URSA ENGAGE PROGRAM

FACULTY MENTOR SUMMARIES
2018-2019

OFFICE OF UNDERGRADUATE RESEARCH, SCHOLARSHIP, & THE ARTS
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Mentor: David Myrold
Co-mentor: Chris Burgess (PhD candidate)
Department: Crop and Soil Science

Research Focus: We study the diversity and function of microbes in soil, particularly their role in soil health.

Potential Student Project: Determining physical, chemical, or biological properties of Oregon soils. Physical properties could include bulk density or water stable aggregates. Chemical properties could include total carbon and nitrogen or total soil protein. Biological properties could include bacterial or fungal population sizes.

Attributes/skills/background sought in undergraduate:
Required: Inquisitive nature, attention to detail, timeliness and dependability.
Preferred: Interest in soil or environmental science, attendance at research group meetings if schedule allows, basic wet-lab skills (use of balance, pipettes, etc.), spreadsheet experience.

Mentoring Plan: I would meet week 5 and 10 of W19, and Week 2 and 7 of Sp19 with the mentee and grad student; grad student would meet weekly during the other week of W & Sp 19.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: david.myrold@oregonstate.edu
Mentor: Rebecca Lybrand

Department: Crop and Soil Science

Research Focus: We study soil, specifically how microbes (bacteria/fungi) interact with and alter soil minerals.

Potential Student Project: Assess the effect of freeze-thaw processes on mineral weathering or greenhouse gas emissions from Arctic soils

Examine how microbes (fungi/bacteria) transform mineral grains in the preliminary stages of mineral weathering

Determine how rock type and landscape position impact soil carbon storage in coastal temperate rainforests

Attributes/skills/background sought in undergraduate:

Basic biology and chemistry science courses (with laboratory sections)

General interest in learning more about soil science (soil science courses are not required)

Meticulous, detail-oriented, and ability to maintain organized, clean work spaces.

Consistency in completing repetitive laboratory or sample preparation tasks.

Work independently and collaborate well in team environments.

Ability to progress in work activities without direct supervision, and exhibit capability to learn new laboratory tasks quickly.

Effective communication skills.

Mentoring Plan: I would be available to meet 2-3 times a quarter (or more) in combination with a graduate student who would meet with the awardee at least once a week.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: rebecca.lybrand@oregonstate.edu
Mentor: Susan Tilton

Department: Environmental and Molecular Toxicology

Research Focus: We use systems biology/genomics and computational approaches to understand chemical risk to humans

Potential Student Project: Advanced cell culture and tissue engineering are increasingly recognized for their potential in mechanistic studies because the three-dimensional structure, metabolic and mitotic activity, multi-cellular communication and cell signaling better recapitulate in vivo response compared to cells grown in monolayer culture. Our lab is exploring mechanisms of toxicity associated with inhalation of chemical pollutants in 3D lung culture models.

Attributes/skills/background sought in undergraduate: Strong interest in laboratory research, interest in toxicology/biochemistry/genomics, excellent written and oral communication skills

Mentoring Plan: I will plan to meet with the mentee through weekly meetings that include personal 1-on-1 meetings about their project and group lab meetings with other members of my lab. I also have a senior faculty research assistant who will work very closely with the undergraduate mentee in the lab on various molecular techniques. My lab meets weekly to discuss ongoing research projects and allows each student to provide a more in-depth presentation of their lab work 1-2 times per term.

Workshop Dates: Neither (advertise on website only)

Contact: susan.tilton@oregonstate.edu
**Mentor:** Brian Sidlauskas

**Department:** Fisheries and Wildlife

**Research Focus:** Fish biodiversity, emphasizing phylogenetics, evolution, taxonomy, morphology and conservation.

**Potential Student Project:** I have an opportunity to examine some of 12,000 fish specimens collected last year in Gabon (west-central Africa) in the vicinity of several potential dam sites. Careful comparison of body shape, skeletons, DNA barcodes, scale counts and coloration can help us resolve taxonomic confusion and better identify which species might be impacted by the dams. Co-authorship on a publication describing or re-describing a species, or providing an identification key is a possibility.

**Attributes/skills/background sought in undergraduate:**

Required: Enthusiasm for fishes, natural history, museum collections, and biodiversity science. Ability to work in a lab containing isopropanol, ethanol and formaldehyde. Ability to collect data carefully and precisely.

Preferred: Majoring in Fisheries and Wildlife, Integrative Biology, Zoology or a related field. Considering graduate school. Prior experience with any of the following: digital photography, photo editing, scripting in R or any other computer language, basic chemical laboratory experience (e.g. introductory chemistry class), genetics, evolution, data entry in spreadsheets or relational databases, prior work in libraries or collections. Ability to read or speak French (Gabon is a Francophone country)

**Mentoring Plan:** Initially, I plan to meet with an undergraduate mentee for a three-hour block of time each week, during which I will train that person in research and lab techniques, lab safety and so forth. I would expect them to also work two hours independently each week. In Spring, once the student has been well trained, we will meet one-on-one for an hour each week, with the student working indecently for four hours. I will provide additional supervision as necessary, and will be present in the lab or down the hall whenever the student is working. The student will also be invited to lab meetings.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** brian.sidlauskas@oregonstate.edu
Mentor: Silvia Rondon

Department: Hermiston Agricultural Research & Extension Center (off-campus)

* able to mentor an E-campus student

Research Focus: Pest identification is critical for pest management purposes. The accurate and precise identification of the pest, life stages and its damage are the factors that could help field men, growers, and/or pest practitioners, anticipate damage and develop control strategies. There is the need to develop innovative techniques that could help with pest identification. DNA bar coding provides an objective and reliable information that serves to corroborate morphological identifications and to make pest identification reliable.

Potential Student Project: 1) Developing molecular database to help barcoding important pests in eastern OR. 2) Create material for morphological comparison (traditional identification keys).

Attributes/skills/background sought in undergraduate:

- Deeply interested in biological systems
- Detail-oriented
- Committed to sometimes tedious hours running molecular experiments
- Love outdoors since the student will collect his/her samples from the field

Mentoring Plan: The student will be trained in collecting information, collecting specimens, processing specimens, learn to run the molecular technique, understand the data collected.

Workshop Dates: Neither

Contact: silvia.rondon@oregonstate.edu
**Mentor:** Rachael Orben

**Department:** Fisheries and Wildlife, Hatfield Marine Science Center (Newport, OR)

**Research Focus:** We focus on seabirds as indicators of ocean health at Yaquina Head Outstanding Natural Area.

**Potential Student Project:** 1) Food on the Fly: provisioning rates of common murre chicks. This project entails diving into the activity watch dataset, which details the rate Common Murre parents return food to their chicks, on a second-by-second basis over the course of a 24-hr period.  
2) Apocalypse: Where and when to nest to not get eaten. The project analyzes common murre reproductive plot data and eagle disturbance data to assess whether certain offshore rocks or locations on those rocks fair better than others.

**Attributes/skills/background sought in undergraduate:**

**Required:**
- Valid driver’s license (US, any state)
- Team player, good communicator, excellent attention to detail
- Enthusiasm for field work in all weather conditions
- Physical ability to lift 30 lbs, climb several flights of stairs, use optical equipment

**Preferred:**
- Background in wildlife/animal sciences/biology/marine biology or related field
- Prior experience with databases (e.g., MS Access) and spreadsheets (e.g., MS Excel)
- Interest in learning basic programming (e.g., R)

**Mentoring Plan:** I plan to meet one-on-one with the student for 30-minute bi-weekly skype meetings approximately 1 Feb to 15 May 2018. Additionally, the student will have the opportunity to attend monthly lab meetings (Seabird Oceanography Lab) and will be part of the 2-hour field season kick-off meeting, approximately 1 May. During the field season (approx. 15 May-30 Aug) the student will interact with other undergraduate students, interns, and researchers as part of this project on a near-daily basis. The entire team plans to work with the student to fill out a learning contract identifying specific personal, professional, and academic goals, including how our team can help the student achieve these. Finally, in preparation for either (or both) of the OSU-sponsored undergraduate research symposia (Undergraduate Summer Research Symposium - Sept, Celebrating Undergraduate Excellence) I plan to interact via email and in-person up to 5 hours/week during the two weeks leading up the symposia.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** rachael.orben@oregonstate.edu
Mentor: Dominique Bachelet

Department: Biological and Ecological Engineering

* able to mentor an E-campus student

Research Focus: My two foci: 1. simulating regional fire risk, 2. developing online global climate change cookbook

Potential Student Project: Use my dynamic global vegetation model MC2 to generate global runs of fire, possibility of also refining regional runs. The model can easily be run on a point on a laptop that runs unix (Mac) or linux (requires good programming skills).

Choose well-liked family recipes (world-wide), match ingredient lists with maps of crop regional extents, past climate records over those areas, land use history, variety physiological thresholds, future climate projections (requires some GIS skills).

Attributes/skills/background sought in undergraduate:

For modeling project:
- Programming skills (required)

For the online climate change cookbook
- some GIS skills, some web development skills (preferred)

For both projects:
- Interest in climate change issues, in science communication, good collaboration skills, willingness to learn new skills

Mentoring Plan: If possible, weekly meetings (office in Gilmore). For E-campus students, if possible, weekly skype calls and weekly updates - one pagers with bullet points for accomplishments, problems, misc. issues.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: bachelet@comcast.net
**Mentor:** Stacey Harper and Bryan Harper

**Department:** Environmental and Molecular Toxicology

**Research Focus:** Our lab investigates the environmental health and safety of novel nanomaterials.

**Potential Student Project:** Small-scale microcosms comprised of algae, bacteria, crustaceans and zebrafish will be used to test the environmental impact of silver nanoparticles.

Determining the fate and effects of nano-enabled pesticide formulations and determining how size may impact exposure and hazard.

Environmental transformations of nanomaterials through riverine and coastal systems.

**Attributes/skills/background sought in undergraduate:**

- Skills will be acquired in the laboratory so no experience is necessary. However, a desire to work in a highly integrative laboratory (including engineers, ecologists, chemists and toxicologists) doing challenging research is highly preferred.

**Mentoring Plan:** The PI, Dr. Stacey Harper will meet with the URSA student at least once a week during our regularly scheduled team meetings. The entire group reports in on the weeks findings and brings up any issues or troubleshooting that needs to be addressed. They also report on what their plans are for the coming week. Our research coordinator, Bryan Harper, will serve as the daily mentor for the URSA student during their time in the laboratory. He has been mentoring undergraduate students in the laboratory for 6 years.

**Workshop Dates:** Neither

**Contact:** stacey.harper@oregonstate.edu
Mentor: John Bolte

Department: Biological & Ecological Engineering

* able to mentor an E-campus student

Research Focus: Applying spatial data analysis and modeling to examine climate change impacts on coastal communities

Potential Student Project: Spatial data development using a Geographic Information System (GIS).

Web-based interactive tool development for coastal resilience planning.

Modeling coastal system processes.

Attributes/skills/background sought in undergraduate:

- Some experience with GIS would be helpful
- Some experience in programming, especially in a web environment, would be helpful
- Interest in climate change impacts on coastal communities would be helpful

Mentoring Plan: Weekly Meetings - discuss, plan and review work. Biweekly meetings - meet with the project team as a whole as part of the general meeting schedule for the project

Workshop Dates: Neither

Contact: john.bolte@oregonstate.edu
**Mentor:** Chet Udell

**Department:** Biological & Ecological Engineering

**Research Focus:** I create plug and play Internet of Things sensor and control systems to give scientists superpowers.

**Potential Student Project:**
1) **Loom** - Plug-and-play wireless sensor kits for people who study environmental science. We're looking for individuals to make new sensors and controllers to integrate into this already vast ecosystem of devices.
2) **OPEnSampler** - a fully programmable open-source water sampler with 2G communication.
3) **eGreenhouse and Hyper-Rail** - a rail system that conveys a sensor package throughout a greenhouse or other dynamic ecological environment. See more at: [http://www.open-sensing.org/](http://www.open-sensing.org/)

**Attributes/skills/background sought in undergraduate:**

- Some programming experiences. We use C/C++ mostly, but any experience will help.
- Highly motivated to self-learn: It is expected most students will not have been exposed to all skills necessary to conduct the project at the outset. It is expected student will work diligently, informed by OPEnS staff and Dr. Udell to learn things on the fly to complete project tasks.
- Must work well with others collaboratively in makerspace environment.
- Should be organized; can plan a project and schedule out times to complete project in the lab.

**Mentoring Plan:** Candidates selected to work on an URSA Engage project for OPEnS Lab (Openly Published Environmental Sensing) have a unique opportunity to work in a hands-on, energetic, makerspace environment with Dr. Udell. There are 6 fully-funded student staff with the experience to help you pick up or hone skills like programming micro-controllers, assembling electronics, sensors, wireless communication, 3D printing, and CAD. We want you to be a part of inventing new devices that enable researchers, ecologists, and those who wish to apply precision agriculture to measure, sense, harvest data, and control things in new ways. OPEnS has a number of exciting projects we could use your help with.

