biology, Chemistry, Computer Science, Data Science, Engineering, Mathematics, Physics, STEM Education/ Empowerment**	Good hands on ability and the willingness, enthusiasm and passion to learn.	Fully in-person	Evocative-Marketing
6. Utilizing Machine Learning to Create Non-Invasive Biopsy for Early Detection of Cancer	**Biology, Chemistry, Computer Science, Data Science, Engineering, Medicine, Physics**	Ideally the student has taken at least one quarter or equivalent of computer science in python, ideally used colab before for classes or fun. Students should have an interest in learning machine learning models.	Fully in-person/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Structural Biology

7. Oligopeptide Models of Biological Protein Action	**Biology, Chemistry, Engineering, STEM Education/ Empowerment**	Mostly biology/chemistry basic skills: pipetting, preparing solutions, measuring pH, handling small items (glass capillaries, cover slides). Good vision, hand dexterity. Good to have, but we can train: calculate molarity, make dilutions, use a balance to weigh.	Fully in- person, Mostly hands-on, in-lab experience	Stanford University, Department of Chemistry
11. Behavior of Social Caterpillars	**Biology, Computer Science, Mathematics, Physics**	Willingness to learn computational skills, read scientific papers, and search for caterpillars in trails!	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Applied Physics
17. Preventing rust while heating rare extraterrestrial materials to understand their magnetic properties	**Chemistry, Computer Science, Engineering, Physics, Geological science; geology; geophysics; planetary science**	Necessary coursework is 1 quarter of electromagnetism (Physics 2B or 4B – this can be in progress spring 2024). Preference will be given to applicants with a demonstrated interest and even some experience in geological or planetary sciences.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University, Department of Geophysics
18. Broadening Accessibility & Training To Emerging Researchers for Innovative Energy Storage (BATTERIES)	**Chemistry, Engineering**	Prospective Interns should have completed their coursework in General Chemistry (Chem 1 series) with lab. Overall, curiosity and a desire to get in the lab and gain experience conducting research are the key prerequisites. Strong preference will be for students transferring to SJSU in fall 2024, studying chemistry, biology, or chemical engineering. You will also need to have a social security number for student employment, this includes for undocumented and international students	Fully in-person/ Mostly hands-on, in-lab experience	San Jose State University, Chemistry
19. Process engineer assistant in a semiconductor company	**Chemistry, Engineering, Physics, STEM Education/ Empowerment**	Awareness of lab safety and basic computer proficiency. Coursework in chemistry or physics will be helpful but not necessary. Just a desire to learn more about how computer chips are made.	Fully in-person/ Mostly hands-on, in-lab experience	EMD Electronics – Operations
20. Towards reliable and explainable visual assistance using data science	**Computer Science, Engineering**	At least one course or background in python preferred but not required (you will be given some training materials for self-study if no coursework), interests in data science.	Fully remote/ online/Mostly on the computer, computational research	University of California, Santa Cruz, Department of Computer Science
23. Predicting novel 2D materials with large-scale simulations and machine learning	**Computer Science, Data Science, Mathematics, Physics, Materials Science**	Coding/ scripting background in Python – completion of CS or equivalent self study, trigonometry. In addition, basic physics (forces, energy, electrostatics) – either a course at Foothill (up to Physics 2B	Fully in-person/ Mostly on the computer, computational research	Department of Material Science and Engineering

		or 4B) or high school physics – is preferred and basic chemistry (atomic structures, chemical bonds) – up to Chem 1B preferred.		
27. Medical Device Intern	**Data Science, Engineering, STEM Education/ Empowerment**	Desire to learn about medical devices, ultasound breast screening, robotic components and accessories. Good hands on ability. Good mechanical and spatial abilities. Experience with 3D CAD software is a plus.Good hands-on, mechanical and spatial abilities.	Fully in-person/Mostly hands-on, in-lab experience	iSono Health
28. Reviewing Quality Assurance Schematics in the Semiconductor Industry	**Engineering**	Some skills and knowledge of hardware engineering principles, digital logic, analog circuits and its hardware implementations is helpful, but not required. Preparing for mechanical or electrical engineering degree.	Fully in-person/Mostly hands-on, in-lab experience	Intermolecular-Equipment Engineering
29. TCAD Simulation of Silicon detectors	**Engineering, Physics**	Completion of 2A and 2B or 4A and 4B preferred. Some basic computer programming skills. Basic electrical engineering (ENGR 37) is a plus.	Hybrid - remote/ online with some in-person opportunities/Mostly on the computer, computational research	SLAC National Accelerator Laboratory
34. R&D Engineering Intern for Heart Valve Device	**Engineering, Medicine**	Ideally, student is in a Mechanical or Biomedical Engineering major who would like to work in the medical device space. Proficient MS Office (Word, Excel, etc.) Comfortable with 3D modeling using SolidWorks or similar CAD programs. Strong writing skills and knowledge of statistical analysis (T-tests) is desirable.	Mostly in-person (at site in Pleasanton, CA) with some remote work when possible, Mostly hands-on, in-lab experience	ConKay Medical Systems, Inc., UCSF Rosenman Institute
35. Designing and validating sound diffusers and acoustic metamaterials	**Computer Science, Engineering**	Some programming background in e.g. MATLAB, Julia, Python preferred, such as a CS 3A or another programming course. If limited programming background, you will be trained and will be expected to do some self study.	Hybrid - remote/ online with some in-person opportunities, Mostly hands-on, in-lab experience, computational research (preferably) with hands-on experiments	San Jose State University: Mechanical Engineering Department
38. R&D Lab Intern for Validation Teams	**Computer Science, Engineering**	**Project 1:** Computer science major with experience using Python. **Project 2:** Computer science or Electronic Engineering major with experience using Python. **Both projects:** Awareness of lab safety and computer proficiency. Coursework in computer architecture would be helpful. The intern should have enthusiasm for learning new concepts and technologies, be detail-oriented, and have good communication skills.	In-person, mostly hands-on experience	Rambus Inc.

		For these projects, only students with demonstrated financial need will be placed – this is a requirement of the funding source for the stipends.		

MATH				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**
5. Discover the world of digital infrastructure and understand how the internet works behind the scenes	**Biology, Chemistry, Computer Science, Data Science, Engineering, Mathematics, Physics, STEM Education/ Empowerment**	Good hands on ability and the willingness, enthusiasm and passion to learn.	Fully in-person	Evocative-Marketing
11. Behavior of Social Caterpillars	**Biology, Computer Science, Mathematics, Physics**	Willingness to learn computational skills, read scientific papers, and search for caterpillars in trails!	Hybrid - remote/ online with some in-person opportunities/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Applied Physics
23. Predicting novel 2D materials with large-scale simulations and machine learning	**Computer Science, Data Science, Mathematics, Physics, Materials Science**	Coding/ scripting background in Python – completion of CS or equivalent self study, trigonometry. In addition, basic physics (forces, energy, electrostatics) – either a course at Foothill (up to Physics 2B or 4B) or high school physics – is preferred and basic chemistry (atomic structures, chemical bonds) – up to Chem 1B preferred.	Fully in-person/ Mostly on the computer, computational research	Department of Material Science and Engineering

MARKETING				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**
39. Marketing initiatives for demand generation and funnel management	**Marketing**	• Strong analytical skills with the ability to interpret data and draw actionable insights. • Proficiency in Excel for data analysis and reporting. • Excellent communication skills, both written and verbal. • Detail-oriented with a proactive approach to problem-solving.	Fully in-person, Data analysis, Process improvement, Event support & participation	Rambus Inc

MEDICINE/PUBLIC HEALTH				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**

6. Utilizing Machine Learning to Create Non-Invasive Biopsy for Early Detection of Cancer	**Biology, Chemistry, Computer Science, Data Science, Engineering, Medicine, Physics**	Ideally the student has taken at least one quarter or equivalent of computer science in python, ideally used colab before for classes or fun. Students should have an interest in learning machine learning models.	Fully in-person/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Structural Biology
8. Biochemistry and structural biology of human chromosomes	**Biology, Chemistry, Medicine**	Should have taken a biology or chemistry lab class. Prefer if you have skills in pipetting, preparing solutions, sterile technique (cell culture), understanding of basic units in chemistry (e.g., mole, gram, liter, molar, pH)	Fully in- person, Mostly hands-on, in-lab experience	Stanford University, Department of Structural Biology
9. Investigation for Protein Stabilizing Compounds in Liquid and Hydrogel Solutions at Intact Therapeutics	**Biology, Chemistry, Medicine, Biotech, cell culture**	At least one quarter of Biology and/or Chemistry with Lab Required. Student should have a basic understanding of lab safety and how to document experiments. Basic data analysis/visualization using spreadsheets is helpful as well.	Hybrid - remote/ online with some in-person opportunities/ Mostly hands-on, in-lab experience	Intact Therapeutics/ UCSF Rosenman Institute
10. Developing tools to purify polluted waters using structural biology	**Biology, Chemistry, Public Health**	Interest in biology related fields (biochemistry, structural biology, microbiology) is sufficient.	This work is mostly in-person, but data-processing, literature reading, and meetings can be done virtually/ Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience	Stanford University, Department of Structural Biology
13. Study of Viral Glycoproteins for Vaccine Discovery	**Biology, Medicine**	Coursework in biology and chemistry not required, but some basic biochemistry and molecular biology knowledge can be helpful, and we can teach them what they do not know.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University, School of Medicine
14. Isolation of Extracellular vesicles from Mesenchymal stem cells	**Biology, Medicine**	Proficiency in basic laboratory techniques, including pipetting, centrifugation, and sample preparation. Ability to follow laboratory protocols and safety guidelines. Knowledge of cell culture principles and practices, including cell maintenance, passaging, and sterility (preferred). Strong written and verbal communication skills for documenting experimental procedures, results, and conclusions. Ability to effectively communicate with team members and present findings in meetings or presentations.	Fully in person/ Mostly hands-on, in-lab experience	Stanford University, Department of Radiology

15. Improving paired immunotherapies through T cell genome engineering	**Biology, Medicine**	Students should be motivated and excited to conduct research in the lab. Students will be expected to have good communication skills and work well as part of a team. Although no prior lab experience is required, knowing the basics, like using a micropipette or being familiar with lab equipment such as centrifuges and laminal flow cabinets, will greatly accelerate the progress of the project and is a plus. An understanding of molecular biology fundamentals would be helpful, as well as some familiarity with cancer immunotherapy.	Fully in-person/ Mostly hands-on, in-lab experience	Stanford University- Stanford Cancer Institute
31. A Systematic Review of Suicide Research Among Transgender and Gender Non-Conforming or Gender Expansive populations	**Public Health**	Attention to detail, curiosity, ability to work with somber subject matter. No coursework required, but this position requires a good deal of reading, being at a computer, and accuracy in pulling relevant details and data from research papers. Being unafraid to ask questions and ask for help when needed is an asset. Interest and familiarity in sexual and gender minority (i.e. LGBTQIA+) communities will be beneficial.	Fully remote/ online/ Mostly literature search, background research	Stanford University, Department of Epidemiology and Population Health
34. R&D Engineering Intern for Heart Valve Device	**Engineering, Medicine**	Ideally, student is in a Mechanical or Biomedical Engineering major who would like to work in the medical device space. Proficient MS Office (Word, Excel, etc.) Comfortable with 3D modeling using SolidWorks or similar CAD programs. Strong writing skills and knowledge of statistical analysis (T-tests) is desirable.	Mostly in-person (at site in Pleasanton, CA) with some remote work when possible, Mostly hands-on, in-lab experience	ConKay Medical Systems, Inc., UCSF Rosenman Institute