**Workshop Dates:** November 19, 5:00 to 6:30 PM – presented by John Selker

**Contact:** [udellc@oregonstate.edu](mailto:udellc@oregonstate.edu)
Mentor: Michelle Kutzler

Department: Animal and Rangeland Sciences

* able to mentor an E-campus student

Research Focus: My research focuses on animal reproduction and veterinary science.

Potential Student Project: As a veterinarian, I am very interested in researching clinically relevant topics. I am interested in discussing other options, but here are a few ideas: 1) Improving methods for equine oocyte aspiration and in vitro maturation/fertilization; 2) Using genomic testing in beef cattle for heifer replacements; 3) Effects of acupuncture on lameness in dairy cattle; 4) Identifying causes of reduced fertility in sheep treated with PG-600.

Attributes/skills/background sought in undergraduate:

- Undergraduate mentees should be honest and dependable (required) with a basic knowledge of animal reproductive physiology and mechanisms of disease (preferred).

Mentoring Plan: I will work closely with the undergraduate mentee, meeting at least once weekly to review progress, set goals, and develop timelines for completion. The mentee will have my cell phone number so that he/she may call/text me any time with concerns or questions. In addition, I will meet with the mentee and other students working in my laboratory 5 times each term during regularly scheduled lab meetings. On a daily basis, the mentee will also be able to interact closely with other undergraduates and graduate students working in the lab.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: michelle.kutzler@oregonstate.edu
**Mentor:** Jeff Chang

**Department:** Botany & Plant Pathology

**Research Focus:** Microbial genomics; plant-associated bacteria.

**Potential Student Project:** Students will engage in a research experience that focuses on understanding plant-associated bacteria. Students will have opportunities to use computational biology to analyze and mine genome sequences. The goal of these projects will be to understand the evolutionary relationships of bacteria. Students will also have opportunities to work in the wet lab and carry out experiments. These will have the goals of understanding how bacteria infect plants.

**Attributes/skills/background sought in undergraduate:**

- Attributes: perseverance; willingness to be challenged; not afraid of making mistakes but will learn to avoid making the same ones; hard work ethic, maturity.
- Background: pursuing degree in the life or computational sciences.

**Mentoring Plan:** Undergraduate students are mentored directly by a postdoc or lab manager. These individuals meet and advise students on a daily basis. I meet with students on a bi-weekly basis. I also expect students to participate in weekly lab meetings. Last, I have an open-door policy and students are welcomed to meet on an ad hoc basis.

**Workshop Dates:** Neither

**Contact:** changj@science.oregonstate.edu
**Mentor:** Ryan Contreras

**Co-mentors:** Aaron Liston and John Lambrinos

**Department:** Horticulture

**Research Focus:** Plant breeding, landscape ecology, genome evolution, adaptability, invasion potential

**Potential Student Project:** Testing relationships between genome size, base pair composition, and environmental plasticity in maples.

We recently published an article on genome sizes in maples and determined GC% of a subset. There is a hypothesis that increased GC% provides an ecological advantage, particularly in harsh environments. We are interested in pursuing the question to determine if that is the case by comparing GC% with climate data where various species evolved. Direction of the research can vary with interest.

**Attributes/skills/background sought in undergraduate:**

Required attributes: inquisitive, dedicated, self-motivated

Required skills: ability to read, interpret, and synthesize scientific literature

Background: biological sciences preferred but not required. Meta-analysis of published data is an example of the sort of work with broad applicability.

**Mentoring Plan:** The proposed project is a collaborative proposal to be mentored by Contreras, Liston, and Lambrinos. One of the three mentors will be available to meet at least weekly with the student.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** ryan.contreras@oregonstate.edu
Mentor: Kate Lajtha

Department: Crop and Soil Science

Research Focus: Forest soil and water biogeochemistry and response to disturbance

Potential Student Project:

1. Factors affecting the stability of soil organic matter
2. The role of differences in forest floor composition on dissolved organic matter production
3. Seasonal and environmental controls on the chemistry of dissolved organic matter in forested watersheds

Attributes/skills/background sought in undergraduate: Students should be majoring in a STEM discipline and have completed at least one full year of inorganic chemistry. Willingness to do field work in remote locations is critical.

Mentoring Plan: I will meet with the student more than once a week, because the student will be working closely with me and my research team both in the lab and in the field. I have one on one meetings with the undergraduate students covering 3 different areas: (1) the initial phase, where I explain the research focus of the lab, go over relevant papers for them to read, and outline hypotheses; (2) the research phase, where students learn field and lab techniques relevant to their project; (3) the writing and analysis phase. In addition, students come to weekly whole-lab meetings. Students are also assigned to a graduate student or post-doc as a co-mentor when the PI is not immediately available to answer questions.

Workshop Dates: Neither

Contact: lajthak@science.oregonstate.edu
Mentor: Glen Li

Department: Food Science and Technology

Research Focus: The project aims to develop biobased flexible foams using biopolymer from wood and grasses.

Potential Student Project: This proposal aims to convert lignin, a biopolymer available from trees and grasses, to functionalized fragments that replace polymeric methyl-diisocyanate (pMDI), which is a petroleum-based chemical commonly used in the commercial production of foams. Biobased pMDI substitutes derived from lignin has potential applications in the production of environmentally friendly packaging. The primary objective is to develop and optimize a process that introduce isocyanate functionalities to lignin.

Attributes/skills/background sought in undergraduate:

- Required: two terms of chemistry with lab
- Preferred: one or more terms of organic chemistry

Mentoring Plan: The URSA research student is expected to have weekly meetings with mentor Dr. Glen Li to discuss plans for lab research. The mentor will work with students on all necessary lab training involved in the research project, and provide guidance on data analysis and technical writing.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: glen.li@oregonstate.edu
**Mentor:** Melanie Link-Perez

**Department:** Botany & Plant Pathology

**Research Focus:** I am broadly interested in the evolution & diversification of plants, with a strong focus on ferns.

**Potential Student Project:** Project 1 uses molecular techniques to address a conservation problem surrounding the endangered native Gentner's Fritillary (wildflower). This species often grows in mixed populations with another Fritillary and the two are indistinguishable when not in flower. We'll develop tools to help conservationists assess population size of this species. Project 2 uses molecular cloning to resolve origins of fern species that resulted from hybridization followed by whole genome duplication.

**Attributes/skills/background sought in undergraduate:** Students should have an interest in plants and at least one biology course (required). Student must be able to focus on details, follow protocols, and keep accurate records. Ability to take direction and seek help when needed is of critical importance. I will train, so no prior experience in the molecular lab is required. For Project 2, previous experience with pipetting, PCR, sterile technique would be helpful.

**Mentoring Plan:** I will meet with mentee each week to discuss progress of the work and plan the week's activities. During the first few weeks, we will work side by side so I can train the mentee.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** melanie.link-perez@oregonstate.edu
Mentor: John Selker

Department: Biological and Ecological Engineering

Research Focus: The development of novel, transformative tools for environmental observation and sensing.

Potential Student Project: Refine the "Evaporometer," an electro-mechanical device used to measure the rates of rainfall and evaporation. Attributes/skills/background sought in undergraduate: Curiosity, interest in mechanical design, interest in electronic design, good team working skills, focus on quality of work, abilities in data analysis (spreadsheets, and beyond). Background in robotics, computer programming, 3-D printing all helpful, but can also be learned on the job. Interest in environmental processes is also important to this opportunity.

Mentoring Plan: I (Dr. Selker) am the PI of the Open-Sensing.org lab, with lab Director Dr. Chet Udell. The student would meet with eery two weeks, while the student would meet with Dr. Udell or the lead graduate student for their project at least once a week, but more likely on each visit to the lab. The undergraduate would complete weekly blog descriptions of their work, and take part in the weekly lab meetings of the team in Dr. Selker's laboratory.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: John.Selker@Oregonstate.edu / 541-737-6304
Mentor: Kelly Vining

Department: Horticulture

Research Focus: My lab works to apply the power of genome sequencing and bioinformatics to plant breeding.

Potential Student Project: Gene discovery: Genes controlling important traits in mint plants. These may be related to disease resistance, male fertility, and spearmint oil vs. peppermint oil types.

Application of bioinformatics tools to genome sequence data, including genome annotation and analysis of gene expression

Attributes/skills/background sought in undergraduate:

Interest in plants and/or plant breeding
Interest in current DNA/genome sequencing technology
Willing to work with complex data
Linux experience, or willing to learn to work in a linux command-line environment

Mentoring Plan: The URSA student will work closely with my FRA/lab manager. I will meet with them at least once per week, and more frequently when needed.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: kelly.vining@oregonstate.edu, 5417372843
Mentor: Carlos Ochoa

Department: Animal and Rangeland Sciences

Research Focus: Ecohydrology; land use effects on soil-plant-water relationships in riparian areas and watersheds.


Attributes/skills/background sought in undergraduate:

Strong desire to learn research skills (required).
Strong work ethics (required)
Hard working (required)
Likes to work outdoors and also in the lab (desired)
Proficient in XLS and other MS software (desired)
Experience with image processing, short videos (desired)

Mentoring Plan: For the most part, the URSA Engage awardee and I can meet once a week. Also, the student is expected to communicate constantly with other students (graduate and undergraduate) in our team to coordinate for specific research activities. If I am not available, the awardee will still meet with other students in our Ecohydrology team to work on activities related to his/her role in our research project (s).

Workshop Dates: Neither (advertise on website only)

Contact: Carlos.Ochoa@oregonstate.edu, 5417370933
Mentor: Derek Godwin (Agriculture/Extension)

Co-mentor: Desiree Tullos, BEE faculty, College of Agriculture and Engineering, Corvallis

Department: Biological and Ecological Engineering

* able to mentor an E-campus student

Research Focus: Impacts of motor boats on streambank erosion, fish-friendly streambank stabilization techniques

Potential Student Project: Review literature on motor boats, wave energy, streambank erosion and fish-friendly stabilization techniques.
Survey streambanks to assess erosion, vegetation and soil conditions between Newberg and Wilsonville.
Compare aerial photos to determine changes in erosion and vegetation over the past 20-30 years.
Develop guidance documents for on how to use fish-friendly techniques to stabilize streambanks and improve water quality.
Engage volunteers in research, field work and presentations.

Attributes/skills/background sought in undergraduate: Required: Strong communication and personal skills to work with volunteers and stakeholders. Physical ability to conduct field work in wet weather conditions (e.g. walking up and down streambanks, carrying up to 25 lbs.). Have valid drivers license and pass criminal background check to work with volunteers.

Preferred: Ability to use GIS applications, basic understanding of recreational motor boats, stream ecology, riparian vegetation and aerial photography.

Mentoring Plan: Both mentors will meet with the student at the beginning of the project. Stakeholder may join in the first or second meeting. Plan of work will be discussed and finalized to guide project work and outcomes. The plan may be modified throughout the project, as appropriate.
Weekly check-ins will be conducted by the primary mentor in the beginning and will shift to co-mentor and stakeholder based on the project phase. If student is at a distance, then weekly meetings will be held via video conference and/or phone.
Regular communication will be conducted via email, cell phone or in-person.
Training will be provided for field work and analysis.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: derek.godwin@oregonstate.edu, 503-510-7582
**Mentor:** Linda Hardison  

**Department:** Botany & Plant Pathology  

**Research Focus:** We study Oregon plants and their role in promoting biodiversity in agricultural systems  

**Potential Student Project:** We are interested in how native plants & habitats can be integrated into working agricultural lands. Rather than fencing out "nature," we look for ways to bring diverse plant species and habitats successfully back into lands managed for agricultural production. We study how managed grazing can be a tool in habitat restoration and lead to land management practices that are both economically and ecologically sustainable.  

**Attributes/skills/background sought in undergraduate:** An interest in learning about biology and/or botany (required).  

**Mentoring Plan:** I will be the primary mentor to meet with the awardee weekly. The research project involves collaborations with several other scientists on and off campus, therefore portions of the work may involve consulting with collaborators.  

**Workshop Dates:** November 19, 5:00 to 6:30 PM  

**Contact:** 541-737-4338, hardisol@oregonstate.edu
**Mentor:** Desiree Tullos

**Department:** Biological and Ecological Engineering

**Research Focus:** My research focuses on the sustainable management and restoration of rivers.

**Potential Student Project:**
One potential project would involve contributing to efforts around reducing the frequency and severity of Harmful Algal Bloom (HAB) at Ross Island, located on the Willamette River in Portland. This work will involve: 1) compiling GIS layers and making maps, 2) compiling PDFs of relevant project documents into a central location and roughly categorizing the information, and 3) Participating in a design charrette with project stakeholders in Portland.

**Attributes/skills/background sought in undergraduate:**
- GIS (Preferred)
- Data and file management (Required)
- Professional communication (Required)
- Interest in sustainable water resources (Required)

**Mentoring Plan:** This student will participate in weekly progress meetings in a role similar to graduate students in my lab. The student will be trained on how to set an agenda and lead a meeting. Agendas will focus on progress towards and issues encountered on detailed project tasks, as well as professional development topics as they arise. In addition, this student will attend bi-weekly lab meetings with my research team to solicit feedback on project ideas and products.

**Workshop Dates:** Neither

**Contact:** desiree.tullos@oregonstate.edu
Mentor: David Williams  
Department: Environmental and Molecular Toxicology/Linus Pauling Institute  
Research Focus: The focus is on chemical carcinogens in the environment and the protective effect of phytochemicals.  
Potential Student Project: Study the absorption, metabolism and excretion of chemical carcinogens in humans.  
Attributes/skills/background sought in undergraduate:  
Required:  
● Motivation  
● Dependability  
● Integrity  
Preferred:  
● Some analytical skills  
● Organic chemistry and or biochemistry  
Mentoring Plan: I have no set office hours and undergraduates are encouraged to engage me often especially at the beginning of a project. The entire laboratory personnel meet weekly to discuss research progress. Undergraduates currently are being trained by Ms. Beth Siddens, a Senior Faculty Research Assistant and she spends a significant amount of time training students (undergraduate and graduate).  
Workshop Dates: Neither  
Contact: david.williams@oregonstate.edu
**Mentor:** Andrew Ross

**Department:** Crop and Soil Science/Food Science and Technology

**Research Focus:** The science and craft of milling and baking whole-grains, including wheat and barley breeding

**Potential Student Project:**
1) The impact of whole-wheat flour age on the vigor, chemistry, and flavor and aroma of whole-wheat sourdough starters and breads.
2) The impact of barley protein concentration on the use of whole-grain naked barley in breadmaking with composite flours.
3) The impact of flour temperature in stone-mills on gluten protein characteristics (HPLC, FTIR, electrophoresis) and baking quality of flour

**Attributes/skills/background sought in undergraduate:**
- Interest in foods and grain-based foods (required)
- Interest in chemistry (required)
- Reasonable understanding of high school or freshman level chemistry and biology (preferred)
- Experience in baking (would be really useful but not essential)

**Mentoring Plan:** Professor meets student weekly (except where travel commitments preclude) to provide background and context for experiment[s] and training in baking techniques if applicable. Research Associate meets weekly to provide training in analytical and flour functionality tests and is responsible for oversight of lab activities. Ecampus is not included as hands-on lab work will be a substantial component of the work. The labs are facilities that handle and process wheat: we recommend that individuals with celiac disease or suspected wheat sensitivities do not apply.

**Workshop Dates:** Neither

**Contact:** andrew.ross@oregonstate.edu
Mentor: Shan He and Diana Shao

Department: Finance

Research Focus: Corporate Finance, e.g. Initial Public Offerings, Seasoned equity offerings, institutional investors

Potential Student Project: Potential projects relate to Cryptocurrencies and ICOs. Some specific examples: a) study the characteristics of cryptocurrencies and the ICO performance, and long run performance following ICOs. b) ICO exchange listing choice c) role of big investors/institutional investors in ICOs

Attributes/skills/background sought in undergraduate: We are finance researchers venturing into the blockchain and cryptocurrency area to understand the economics, market mechanisms, and market response to cryptocurrencies. We sought students who have deep interest and good knowledge in blockchain technology and cryptocurrency and who are motivated and interested in studying the economics of cryptocurrency fund raising, performance and exchange selection. As our study will involve empirical analysis of data, mentees are also expected to be able to understand and collect related data in an ethical and rigorous manner to warrant meaningful data analysis and interpretation.

Mentoring Plan: Primary mentor (or co-mentor) or the mentor team plan to meet with the student about once a week to review progress and discuss directions and action plans going forward. The meeting modality will be face-to-face and/or online meeting, depending on student location.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: shan.he@oregonstate.edu
Mentor: Jimmy Yang

Department: Finance (College of Business, Corvallis campus)

* able to mentor an E-campus student

Research Focus: International financial markets; financial market regulations; global financial crisis

Potential Student Project:
1) What have we learned from the global financial crisis?
2) The effectiveness of financial market regulations that are designed to stabilize the markets

Attributes/skills/background sought in undergraduate:
● Strong interest in the financial markets

Mentoring Plan: Once a week. For Ecampus students, WebEx can be used.

Workshop Dates: Neither

Contact: jimmy.yang@bus.oregonstate.edu
Mentor: Maria Kavanaugh

Department: College of Earth, Ocean, and Atmospheric Sciences

* able to mentor an E-campus student

Research Focus: I use computational and optical approaches to study the patterns of plankton in the ocean.

Potential Student Project: Mapping changes in phytoplankton communities off of Oregon and California
Developing lightweight interfaces to control a hyperspectral camera for drone-based remote sensing.
Comparing optical and microscopy based metrics of phytoplankton diversity
Developing morphological indicators of phytoplankton cell stress.

Attributes/skills/background sought in undergraduate: Willingness to learn computational techniques
Growth mindset
Curiosity about oceans and ocean observing

Mentoring Plan: First, we would meet to discuss mutual expectations and goals-- both within the project and what the student hopes that the research experience would provide. Together we would chart out an initial course-- with the understanding that science can provide surprises and projects can evolve. I would meet with student twice or three times per week until the student is comfortable with their understanding of project goals, methods, and progress. I would then give the student some ownership in their process, meeting on an as needed basis (but at least once per week for check-ins and next steps). Toward the last third of their project, we would meet to revisit student goals for after their project completion and discuss the necessary steps for completion and/or project growth and continuance.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: mkavanau@ceoas.oregonstate.edu, 541-737-8009
Mentor: Ed Brook

Department: College of Earth, Ocean, and Atmospheric Sciences

Research Focus: I study the history of atmospheric greenhouse gases and their links to climate change.

Potential Student Project: Evaluate the temperature dependence of methane production in dusty ice from Greenland.

Filter ice samples for cosmic spherules (melted micrometeorites) and characterize their composition and size distribution.

Attributes/skills/background sought in undergraduate: Required: Attention to detail. Ability to work with others. Interest in earth science.

Mentoring Plan: Once per week with either me or a post doc or graduate student mentor (and if post doc or student is mentoring, at least one per month with me). In reality in my laboratory I consult with everyone working there weekly.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: brooke@geo.oregonstate.edu
**Mentor:** Shanaka de Silva

**Department:** College of Earth, Ocean, and Atmospheric Sciences

**Research Focus:** How volcanoes behave - what can we learn about volcanoes from the lava that is erupted?

**Potential Student Project:** Lava and pumice from a volcano are "frozen" samples of magma at the time of eruption. The crystals/minerals within them record their history of growth in the magma as a function of temperature, pressure, and chemistry of the magma. By analyzing crystals in detail, we can track the temperature, pressure, and chemical evolution of the magma. The student will collect this information to understand the evolution of a volcanic system leading up to eruption.

**Attributes/skills/background sought in undergraduate:**

- Geology major
- Taking or has taken GEO201, GEO295, Mineralogy
- Lab safety training for Wilkinson 021, 031

**Mentoring Plan:** For the first 5 weeks student and advisor will meet once a week to track progress. After the 5 weeks meetings will be results and progress based initiated by the student. Student will be part of a research group that meets once a month. Student will be expected to summarize progress to the group at these meetings. The research group will form the cohort for the student.

**Workshop Dates:** Neither

**Contact:** desilvas@geo.oregonstate.edu
Mentor: Adam Schultz

Department: College of Earth, Ocean, and Atmospheric Sciences

Research Focus: To develop new sensors for imaging of the Earth's interior for resource and natural hazards studies.

Potential Student Project: I run the largest academic facility in the world devoted to 3D electromagnetic (EM) imaging of Earth's crust and mantle. This is a breakthrough technology that's producing new insights into the location of critical natural resources (geothermal energy, clean groundwater, minerals) and providing better understanding of natural hazards (the causes of subduction zone earthquakes, the volcanic eruption cycle). I am looking for two undergrads to work on new sensor concepts for measuring EM fields.

Attributes/skills/background sought in undergraduate:

- Required: Engineering, Chemistry or Physics major. Computer Science major or minor may also be considered.
- One student would be working on new geophysical electrode designs for sensing the Earth's electric fields (some familiarity with chemistry is a plus).
- Another student would be working a new fluxgate and induction coil magnetometer sensor technology.
- Most likely best suited to a 2nd year student or a mature transfer student given the need for fundamental knowledge of the major study areas indicated above.

Mentoring Plan: I would plan for the URSA Engage student(s) to join my weekly all hands lab meeting, and also would pan to interact with them directly, or for my FRA/Postdoc/GRA(s) also to meet with them at least once weekly, if not more frequently since we operate a dynamic lab with frequent face-to-face interactions.

Workshop Dates: November 19, 5:00 to 6:30 AM

Contact: adam.schultz@oregonstate.edu
Mentor: Frederick Colwell

Department: College of Earth, Ocean, and Atmospheric Sciences

Research Focus: We investigate the ecology of microorganisms in different ocean and terrestrial environments.

Potential Student Project: An example project would involve extracting and sequencing DNA from microbes sampled from one of the earth environments that we study (e.g., deep marine sediments, wetland sediments). After sequencing the student would learn how to use computational techniques to identify the microbes and study the sequences from the different microbes in the samples and detect patterns that may be controlled by environmental characteristics of the sample locations.

Attributes/skills/background sought in undergraduate:

- Minimum: 1) willingness to dedicate time needed to learn lab techniques to carefully extract DNA (we will teach you how to do this); 2) ability to work safely in a "shared" lab environment and take instructions; 3) interest in learning about microbiology and the environmental conditions under which microbes survive; 4) curiosity about the natural world and commitment to ask questions; 5) interest in refining lab and scientific skills
- Optimum: previous microbiology experience.

Mentoring Plan: I am willing to meet with the URSA mentee a minimum of 3 times during the quarter if the graduate student working with me can meet weekly with the student. If the graduate student cannot meet with the student then I can meet weekly with the URSA student.

Workshop Dates: November 5, 5:00 to 6:30 AM

Contact: rcolwell@coas.oregonstate.edu
Mentor: Joseph Stoner

Co-mentors: Brendan Reilly (Research Associate, Postdoc) and Maureen Walczak (Research Associate, Postdoc)

Department: Geology and Geophysics

Research Focus: Climate history of the Pacific NW over thousands of years using marine and lake sedimentary archives

Potential Student Project: We are interested in recruiting a student to study sediment cores from the Pacific Northwest (PNW) and Northeast Pacific (NEP) to learn about past changes in Columbia River discharge, PNW precipitation, and NEP oceanographic conditions. The student will use sedimentologic methods such as grain-size, magnetic, geochemical, and/or micropaleontological analyses. Specific research questions can be tailored to the student’s interest. Opportunities for continued work on these archives are possible.

Attributes/skills/background sought in undergraduate:

STEM Major (Required)
Interest in Earth History and Climate (Required)
Major in Earth Science Field (e.g. Geology, Ocean Science) (Preferred)
Previous coursework in Geology, Sedimentology, and/or Stratigraphy (Preferred)

Mentoring Plan: The OSU Paleo and Environmental Magnetism Lab has weekly meetings that all members (PI, Postdoc, Graduate Students, Undergraduates) can attend. For undergraduates, while always welcome, these meetings are optional depending on if we are discussing matters relevant to their projects and if the meetings fit with their class schedules. However, we would want to include the USRA Engage Awardee at least 2-3 times per quarter so that they can discuss their project with the entire group and present results. One-on-one meetings can take place on a weekly basis with Postdocs Brendan Reilly (primary point of contact) and/or Maureen Walczak. Our preference is for an on-campus student, as work would entail use of OSU labs and facilities.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: jstoner@coas.oregonstate.edu
Mentor: Jennifer Hutchings

Department: Physics of Ocean and Atmosphere

* able to mentor an E-campus student

Research Focus: Sea ice dynamics, that is kinematics (motion) and mechanics of sea ice. With emphasis on forecasting

Potential Student Project:
Structural mechanics of sea ice
Engineering or Geology students might be interested in applying their knowledge of solid mechanics to sea ice remotely sensed imagery. We will also use ice drift data to identify possible stress states of pack ice.

Arctic field work support
Design of an optimal buoy array for monitoring the drift and deformation of pack ice during a year long deployment. Computer programming will be required.

Attributes/skills/background sought in undergraduate:
Experience with a Programming Language - preferred

Mentoring Plan: Meetings will be held for an hour once a week, and twice weekly if needed. The URSA Engage student will be invited to participate in monthly informal meetings of CEOAS polar researchers and my research group. They will be encouraged to participate in the campus wide research day and present their poster to the research group before this. Instruction will be given in keeping lab notes, report writing and presentation. An Ecampus student would meet through video conferencing, and we would maintain a schedule to the meetings. It will be harder to integrate an Ecampus student in the the CEOAS research group, but I will look into having the student join these meetings by skype if this fits the students schedule.

Workshop Dates: Neither

Contact: jhutchings@coas.oregonstate.edu, 5417374453
**Mentor:** Miguel Goni

**Department:** Ocean Ecology & Biogeochemistry

* able to mentor an E-campus student

**Research Focus:** Organic matter cycling in ocean margins, including Pacific Northwest region and Arctic

**Potential Student Project:** Characterization of organic matter distribution and sources in water column and sediments from the Oregon, Washington and Arctic margins.