PSYCHOLOGY/SOCIAL JUSTICE				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**
30. A Platform for Elevating Youth Voices and Choices	**Psychology**	No prior research experience is required! We're looking for someone who is..: - interested in social psychology and education - highly detail-oriented - passionate and curious - eager to learn - passionate about social/criminal justice * some experience with qualitative data (collecting/analyzing) helps but isn't required	Fully remote/ online/Mostly literature search, background research, qualitative and quantitative data analysis	**Stanford University, Department of Psychology**

STEM EDUCATION/STEM EMPOWERMENT				
Project Title	**Keywords**	**Required Skills**	**Modality**	**Institution/ Company**
5. Discover the world of digital infrastructure and understand how the internet works behind the scenes	**Biology, Chemistry, Computer Science, Data Science, Engineering, Mathematics, Physics, STEM Education/ Empowerment**	Good hands on ability and the willingness, enthusiasm and passion to learn.	Fully in-person	Evocative-Marketing
7. Oligopeptide Models of Biological Protein Action	**Biology, Chemistry, Engineering, STEM Education/ Empowerment**	Mostly biology/chemistry basic skills: pipetting, preparing solutions, measuring pH, handling small items (glass capillaries, cover slides). Good vision, hand dexterity. Good to have, but we can train: calculate molarity, make dilutions, use a balance to weigh.	Fully in- person, Mostly hands-on, in-lab experience	Stanford University, Department of Chemistry
19. Process engineer assistant in a semiconductor company	**Chemistry, Engineering, Physics, STEM Education/ Empowerment**	Awareness of lab safety and basic computer proficiency. Coursework in chemistry or physics will be helpful but not necessary. Just a desire to learn more about how computer chips are made.	Fully in-person/ Mostly hands-on, in-lab experience	EMD Electronics – Operations
27. Medical Device Intern	**Data Science, Engineering, STEM Education/ Empowerment**	Desire to learn about medical devices, ultasound breast screening, robotic components and accessories. Good hands on ability. Good mechanical and spatial abilities. Experience with 3D CAD software is a plus.Good hands-on, mechanical and spatial abilities.	Fully in-person/Mostly hands-on, in-lab experience	iSono Health
32. A Qualitative Exploration of Low-Income Student's Experience in Science	**STEM Education/ Empowerment**	No skills required. A basic understanding of Excel or Google Sheets, as well as a familiarity with literature review techniques, grounded in psychology and science education is helpful but not necessary. Additionally, basic proficiency in mathematics or statistics is beneficial. Strong presentation and communication skills are also desirable. However, the primary requirement is a willingness to learn and grow, making this opportunity suitable for individuals eager to enhance any of the aforementioned skills through hands-on experience in a supportive environment.	Fully remote/ online/ Mostly on the computer, computational research, Mostly literature search, background research	FLi Sci, Research and Eval33.uation

KEEP READING BELOW FOR DETAILED DESCRIPTIONS OF OPPORTUNITIES.

Make sure you read the details as you make your selections of what project you'd be interested in!

PROJECT FULL DESCRIPTIONS

You will find below all the projects that were listed above in the Quick Links Table of Contents. This provides more detail, so be sure to read through the projects you are interested in.

Discipline	Biology
Project Title	**1: Feeling salty: discovering how San Francisco flies have evolved to live in extreme environments**
Mentor, Title	Kirsten Verster, Postdoc
Institution/ Affiliation	Stanford: Biology
Institution/ Company Website	https://hadlylab.stanford.edu/
Company Description/ Mission	We envision a world that puts diversity first, in all living systems, wild and human. Just like biodiversity in the ecosystems we study, diversity in any system confers strength, resilience, and beauty. We actively bring together and integrate a diverse set of people, perspectives, scientific methods, tools, ecosystems and time-scales.
Mentor Bio	I'm a pretty extroverted Cuban-American woman from Miami. I am very interested in Cuban music history, and teach salsa dance, salsa musicality, and have a fun little blog called "Salsa & Storytelling" about topics in Cuban music. I also sing in a salsa band. Lowkey obsessed. I also have an amazing little dog who I've trained to do a variety of tricks. Highkey obsessed.
Project Description	"Brine fly" larvae are adapted to extremely salty environments, such as those found in the San Francisco Bay Salt Flats found just south of Stanford. Specifically, there is a fly group known as Ephydra which are found in some of the saltiest waters in the world, such as Mono Lake, CA and the Great Salt Lake in Utah - they live in places almost three times as salty as the ocean! Brine flies have been described as having a "contagious" distribution, and they serve and have served as important food sources for local wildlife and Indigenous people. I am seeking undergraduate researchers who can help characterize this fly genus. Some potential projects and questions the students could tackle include: 1) did these flies experience horizontal gene transfer to help them occupy salty environments? (bioinformatics) 2) are there fitness consequences (e.g. size, development time) associated with living in ponds of varying salinities? (fieldwork, morphometrics) 3) how are different brine fly species related to each other? (phylogenetics) 4) are there genetic differences between conspecific flies from different geographic regions? (population genetics)
Required Skills	Strong candidates will have an introductory understanding (and enthusiasm!) of genetics and evolutionary biology. Previous experience in a basic molecular biology lab (e.g. Biology Lab Course) and fundamental skills such as pipetting and sterile technique are preferred. All students studying brine flies are expected to spend ~1 day/week in the field (around the Bay Area, usually a drive <2 hours) assisting in specimen collections.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students

Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology
Project Title	**2: Evolution of pigment patterns in swordtail fish**
Mentor, Title	Tristram Dodge, PhD Candidate
Institution/ Affiliation	Stanford University: Biology
Institution/ Company Website	327 Campus Drive Stanford CA 94305
Company Description/ Mission	The Schumer Lab is an evolutionary genetics group at Stanford studying adaptation, hybridization, and speciation in swordtail fish.
Mentor Bio	I'm a third year PhD candidate in Biology at Stanford. Originally from Oakland, CA, I did my undergrad in Minnesota (also in Biology). I like running, hiking, fishing, and taking pictures of plants and animals.
Project Description	Swordtail fish (genus: Xiphophorus) have evolved many pigment patterns with various possible functions. Our lab group has figured out what genes control many of these patterns and now want to know why they evolved (ie what are the costs and benefits of having such spots?). This project could involve the following aspects: 1) helping run/record behavioral trials to test female preference or male aggression 2) measure/score different behaviors from the trial videos 3) analyze behavioral/morphological data to test hypotheses 4) read scientific papers to contextualize results. Modality and emphasis on particular duties can range depending on experience and preferences of applicant.
Required Skills	Interest in evolution, behavior, or fish is the only requirement. Some background in biology—particularly evolution and genetics—is useful, but willingness to learn and ask questions is more important.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology
Project Title	**3: Invasive plant success in a changing climate**
Mentor, Title	Andrea Nebhut, Visiting Student
Institution/ Affiliation	Carnegie Institution for Science: Department of Global Ecology
Institution/ Company Website	https://bse.carnegiescience.edu/

Company Description/ Mission	Devoted to disrupting the traditional, siloed perspective on research in the life sciences and pursuing an integrated approach to solving humanity's greatest challenges.
Mentor Bio	I'm Andrea Nebhut, a second-year biology PhD student at Stanford University, co-advised by Dr. Jeff Dukes and Dr. Tad Fukami. My research focuses on climate change and species invasion through the lens of plant community ecology. I received my BS in Biology and Environmental Studies from Trinity University in San Antonio, TX, and my MS in Forestry and Natural Resources from Purdue University in West Lafayette, IN. Outside of the lab, I enjoy drawing, creative writing, TTRPGs like Dungeons & Dragons, and finding any excuse to visit my friends' dogs.
Project Description	Climate change and the arrival of invasive species are changing how plants function and compete in many ecosystems. This project will evaluate how specific traits of native and invasive plant species jointly contribute to the reproductive success of invasive plants in manipulated precipitation and temperature environments, using California serpentine grasslands as a model system. You will be paired with a graduate student mentor to aid in an ongoing experiment on native-invader competition and will gain experience with a combination of field, greenhouse, and laboratory work, including maintaining potted plant communities, measuring morphological plant traits, understanding patterns of resource consumption, quantifying reproductive output, processing, visualizing, and analyzing datasets in R or Python, and presenting your findings.
Required Skills	An ideal student researcher for these projects will have enthusiasm for learning new things, be reliable, detail-oriented, well-organized, have good communication skills, and will be comfortable working outdoors, including in adverse weather conditions typical of California. This project is well-suited to beginning researchers and no prior experience is necessary, though experience with plant identification, data management and analysis, or basic machine shop skills may be beneficial.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience, The work is mostly hands-on, including work in the lab, at an outdoor experiment, and at local field sites
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Computer Science, Data Science
Project Title	**4: Building PDBCleanV2, a Python library to curate molecular structures**
Mentor, Title	Fatima Pardo Avila, Basic Life Research Scientist
Institution/ Affiliation	Stanford University: Department of Structural Biology
Institution/ Company Website	https://med.stanford.edu/structuralbio.html