Determination of micro-plastics distributions in PNW and Arctic coastal margins

Quantification of organic matter eroded from different watersheds along PNW and Arctic

**Attributes/skills/background sought in undergraduate:**
- Required - punctuality, commitment to the project, curiosity and drive
- Required - interest and experience in chemistry - including environmental and/or marine chemistry
- Preferred - laboratory experience, basic computer skills (spreadsheets, word, graphing)

**Mentoring Plan:** In combination with my research associate/lab manager (Kylie Welch), we will meet weekly with the URSA Engage Awardee to go over issues associated with working in the lab, analytical details and progress on specifics of student's project. Because the work is primarily lab- and field-base, I am not sure an Ecampus student would be the best fit for my group.

**Workshop Dates:** Neither

**Contact:** mgoni@coas.oregonstate.edu
Mentor: Alyssa Shiel

Department: Geology and Geophysics

Research Focus: Dr. Shiel investigates sources, transformations, transport, and fate of metals in the environment.

Potential Student Project: Several potential projects in Dr. Shiel's lab focus on air quality in natural and urban environments. Potential projects include an investigation of lead sources in forests across the Pacific Northwest. These projects use moss and lichens as archives of atmospheric metal deposition. Other potential projects will be centered on improving our understanding of the uptake and loss of metals from moss and lichen tissues through lab and field experiments.

Attributes/skills/background sought in undergraduate: Students should be enthusiastic about the research projects available. Students should enjoy spending time both in the lab and the field and be interested in gaining hands-on experience with analytical techniques. General chemistry and an interest in chemistry are required.

Mentoring Plan: At the start of the project, Dr. Shiel and the mentee will develop the project goals and a timeline together. Dr. Shiel and the mentee will meet one on one each week to discuss plans for the week, progress, and challenges. The mentee will attend the monthly lab group meeting to interact with the other students in Dr. Shiel's lab group. Dr. Shiel, senior graduate students, and the lab manager will all participate in the training of the mentee.

Workshop Dates: Neither

Contact: ashiel@ceoas.oregonstate.edu
Mentor: John Dilles

Department: Geology and Geophysics

Research Focus: My geologic research focuses on the origin of metallic mineral deposits (copper, gold).

Potential Student Project: 1) Mineralogy of hydrothermally altered rocks associated with copper & gold ores (using field and lab techniques): Zunyite, muscovite, pyrophyllite
2) Geochronology studies (Ar-Ar and U/Pb zircon methods) of igneous rocks and hydrothermal minerals.
3) field geology and structural geology mineral districts
4) Isotopic and trace element tracer studies of hydrothermal or igneous processes.
--field studies in western USA (Cascades, Butte MT), Canada, S America

Attributes/skills/background sought in undergraduate:

required
a) be curious about how rocks and mineral deposits form
b) be willing to work hard and spend the time to do robust lab and field studies.
c) have good communication skills

preferred
a) some lab or field work experience
b) have completed a course in physical chemistry, mineralogy, or petrology

Mentoring Plan: I will plan to be available to meet with students each week, and at present have 5 graduate students who could help advise and assist. In my experience, meetings are best held in the lab or field while working on the problem.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: dillesj@geo.oregonstate.edu
Mentor: Cory Buxton

Department: Science and Mathematics Education

* able to mentor an E-campus student

Research Focus: Research on engaging immigrant students, families, and communities in science learning

Potential Student Project: For the past 10 years, I've been doing research in Georgia on community engagement in STEM in immigrant and newcomer communities as a way to support students and families in learning about STEM academic and occupational pathways. We are now starting a new research project on this same topic here in Oregon. Potential student projects will involve participation in a needs assessment in immigrant communities and in the design, implementation, and study of bilingual workshops for families.

Attributes/skills/background sought in undergraduate:

- Interest in community engagement with adolescents and families (required)
- Interest in STEM learning and STEM careers (required)
- Experience working in immigrant communities (preferred)
- Intermediate Spanish language skills (preferred)

Mentoring Plan: I plan to meet weekly with the student during the period of time that the student will work with me on this project. If an E-campus student, then these meetings will take place using Zoom or Skype. We have a research team meeting related to this work that takes place on Thursdays from 12:30-2:00 PM. If possible for the student to attend these meetings that will be the best way to be most fully engaged in the research project. I can also meet with the student individually after this meeting for 1-on-1 mentoring as needed.

Workshop Dates: Neither

Contact: cory.buxton@oregonstate.edu
Mentor: Joseph Louis

Department: Civil and Construction Engineering

* able to mentor an E-campus student

Research Focus: Virtual Reality for visualizing construction operations using Unity game engine.

Potential Student Project:

1. Creation of virtual construction site environments using Unity
2. Creating digital dashboards to display IoT sensor data through Augmented Reality interface
3. Creating navigable virtual building environments in game engines
4. Creating building and city-level digital twins for simulating their operations in game engines

Attributes/skills/background sought in undergraduate:

Computer Programming - Required

Computer Graphics - Preferred

Unity Programming - Preferred

Mentoring Plan: I intend to meet my mentee once a week for an hour.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: joseph.louis@oregonstate.edu
Mentor: Zhenxing Feng

Department: CBEE

* able to mentor an E-campus student

Research Focus: Energy storage (battery, supercapacitor), and in situ analysis using scattering and spectroscopy

Potential Student Project:

Project 1: Clean water and battery. We will use water treatment waste as battery electrodes to develop better energy storage devices.

Project 2: Reaction cell design. Preference will be given to students who have Solidworks or AutoCAD experience. The student will help design battery and electrochemical cells that will be used for in situ tests.

Project 1: Lithium ion battery. Student will use surface coating to improve battery energy density and cycling.

Attributes/skills/background sought in undergraduate:

- Good chemistry/physics background.
- Good communication and presentation skills.
- Student interested in project 2 for cell design needs to be familiar with Solidworks software.

Mentoring Plan: URSA undergraduates will involve in experimental research in my groups. In particular, they will work closely with my PhD students to finish a project together. The student will need to attend my weekly group meeting for project discussion and process reports. Especially the URSA students will be part of the subgroup team for further meeting on the project he/she is working on. Presentations are requested or at least suggested to give a summary in front of all other group members. In additions, the undergraduate will meet with me to discuss the progress and make detailed plans.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: zhenxing.feng@oregonstate.edu
Mentor: Tala Navab-Daneshmand

Department: CBEE

Research Focus: Characterization of enteric bacteria in the environment and the associated treatment processes

Potential Student Project: Investigating the prevalence of antibiotic-resistant bacteria in wastewater treatment facilities across Oregon. In this study we will characterize wastewater influent, treated effluent and biosolids from treatment facilities as well as other parameters such as antibiotics, heavy metals, and several physical/chemical parameters. Student working on this project will take over the measurement and analyses of one or more parameters.

Attributes/skills/background sought in undergraduate: enthusiastic, motivated, eager to learn, as well as organized and professional

Mentoring Plan: I will meet with the undergraduate mentee weekly to discuss the progress of the project. The student mentee will have regular meetings with a graduate student working in the lab. The grad students will train the undergrad mentee with me overseeing. The student mentee will start helping the grad student and will eventually take over a part of the project. We hold weekly group meetings, where students present their work every week. In these group meetings we also review and discuss recently publish journal papers. The undergraduate student will be precipitating in the meetings and presentations to gain oral presentation skills.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: tala.navab@oregonstate.edu
Mentor: Kyle Niemeyer

Department: Mechanical, Industrial, and Manufacturing Engineering

Research Focus: Computational modeling of combustion and fluid flows; open source software and data.

Potential Student Project: Helping build a database of measurements from combustion experiments, and using those data to validate and improve models for fuel combustion. Any student-driven project that aligns with diversity and social justice issues could be supported and developed via this program.

Attributes/skills/background sought in undergraduate:

- Python programming (preferred)

Mentoring Plan: URSA Engage students would meet with me once a week on average, some weeks potentially meeting with a PhD student or senior undergraduate researcher working on a similar project or joining in on the overall group meeting. In addition, all team members use Slack for instant messaging and immediate feedback to questions.

Workshop Dates: November 5 and November 19, 5:00 to 6:30

Contact: kyle.niemeyer@oregonstate.edu
Mentor: Ravi Balasubramanian

Department: Mechanical, Industrial, and Manufacturing Engineering

Research Focus: Robotics, biomechanics, orthopedic implants.


Attributes/skills/background sought in undergraduate:

- Design, Solidworks, 3D printing, computer simulation

Mentoring Plan: I will meet with the student once a week. In case of travel, my postdoc or grad student will meet with the URSA student.

Workshop Dates: Neither

Contact: ravi.balasubramanian@oregonstate.edu
Mentor: Megumi Kawasaki

Department: Mechanical, Industrial, and Manufacturing Engineering

Research Focus: Processing of nanostructured metals using high-pressure and characterize their mechanical properties.

Potential Student Project: 1) Synthesis of nanostructured Aluminum alloy systems and check the improved hardness changes. 2) Hardness stability of ultrafine grained Aluminum during heat treatment. 3) Scale up of the nanostructured metal processing technique: Sample size effect to the hardness differences. 4) These samples can be chosen from Aluminum, Magnesium, Copper, and Titanium for the mentee’s interest.

Attributes/skills/background sought in undergraduate:

- Required: Student who does not mind making his/her hands dirty during metal polishing.
- Required: Student who is patient and willing to learn new things.
- Required: Student who has a base computer skill for Word, Excel, Powerpoint.

Mentoring Plan: I am willing to meet more than once a week. In the meeting, we will discuss the research directions, experimental plans, questions and answers on the theoretical understanding of the research techniques and principles.

My graduate student who can support the mentee's research will be able to meet every day if mentee wants. In this meeting, the graduate student will teach the technical part of hands-on experiments and analysis.

Workshop Dates: Neither

Contact: megumi.kawasaki@oregonstate.edu
**Mentor:** Skip Rochefort

**Student co-mentors:** Charlie Kawasaki, Emma Lingle, Mimi Stanley, Elliott Clement

**Department:** Chemical, Biological, and Environmental Engineering

**Research Focus:** Our lab is focused on polymers, hydrogels, plastics in applications in BioEng, EnvEng, ChemEng CBEE.

**Potential Student Project:** Examples of current projects: 1) Materials Characterization for 3D printing. 2) Recycling Failed 3D prints to produce 3D filament. 3) Insulation Materials (alpaca wool and other eco-friendly materials). 4) Fire Resistant Roofing Material based on disposable diaper technology. 5) Hydrogel composites for the repair of ruptured spinal discs. 6) Design of disposable products in the adult incontinence market. 7) Eco-Friendly Feminine Hygiene Absorbent Pads. 8) Plastics to Oil - community level recycling.

**Attributes/skills/background sought in undergraduate:**

Required:
- Enthusiasm, sense of humor, ability to work with others, reliability, communication, commitment.

Preferred:
- Some basic laboratory skills

**Mentoring Plan:** Research group (entire research lab with faculty) once per week. Project Team meetings (with faculty) once per week and as needed) Project Team research, 2-3 times per week as needed in lab.

**Workshop Dates:** Neither

**Contact:** skip.rochefort@oregonstate.edu
**Mentor:** Yong Bakos

**Department:** Computer Science (Cascades/Bend)

**Research Focus:** Software Engineering projects (database-backed web applications) and exploring new tools/languages.

**Potential Student Project:** 1) PerfectPlate: Using computer vision to measure catering consistency. 2) Ecotone: Tracking biodiversity on the Cascades campus. 3) BDA Explorer: Tracking artificial beaver dams for river restoration. 4) Falcon Time: An activity scheduling tool for middle schools. 5) Tracing Resilience: An online catalog of youth resilience measures. 6) Innkeeper: An incident log for a homeless shelter. 7) Talent Roster: Online computer science student profiles for employers. ([Link.](#))

**Attributes/skills/background sought in undergraduate:**

- Basic programming experience
- High motivation to learn
- Passionate about building meaningful software systems.

**Mentoring Plan:** One 30-minute meeting per week.

**Workshop Dates:** Neither

**Contact:** yong.bakos@osucascades.edu
Mentor: Albrecht Jander

Department: Electrical and Computer Engineering

Research Focus: I am primarily interested in applying magnetism and magnetic materials in new areas of technology.

Potential Student Project: Project ideas. (We can discuss other ideas in person.) 1) Build the world’s best Kerr (magnetic) microscope. You would learn basic optics, use optical design software, assemble components and help write software. (This project would be good for a team of students.) 2) Help set up and commission a Superconducting Quantum Interference Device (SQUID) magnetometer. This instrument will be used by biologists, geologists and engineers to study magnetic materials. 3) Make measurements, data analysis.

Attributes/skills/background sought in undergraduate:

- The student should be self-motivated, curious and interested in learning on his/her own.
- Hands-on experience, e.g. robotics club, maker space, work on your own bike, etc. is highly desired.
- Good communications skills are very important.

Mentoring Plan: I will meet weekly with the student to guide and advise on his/her project. The student will work in the laboratory together with other undergraduate students and under the guidance of graduate students. Further, the student will be expected to join weekly laboratory meetings where all graduate and undergraduate students of the laboratory discuss their work and progress.