Company Description/ Mission	The Department of Structural Biology at Stanford is a world leader in the molecular and structural understanding of biology. The discipline sits at the interface of physics, chemistry, and biology. Research in the department spans a wide range of biological problems at the molecular, cellular, tissue, and whole animal scales. The Levitt Lab is a computational biology lab, in recent years we have worked on protein structure prediction, molecular basis of translation and COVID dynamics.
Mentor Bio	My name is Fatima Pardo Avila. I was born and raised in Mexico City, where I got a BSc in Basic Biomedical Research. My undergraduate program allowed me to do internship rotations in research labs. This allowed me to figure out what research I enjoyed the most. I became interested in using computational biology to understand how life works at the molecular level and was determined to become a scientist. My family had financial trouble at the time of graduation and didn't understand why I wanted to obtain a PhD. Fortunately, I won a fellowship that allowed (paid for) me to move to Hong Kong and get a PhD in Chemistry at the Hong Kong University of Science and Technology. After graduation, I moved to the USA for a postdoc at Stanford University in the lab of Michael Levitt, where I am currently a Research Scientist. In my free time, I enjoy learning Mandarin Chinese, listening to BTS, and enjoying delicious food.
Project Description	In recent years, there has been an explosion in the number of molecular structures available in public databases. We can extract meaningful information by comparing these structures. However, comparing multiple structures can be challenging due to a lack of homogeneity in these datasets and deposition errors. We built PDBCleanV2 (bit.ly/PDBCleanV2), a Python tool to help address common issues with structures and create curated datasets. You will work to improve this Python tool while learning about computational structural biology. You will also use PDBCleanV2 to analyze molecular datasets. The skills you will acquire could also be used to analyze other biological datasets.
Required Skills	Basic knowledge of Python (completion of CS 3A) and general chemistry/ biochemistry (completion of Chem 1A) is preferred but not required. It would be good to have some comfort using the terminal (unix/linux systems). But also, if this project excites you, you don't have the exact courses, but you have a desire to learn more, then select this project!
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Computer Science, Data Science, Engineering, Mathematics, Physics, STEM Education/ Empowerment
Project Title	**5: Discover the world of digital infrastructure and understand how the internet works behind the scenes.**
Mentor, Title	Renée Lawrence, Director of Marketing
Institution/ Affiliation	Evocative: Marketing
Institution/ Company Website	https://evocative.com/
Company Description/ Mission	The world is only becoming more and more digital. And for enterprises needing to drive digital innovation and deliver positive end-user experiences, colocation alone is no longer enough. Having the access to scale across edge locations in strategic metros via interconnection is critical to future growth. And choosing where, when, and how you connect to your partners and customers can (and will) change over time. Through our colocation, network, cloud, and managed services, Evocative provides the infrastructure platform with all the critical building blocks you need to build, connect, grow, and ultimately drive your business forward. With 24 data centers and 32 PoPs across 14 strategically located metros connected by our global network backbone, our edge locations and direct on-ramps enable you to deliver exceptional digital experiences.
Mentor Bio	Will be added
Project Description	The Digital Infrastructure industry powers the world we live in. Data Centers work around the clock in order to keep the things we rely on working smoothly such as the internet, social media, emails, online banking, etc. It is a behind the scenes industry that is looking for young talent to break into the industry, becoming the next leaders to lead the industry into a more sustainable future. We are looking for a student that is curious, enthusiastic and has the passion to learn about the responsibilities of a data center technician. Data center technicians are the skilled hands-on professionals who provide various services that keep data servers and hardware networks operating smoothly. They serve as the first line of defense in safeguarding a company's valuable and sensitive information. They complete preventative maintenance of equipment and network devices and perform tasks including running cables, improving physical security, and checking utilities. They examine power sources and heating and cooling controls to ensure a data center will not overheat and troubleshoot and repair servers with hardware or network issues.
Required Skills	Good hands on ability and the willingness, enthusiasm and passion to learn.
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Fully in-person, Willingness to learn
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Computer Science, Data Science, Engineering, Medicine, Physics
Project Title	**6: Utilizing Machine Learning to Create Non Invasive Biopsy for Early Detection of Cancer**
Mentor, Title	Yonatan Winetraub, Instructor
Institution/ Affiliation	Stanford Unveristy: Structural Biology
Institution/ Company Website	yolab.xyz
Company Description/ Mission	The lab combines machine learning and optical imaging to create realistic non invasive biopsy images. We assist clinicians in determining tumor margins and treatment and closely work with department of dermatology and neuroscience.
Mentor Bio	I founded an organization called SpaceIL that sent the first private spaceship to the Moon in 2019. I started SpaceIL in Israel with two friends at a bar, writing down our ideas on a napkin. Today I work at Stanford researching how to diagnose cancer without taking biopsies.
Project Description	Multiple options exist. The student will join the lab's main project "developing non invasive biopsy tool" and could assist in tasks from sample collection and preparation to writing simple codes to process the data and run machine learning algorithms. More specifically, the student will help by evaluating several machine learning models to see how they perform. You would read 1-2 papers and help us implement methods from the paper to improve our algorithm.
Required Skills	Ideally the student has taken at least one quarter or equivalent of computer science in python, ideally used colab before for classes or fun. Students should have an interest in learning machine learning models.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Engineering, STEM Education/ Empowerment
Project Title	**7: Oligopeptide Models of Biological Protein Action**
Mentor, Title	Daniel Fernandez, Staff Scientist
Institution/ Affiliation	Stanford University: ChEM-H Macromolecular Structure Knowledge Center (MSKC)
Institution/ Company Website	https://mskc.stanford.edu/
Company Description/ Mission	MSKC's aim is to serve as a training ground for the future generations of researchers. Our model is hybrid - we are a service center and a teaching lab focusing on molecular structural-functional studies. We encourage and facilitate interdisciplinary research providing expertise and instrumentation

	in one spot for the production of high-quality samples for different downstream applications.
Mentor Bio	My name is Daniel Fernandez, I was born and raised in Buenos Aires, Argentina. The first in my family to earn an academic degree, I earned my Licenciado (BS) degree in small-molecule X-ray diffraction of pharmaceutical compounds. I turned to protein crystallography on my PhD studies and postdoctoral work in Europe. I crossed the pond to join Stanford as a postdoc, then became staff scientist running the Macromolecular Structure Knowledge Center (MSKC) at Stanford Sarafan ChEM-H. At MSKC you'll find me training students in protein research. A colleague of mine had described me as an effective educator – patient and thorough.
Project Description	Oligopeptides are a class of organic compounds containing a sequence of between three and ten α-amino acids joined through peptide bonds. Glycine is the smallest and more stable amino acid with a distinctive structure due to its single Cα atom. Glycine forms linear peptidic compounds called polyglycine. Because of its simple structure, glycine is a common element in proteins and enzymes, and glycine and its oligopeptides have been the subject of extensive studies. In the biomedical literature it has been acknowledged that many of these may serve as models for biologically important species. Experimental data on many of them is still lacking. We are going to work on polyglycine oligopeptides to profile their ligand-binding properties through a combination of in-solution biophysical assays and in the solid state by X-ray crystallography. In this internship, you will gain many skills in bench research as well as x-ray diffraction analysis by working directly with instruments and processes in our lab.
Required Skills	Mostly biology/chemistry basic skills: pipetting, preparing solutions, measuring pH, handling small items (glass capillaries, cover slides). Good vision, hand dexterity. Good to have, but we can train: calculate molarity, make dilutions, use a balance to weigh.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Medicine
Project Title	**8: Biochemistry and structural biology of human chromosomes**
Mentor, Title	Andrew Beel, Instructor
Institution/ Affiliation	Stanford: Structural Biology
Institution/ Company Website	http://beel.stanford.edu
Company Description/ Mission	Elucidation of principles of mesoscale structural biology

Mentor Bio	I completed an M.D. and a Ph.D. in Biophysics, the latter under Professor Roger Kornberg, at Stanford in 2022. I formed a lab thereafter with generous support from the NIH Early Independence Award. My lab divides its time between experimental biochemistry, structural biology (microscopy and crystallography), and tool development (primarily computational but also hardware to some extent). Given my training, I am able to advise on both research and medical paths.
Project Description	Our lab is part of the Department of Structural Biology at the Stanford University School of Medicine. We are focused on understanding how chromosomes are reshaped during cell division. To do this, we use a combination of biochemistry and structural methods, such as super-resolution light microscopy, electron microscopy, and X-ray crystallography. A key part of our research involves the production of proteins by harnessing the metabolic capabilities of microorganisms such as bacteria or yeast—a process known as heterologous expression. After the enzymes are produced by such microorganisms, we purify them from the rest of the cellular contents using biochemical techniques such as fractional precipitation, differential centrifugation, and liquid chromatography. Students who join our project will develop essential skills in molecular biology and biochemistry. These include molecular cloning, DNA sequencing, protein expression and purification, and analytical characterization (e.g., gel electrophoresis). These skills are not only of academic interest, as they are widely applied in the biotechnology and pharmaceutical industries; as such, this internship experience would be invaluable for students considering careers in those industries.
Required Skills	Should have taken a biology or chemistry lab class. Prefer if you have skills in pipetting, preparing solutions, sterile technique (cell culture), understanding of basic units in chemistry (e.g., mole, gram, liter, molar, pH)
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Medicine, Biotech, cell culture
Project Title	**9: Investigation for Protein Stabilizing Compounds in Liquid and Hydrogel Solutions at Intact Therapeutics**
Mentor, Title	Chris Zhan, Sr. Scientist
Institution/ Affiliation	Intact Therapeutics: N/A
Institution/ Company Website	https://intacttherapeutics.com/
Company Description/ Mission	Intact Therapeutics is a clinical stage, biopharmaceutical company focused on developing targeted therapies for the gastrointestinal tract based on technology developed at Stanford University. Our drug delivery technology is

	designed to increase local exposure of therapy to diseases affecting the mucosal lining, thereby improving efficacy and increasing patient acceptance.
Mentor Bio	I am a first-generation immigrant who grew up in the east bay. I attended the Peralta Community Colleges before transferring to UC Berkeley, where I received a B.S. in Chemical Engineering and Material Science. I have 7 years of manufacturing and quality experiences in medical devices where I worked in formulation development and drug delivery technologies. I am now a formulation scientist at Intact Therapeutics working on the development of a drug delivery platform using thermosensitive hydrogels.
Project Description	Mucositis describes the break down of epithelial cells that line the gastrointestinal (GI) tract, exposing the mucosal tissue or mucosa to ulcerations and infections. Oral mucositis (OM) is a common and debilitating side effect of chemotherapy and radiotherapy during cancer treatment, especially among head/neck cancer patients. The mouth is one of the most sensitive parts of the body and the pain associated with OM can lead to nutritional problems due to the inability to eat. Pain aside, the open sores in the oral mucosa can also increase the risk of infection for patients. All these factors together have a significant effect on patient's quality of life and can even lead to a reduction in cancer treatments in some cases to alleviate some of the symptoms. In this internship, the student will contribute to the ongoing research and development efforts aimed to treat and prevent oral mucositis. The work will be focused on the development of an oral topical mouthwash with a protein to stimulate epithelial cell regeneration to combat OM. The project may also expand the platform to other proteins with different biological targets and indications. In practice, the student can expect a combination of literature research and hands-on lab work. The student will learn about polymer preparation and characterization techniques, biological assays for protein characterization, and mammalian cell culture techniques. These skills will be used in tandem with literature research to discover biological targets that are stabilized by certain polymer solutions and their mechanism of action.
Required Skills	At least one quarter of Biology and/or Chemistry with Lab Required. Student should have a basic understanding of lab safety and how to document experiments. Basic data analysis/visualization using spreadsheets is helpful as well.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Chemistry, Public Health
Project Title	**10: Developing tools to purify polluted waters using structural biology**
Mentor, Title	Sheena Vasquez, Postdoctoral Fellow
Institution/ Affiliation	Stanford: Biology/ Barnes Lab
Institution/ Company Website	https://www.thebarneslab.com/
Company Description/ Mission	"The Barnes lab excels in leveraging interdisciplinary approaches to address fundamental principles of viral-host interactions for therapeutic benefit. We combine biophysical and structural methods with in vivo approaches to understand how enveloped viruses infect host cells and elicit immune responses. In particular, our research translates knowledge of the structural correlates of antibody-mediated neutralization into the development of highly protective antibodies and therapeutic reagents."
Mentor Bio	I began my scientific career as a community college, low-income, first generation (U.S. citizen and college graduate) student. I was fortunate to find supportive and encouraging mentors that provided opportunities for me to gain research while at community college, which led me to continue my studies and earn my doctoral degree. Now, I use structural biology and biochemistry techniques to understands proteins found in viruses and bacteria in order to understand how we can target these proteins to neutralize viruses, or use these proteins to refine nitrogen from wastewater. When not in lab, I enjoy spending time with my cat and close friends and family, creating art (photography and paintings/chalk), and attending live-music events. My goal is to pay-it-forward by providing students from marginalized backgrounds with limited resources the opportunity to conduct research and build their communities.
Project Description	Nitrogen is needed by all living beings, yet the build-up of nitrogen nutrients causes pollution and damages the quality and aquatic life of natural waters. In return, this build-up disrupts the natural nitrogen cycle, leading to worsening greenhouse effects, the reduction of ozone layer protection, and harmful algal blooms. which causes death to aquatic life and contaminates drinking water. Fortunately, microorganisms, like bacteria, use proteins known as enzymes to convert nitrogen pollutants into various products that can be useful to human health. These products can be used for rescue therapy as inhalant medication for hypertension of newborns, respiratory distress, bronchitis and COVID-19. Therefore, we hope to combat harmful effects of nitrogen build-up by using nature's chemical engineers (enzymes) to obtain useful products from nitrogen-polluted waters. First, we need to understand the structural details of these enzymes to better engineer them for the eventual use of refining nitrogen from wastewater. In this summer research project, the student will use microbiology, biochemistry and structural biology to understand the structural details of the enzyme, Hydroxylamine oxidoreductase (HAO) from N. europaea cells. This work will aid tremendously in our eventual use of using HAO to purify nitrogen nutrients from wastewater.
Required Skills	Interest in biology related fields (biochemistry, structural biology, microbiology) is sufficient.

Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	This work is mostly in-person, but data-processing, literature reading, and meetings can be done virtually, Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Computer Science, Mathematics, Physics
Project Title	**11: Behavior of Social Caterpillars**
Mentor, Title	Avaneesh Narla, Stanford Science Fellow
Institution/ Affiliation	Stanford University: Applied Physics
Institution/ Company Website	https://avnarla.people.stanford.edu/
Company Description/ Mission	I am interested in fundamental questions related to physics, life sciences and mathematics. I am especially interested in how individual interacting elements come together to exhibit collective behaviours and how these behaviours can be described quantitatively.I believe collective dynamic processes of adaptation and response to environmental changes are essential to understanding the impact of anthropogenic climate change, especially the biodiversity crisis. I hope that quantitative investigation of these processes can help us mitigate the effects of these catastrophes and provide equitable resources globally to enable sustainable engagement with our natural world.
Mentor Bio	Avaneesh is a Stanford Science Fellow hosted by the Good and Fisher Labs. He is broadly interested in the dynamic adaptation of biological collectives. He is doing this in the context of microbial communities adapting to dynamic resource environments by studying the interplay of ecology and evolution, and in the context of social insects by studying collective behavior and decision-making in response to environmental changes.
Project Description	Embark on a fascinating journey where the intricate world of caterpillars meets the principles of physics! Yes, physics! This project offers a blend of nature's marvels with scientific exploration. You'll dive into the captivating behaviors of caterpillars, discovering their collective patterns. You'll also delve into fundamental physics concepts, learning how they can be ingeniously applied to understand these tiny creatures. Your role will be dynamic: from studying caterpillar behavior to analyzing real-world data. Then, you'll bring your insights to life through computer simulations. This isn't just about observing nature – it's about unlocking its secrets through the lens of physics. Prepare to be amazed by what you'll find!
Required Skills	Willingness to learn computational skills, read scientific papers, and search for caterpillars in trails!
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students

Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly on the computer, computational research, Mostly literature search, background research, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	Two interns

Discipline	Biology, Ecology
Project Title	**12: Research assistant for study on the impacts of salmon aquaculture in Newfoundland, Canada**
Mentor, Title	Jemma Fadum, Postdoctoral Fellow
Institution/ Affiliation	Carnegie Science, Stanford: Global Ecology
Institution/ Company Website	https://carnegiescience.edu/research-areas/ecology
Company Description/ Mission	The Zakem lab group aims to improve understanding of the connections between microbial ecosystems, global biogeochemistry, and the climate system.
Mentor Bio	My name is Jemma and I am a postdoctoral fellow at Carnegie Science. I grew up between Illinois, Virginia and Colorado and went to Colorado State University for both my undergraduate degree and my PhD. I was a first generation college student from a low income family so I am very familiar with trying to balance a job with going to school. I will make sure you get the flexibility and support you need to have a successful internship if you are also trying to find that balance! Outside of work, I enjoy hiking, mountain biking and boxing.
Project Description	As a research assistant, you will perform background research and literature review to summarize our current understanding of the ecology of coastal Newfoundland. In addition, you will assist with fieldwork method development and, if the you have graphic design skills or are interested in developing those skills, there are many science communication opportunities with this project as well. We may have a chance to go out to bodies of water (depending on your comfort level with water) to collect samples and to test equipment.
Required Skills	Basic biology/ ecology knowledge is helpful though not required. Intern must be able to commit to one in-person meeting per week with 3-5 additional in-person days for fieldwork. Otherwise, work hours and location are flexible. Desirable skills include being well-organized and having good communication skills, everything else can be learned! Fieldwork will be accessible for all abilities and no previous experience is need. Gear and safety resources will be provided. Additional opportunities to explore science communication if that is of interest!
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly literature search, background research, Fieldwork (no previous experience required), graphic design (optional)

Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	Two interns

Discipline	Biology, Medicine
Project Title	**13: Study of Viral Glycoproteins for Vaccine Discovery**
Mentor, Title	Javaria Najeeb, Postdoctoral Scholar
Institution/ Affiliation	Stanford University: School of Medicine, Department of Structural Biology
Institution/ Company Website	https://med.stanford.edu/structuralbio.html
Company Description/ Mission	We study viruses in our lab to try to design antibodies and vaccines against them
Mentor Bio	I am a structural biologist and immunologist who was the first woman in my family to get a 4-year college degree and first person to get a doctorate. I overcame persistent opposition and pressures to get married at a young age. I am frequently outnumbered in scientific settings as a brown, muslim, first generation immigrant woman. I love talking about science and mentoring younger folks. In my spare time I like to go outdoors and be active and to spend time with my friends and loved ones.
Project Description	We are studying viral envelope proteins that are essential to the immune response and targeting them for the development of life-altering and life-saving therapeutics
Required Skills	Coursework in biology and chemistry not required, but some basic biochemistry and molecular biology knowledge can be helpful, and we can teach them what they do not know.
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	SLI will review
# of possible interns	One intern

Discipline	Biology, Medicine
Project Title	**14: Isolation of Extracellular vesicles from Mesenchymal stem cells**
Mentor, Title	Shashank Chetty, Post-doc Researcher
Institution/ Affiliation	Stanford University: Radiology
Institution/ Company Website	https://www.stanfordiris.com/vision
Company Description/ Mission	At Stanford University, Dr Thakor directs a unique multidisciplinary program called IRIS - Interventional Radiology Innovation at Stanford which is placed at the intersection of Stanford University, with its world-renowned and pioneering science, and Silicon Valley, with its cutting-edge innovative start-ups and leading industry partners. Our program is designed to bring together scientists, engineers, physicians, healthcare providers, and industry partners, in a cohesive and unified approach with the goal of pioneering Precision

	Delivery to facilitate creating unique and innovative solutions for unmet clinical needs.
Mentor Bio	I got my bachelor's degree in biotechnology from Anna University, my master's, and my Ph.D. in nanoscience and technology from Pondicherry University. And now I'm working as a post-doctoral researcher at Stanford University's School of Medicine. I have a keen interest in a wide range of subjects, from science and technology to the arts and humanities. Enthusiastic about fostering a love for learning and research in individuals like yourself. I am eager to support your academic and research endeavors. Every project is a learning opportunity, and the journey is just as important as the destination. Embrace challenges, ask questions, and enjoy the process of unraveling the mysteries of your chosen field. I'm here to assist you throughout your research endeavors. Let's embark on this exciting journey together!
Project Description	The primary goal of this project is to develop an efficient protocol for isolating extracellular vesicles that are released from stem cells. This research aims to contribute to the understanding of the therapeutic potential of stem cell-derived extracellular vesicles in various biomedical applications. Expected Outcomes: Learning protocol for isolating stem cell-derived extracellular vesicles. Characterization of stem cell-derived extracellular vesicles, including their cargo and functional properties. Insights into the therapeutic potential of stem cell-derived extracellular vesicles for various applications, including regenerative medicine and immune modulation.
Required Skills	Proficiency in basic laboratory techniques, including pipetting, centrifugation, and sample preparation. Ability to follow laboratory protocols and safety guidelines. Knowledge of cell culture principles and practices, including cell maintenance, passaging, and sterility (preferred). Strong written and verbal communication skills for documenting experimental procedures, results, and conclusions. Ability to effectively communicate with team members and present findings in meetings or presentations.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology, Medicine
Project Title	**15: Improving paired immunotherapies through T cell genome engineering**
Mentor, Title	Sean Yamada-Hunter, Postdoctoral Fellow

Institution/ Affiliation	Stanford University: Mackall Lab - Stanford Cancer Institute
Institution/ Company Website	https://med.stanford.edu/mackalllab.html
Company Description/ Mission	The Mackall lab seeks to discover fundamental principles that control tumor:immune interactions and to apply these insights to develop novel immunotherapies for cancer. Current areas of major focus include in depth studies of the molecular and cellular processes that govern T cell exhaustion, identification of new immune targets expressed by cancer and leveraging emerging synthetic biology platforms to create next generation chimeric antigen receptors that manifest enhanced potency, regulatability, multispecificity and exhaustion resistance. We are a multidisciplinary team, which spans undergraduate researchers, graduate students and postdoctoral fellows, medical students and physicians and early career and senior scientists with expertise in cellular immunology, molecular immunology and oncology, synthetic biology, computational science and clinical investigation. The Mackall laboratory works closely with clinical and translational investigators within the Stanford Center for Cancer Cell Therapy to test novel therapeutics in early phase clinical trials and to identify biomarkers of response and mechanisms of resistance to cancer immunotherapies.
Mentor Bio	I am a postdoctoral fellow in the Mackall Lab in the Stanford Cancer Institute, where I work on synthetic biology approaches to overcoming challenges facing CAR T immunotherapies. Before joining the Mackall lab, I got my PhD from Stanford in Cancer Biology. I'm a California native, born and raised in San Diego, before attending UCLA for undergrad, where I studied biochemistry. I'm passionate about mentoring young scientists and strive to create a fun and inclusive environment, while doing some cool science at the same time! For fun, I love spending time with my wife (who, fun fact, is a professor at Foothill College!) and our toddler, hiking, cooking, and exploring the Bay Area! I'm an avid sports fan and really enjoy gardening and being outdoors in nature.
Project Description	Immunotherapy (treatments which focus on controlling the immune system) has revolutionized cancer treatment, leading to long-term disease cures. However, many patients still do not respond to single immunotherapies or develop resistance, leading to an interest in using multiple immunotherapies together for greater therapeutic benefit. We are focused on one such pairing, developing treatments that pair together two different kinds of killer white blood cells called T cells and macrophages. Specifically, we are focused on pairing a type of engineered T cell called a chimeric antigen receptor T cell (CAR T) with an antibody drug (called anti-CD47) that helps macrophages work better. CAR T cells come from cancer patients themselves, and are changed in the lab to be able to detect and attack cancer cells directly. CD47 lets white blood cells know not to attack healthy cells and organs, but cancers also use it to evade detection by the immune system. Blocking CD47 allows for stronger antitumor immune responses. This project will focus on using gene editing techniques to make changes to the CD47 gene on T cells to allow for pairing with anti-CD47 therapies, which otherwise lead to the targeting and elimination of therapeutic T cells. We will focus on testing a number of cutting-edge CRISPR gene editing