Workshop Dates: November 5, 5 to 6:30 PM

Contact: jander@eecs.orst.edu
**Mentor:** Jinsub Kim

**Department:** Electrical and Computer Engineering

*able to mentor an E-campus student*

**Research Focus:** Secure and unbiased machine learning (how to learn from data in a secure and unbiased way).

**Potential Student Project:** Machine learning techniques are increasingly used to make data-driven decisions for our society such as mortgage application and hiring decisions. One caveat of employing machine learning algorithms is that the algorithms themselves can be potentially biased; in particular, the distributions of decisions may heavily depend on sensitive attributes in features such as race, gender, and age. In this project, students will investigate methods that can make machine learning algorithms free of bias.

**Attributes/skills/background sought in undergraduate:**

- Basic skills in Python or MATLAB (required). Exposure to or strong interest in machine learning (required).

**Mentoring Plan:** I plan to meet with a URSA student monthly to check the progress and help with any question. I will assign a graduate student mentor to meet with the URSA student weekly. The graduate student mentor will meet the URSA student biweekly to assist the project (or by appointment). For eCampus student, offline meetings will be replaced with WebEx/Skype meetings.

**Workshop Dates:** Neither

**Contact:** jinsub.kim@oregonstate.edu
Mentor: Julie A. Adams

Department: EECS/Robotics

Research Focus: Intelligent decision support for humans interacting with robotic systems and distributed AI.

Potential Student Project: Project A: Develop of standardized data analysis methods for swarm robotics evaluations. This project will explore different ways to analyze large datasets (i.e., RStudio, Python, etc.) using statistical analyses.

Project B: Develop a Robot Operating System (ROS) software package to integrate a novel task planning framework and create a rapid testing platform for multi-robot planning. The goal is produce a platform for testing task planning algorithms on real robots.

Attributes/skills/background sought in undergraduate:

- Coding experience (required)
- Human factors engineering/industrial engineering experience (preferred)
- Computer science experience (preferred)
- Artificial intelligence experience (preferred)
- Knowledge of statistics (preferred)
- Ability to independently solve open ended problems (required)
- Ability to work independently and as a part of a team (required)

Mentoring Plan: Mentor will meet with undergraduate mentee once every 5 weeks. Graduate student will meet with undergraduate mentee on a weekly basis.

Workshop Dates: November 5, 5 to 6:30 PM

Contact: julie.a.adams@oregonstate.edu
**Mentor:** David Trejo

**Department:** Civil and Construction Engineering

**Research Focus:** My research focuses on understanding the mechanisms of deterioration of material and systems.

**Potential Student Project:** Development of a simple test that tells when a steel begins to corrode when exposed to salts. Because there are many different steels and some are more resistant to corrosion, this could provide relevant information to academics and the industry on how to objectively report corrosion rankings. Likely this would be dependent on the amount of salt that the metal is exposed to and analysis of this will be needed. Our labs have all equipment to do this.

**Attributes/skills/background sought in undergraduate:** Willingness to do research; initiative; willingness to fail a bit but also willing to keep trying (determination).

**Mentoring Plan:** I think meeting an engaging with students is critical for success. I would like to meet weekly to ensure engagement and success.

**Workshop Dates:** November 5, 5:00 to 6:30 PM

**Contact:** david.trejo@oregonstate.edu
Mentor: Karl Haapala

Department: MIME

Research Focus: We assist decision makers in meeting consumer needs, while not causing harm to people or the planet.

Potential Student Project: We are developing a software application to support hybrid additive/subtractive manufacturing process using 3D printing and computer controlled milling. This project requires a unified software and graphical user interface to control functionality of both processes. We are also developing software-based methods to analyze sustainability impacts of manufacturing processes.

Attributes/skills/background sought in undergraduate: We are looking for students interested in learning more about the following topics: C and C++; GRBL controller board programming; Arduino programming; Integrated electronics; Systems integration; Software development.

Mentoring Plan: I will plan to meet with my mentee on a weekly basis, while my graduate student will meet with the mentee two to three times per week to coordinate the work. We will hold face-to-face in-office and in-lab meetings, and communicate in between times via email.

Workshop Dates: Neither

Contact: karl.haapala@oregonstate.edu, 541-737-3122
Mentor: Lewis Semprini

Department: CBEE

Research Focus: My research focuses on biological processes for the treatment of emerging contaminants

Potential Student Project: Transformation of mixtures of 1,4-dioxane and chlorinated aliphatic hydrocarbons by Rhodococcus rhodochrous 21198 when grown on alcohols and organic acids that can be produced by slow-release compounds.

Evaluation of A Novel Multiple Primary Substrate (MPS) Cometabolic Biosparging Technology for In Situ Bioremediation of 1,4-Dioxane and Chlorinated Solvents

Attributes/skills/background sought in undergraduate:

- Some laboratory experience
- Completed first year of chemistry
- Organic chemistry

Mentoring Plan: Dr. Semprini will meet with the student mentee on a weekly basis for 30 min to plan laboratory experiments and discuss past research results. The student mentee will also be assigned a graduate student mentor that they will meet with on a weekly basis and who will directly supervise the student in the lab. The student mentee will also be invited to attend the weekly research group meeting of all students that Dr. Semprini supervises.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: lewis.semprini@oregonstate.edu
**Mentor:** Tyler Radniecki

**Department:** CBEE

**Research Focus:** My lab focuses on sustainable biological treatment processes for stormwater and wastewater.

**Potential Student Project:** My lab currently has openings for stormwater related projects.

In particular, we are interested in determining how effective raingardens, bioswales and constructed wetlands are at removing antibiotic resistant bacteria from contaminated stormwater. This will involve field work.

We are also interested in testing the efficiency of various stormwater adsorbents (e.g. activated carbon and biochar) in removing antibiotic bacteria from stormwater. This will primarily be lab-based studies.

**Attributes/skills/background sought in undergraduate:** No formal lab experience is required. It is preferred if the students have had at least one college-level chemistry course. Students must be detail oriented, willing to keep a detailed lab notebook, show up on time, communicate with other labmates, have the ability to remain focused on the task at hand and have an eagerness to learn new lab skills. All other skills will be taught as needed for the project.

**Mentoring Plan:** The URSA Engage mentee will partake in weekly lab meetings where he/she will have the opportunity to present their work, ask questions and learn more about the other projects going on in the lab.

I will also meet with the mentee once a week outside of lab meeting to discuss the project.

Finally, the mentee will be working closely with other senior undergraduate researchers and graduate students on the project. They will be expected to have near daily interactions in the lab as the proposed project is an off shot of a larger project.

**Workshop Dates:** Neither

**Contact:** tyler.radniecki@oregonstate.edu
Mentor: Joshua Gess

Department: Mechanical, Industrial and Manufacturing Engineering

Research Focus: Applied high performance electronics cooling studies with fundamental experiments in heat transfer.

Potential Student Project: Determination of quenching fluid flow paths and coolant requirements to two-phase heat transfer processes. Fluorescent laser-based Particle Image Velocimetry (PIV) and two-color thermal-Laser Induced Fluorescence (LIF) will be used for the hydrodynamic and thermal characterization. Determination of liquid profiles measuring the microstrain deflection of thin condensate layers using stereo Digital Image Correlation (DIC) techniques.

Attributes/skills/background sought in undergraduate: Self-Motivated - Must be willing to reach their own goals of undergraduate publication. Creative - Must be willing to look at new and innovative ways to take measurements. Driven - I tell my students all the time, you are going to spend 75% of your thought and time putting together the experiment, 15% getting data, and 10% telling people about it in publications. You must be willing to accept this and not get discouraged when experimentation takes a long time.

Mentoring Plan: My graduate student will be the primary point of contact, but I will meet with the undergraduate student once every three weeks to manage progress toward the student's stated research goals and relationship with the graduate student mentor. The undergraduate will meet with the graduate student mentor once a week to assess progress toward research goals. The undergraduate will be expected to publish at one conference with the graduate student where modelled and empirically derived limits to the intermediate data are collected. The undergraduate student will be a co-author on both of the conference papers published. The goal here is that the undergraduate research is in-line with the graduate student's research so that research goals are supported and driven by the graduate student leader.

Workshop Dates: November 5 & 19, 5:00 to 6:30 PM

Contact: joshua.gess@oregonstate.edu / 5417377034
Mentor: Xinhui Zhu

Co-mentor: Ravi Balasubramanian

Department: MIME

Research Focus: I will schedule one-hour weekly meetings with the student and also will have them work in my lab for 4 hours per week to achieve the goal.

Potential Student Project: How does the robotic arm decrease human workers' workload; How to reduce surgeons' mental stress during robotic surgeries

Attributes/skills/background sought in undergraduate: Prefer skills: Statistic analysis; software (Microsoft Office, SPSS, and Minitab); writing technical reports

Mentoring Plan: I will schedule one-hour weekly meetings with the student and also will have them work in my lab for 4 hours per week to achieve the goal.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: zhuxin@oregonstate.edu
Mentor: Gerrad Jones

Department: Biological and Ecological Engineering

Research Focus: My research focus is on identifying the chemicals driving health problems in aquatic ecosystems.

Potential Student Project: There are 10's of thousands of chemicals in the environment, and my lab group does an even mixture of field work, lab work, and statistical analysis to identify which of these compounds are problematic. I would like the student to collect surface/groundwater in polluted environments to create libraries of chemicals found in each environment. These libraries can then be used to identify the source of pollutants from new environments.

Attributes/skills/background sought in undergraduate: Students must be creative. Identifying chemicals of concern is not easy, and creative out-of-the-box thinking is critical. Also, students must be tenacious. If unsolved problems are a motivator for you, this is the position for you. There is a lot of space for trying wild ideas and seeing if they work. Enthusiasm and willingness to preserve are important.

If you are looking for simple experiments to do in the lab, this position will not suit you well. There are very few routine solutions in this space.

Mentoring Plan: I am able to meet with an undergraduate at least one a week. I anticipate that the undergraduate student will work closely with a graduate student, so there will be multiple points of contact with the new mentee.

Workshop Dates: November 5, 5:00 to 6:30 PM, November 19, 5:00 to 6:30 PM

Contact: gerrad.jones@oregonstate.edu
Mentor: Gregory Rorrer

Department: Chemical, Biological, and Environmental Engineering

Research Focus: Algae for production of biofuels and nanostructured materials

Potential Student Project:
1. Aquaculture of red algae in engineered systems for food or biofuels
2. Production of nanofibers from diatom algae

Attributes/skills/background sought in undergraduate: Chemical, bioengineering, or environmental engineering major preferred

Mentoring Plan: Graduate student or post-doc interaction: primary contact for laboratory work
Faculty interaction: participate in weekly lab meetings, periodic one-on-one meetings as needed (at least 2-3 times per term)

Workshop Dates: Neither (advertise on website only)

Contact: gregory.rorrer@oregonstate.edu
Mentor: Hector Vergara

Department: MIME

Research Focus: Design, analysis, and optimization of systems that produce and deliver goods and services.

Potential Student Project: Disaster Relief Logistics: Making sure that supplies reach those who need them the most after a disaster is critical. In this research, models to design distribution networks for aid are tested computationally. This requires creating datasets from available information in different sources to test the performance of models developed by graduate students.

Attributes/skills/background sought in undergraduate: Required: Good mathematical, computer and communication skills; organization and self-motivation
Preferred: Familiarity with coding/programming

Mentoring Plan: I will mentor the student in a one-on-one setting. We will meet on a weekly basis to review accomplishments, discuss challenges and plan next steps. The student will have to write a meeting report in advance to the meeting and come prepared with additional materials such as research notes, reviewed journal papers, analytical models, computer code, etc. I will share suggestions on how to perform certain research tasks and inform the student of available resources. The student will write a final report summarizing research activities and results. The writing of the report will start relatively early in the project and drafts will be reviewed by me every two or three weeks. The student will receive timely feedback on the content and style of the report. Finally, the student will have the opportunity to interact with graduate students and learn about their research and experiences.

Workshop Dates: Neither (advertise on website only)

Contact: hector.vergara@oregonstate.edu
Mentor: Raffaele De Amicis

Department: Electrical Engineering and Computer Science

Research Focus: My Research focuses on Virtual and Augmented Reality in the area of design and creativity.

Potential Student Project: My Mixed Reality Space - Building inspirational virtual environments: Students will be involved in the design and building of an inspirational & inclusive virtual environment that fully supports human well-being. We will aim to create a completely new relationship with human surrounding digital space.

OSUTopia - Designing and sharing your very large 3D urban environments: Students will be involved in the design and build in a procedural 3D realistic virtual reality urban environment.