	platforms, including gene knock-in and base-editing, to identify the most promising platforms to use for future therapeutic studies.
Required Skills	Students should be motivated and excited to conduct research in the lab. Students will be expected to have good communication skills and work well as part of a team. Although no prior lab experience is required, knowing the basics, like using a micropipette or being familiar with lab equipment such as centrifuges and laminal flow cabinets, will greatly accelerate the progress of the project and is a plus. An understanding of molecular biology fundamentals would be helpful, as well as some familiarity with cancer immunotherapy.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Chemistry
Project Title	**16: Designing High-Energy-Density Zinc Batteries**
Mentor, Title	Xinzhe Xue, PhD Candidate
Institution/ Affiliation	University of California Santa Cruz: Department of Chemistry and Biochemistry
Institution/ Company Website	https://li.chemistry.ucsc.edu/
Company Description/ Mission	Our lab focuses on materials chemistry for green energy such as energy storage (supercapacitors and batteries)
Mentor Bio	My name is Xinzhe Xue, and I am a third year PhD candidate in Physical/Materials Chemistry at UC Santa Cruz. I am currently working on designing electrolytes and materials for high-energy energy storage systems (supercapacitors and batteries), I like to go to the gym, do hiking and drawing/designing in my spare time! I am looking forward to seeing you!
Project Description	This project is to design better materials for high energy density zinc battery systems. Student will be able to prepare materials and electrolytes via various methods, and will learn how to process the testing data as well as fundamentals on electrochemistry.
Required Skills	This project will require 1 quarter of general chemistry or some background in electrochemistry – this is a plus but not necessary.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly literature search, background research, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Chemistry, Computer Science, Engineering, Physics, Geological science; geology; geophysics; planetary science
Project Title	**17: Preventing rust while heating rare extraterrestrial materials to understand their magnetic properties**
Mentor, Title	Thom Chaffee, PhD Candidate
Institution/ Affiliation	Stanford: Geophysics
Institution/ Company Website	https://magnetism.stanford.edu/
Company Description/ Mission	The Tikoo group uses laboratory paleomagnetism techniques and computer modeling to investigate the magnetic fields of planetary bodies & magnetic properties of extraterrestrial materials, with particular focus on uncovering the history of the extinct magnetic dynamos on the Moon and Mars.
Mentor Bio	I am a fourth year PhD candidate in the Stanford Geophysics department working in the lab of Dr. Sonia Tikoo. My research investigates the intersection of planetary magnetism and thermodynamics, with a focus on lunar materials. I am very passionate about education and plan to be a professor after finishing my degree. I have directly supervised undergraduates in the lab before and am confident in my ability to meet you at your skill level and adapt the internship experience towards your strengths and interests. I am also very passionate about geology and planetary science—it is a delight to get to work with NASA and investigate the many open scientific questions about our solar system. I identify as coming from a low-income background and want to help students of all identities and backgrounds find their pathway to flourishing in these exclusionary fields where many types of people remain underrepresented.
Project Description	Our lab studies the ancient lunar magnetic field, which is no longer active. We learn about it by measuring the magnetic field locked into lunar rocks at the time they formed, millions to billions of years ago. Magnetic analysis of extraterrestrial materials (e.g. Apollo samples, meteorites) requires samples to be heated above 700 °C in the laboratory. However, these materials form in low-oxygen environments and are geochemically unstable in the Earth's atmosphere above ~200 °C as their ferromagnetic carriers will rust, destroying the preserved magnetic signal we wish to measure. Similarly, heating in vacuum causes rusting due to trace gas impurities. To prevent this alteration, we are developing an atmospheric control system that supplies a mixture of gases into a sealed vessel containing the samples while they are heated. The student will assist with assembly and fine-tuning of the oven control system to identify oxidation in the test samples. Students with strong software skills may also assist with development of an automated control system in LabVIEW to integrate thermochemical sensor feedback into the gas flow control. With this system functional, we will focus on studying the magnetic behavior of the iron phosphide mineral schreibersite present in many returned lunar rock samples. That's right, these rocks were collected by astronauts! The student will assist with running experiments, collecting data, and preliminary

	data analysis—students with appropriate experience may operate experiments on synthetic samples independently with some oversight.
Required Skills	Necessary coursework is 1 quarter of electromagnetism (Physics 2B or 4B – this can be in progress spring 2024) Preference will be given to applicants with a demonstrated interest and even some experience in geological or planetary sciences.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Chemistry, Engineering
Project Title	**18: Broadening Accessibility & Training To Emerging Researchers for Innovative Energy Storage (BATTERIES)**
Mentor, Title	Philip Dirlam, Assistant Professor
Institution/ Affiliation	San Jose State University: Chemistry Department
Institution/ Company Website	https://www.sjsu.edu/chemistry/
Company Description/ Mission	The Chemistry Department at San José State University strives to provide broad access to the highest quality education possible in the molecular sciences at the baccalaureate and master's degree levels. To achieve this ambitious goal, we have crafted a curriculum affording students access to expert instructors in each of the sub-fields of chemistry via traditional classroom courses, hands-on laboratory courses, and research laboratories.
Mentor Bio	Hello! My name is Philip Dirlam and I'm a faculty member at San Jose State University. I teach organic and polymer chemistry and I am interested in pursuing research into new materials and their use in energy storage technology (batteries). I'm originally from rural Minnesota and after high school I escaped to California where I completed my undergraduate studies at Cal Poly in San Luis Obispo. After undergrad I made my way to the desert in Tucson AZ where I completed my graduate work on polymers and their use in next-generation batteries. I then spent a few years doing research back in Minnesota at the Center for Sustainable polymers before finally starting as a professor at SJSU. My favorite part of my job is working with students in the lab. To get away from the academic world I like outdoor activities including disc golf, gardening, camping, hunting, fishing and also love to cook (experiments you can eat!).
Project Description	We are investigating how metal-organic frameworks (MOFs) can be used to enhance the performance of Lithium-Sulfur (Li-S) batteries. The project is a collaboration amongst researchers at CSU Chico and Lawrence Livermore National Lab. My group at San Jose State University will be carrying out two key aspects of the overall project: 1) Synthesis of the organic compounds

	that function as the linkers in the MOFs, and 2) Fabrication and testing of the Li-S batteries.
Required Skills	Prospective Interns should have completed their coursework in General Chemistry (Chem 1 series) with lab. Overall, curiosity and a desire to get in the lab and gain experience conducting research are the key prerequisites. Strong preference will be for students transferring to SJSU in fall 2024, studying chemistry, biology, or chemical engineering. You will also need to have a social security number for student employment, this includes for undocumented and international students
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	Two interns

Discipline	Chemistry, Engineering, Physics, STEM Education/ Empowerment
Project Title	**19: Process engineer assistant in a semiconductor company**
Mentor, Title	Samira Bagheri, Ops Manager
Institution/ Affiliation	EMD Electronics: Operations
Institution/ Company Website	https://www.emdgroup.com/en/
Company Description/ Mission	To support semiconductor R&D activities within EMD Electronics
Mentor Bio	I have a Ph.D. in nanotechnology and did my MBA at Golden Gate University. I have been at EMD for 2 years and I have more than 10 years of experience in metrology and operations in semiconductor companies. EMD Electronics is one of the pioneers in chemical manufacturing for the semiconductor industry. It's affiliated with Merck KGaA, a company based in Germany that was founded in 1668.
Project Description	You'll have an opportunty to learn about semiconductor manufacturing in this internship. You will learn more about deposition tools – Atomic Layer Deposition, Physical Vapor Deposition. You'll also learn about metrology tools – X-Ray Difraction Analysis (XRD), X-Ray Fluroescence Analysis (XRF). This is a hands-on training to use these tools which are important parts of measuring chemical and physical properties of semiconductor components, such as transistors which are essential components of a microchip. You will be working at the level of angstroms!
Required Skills	Awareness of lab safety and basic computer proficiency. Coursework in chemistry or physics will be helpful but not necessary. Just a desire to learn more about how computer chips are made.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience

Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	Two interns

Discipline	Computer Science, Data Science, Engineering
Project Title	**20: Towards reliable and explainable visual assistance using data science**
Mentor, Title	Li Liu, Ph.D. student
Institution/ Affiliation	University of California, Santa Cruz: Computer Science and Engineering
Institution/ Company Website	https://engineering.ucsc.edu/departments/computer-science-and-engineering/
Mentor Bio	I am an international student and a first-generation student currently pursuing my Ph.D. in the Computer Science and Engineering department at UC Santa Cruz. Throughout my undergraduate studies, I was fortunate to receive guidance and support from many senior schoolmates, which deeply influenced my academic journey. Their mentorship instilled in me a desire to contribute back to the community and support others in similar ways. Now, as a Ph.D. student, I am excited to paying it forward by offering guidance and assistance to fellow students, hoping to create a supportive environment for everyone to succeed
Project Description	Responsible data science, empowered by its ability to analyze data and tackle pressing societal issues like poverty, inequality, climate change, and public health crises, is a formidable force for social good. This internship will be a research-oriented project. You have the choice of building on my research which involves using responsible data science and AI as a tool in addressing visual impairment. Or we can work together to develop your own project in areas related to my interest in data science as a tool for social impact. I believe responsible data science empowers communities to participate fully and equitably in society, driving positive change toward a more just and inclusive world, and we can work together to create a project that uses your skills.
Required Skills	At least one course or background in python preferred but not required (you will be given some training materials for self study if no coursework), interests in data science.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully remote/ online, Mostly on the computer, computational research
Selection Process	SLI will review
# of possible interns	One intern

Discipline	Computer Science, Data Science
Project Title	**21: Advancing Satellite Machine Learning Foundation Models for Disaster Preparedness, Response and Recovery Use Cases**
Mentor, Title	Olivia Alexander, Associate Data Scientist
Institution/ Affiliation	USRA: Data Science

Institution/ Company Website	https://riacs.usra.edu/
Company Description/ Mission	USRA's Research Institute for Advanced Computer Science (RIACS) is dedicated to equitably building national capacity for foundational and use-inspired research in artificial intelligence and quantum computing supporting public good applications.
Mentor Bio	I am an associate data scientist at Universities Space Research Association (USRA) which contracts with government agencies such as NASA and USGS. I work in the environmental data science group, working with satellite data for earth science projects.
Project Description	We are offering a paid remote internship opportunity for a talented and motivated student to further develop their expertise in artificial intelligence and advance the state-of-the-art in use of satellite data foundation models for a number of downstream applications focused on disaster preparedness, response and recovery (e.g., wildfires). Foundation models are typically large-scale models trained on diverse datasets to learn a broad understanding of a given subject as for computer vision and natural language processing. Foundation models are designed to be capable of fine-tuning for more specific tasks or domains, making them a key starting point for developing more specialized AI models.
Required Skills	• Programming skills in Python and/or PyTorch (3A and 3B completion preferred) • Prior knowledge of machine learning and GNU/Linus is preferred • Prior experience with multispectral remote sensing data products and geospatial information systems (GIS) is a plus but not required • Excellent problem-solving skills and ability to work independently If you have some programming and AI/ ML skills and interest, please do apply!
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully remote/ online, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	Two interns

Discipline	Computer Science, Data Science
Project Title	**22: Project 1: Machine Learning: Video-to-Text / Project 2: Machine Learning: Speech-to-Text**
Mentor, Title	Sylvain Flamant, AI internship program manager
Institution/ Affiliation	Esperanto Technologies: AI group
Institution/ Company Website	https://www.esperanto.ai/
Company Description/ Mission	Esperanto develops and markets RISC-V based hardware and associated software to enable efficient deployment of AI or HPC workloads in datacenters and near-edge environments. The company's proprietary

	technology enables highly compute-energy efficient computing systems at production scale.
Mentor Bio	I am a French citizen with a 5 years Mechanical Engineering diploma and a degree in Optics (1981), who came to the US to study and get a MSEE at Stanford (1984) after being a French officer in the army in Germany (1981-1982) and a lifeguard and swimming instructor one summer at Club Med (5 months in 1983). Since then, I have worked as a design engineer in Telecoms, and VDSL doing lots of DSP designs both in hardware and software. 5 years ago I took a side step towards Machine Learning. My elder son is also working in AI but is much smarter than I am! My wife (Taiwanese-American) and my 2 sons speak Chinese and French, and we all like to travel. For the last 15 years I have spent a lot of weekends volunteering with USA-swimming as a Judge, Starter or Referee.
Project Description	Please choose one of the two projects being offered: Project 1) Video-to-text: Generative AI is a recent field of research. New trained models for understanding images are now available, but they are not very accurate yet. The intern will be part of a team experimenting with an AI "image-to-text" system . The team will fine tune the "video-to-text" model(s) for specific vertical applications and evaluate its accuracy (possible such narrower vertical applications could be: "incident detection (for example falls) in an hospital environment", "detection of suspicious activity on security videos" etc.). Project 2) Speech-to-text: The intern will evaluate the current state of available pre-trained models in the speech to text area. He will build a system of models which will be able to perform a Speech-to-text summarization. A possible extension of the work would be to look at the vertical application in the medical field where a model would be fine-tuned to assist a physician summarizing his recorded audio of a patient visit.
Required Skills	Very good computer sciences background in Python - completion of 3 course series (or taking 3C in spring). Some exposure to introductory level Machine Learning or Deep Learning classes very helpful. Linear Algebra and statistics coursework required - either at Foothill or elsewhere.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	40% onsite minimum with encouragement to spend more time in person if possible, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Computer Science, Data Science, Mathematics, Physics, Materials Science
Project Title	**23: Predicting novel 2D materials with large-scale simulations and machine learning**
Mentor, Title	Johnathan Georgaras, PhD Candidate
Institution/ Affiliation	Stanford University: Department of Material Science and Engineering

Institution/ Company Website	https://jornada.stanford.edu
Company Description/ Mission	We are a theory/computational group focused on 2D and quantum materials. We study their electronic and optical properties to engineer new materials for applications in energy research, renewables, and quantum information.
Mentor Bio	My name is Johnathan Georgaras. I am a 4th year PhD student in the Jornada Group studying Materials Science at Stanford University. I am a Greek-Canadian student and the first of my family to got to graduate school in the United States. My work focuses on the electronic, optical, and structural properties of 2D materials and my background was in physics and computational optimization in college. I have lived 4 years in California and I have picked up many hobbies that take advantage of the abundant nature like kiteboarding and surfing. I take pride in giving back to my community in many ways including: helping facilitate graduate student housing social events; and acting the vice-chair of the School of Engineering's Dean's Graduate Student Advisory Council which provides a feedback and activation mechanism for unheard graduate students' voices to be heard by the Dean. I participated in this program last year (had an amazing time) and I am looking forward to working with a Foothill college student again.
Project Description	Through this internship, you will learn and use a combination of theoretical and computational tools to predict the electronic and optical properties of novel 2D materials, such as graphene, and also emerging properties from twisting and straining these materials. You will learn how to use state-of-the-art computational tools based on concepts such as density-functional theory (DFT), first-principles calculations based on many-body perturbation theory (MBPT), and machine-learned force fields. We are trying to find more cost effective ways to understand the properties of 2D materials using these computational tools and machine learning. You will also use large-scale computational resources to carry out these calculations and will be able to engage with the vibrant experimental community at Stanford on 2D materials to test their predictions.
Required Skills	Coding/ scripting background in Python – completion of CS or equivalent self study, trigonometry. In addition, basic physics (forces, energy, electrostatics) – either a course at Foothill (up to Physics 2B or 4B) or high school physics – is preferred and basic chemistry (atomic structures, chemical bonds) – up to Chem 1B preferred.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Project 24: Software Engineering Intern at Bio-Techne has been cancelled

Discipline	Data Science
Project Title	**25: Textsmith: Harnessing the Power of AI for Text Classification**
Mentor, Title	Wonhee Lee, Senior Research Analytics Scientist
Institution/ Affiliation	Stanford: Research Hub
Institution/ Company Website	https://gsbresearchhub.stanford.edu/
Company Description/ Mission	The Research Hub provides tailored services responsive to the needs of GSB faculty members, including research planning consultation, data acquisition, and computation and analytics support. We also provide a wide range of research services to GSB students and staff as well as the broader Stanford community
Mentor Bio	Wonhee Lee is a member of the analytics division on the Data, Analytics, and Research Computing (DARC) team and supports GSB faculty research through consultations, technology explorations, and formulating solutions for challenging data collection and transformation projects. Her areas of expertise include natural language processing, machine learning, feasibility tests, and external resource management. Prior to Stanford GSB, Lee worked at RMC Research Corporation, Stanford's psychology department, and other universities as a quantitative researcher and project manager where she led projects aimed at increasing positive social and educational outcomes via changes in behavior or mindset. Lee holds a master's degree in educational psychology from the University of Colorado, Denver.
Project Description	Our project aims to leverage the advanced capabilities of generative AI models, specifically the GPT (Generative Pre-trained Transformer) and leading open source models like LLaMA (Large Language Model Meta AI), for sophisticated text classification tasks. Our primary goal is to develop and implement these models to effectively categorize a wide range of textual data, extending from news articles to job postings. The focus will be on creating a robust system capable of understanding and classifying text based on context and subject matter. Key activities will include training the models on text data using a variety of prompts, fine-tuning these prompts for optimal responses, enhancing performance for accuracy and efficiency, and devising evaluation strategies and metrics. This project is intended to transition complex classification challenges from manual processes to automated solutions. We are excited to offer an opportunity for someone who is eager to learn about the applications of Generative AI in advancing research in the field of natural language processing. If you are interested in contributing to our project, we encourage you to apply for this project!
Required Skills	Preferences will be given to applicants who meet the following criteria: - Cumulative GPA of 2.5 or above - No prior internship experience - Demonstrated Financial Aid needs

	- Computer Science major or a course in the Python series, or basic python programming skills (e.g., completion of the several programming courses) - Ability to follow instructions and incorporate feedback
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students. Student needs to be authorized to work in the U.S. – you will be hired at Stanford.
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Project 26: Bioinformatics & Research Intern at Digbi Health has been cancelled

Discipline	Data Science, Engineering, STEM Education/ Empowerment
Project Title	**27: Medical Device Intern**
Mentor, Title	Tony DAlessandro, Director of Mechanical Engineering
Institution/ Affiliation	iSono Health: Engineering
Institution/ Company Website	isonohealth.com
Company Description/ Mission	We are working on making ultrasound breast screening available to all.
Mentor Bio	I am a mechanical engineer. I've been working on medical devices for 20 years. I've been principal the launch 6 devices. I've worked for both big and small companies. I got my bachelor's degree from San Francisco State in mechanical engineering. I'm a car guy!
Project Description	iSono Health is a medical device start-up located in South San Francisco, working on making ultrasound breast screening accessible and more comfortable for all. As an intern this summer, you will support the team in build and prescription of how we build to contribute to the quality improvements. You will review designs and provide fresh new eyes on improving the designs. Bring an interest in medical devices, women's health, and creative ideas to join our team!
Required Skills	Desire to learn about medical devices, ultasound breast screening, robotic components and accessories. Good hands on ability. Good mechanical and spatial abilities. Experience with 3D CAD software is a plus.Good hands-on, mechanical and spatial abilities.
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Engineering
Project Title	**28: Reviewing Quality Assurance Schematics in the Semiconductor Industry**
Mentor, Title	Stephanie Limon, Sr. Equipment Engineering Manager
Institution/ Affiliation	Intermolecular: Equipment Engineering
Institution/ Company Website	https://www.emdgroup.com/en/expertise/semiconductors/custom-innovation/intermolecular.html
Company Description/ Mission	We are the trusted partner for materials innovation. We explore, test and develop advanced materials that are revolutionizing the next generation of electronics that make lives easier, entertaining and more productive. For more than 15 years, our team, methodologies and quality data have driven impactful outcomes, market opportunities and innovative product designs for our customers. As the Silicon Valley science hub of Merck KGaA, Darmstadt, Germany, we are perfectly positioned to break the boundaries of science and technology. We advance digital living.
Mentor Bio	I am a Latina who was born and raised in San Jose, Ca. I understand we all have different paths to take in life. I am always looking to give back to my community, giving others opportunities to help them reach their education/career goals. I lead a team of 14 male engineers/technicians and 1 female engineer. The team comes from different backgrounds with a common goal to help each other continue to learn.
Project Description	Student will gain drawing/design skills using computer software programs to do quality checks on parts to be installed on our Physical Vapor Deposition and Atomic Layer Deposition tools. These are tools commonly used in the semiconductor industry. You will be using different softwares for doing these quality checks, and that will be provided to you part of the internship. This is a good way to learn about the tools used in the semiconductor industry.
Required Skills	Some skills and knowledge of hardware engineering principles, digital logic, analog circuits and its hardware implementations is helpful, but not required. Preparing for mechanical or electrical engineering degree.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Engineering, Physics
Project Title	**29: TCAD Simulation of Silicon Detectors**
Mentor, Title	Julie Segal, Staff Engineer
Institution/ Affiliation	SLAC National Accelerator Laboratory: TID
Institution/ Company Website	https://www6.slac.stanford.edu
Company Description/ Mission	DOE funded physics research