Attributes/skills/background sought in undergraduate: This experience is for beginner to intermediate students. No prior programming knowledge is required, and any experience you have will only help. No prior AR/VR experience and knowledge needed. Further information is available at the following link: http://eecs.oregonstate.edu/people/de-amicis-raffaele

Mentoring Plan: I plan to assist students through a dynamic and nurturing mentoring program. Students will experience the latest technologies provided by top companies, as provided through a dedicated educational program. Through project-based training, students will learn the skills needed to create spectacular virtual and augmented experiences. We will explore industry best practice methodologies and concepts to create spectacular virtual and augmented experiences. This way students will build a knowledge and direct experience of real-world contexts and links to the creative industries. Students will be given the necessary support - including the necessary HW and SW, to ensure a fruitful use of the software tools needed to implement the project. In this regard, I will offer two weekly meeting: each meeting will stand for 3 hours. The 6 hours per week interaction minimum would be maintained throughout the 15 weeks. Students will be highly encouraged to participate in the Celebrating Undergraduate Excellence event on the OSU campus.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: raffaele.deamicis@oregonstate.edu
Mentor: Thomas Miller

Department: Civil and Construction Engineering

Research Focus: Structural engineering: wood buildings, seismic design, cold-formed steel.

Potential Student Project: TEACHING STRUCTURAL DESIGN WITH OSU BUILDINGS: This year, 2 students collected photos, plans for buildings on campus. They built a good database to use in taking the next step. The 2nd phase (this year) would be to collect a bit more building data, but primarily to use the drawings and photos and design specifications for wood, steel and concrete to develop teaching materials for our undergraduate design courses and make them come "alive" by referring to structures students live and study in.

Attributes/skills/background sought in undergraduate:

- Junior or senior in the civil engineering program (pro-school student) interested in focusing on structural engineering (required)

Mentoring Plan: I would plan to meet with the undergraduate student once a week.

Workshop Dates: Neither

Contact: thomas.miller@oregonstate.edu
Mentor: Kevin Brown

Department: Pharmaceutical Sciences and CBEE

*able to mentor an E-campus student

Research Focus: I am a complex systems scientist, with focus areas in biology, neuroscience, and cognitive science.

Potential Student Project: 1) Networks of pulse coupled oscillators as a model of neural systems. 2) Mathematical modeling of breast cancer pathways. 3) Mathematical modeling of cell signaling from growth factor receptors. 4) Computational prediction of coevolving amino acids in protein families. 5) Measures of phonological similarity between words. 6) Psychological validity of networks formed from word-word meaning similarity.

Attributes/skills/background sought in undergraduate:

- Some experience with computer programming (required)
- Python language experience (preferred)
- Differential equations (preferred)
- Linear algebra (preferred)
- Basic statistics (preferred)

Mentoring Plan: I mentored two graduate students and five undergraduates at my previous institution; in all cases, regardless of student rank, I met with my mentees for at least one-half to one hour per week. If the student is an Ecampus student, then we will conduct the weekly meeting via Google Hangout or Skype. Students can always reach me outside of regular meeting times via the Slack app; I give all my students of any rank an account in my Lab Slack channel.

Workshop Dates: Neither

Contact: kevin.brown@oregonstate.edu
Mentor: Chet Udell

Department: Biological & Ecological Engineering

Research Focus: I create plug and play Internet of Things sensor and control systems to give scientists superpowers.

Potential Student Project: 1) Loom - Plug-and-play wireless sensor kits for people who study environmental science. We're looking for individuals to make new sensors and controllers to integrate into this already vast ecosystem of devices. 2) OPEnSampler - a fully programmable open-source water sampler with 2G communication. 3) eGreenhouse and Hyper-Rail - a rail system that conveys a sensor package throughout a greenhouse or other dynamic ecological environment. See more at: http://www.opensensing.org/

Attributes/skills/background sought in undergraduate:

- Some programming experiences. We use C/C++ mostly, but any experience will help.
- Highly motivated to self-learn: It is expected most students will not have been exposed to all skills necessary to conduct the project at the outset. It is expected student will work diligently, informed by OPEnS staff and Dr. Udell to learn things on the fly to complete project tasks.
- Must work well with others collaboratively in makerspace environment.
- Should be organized; can plan a project and schedule out times to complete project in the lab.

Mentoring Plan: Candidates selected to work on an URSA Engage project for OPEnS Lab (Openly Published Environmental Sensing) have a unique opportunity to work in a hands-on, energetic, makerspace environment with Dr. Udell. There are 6 fully-funded student staff with the experience to help you pick up or hone skills like programming micro-controllers, assembling electronics, sensors, wireless communication, 3D printing, and CAD. We want you to be a part of inventing new devices that enable researchers, ecologists, and those who wish to apply precision agriculture to measure, sense, harvest data, and control things in new ways. OPEnS has a number of exciting projects we could use your help with.

Workshop Dates: November 19, 5:00 to 6:30 PM – presented by John Selker

Contact: udelc@oregonstate.edu
Mentor: John Bolte

Department: Biological & Ecological Engineering

* able to mentor an E-campus student

Research Focus: Applying spatial data analysis and modeling to examine climate change impacts on coastal communities

Potential Student Project: Spatial data development using a Geographic Information System (GIS).

Web-based interactive tool development for coastal resilience planning.

Modeling coastal system processes.

Attributes/skills/background sought in undergraduate:

- Some experience with GIS would be helpful
- Some experience in programming, especially in a web environment, would be helpful
- Interest in climate change impacts on coastal communities would be helpful

Mentoring Plan: Weekly Meetings - discuss, plan and review work. Biweekly meetings - meet with the project team as a whole as part of the general meeting schedule for the project

Workshop Dates: Neither

Contact: john.bolte@oregonstate.edu
Mentor: Desiree Tullos

Department: Biological and Ecological Engineering

Research Focus: My research focuses on the sustainable management and restoration of rivers.

Potential Student Project:
One potential project would involve contributing to efforts around reducing the frequency and severity of Harmful Algal Bloom (HAB) at Ross Island, located on the Willamette River in Portland. This work will involve: 1) compiling GIS layers and making maps, 2) compiling PDFs of relevant project documents into a central location and roughly categorizing the information, and 3) Participating in a design charrette with project stakeholders in Portland.

Attributes/skills/background sought in undergraduate:
- GIS (Preferred)
- Data and file management (Required)
- Professional communication (Required)
- Interest in sustainable water resources (Required)

Mentoring Plan: This student will participate in weekly progress meetings in a role similar to graduate students in my lab. The student will be trained on how to set an agenda and lead a meeting. Agendas will focus on progress towards and issues encountered on detailed project tasks, as well as professional development topics as they arise. In addition, this student will attend bi-weekly lab meetings with my research team to solicit feedback on project ideas and products.

Workshop Dates: Neither

Contact: desiree.tullos@oregonstate.edu
Mentor: Dominique Bachelet

Department: Biological and Ecological Engineering

* able to mentor an E-campus student

Research Focus: My two foci: 1. simulating regional fire risk, 2. developing online global climate change cookbook

Potential Student Project: Use my dynamic global vegetation model MC2 to generate global runs of fire, possibility of also refining regional runs. The model can easily be run on a point on a laptop that runs unix (Mac) or linux (requires good programming skills).

Choose well-liked family recipes (world-wide), match ingredient lists with maps of crop regional extents, past climate records over those areas, land use history, variety physiological thresholds, future climate projections (requires some GIS skills).

Attributes/skills/background sought in undergraduate:

For modeling project:
- Programming skills (required)

For the online climate change cookbook
- some GIS skills, some web development skills (preferred)

For both projects:
- Interest in climate change issues, in science communication, good collaboration skills, willingness to learn new skills

Mentoring Plan: If possible, weekly meetings (office in Gilmore). For E-campus students, if possible, weekly skype calls and weekly updates - one pagers with bullet points for accomplishments, problems, misc. issues.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: bachelet@comcast.net
**Mentor:** John Selker

**Department:** Biological and Ecological Engineering

**Research Focus:** The development of novel, transformative tools for environmental observation and sensing.

**Potential Student Project:** Refine the "Evaporometer," an electro-mechanical device used to measure the rates of rainfall and evaporation.

Attributes/skills/background sought in undergraduate: Curiosity, interest in mechanical design, interest in electronic design, good team working skills, focus on quality of work, abilities in data analysis (spreadsheets, and beyond). Background in robotics, computer programming, 3-D printing all helpful, but can also be learned on the job. Interest in environmental processes is also important to this opportunity.

**Mentoring Plan:** I (Dr. Selker) am the PI of the Open-Sensing.org lab, with lab Director Dr. Chet Udell. The student would meet with every two weeks, while the student would meet with Dr. Udell or the lead graduate student for their project at least once a week, but more likely on each visit to the lab. The undergraduate would complete weekly blog descriptions of their work, and take part in the weekly lab meetings of the team in Dr. Selker's laboratory.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** John.Selker@Oregonstate.edu / 541-737-6304
Mentor: Derek Godwin (Agriculture/Extension)

Co-mentor: Desiree Tullos, BEE faculty, College of Agriculture and Engineering, Corvallis

Department: Biological and Ecological Engineering

* able to mentor an E-campus student

Research Focus: Impacts of motor boats on streambank erosion, fish-friendly streambank stabilization techniques

Potential Student Project: Review literature on motor boats, wave energy, streambank erosion and fish-friendly stabilization techniques.
Survey streambanks to assess erosion, vegetation and soil conditions between Newberg and Wilsonville.
Compare aerial photos to determine changes in erosion and vegetation over the past 20-30 years.
Develop guidance documents for on how to use fish-friendly techniques to stabilize streambanks and improve water quality.
Engage volunteers in research, field work and presentations.

Attributes/skills/background sought in undergraduate: Required: Strong communication and personal skills to work with volunteers and stakeholders. Physical ability to conduct field work in wet weather conditions (e.g. walking up and down streambanks, carrying up to 25 lbs.). Have valid drivers license and pass criminal background check to work with volunteers.

Preferred: Ability to use GIS applications, basic understanding of recreational motor boats, stream ecology, riparian vegetation and aerial photography.

Mentoring Plan: Both mentors will meet with the student at the beginning of the project. Stakeholder may join in the first or second meeting. Plan of work will be discussed and finalized to guide project work and outcomes. The plan may be modified throughout the project, as appropriate.
Weekly check-ins will be conducted by the primary mentor in the beginning and will shift to co-mentor and stakeholder based on the project phase. If student is at a distance, then weekly meetings will be held via video conference and/or phone.
Regular communication will be conducted via email, cell phone or in-person.
Training will be provided for field work and analysis.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: derek.godwin@oregonstate.edu, 503-510-7582
Mentor: Matt Betts

Co-mentor: Kara Leimberger (graduate student)

Department: Forest Ecosystems and Societies

Research Focus: The focus of our research is hummingbird pollination of tropical forest plants.

Potential Student Project: 1. To what extent are pollinator networks (links between plants and pollinators) disrupted by tropical forest fragmentation?

2. We have discovered that a tropical plant can 'recognize' its pollinators and invest in reproduction according to whether the pollinator is likely to be efficient (Betts et al. 2015 - PNAS). We continue to pursue other ideas along these lines (whether other plant species have it, how the mechanism operates).

Much of this work involves collecting data from cameras.

Attributes/skills/background sought in undergraduate: Required
1. Understanding of plant-animal interactions
2. Tolerance for extensive lab/computer work (good working knowledge of computers)
3. Strong work ethic
4. Strong grades
Preferred
5. Desire to pursue grad school.

Mentoring Plan: I meet with Claire at least once every other week. Kara meets with her every week. Also, Claire attends my lab meetings and participates extensively.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: matt.betts@oregonstate.edu
Mentor: Steven Strauss

Department: Forest Ecosystems and Society

Research Focus: Plant biotechnology and genetic analysis with the goal of improved productivity and sustainability.

Potential Student Project: 1) CRISPR editing of floral genes in trees to prevent invasiveness and avoid gene flow (link). 2) Genomic (GWAS) analysis of genes that affect genetic engineering capacity (NSF funded) in poplar trees (link).

Attributes/skills/background sought in undergraduate:

- Passion for the study and use of genetics and biotechnology approaches to produce wood, energy, food, and improve environmental quality.
- Strong interest in genetic science and technology for their careers.
- Excellent communication and teamwork skills, and high ethical standards.
- Ability to do science successfully based on courses, experience, organization, and work ethic.

Mentoring Plan: Students working in the lab will meet with me or a secondary mentor (to guide them in the lab day to day) weekly, and also interact extensively every day they work in the lab with postdocs, grad students, and undergraduate researchers. All in the lab meet at least once per week in a laboratory-wide review and discussion meeting.

Workshop Dates: Neither

Contact: steve.strauss@oregonstate.edu
Mentor: James Rivers

Department: Forest Ecosystems & Society

Research Focus: Our group studies the ecology of pollinator within managed forests of Oregon.

Potential Student Project: Project 1. The student will assist with a study that is evaluating reproductive activity of solitary bees by quantifying the number, quality, and size of bee offspring via x-rays of bee nests. Project 2. The student will assist with preparing slides for pollen identification as part of a study to assess how wildfire influences the food that solitary bees feed to their young. Project 3. The student will assist in creating a reference collection of bees from forested areas of western Oregon.

Attributes/skills/background sought in undergraduate:

No special skills are required, but students must be hard-working, self-motivated, adopt a task-oriented approach to their work, be good communicators, and have a strong curiosity to learn about the natural world.