Mentor Bio	Physics undergraduate at Berkeley, worked in the semiconductor industry after graduation. Later went back to grad school at Stanford for Phd in electrical engineering. I have been working at SLAC developing instrumentation for physics experiments for 14 years. I have two grown children and a Labrador retriever who is an "empty nest" dog.
Project Description	The student will help develop silicon sensors for high energy particle physics experiments. These sensors are somewhat like the camera chips in cell phones but optimized for high energy particle tracks. The student will use TCAD tools (technology computer aided design) that are widely used in the semiconductor industry to develop semiconductor devices such as transistors and light sensors. We will use a process simulation tool to simulate the semiconductor fabrication process, and a device simulation tool to simulate the device operation. The student may also be exposed to semiconductor fabrication and/or circuit design depending on background and interest.
Required Skills	Completion of 2A and 2B or 4A and 4B preferred. Some basic computer programming skills. Basic electrical engineering (ENGR 37) is a plus.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Psychology
Project Title	**30: A Platform for Elevating Youth Voices and Choices**
Mentor, Title	Virginia Isarraras, Research Coordinator
Institution/ Affiliation	Stanford University: Psychology
Institution/ Company Website	Lifting the Bar
Company Description/ Mission	Every young person needs strong and trusting relationships with educators to succeed: At least one person who sees in you the good person you can become, especially when you're struggling, and even when you can't see that yet. That relationship can inspire a student to become that good person and show them the way. Yet stereotypes can render marginalized youth invisible to teachers or define them in pejorative ways. Lifting the Bar is a social psychological intervention designed to improve academic outcomes for students in challenging circumstances (justice involved, foster care, ELL, substance use) by "sidelining" the bias that students face when in school.
Mentor Bio	I am a first-generation, low-income Latina. I graduated from Stanford University class of 2023. I am currently a full time research coordinator at Stanford University. I am passionate about increase education access to marginalized youth. My undergraduate work, that of which I continue to work on now, was an adaptation of the Lifting the Bar work (outlined here)

	for English Language Learners. Ultimately, my lived experiences drive my research interests and I am excited to share that with folks!
Project Description	Lifting the Bar is a social psychological intervention initially designed to improve outcomes for students transitioning out of juvenile detention by minimizing the bias that students face when returning to school because of their history. In the intervention, students have a platform to reflect on their goals and values in school and then identify an educator whom they would like to get to know better. Now, we've upscaled this work and are implementing an adaptation of the original study for foster students across two southern California school districts. Our cycle of adaptation has also grown to include adaptations for students facing similarly challenging circumstances such as students experiencing substance use, English learners, and refugee students.
Required Skills	No prior research experience is required! We're looking for someone who is..: - interested in social psychology and education - highly detail-oriented - passionate and curious - eager to learn - passionate about social/criminal justice * some experience with qualitative data (collecting/analyzing) helps but isn't required
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Fully remote/ online, Mostly literature search, background research, qualitative and quantitative data analysis
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Public Health
Project Title	**31: A Systematic Review of Suicide Research Among Transgender and Gender Non-Conforming or Gender Expansive populations**
Mentor, Title	Shamsi Soltani, PhD Student
Institution/ Affiliation	Stanford University: Department of Epidemiology and Population Health
Institution/ Company Website	https://med.stanford.edu/epidemiology-dept.html
Company Description/ Mission	The Stanford Suicide Prevention Research Laboratory utilizes cognitive, biological (e.g., fMRI), and behavioral testing paradigms, with an emphasis on translational therapeutics across the lifespan. Our mission is to identify novel therapeutics, including seminal work to establish the subfield of sleep and suicide prevention. A special focus is the development of rapid-action, low-risk interventions for the prevention of suicide. Our mission is to evaluate transdiagnostic risk factors and biomarkers underlying treatment response that may inform etiology, reduce stigma, and advance innovation. Advocating for its utility as a visible, yet non-stigmatizing warning sign of

	suicide—our earliest work delineated sleep as a risk factor for suicidal behaviors.
Mentor Bio	Hailing from the Bay, Shamsi studies behavioral data science in the Department of Epidemiology and Population Health at Stanford University. She builds upon years of public service as a Senior Epidemiologist for the City and County of San Francisco, where she focused on COVID-19 response and transportation injury prevention. Currently, she studies suicide risk and prevention among LGBTQIA+ communities. Born and raised in San Francisco, Shamsi is a child of immigrants. She is fond of riding bikes, reading reams of fiction, and sweating through rhythm & motion dance classes.
Project Description	This project is a systematic review of all existing suicide risk and prevention research among transgender and gender-nonconforming (GNC) populations. The idea behind a systematic review is to find all peer-reviewed (and in this case, English language) literature on a specific topic, comprehensively analyze it, and distill findings and recommendations. I am a former public health professional and 3rd year PhD student in Epidemiology at Stanford University, and have designed this project as the launching pad for further research that aims to address suicide risk disparities faced by transgender and GNC people and LGBTQIA+ communities more generally. The matched SLI student would be an integral part of this project, and a co-author on the eventual publication. We aim to publish this work in a top-tier medical journal to reach maximum possible readership.
Required Skills	Attention to detail, curiosity, ability to work with somber subject matter. No coursework required, but this position requires a good deal of reading, being at a computer, and accuracy in pulling relevant details and data from research papers. Being unafraid to ask questions and ask for help when needed is an asset. Interest and familiarity in sexual and gender minority (i.e. LGBTQIA+) communities will be beneficial.
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Fully remote/ online, Mostly literature search, background research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	STEM Education/ Empowerment
Project Title	**32: A Qualitative Exploration of Low-Income Student's Experience in Science**
Mentor, Title	Gabriel Reyes, Founder and CEO
Institution/ Affiliation	FLi Sci: Research and Evaluation
Institution/ Company Website	www.FLiSci.org
Company Description/ Mission	Prepare low-income students historically excluded from research to pursue advanced degrees in science and medicine.
Mentor Bio	Will be added

Project Description	The task involves piloting a qualitative interview study to delve into the experiences, challenges, and achievements of participants in the FLi Sci Scholars Program. Methodologically, this entails developing interview protocols and conducting semi-structured interviews with a small sample of program participants. Subsequently, the recorded interviews will be transcribed, and qualitative data analysis techniques, such as thematic analysis, will be employed to identify patterns and themes within participants' narratives. Through this methodology, the study aims to gain valuable insights into participants' perceptions and experiences within the FLi Sci Scholars Program.
Required Skills	No skills required. A basic understanding of Excel or Google Sheets, as well as a familiarity with literature review techniques, grounded in psychology and science education is helpful but not necessary. Additionally, basic proficiency in mathematics or statistics is beneficial. Strong presentation and communication skills are also desirable. However, the primary requirement is a willingness to learn and grow, making this opportunity suitable for individuals eager to enhance any of the aforementioned skills through hands-on experience in a supportive environment.
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Fully remote/ online, Mostly on the computer, computational research, Mostly literature search, background research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Ecology
Project Title	**33: Assessing Temperature and Water Constraints on Growing-Season CO2 Uptake in Arctic and Boreal Ecosystems**
Mentor, Title	Jiaming Wen, Postdoctoral Fellow
Institution/ Affiliation	Carnegie Institution for Science: Global Ecology
Institution/ Company Website	https://michalak.sites.stanford.edu/
Company Description/ Mission	Our lab are interested in understanding the cycling and emissions of greenhouse gases at the Earth surface at urban to global scales – scales directly relevant to informing climate and policy – primarily through the use of atmospheric observations that provide the clearest constraints at these critical scales.
Mentor Bio	My name is Jiaming Wen, and I am currently a postdoctoral fellow in Michalak Lab at the Carnegie Institution for Science. My research interest is to study how ecosystems interact with climate change. I was born in Datong, China, and got my bachelor degree at Tsinghua University, Beijing, China. I came to the U.S. in 2017 for Ph.D. research at Cornell University. During my spare time, I like hiking and reading books.
Project Description	The uptake of CO2 by ecosystems is regulated by environmental factors such as temperature and water availability. In Arctic and boreal (specifically, the

	ecoystem in Alaska) ecosystems, it has been commonly understood that CO2 uptake is predominantly limited by temperature, with water limitation playing a minor role. However, climate change may shift carbon dynamics. Warming ramps up water demand, leading to water limitations, particularly during the growing season when plants need water the most to fuel photosynthesis. Understanding environmental constraints on CO2 uptake is critical for us to assess the climate impact and predict the trajectory of the Arctic–boreal carbon cycle. In this project, we will analyze measurements of carbon fluxes from multiple towers in the Arctic–boreal region, and examine how temperature and water availability affect the growing-season CO2 uptake of these ecosystems. Furthermore, we will leverage long-term records of flux tower measurements to study whether and how temperature and water limitations vary as climate warms.
Required Skills	Basic programming skills (e.g., R, Python, Matlab, Julia), prior background knowledge or completion of CS 3A strongly preferred. Basic data analysis skills (e.g., reading .csv files, filtering data based on conditions, making plots, linear regression) - prior coursework in statistics recommended. Interest in ecology and climate change is preferred.
Duration	15 hours per week for 9 weeks (7/8/24 - 9/6/24) - $2600 stipend for students
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly on the computer, computational research
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Engineering, Medicine
Project Title	**34: R&D Engineering Intern for Heart Valve Device**
Mentor, Title	Albert Yuan
Institution/ Affiliation	ConKay Medical Systems, Inc., UCSF Rosenman Institute
Institution/ Company Website	www.ConKayMedical.com
Company Description/ Mission	At ConKay, we are developing a medical device to help treat patients suffering from leaking heart valves, also known as Valvular Regurgitation. Our device is a minimally invasive catheter system coming from the femoral vein in a patients leg and our device pulls in a patients valve diameter mimicking open-heart surgery. We believe we have the potential to help millions of patients worldwide, including many with no medical options, so they can all live longer lives with their loved ones.
Mentor Bio	My name is Albert Yuan and I am the CEO and founder of a medical device company called ConKay Medical Systems. We are developing a catheter-based system for treating patients suffering from leaking heart valves. I have over 20+ years of engineering experience and I received my bachelors degree from the University of Davis, CA in BioSystems Engineering and my Masters degree from Cal Poly, San Luis Obispo. I love mentoring students

	and am currently a mentor at Dublin High School for their STEM academy and I also volunteer as an Industry Advisory Board member for the Cal Poly San Luis Obispo's Biomedical engineering program where I mentor college students every year. My other hobbies include hiking, playing soccer, watching sports, and hanging out with my family during my free time. I also volunteer as a soccer coach for my daughter's soccer team.
Project Description	The R&D Intern would help support activities for developing a catheter medical device to treat patients suffering from leaking heart valves. Activities may include 3D modeling, testing on the bench, data analysis, and support manufacturing prototypes.
Required Skills	● Ideally, student is in a Mechanical or Biomedical Engineering major who would like to work in the medical device space. ● Proficient MS Office (Word, Excel, etc.) ● Comfortable with 3D modeling using SolidWorks or similar CAD programs ● Strong writing skills and knowledge of statistical analysis (T-tests) is desirable.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Mostly in-person (at site in Pleasanton, CA) with some remote work when possible, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Computer Science, Engineering
Project Title	**35: Designing and validating sound diffusers and acoustic metamaterials**
Mentor, Title	Feruza Amirkulova, Associate University
Institution/ Affiliation	San Jose State University: Mechanical Engineering Department
Institution/ Company Website	https://sjsu.edu/me/
Company Description/ Mission	Our mechanical engineering program at SJSU has three stems: design, mechatronics, and thermal-fluid sciences. Design and thermal-fluid sciences are the backbone of all accredited mechanical engineering programs in the country. Mechatronics is a departmental specialty at SJSU and offers our students another fascinating and marketable field of study. Our hands-on curriculum incorporates a multitude of laboratory experiences to put classroom theory into practice. Our award-winning design projects demonstrate just how proficient our students and faculty are at designing and building creative ideas that make a difference. Lastly, we involve our undergraduate and graduate students in our faculty research, advancing the frontiers of mechanical engineering.
Mentor Bio	Please refer to: https://www.sjsu.edu/people/feruza.amirkulova/
Project Description	Sound diffusers are physical items created and installed to improve acoustic properties of a space and create a specific listening experience. In this internship, you will model sound diffusers and acoustic metamerials using optimization and machine learning algorithms. You will gain computational

	programming skills as well as hands-on experience in sound measurements. You will also further work on the validation of these diffusers through sound measurements performed in an anechoic chamber (a room designed to replicate a free field where sound does not reflect back) in our lab.
Required Skills	Some programming background in e.g. MATLAB, Julia, Python preferred, such as a CS 3A or another programming course. If limited programming background, you will be trained and will be expected to do some self study.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Hybrid - remote/ online with some in-person opportunities, Mostly hands-on, in-lab experience, computational research (preferably) with hands-on experiments
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Biology
Project Title	**36: Development of a microfluidic platform for high throughput genomic analysis.**
Mentor, Title	Mackenzie Bullock, Research Associate II
Institution/ Affiliation	Standard BioTools: Research and Development
Institution/ Company Website	www.standardbio.com
Company Description/ Mission	Unleashing tools to accelerate breakthroughs in human health.
Mentor Bio	Mackenzie Bullock is a Research Associate II at Standard BioTools. She really enjoys science and takes pride in being a woman in the STEM field. One aspect of she really enjoys with her current role, is that she is always learning. While majority of her time is spent at a lab bench, she has been able to learn new skills and experiences in a professional setting. Mackenzie has a bachelor's degree from UC Davis in Genetics and Genomics. She is originally from the Bay Area and loves the community here. In her free time, she enjoys hiking, crafting, and exploring different neighborhoods through walks.
Project Description	The molecular biology based project will focus on development and testing a new microfluidic product for genomic testing. Participants will have the opportunity to learn laboratory skills in the field of molecular biology. In addition, the project will provide hands-on opportunities to learn about how hardware and software components of the system interact with the molecular biology experiments they are performing. This is ideal for someone with an interest in molecular biology while also wanting experience and exposure to other technical fields of a biotech company.
Required Skills	At least one quarter of introductory biology or equivalent. At least one quarter of science with a lab is preferred.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students

Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Discipline	Computer Science, Data Science
Project Title	**37: Frontend, Backend or Data analyst Intern**
Mentor, Title	Jean Calderon, Program Director
Institution/ Affiliation	CCPathways: Apprenticeship Program
Institution/ Company Website	https://ccpathways.org/
Company Description/ Mission	To create a world where every individual, regardless of their background or circumstances, has equal access to opportunities for skill development, personal growth, and workforce success, fostering a global community empowered to realize their full potential and contribute positively to society.
Mentor Bio	Project Manager at ioet, Quito. Led web app development, managed teams, enhanced processes. Co-founder of Klav, SaaS startup
Project Description	CCPathways is non profit organization supporting individuals from diverse backgrounds to enter the tech workforce. This internship is different from other projects in this catalog as it is focused on training and building skills in the given project area as an onramp before working on real-world company projects. If you are interested in this internship, please select the project(s) that you are interested in. Project 1: Data Analyst Apprentice: Analyze and visualize real-world datasets to derive insights and support decision-making processes within our organization. Gain hands-on experience in data manipulation, analysis, and presentation techniques. Project 2: Frontend Developer Intern: Collaborate with our team to design and develop user-friendly interfaces for web applications. Learn JavaScript while implementing responsive design principles and enhancing user experience. Project 3: Backend Developer Intern: Contribute to the development of robust backend systems and APIs that power our applications. Work with Node.js and databases to build scalable and efficient server-side solutions.
Required Skills	Prospective interns should have a basic understanding of computers and programming concepts, with coursework in programming being a plus. Additionally, strong problem-solving skills and a willingness to learn are essential for success in our apprenticeship programs. *To be eligible for this internship, you need to have completed financial aid paperwork for Foothill and have demonstrated financial need (i.e. "unmet need" in your financial aid package). This is a requirement for the payment for this partnership. If you are not sure if you have unmet need, go ahead and express your interest in this project and SLI will look up your need.*

Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully remote/ online, Mostly on the computer, computational research
Selection Process	SLI will review
# of possible interns	5

Discipline	Computer Science, Engineering
Project Title	**38: R&D Lab Intern for Validation Teams (2 projects)**
Mentor, Title	William Ng, Technical Director Max Mu, SPE Validation Engineering Davy Pang, PE Applications Engineering
Institution/ Affiliation	Rambus Inc.: Research and Development
Institution/ Company Website	https://rambus.com/
Company Description/ Mission	Rambus is a global company that makes industry-leading memory interface chips and Silicon IP to advance data center connectivity and solve the bottleneck between memory and processing. With over 30 years of semiconductor experience, we are a leading provider of high-performance products and innovations that maximize the bandwidth, capacity and security for AI and other data-intensive workloads. Our world-class team is the foundation of our company, and our innovative spirit drives us to develop the cutting-edge products and technologies essential for tomorrow's systems.
Mentor Bio	William's bio: *I have 20+ years of experience in semiconductor validation, characterization, and debugging of high-speed interfaces, including DDR, PCIe, SATA, Fibre Channel, and XDR memory. Prior to that, I worked in logic design and micro-architecture of processors and 3D graphics. I received a BS in Electrical Engineering and Computer Science with Honors from the University of California, Berkeley.* *I love working hands-on in the lab, developing software tools to automate lab equipment, and debugging complex electronics systems. My job includes developing test plans and software to automate computer server systems, Automated Test Equipment, and testbench equipment to efficiently achieve test coverage for semiconductor devices. I have also developed software programs to automate lab data analysis and report generation flows.* Max' bio: *I have been working in the semiconductor industry for over 20 years. starting as a firmware and software designer, later as validation engineer. I'm now working on the post-silicon validation of DDR5 product at Rambus, where you can enjoy utilizing a variety of test equipment and methodologies to ensure the quality and functionality of the products. I am passionate about guiding and supporting aspiring young engineers in their professional development, sharing my knowledge and practical techniques. I finished my college in China and worked there for 15 years then moved to*

	California. I like spending time with my family and hiking, now I am a tennis fan and really enjoy playing tennis (skill need improve of course 😊). Davy's Bio *I have over 20 years of hardware design experience which includes many types of interfaces. DDR, PCIe, I2C, Ethernet, Fiber Channel, and many kinds of CPU/MicroController. I have a dual Master in Engineering, and MBA. I love to work in the lab environment where there are different challenges to resolve. It is never a boring day in the lab. There are many kinds of work in the lab, debugging, validation, documentation, and collaboration with different groups to resolve issues. I also enjoy sharing my knowledge with younger engineers and it is an amazing feeling when I watch them growth as engineers.*
Project Description	**Project 1**: Our team focuses on validation and production of memory buffer semiconductor System-on-Chip (SoC) products used in high-speed memory interconnect applications. We work in the lab to automate data collection and provide results to ensure system performance and specification compliance. Through this internship, you will gain experience with the latest high-speed memory interface technologies used in memory and data center applications, including DDR5 DRAM, Compute Express Link (CXL), and PCIe. Also, you will gain experience using the next generation Intel and AMD server systems used during the validation of our products. **Project 2:** Our team focuses on validation and production of memory buffer semiconductor Application Specific Integrated Circuits (ASIC) products used in Memory Modules (DIMM) which are used in Client and Server Memory Subsystems. We work in the lab to automate data collection and provide results to ensure system performance and specification compliance. Through this internship, you will gain experience with the latest high-speed memory interface technologies used in memory and data center applications. Also, you will gain experience using the next generation Intel and AMD server systems used during the validation of our products. Rambus's San Jose lab includes data center server systems and measurement equipment. You will learn about maintaining and debugging the test server systems, validation platforms, test equipment, hardware interface boards, and system software such as BIOS and Linux. You will develop software tools that will be used by Rambus engineers to automate the testing of semiconductor products in server systems. You may also develop software utilities and tools for Raspberry Pi and other test tools that are critical to Validation Engineers on the team.
Required Skills	**Project 1:** Computer science major with experience using Python (at least CS 3A). **Project 2:** Computer science or Electronic Engineering major with experience using Python (at least CS 3A). Both projects: Awareness of lab safety and computer proficiency. Coursework in computer architecture would be helpful. The intern should have enthusiasm for learning new concepts and technologies, be detail-oriented, and have good communication skills.

	For these projects, only students with demonstrated financial need will be placed – this is a requirement of the funding source for the stipends.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Mostly hands-on, in-lab experience
Selection Process	Mentor will review 3 - 5 student applications and pick their 1 or 2 top choices to make offers to.
# of possible interns	1 intern for project 1; 2 interns for project 2

Discipline	Marketing
Project Title	**39: Marketing initiatives for demand generation & funnel management**
Mentor, Title	Raj Uppala, Sr. Director of Marketing
Institution/ Affiliation	Rambus Inc.: Marketing
Institution/ Company Website	https://rambus.com/
Company Description/ Mission	Rambus is a global company that makes industry-leading memory interface chips and Silicon IP to advance data center connectivity and solve the bottleneck between memory and processing. With over 30 years of semiconductor experience, we are a leading provider of high-performance products and innovations that maximize the bandwidth, capacity and security for AI and other data-intensive workloads. Our world-class team is the foundation of our company, and our innovative spirit drives us to develop the cutting-edge products and technologies essential for tomorrow's systems.
Mentor Bio	Raj Uppala is the Sr. Director of Marketing at Rambus where he oversees the branding, positioning, demand generation, & sales enablement efforts to drive leads into opportunities, for the Silicon IP business unit. Prior to joining the HDD business unit at WD, Raj led the GTM & Outbound Product Management for a corporate strategic initiative to build a smart video camera product line encompassing Cameras, AI analytics, & Video Management System, delivered as a service. Raj began his career designing memory & mixed-signal IC's, subsequently transitioning to marketing and product line management roles across a few Semiconductor companies. He holds a MBA from Cornell University and a MS in EE from Mississippi State University. On a personal front, Raj loves the outdoors, travel, & experimenting in the kitchen. In his leisure, you can find him on a run, a bike, or a hiking trail, strategically positioned next to a good food joint. Having hiked Mt. Whitney & the Grand Canyon rim-to-rim trail in the recent past, he's always on the lookout for fun challenges.
Project Description	• Observe and collaborate closely with all functions within the Marketing team to understand team dynamics and operations. • Establish or improve processes related to event planning, execution, funnel management, & sales enablement.

	• Participate & assist with event execution, generate reports with key metrics along with opportunities for improvement. • Review funnel management activities, analyze results to draw actionable conclusions and recommendations to improve conversion rate. • Monitor demand generation lead delivery into CRM platforms and report discrepancies. • Work closely with all functions of digital marketing including leveraging social media, branding, collateral, and marketing operations to improve awareness and increase conversions. • Identify opportunities to automate reporting of various processes.
Required Skills	• Strong analytical skills with the ability to interpret data and draw actionable insights. • Proficiency in Excel for data analysis and reporting. • Excellent communication skills, both written and verbal. • Detail-oriented with a proactive approach to problem-solving.
Duration	20 hours per week for 9 weeks (7/8/24 - 9/6/24) - $3500 stipend for students
Modality/ Type of Work	Fully in-person, Data analysis, Process improvement, Event support & participation
Selection Process	Mentor will review 3 - 5 student applications, arrange short interviews with top candidates, and then pick 1 or 2 top choices to make offers to.
# of possible interns	One intern

Updated Friday, 3/29/24

- *Eliminated project **26: Bioinformatics and Research Intern at Digbi Health***
- *Added project **35: Designing and Validating Sound Diffusers and Acoustic Materials at San Jose State***

Updated Monday, 4/1/24

- *Eliminated project **24: Software Engineering Intern at Bio-Techne***