Mentoring Plan: Along with my postdoctoral research associate, we will initially meet with the student to discuss their interests and how they best align with the project’s goals. We will then train the students in the techniques needed for the position, and ensure they understand what is expected of them. Thereafter, we will hold weekly meetings with the student to outline expectations, discuss progress, troubleshoot issues that may arise, and answer questions. We will also support the student’s participation in regular research meetings of the OSU Pollinator Research Group held during fall and winter terms.

Workshop Dates: Neither

Contact: jim.rivers@oregonstate.edu
Mentor: Ian Munanura

Department: Forest Ecosystems and Society

Research Focus: Understanding the relationship between human well-being, human-wildlife conflicts, and tourism

Potential Student Project:
1. Social science research design and data analysis
2. Creating and managing databases for social science research projects
3. Website development for a research program
4. Development of research communication and promotion materials (i.e. brochures)
5. Development of social media communication tools.

Attributes/skills/background sought in undergraduate:
1. Interest in human dimensions of natural resources management (required)
2. Interest in helping to address human-wildlife conflicts at a local and international scale (preferred)
3. Knowledge of Microsoft Excel application (required)
4. Interest in social science research (required)
5. Good writing skills (required)
6. Experience in social media tools (preferred)

Mentoring Plan: I would be happy to meet with the student once a week for one hour.

Workshop Dates: Neither

Contact: ian.munanura@oregonstate.edu
Mentor: Dave Stemper

Department: Forest Ecosystems & Society

Research Focus: Natural resource education/curriculum design & environmental interpretation (public communication).

Potential Student Project:
1) Design of interpretive materials (e.g. posters, displays) for Deschutes National Forest (Central Cascades).
2) Design of interpretive materials (e.g. posters, displays) for Siuslaw National Forest on the Oregon Coast.
3) Design of natural resource education activities for Oregon State University’s McDonald Dunn Research Forest.
4) Design of natural resource education activities for Castle Family Forest (Philomath, Oregon) & Oxbow Farm (Seattle, Washington).
5) Other opportunities term by term

Attributes/skills/background sought in undergraduate:

Preferred:
- Interest in environmental interpretation, or...
- Interest in formal or informal education.
- Interest in flexing one's creative skills and expressing ideas.
- No strict requirements

Mentoring Plan: I am very flexible with regard to meeting with an undergraduate mentee. I am based in Portland, as I teach primarily via Ecampus. That said, I often travel to campus for departmental meetings and other functions. As such, it is likely that I could mesh with a student's schedule in order to set up face to face meetings.

Though the actual number of meetings would depend on details of the particular project, in the past I have typically met with students once every two weeks.

As I teach primarily Ecampus courses, I am very willing to mentor Ecampus students. I have done so in the past, and can meet over the phone, via email, WebEx, or other Canvas,Â­related portals. I've found that coordinating with Ecampus students is relatively easy.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: stemperd@oregonstate.edu
**Mentor:** Michael Wing

**Department:** Forest Engineering, Resources, and Management

* able to mentor an E-campus student

**Research Focus:** The application of unmanned aircraft systems (UAS, also called drones) to conduct remote sensing.

**Potential Student Project:** We are currently analyzing data from an Oregon vineyard to determine whether we can detect the Red Blotch virus with a multi-spectral camera before it is visible to the naked eye. These results may help vineyards in Oregon and elsewhere to better manage this vineyard threat. Another project involves search and rescue data that we collected with the Coast Guard. Of interest is how close our quad copter needs to be from a potential person in the ocean, before our camera can detect that person.

**Attributes/skills/background sought in undergraduate:**

Required: The interest and ability to learn and apply technical tasks quickly. This experience will involve UAS aircraft building and maintenance, computer software applications with flight planning and remote sensing packages, and the ability to perform technical writing about our processes and results.

Preferred skills: Software programming, UAS build experience, Remote sensing

**Mentoring Plan:** I will meet with the student on a weekly basis. A PhD student housed in the AIS Laboratory will meet with the student more frequently and as needed.

**Workshop Dates:** Neither

**Contact:** michael.wing@oregonstate.edu / 5417374009
Mentor: Anita Cservenka

Department: Psychological Science

Research Focus: Substance Use and Neurocognitive Functioning in Young Adults

Potential Student Project: A potential project includes the examination of self-reported personality traits in young adult marijuana users and their association with neurocognitive functioning.

Another project would be analyzing sleep characteristics in young adult marijuana users and their association with neurocognitive functioning.

A third project might be determining how craving is associated with neurocognitive performance in young adult marijuana users.

Attributes/skills/background sought in undergraduate:

- Ability to search for and review background literature - required
- Organized and attends to detail - required
- Courses taken in psychology, biology, or related field - preferred
- Familiarity with statistical analyses - preferred
- Interest in substance use research - preferred

Mentoring Plan: As a mentor, I will be meeting with the URSA Engage awardee once a week throughout the 15 week duration of their project. These meetings will be one-on-one meetings lasting 30 minutes to 1 hour where we will discuss project progress, data analyses, and preparation of the project for presentation and/or publication. I will also be meeting with the awardee at weekly 1 hour lab meetings where the awardee will be meeting with other lab members and sharing project updates with the group. I expect frequent email and/or phone communication with the awardee throughout the duration of their project in addition to the weekly in-person meetings, so that questions can be answered quickly. In addition to the training I provide, the awardee will be trained by a current graduate student in the lab on the study measures, their administration, and scoring. It is expected that the awardee will meet with the graduate student at least once week in addition to meeting with me once a week throughout the project period.

Workshop Dates: Neither (advertise on website only)

Contact: anita.cservenka@oregonstate.edu
Mentor: David Kerr

Department: Psychological Science

Research Focus: How snap judgements about appearance influence a person's life outcomes (e.g., crime).

Potential Student Project: Students can assist with collecting data on the rapid judgments people make about a sample of boys' and men's faces. Students will instruct and supervise raters of facial characteristics (such as attractiveness, maturity, trustworthiness). Students can then propose research projects using the data. For example, students might hypothesize that early drug use contributes to premature aging of the face, which in turn constrains young adults' life opportunities.

Attributes/skills/background sought in undergraduate: Required:
- Commitment to the ethical handling of sensitive data.
- Commitment to being on-time to all study appointments.
- Interests in quantitative methods (math, statistics).

Preferred:
- Science or quantitative (math, computer science) major or minor.

Mentoring Plan: Either a graduate student or I will meet with the mentee at least once per week during the funding period; I will meet with the mentee at least once every other week. Meetings will focus on supervision of their work on data collection, and on the mentee's individual research goals.

Workshop Dates: none

Contact: david.kerr@oregonstate.edu
Mentor: Kryn Freehling-Burton

Department: Women, Gender, and Sexuality Studies/SLCS

* able to mentor an E-campus student

Research Focus: Qualitative research on women in mathematics & undergraduate learning online. Media analysis film/TV

Potential Student Project: I am starting a research study on women in mathematics at OSU to partner with Oregon State ADVANCE to examine student experiences in this field in higher education. I am our online major coordinator and am interested in researching online learning in the field of Women, Gender, & Sexuality Studies, especially blending school, family, work, & activism. I am also starting to imagine a study with my Women in the Movies class about film watching at the 200-level.

Attributes/skills/background sought in undergraduate: Confidence, especially in learning new skills.
Interest in applying research to societal change--at OSU and beyond.
Independent worker.
Good record keeper, especially with library research and notetaking during meetings, interviews, data analysis.

These are all required skills but part of this process will be sharpening them so if a student has little experience, that is fine!

Mentoring Plan: I would meet weekly with the student for 30-60 minutes, either in my office or by skype/webex/phone (for distance students). For the first few weeks, we'll meet for an hour, but once the project is going, we will be conducting the research so a check-in meeting of 30 minutes is appropriate. Toward the end of the spring term, we will be researching less and our meeting time will increase to 60 minutes (or possibly more) for the data analysis and writing. The particular project will determine these times and we will schedule 2-3 weeks ahead based on what is left to accomplish.

I may have a graduate assistant working with me if a student researcher wants to join one of my projects in process. The grad student would join our weekly/bi-monthly meetings and also be working on the research with us but I would be at all the meetings.

I will set up a google docs folder to work with students so documents can be shared and viewed as the project moves forward.

Workshop Dates: Neither

Contact: kryn.freehling-burton@oregonstate.edu
Mentor: Benita Blessing

Department: Word Languages + Cultures /SLCS

* able to mentor an E-campus student

Research Focus: Beyond Disney. Analysis of race/class/gender in German and other fairy tale film adaptations.

Potential Student Project: The awardee will compare and contrast portrayals of race/class/gender themes in 19th-century written versions of Grimms' fairy tales with the 20th-century West and East German film adaptations, with attention to other countries' fairy tale films (USA, the former Czechoslovakia, Italy, etc.).

Depending on the student's interests, they will help compile examples of how fairy tale film adaptations of race/class/gender themes have evolved over time and socio-geographic space.

Attributes/skills/background sought in undergraduate: Required: Interest in literature and film analysis (especially concerning race/class/gender/sexuality themes), good writing skills, interest in German culture and language, ability to work independently on assigned projects, good organizational skills.

Preferred: German language skills (beginning, intermediate, or native) and/or intermediate level knowledge of French, Czech, Italian, Russian; familiarity with Grimms' fairy tales.

This is an ideal position for a student interested in seeing what one can do with a foreign language for a career, regardless of the student's foreign language level.

Mentoring Plan: The student will meet with me weekly for an hour to discuss findings and receive assignments for the next week. Research and assignments will generally take 4 hours a week to complete; it would be possible for a student to request that they work more hours one week and fewer the next week depending on their schedules. Assignments and research materials will be shared via OSU's Box platform.

Students on campus will meet with me in my office; students on ecampus may meet with me in a video conference using OSU's WebEx platform if they are not local. Video conferencing must take place via a computer or notebook in order for the student to see and live edit my shared screen documents; a cell phone video conference is not sufficient.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: benita.blessing@oregonstate.edu, 740-590-1264 (cell)
Mentor: Evan Baden

Department: Art and Communication

Research Focus: My research focuses on documentary photography projects -- youth culture or social practices/rituals

Potential Student Project: Any type of photographic project that deals with documentation of aspects of human society.

Attributes/skills/background sought in undergraduate: Mentee should be studying photography in some capacity (major or minor) at Oregon State University.

Mentoring Plan: I plan to meet with my mentee on a weekly basis. These will be in-person meetings

Workshop Dates: Neither

Contact: evan.baden@oregonstate.edu
Mentor: Michael Trevathan

Department: Political Science

* able to mentor an E-campus student

Research Focus: My research focuses on the processes of conflict and cooperation over natural resources (water).

Potential Student Project: I would like to facilitate student learning and research in the area of the politics of natural resources and the environment. Potential projects could include data collection, data analysis (econometric or spatial models), developing a conference paper(s), conference participation and presentations at regional or national political science conferences.

Attributes/skills/background sought in undergraduate:

Mentoring Plan: For Corvallis campus students I would like to have a dedicated weekly meeting that would last for approximately one hour per meeting. During the first few weeks of the project I would expect to meet with the student about twice a week for the first two to three weeks. The duration and number of the meetings may vary depending on the project's progress and the student's academic schedule. When the project nears completion, additional meetings, or longer meetings may be necessary to assist the student in preparation for conference travel/presentation preparation. Additional meetings and mentoring can also be accomplished via Skype or similar media if necessary/desired.

Distance-learning mentees should expect the same schedule as described above, but the mode of interaction will be via Skype, Google Hangouts, or a similar mode of communication, in addition to emails.

Workshop Dates: Neither

Contact: michael.trevathan@oregonstate.edu
Mentor: Sarah Dermody

Department: Psychological Science

Research Focus: Much of our research focuses on problematic usage patterns of alcohol and nicotine products.

Potential Student Project: 1) Assist in a laboratory study in heavy drinking smokers examining the effects of reducing alcohol use on ability to quit smoking. 2) Help with a data analysis project to examine how various levels of monetary compensation can affect someone’s drug use patterns. 3) Conduct a literature review on sex and gender differences in the consequences from binge drinking. This would help inform a project in order to better characterize binge drinking and its consequences in transgender individuals.

Attributes/skills/background sought in undergraduate:

- Taken a course in research methods and/or statistics
- Taken at least one course in the human sciences (psychology or biology, for example)
- The ability to work independently and to stay organized
- A strong desire to learn about drug use and addiction research

Mentoring Plan: The student will meet weekly with myself, including a weekly laboratory meeting.

Workshop Dates: Neither

Contact: sarah.dermody@oregonstate.edu
Mentor: Peter Betjemann & David Baker

Department: Writing, Literature, and Film

Research Focus: U.S. art history and literature (Betjemann); film, documentary, and creative writing (Baker).

Potential Student Project: Betjemann and Baker would like to co-mentor a student interested in producing a short documentary film on the history of the visual and literary arts at OSU. Research subjects in that area could vary: the film could be about a specific OSU writer (Bernard Malamud, for instance, author of novels including The Natural) or artist (Gordon Gilkey, for instance, a prolific artist, OSU Dean, and one of the "Monuments Men" in WWII charged with recovering stolen artworks).

Attributes/skills/background sought in undergraduate:

- Interest in literature, art, and/or the history of OSU (required)
- Interest in documentary (required)
- Technical facility (required), particularly in film production (preferred)
- Familiarity with research in the humanities (preferred)

Mentoring Plan: Phase 1) Peter Betjemann will mentor the student's research on the history of literary and visual arts at OSU (mid-winter to early spring). Phase 2) David Baker will mentor the student's presentation of the research in the form of a short documentary film (early spring to the end of spring 2019).

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: peter.betjemann@oregonstate.edu
**Mentor:** Bryan Tilt

**Department:** Anthropology, School of Language, Culture and Society

* able to mentor an E-campus student

**Research Focus:** Social and cultural impacts of International Development Projects.

**Potential Student Project:** The general focus of this research is to understand how major international development projects, such as hydropower dams, affect individuals and communities in developing countries. Projects may include: (1) analyzing a database on development projects from around the world; (2) conducting case study research on selected countries; and (3) helping to publish a web-based version of the database in order to make it accessible to researchers and the general public.

**Attributes/skills/background sought in undergraduate:**

This project would be a good fit for students interested in social science and/or international development. I seek a student with the following attributes and skills:

- Ability to work independently and as part of team (required)
- Good written communication skills in English (required)
- Some technical skills such as web development and graphic editing (preferred)

Please don’t be deterred if you don’t have all the skills outlined above; this is a learning opportunity, so you’ll acquire more skills as you go.

**Mentoring Plan:** Throughout the URSA Engage period, the student will be part of a research team including the professor and several graduate students. This team meets twice per month. In addition, the professor will meet with the student individually at least twice per month (for a total of 4 meetings/month) in order to outline research expectations, check on progress, and discuss any concerns. If the student researcher is an e-campus student, these meetings may be held remotely via Skype or WebEx.

**Workshop Dates:** November 5, 5:00 to 6:30 PM

**Contact:** bryan.tilt@oregonstate.edu
**Mentor:** Kathleen Bogart  

**Department:** Psychology  

**Research Focus:** Psychology of the forgotten "ism," ableism, or prejudice toward disabled people and rare disorders.  

**Potential Student Project:**  
Although each rare disorder affects less than 200,000 Americans, the 7,000 rare disorders combined affect 10% of Americans. One project assesses these needs, from the perspectives of people with a variety of rare disorders, to find similarities and differences across disorders. Another line of research examines if "identifying" as a person with a disability or expressing disability pride leads to greater well being. A third project could be assisting with rare disorder and disability awareness events held by the lab and assessing how to reduce stigma.

**Attributes/skills/background sought in undergraduate:**  
- Preferred: personal or professional interest in disability or disorders  
- Required: critical thinking; responsibility; motivation; persistence

**Mentoring Plan:** I have an active lab that meets every other week, and the student will be involved with those meetings. On the off weeks, either myself or my PhD student Brooke Bryson will meet with the student.

**Workshop Dates:** Neither  

**Contact:** [kathleen.bogart@oregonstate.edu](mailto:kathleen.bogart@oregonstate.edu)
Mentor: Jason Fick

*able to mentor an E-campus student*

Department: Music

Research Focus: Music technology, composition, production, synthesis, and electronic music.

Potential Student Project: Potential projects could include original music for acoustic instruments or technology. This could culminate as a three-to-five song EP written and mixed by the student. An interactive software environment and performance featuring synthesis and electronic music would also be welcomed. Other ideas involving intersections between technology and music are encouraged.

Attributes/skills/background sought in undergraduate:

- Creativity with technology is a must. Strong critical thinkers that are both independent learners and highly motivated individuals are desired. Music production/software skills are a benefit. I welcome potential inter-disciplinary projects that make connections between music and other areas (particular science and new media).

Mentoring Plan: I plan to meet with potential undergraduate mentees face-to-face, for at least one hour per week to listen and evaluate projects. I will work with E-campus students through Skype or FaceTime for the same time length. A graduate student could potential work with me, and I would provide them 5, one-hour meetings per term.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: jason.fick@oregonstate.edu
**Mentor:** Geoffrey Barstow

**Department:** History, Philosophy, and Religion

* able to mentor an E-campus student

**Research Focus:** I research Tibetan Buddhism. Especially animal ethics and the master / student relationship.

**Potential Student Project:** My research focusses on reading biographies of Tibetan Buddhist teachers. We then look at what these texts can tell us about Tibetan religious practices and beliefs. For students, the research involves reading these biographies (in English!) and annotating them. In addition, I would like to work with a student to design and implement a database to help analyze the data that we have collected.

**Attributes/skills/background sought in undergraduate:**

Students need to be curious and skilled readers. I would particularly appreciate working with a student who has database skills.

**Mentoring Plan:** Last winter I met with the students individually roughly once a week, and as a group several times during the research period. I imagine doing similarly this time. I will connect with E-campus students using Skype and email, and would also likely end up having to mail them the necessary books.

**Workshop Dates:** November 5, 5:00 to 6:30 PM

**Contact:** barstowg@oregonstate.edu
Mentor: Kristen Macuga

Department: Psychological Science

Research Focus: Use virtual reality (VR) to study how sensory info influences actions and contributes to learning

Potential Student Project: Using virtual reality to selectively manipulate visual information and measure changes in motor performance and learning in a task such as ball catching or tool use.

- Examining human-computer interaction in automated vehicles through driving simulation
- Investigating how the visual display of information in graphical user interfaces (GUIs) influences decision making

Attributes/skills/background sought in undergraduate:

- Ability to work well with others (required)
- Responsible and punctual (required)
- Motivated (required)
- Good written and oral communication skills (required)
- Some familiarity with the scientific method and experimental psychology (preferred)
- Computer programming and/or computer graphics/3D modeling (preferred)
- Statistics knowledge (preferred)

Please don’t be deterred if you don’t have all the skills outlined above; this is a learning opportunity, so you’ll acquire more skills as you go.

Mentoring Plan: I plan to meet with the student once per week. There may also be an opportunity to meet with a postdoc, graduate student or other team members, depending on the selected project.

Workshop Dates: Neither

Contact: kristen.acuga@oregonstate.edu
Mentor: Karen Holmberg

Department: Writing, Literature, and Film/MFA Program

* able to mentor an E-campus student

Research Focus: Letterpress printing, book arts, poetry of science, creative uses of fieldwork, Russian, translation

Potential Student Project:

1. Setting up of letterpress studio in Moreland Hall, research on other centers for the book/models.


3. Service learning projects involving literary arts in the community, potentially with children experiencing mental health issues.

4. Creative projects involving hybrid uses of poetry, nonfiction, and image.

5. Projects on poetry and the environment, poetry and science.

6. Translation projects.

Attributes/skills/background sought in undergraduate:

Required:

- Interest in hands on use of letterpress technology.
- Visual literacy: background or practice in art, graphic design, or other visual field.
- Experience in creative writing (any genre).

Preferred:

- Strong library skills and willingness to visit Library Special Collections in Oregon.

Mentoring Plan: I would be willing to engage with a mentee once a week. I can "meet" with distance students through Skype or other technology, and through email.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: karen.holmberg@oregonstate.edu
**Mentor:** Kenneth Maes

**Department:** Anthropology

**Research Focus:** Global Health, Community Health Workers, Food and Water Insecurity, Mental Health, Caregiving

**Potential Student Project:** Analyzing survey data and qualitative interviews conducted with unpaid community health workers in Ethiopia, to understand the challenges they face in their work and lives.

Analyzing household water insecurity data from Ethiopia, and improving the way we measure water insecurity around the world.

Analyzing data to evaluate the impacts of community health workers on population health in Oregon.

Improving the way we evaluate the impacts of community health workers in the US and globally.

**Attributes/skills/background sought in undergraduate:** Required: willingness to read background literature, readiness to take on challenges involved in the research process. Preferred: interest in human rights, gender equality, health equity, and social justice

**Mentoring Plan:** I like to meet once per week, or every other week depending on the student's schedule. I arrange for 1 of my graduate students to also meet with URSA awardees, and to work collaboratively. During meetings, we will discuss the research process, data analysis, and assigned reading related to the research topic.

**Workshop Dates:** Neither

**Contact:** kenneth.maes@oregonstate.edu
**Mentor:** Michelle Inderbitzin

**Department:** Sociology, School of Public Policy  
* able to mentor an E-campus student

**Research Focus:** Juvenile justice, prisons & youth correctional facilities, prison culture, transformative education

**Potential Student Project:** 
1. New project: use of discretion in decision-making by juvenile probation officers. There will be many elements to this study, including background research and reviewing the relevant literature, forming the questions and hypotheses to investigate, collecting the data, doing field observations, and analyzing the findings. We will likely be in the early phases in winter and spring 2019.

    - Research on educational programming in prisons; collecting data on existing programs and their offerings.

**Attributes/skills/background sought in undergraduate:** Required:
- Intellectual curiosity
- Interest in topic
- Willingness to learn
- Dependability
- Strong reading and writing skills

**Mentoring Plan:** I will set up weekly meetings with the URSA Engage awardee and supervise the research myself. If it is an Ecampus meeting, we will communicate and check in weekly by email and/or web or Skype chats.

**Workshop Dates:** Neither (advertise on website only)

**Contact:** mli@oregonstate.edu
Mentor: Andrew Myers

Department: Art/School of Arts and Communication

* able to mentor an E-campus student

Research Focus: Visual artist, Multimedia drawing/painting-natural environment, conservation of wild places/creatures

Potential Student Project: Multimedia drawing/painting/installation projects involving concepts such as:
- Healthy Ecosystems
- Conservation and preservation of wild places/creatures
- Endangered species
- Extinction
- Natural history collections
- Narrative/storytelling related to these topics

Attributes/skills/background sought in undergraduate:

Required:
- Basic level drawing skills

Preferred:
- Interest in the preservation and conservation of the natural environment/wildlife
- Interest in exploring natural history collections/research through visual art media

Mentoring Plan: I plan to meet with URSA Engage Awardee once a week unless extra meetings are required.

Workshop Dates: Neither (advertise on website only)

Contact: andy.myers@oregonstate.edu
Mentor: Tim Jensen

Department: School of Writing, Literature, and Film

Research Focus: My work is at the intersection of ecology, rhetoric (persuasion), and emotion, esp. guilt and grief.

Potential Student Project: As part of my current book project on environmental guilt, I've done some initial research on ecological grief, the emotional experience of loss for healthy landscapes, species, watersheds, etc. An URSA Engage student who is interested in environmental communication and how we relate to the loss of bio-diversity might begin their research with a co-created annotated bibliography, then transition to either a public-facing piece or pedagogical project for future classes.

Attributes/skills/background sought in undergraduate: Required:
- interest in environmental / ecological issues

Strongly preferred:
- interest in communication (theories of rhetoric, language, emotion, etc.)

Mentoring Plan: My aim would be to set a standing time for meeting once a week (ideally over coffee). Most of these would be check-ins and conversations, but a couple will be designated work sessions, where we collaborate during the set time.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: tim.jensen@oregonstate.edu, 5417371344
Mentor: Nicole von Germeten

Department: School of History, Philosophy, and Religion

Research Focus: The early history of policing

Potential Student Project: Research assistance for collecting historiography, analyzing data, potentially learning to read 18th-century Spanish handwritten documents under my tutelage.

Attributes/skills/background sought in undergraduate: An interest or curiosity in law enforcement, Latin American history, criminal justice, race/gender based analysis. Highly desired – excellent ability to analyze large excel charts. Training in searching for secondary sources/bibliography and formatting bibliography carefully is also highly desired. Overall, this requires an ability to organize paperwork, work carefully on small details, and good time management.

Mentoring Plan: My current book project has the working title: Men with Lights: A History of an Early North American Police Force. Mexico City authorities attempted to create one of the first professional police forces in North America, with its origins going back to the late medieval Spanish highway patrol (the santa hermandad). This book tells the story of the night watchmen who walked their beats on the streets of eighteenth-century Mexico City. Their key duties were maintaining the new street lighting, and arresting men and women for public drunkenness. These plebeian foot patrolmen functioned as street level enforcers of late colonial racial policies, while at the same time facing frequent violent resistance from the populace.

I am looking for a student to help me gather, organize, and analyze secondary sources relating to the global history of law enforcement. This student, if interested, could also read the primary sources I have gathered from the Mexico City National Archive, and help me organize my next collection of sources. They would also help me analyze excel data that I have already gathered.

I would be happy to meet with the student every other week or as needed. Most of the work would be done independently.

Workshop Dates: Neither

Contact: vongermj@oregonstate.edu 541 737 9564
Mentor: Kevin Brown

Department: Pharmaceutical Sciences and CBEE

* able to mentor an E-campus student

Research Focus: I am a complex systems scientist, with focus areas in biology, neuroscience, and cognitive science.

Potential Student Project: 1) Networks of pulse coupled oscillators as a model of neural systems. 2) Mathematical modeling of breast cancer pathways. 3) Mathematical modeling of cell signaling from growth factor receptors. 4) Computational prediction of coevolving amino acids in protein families. 5) Measures of phonological similarity between words. 6) Psychological validity of networks formed from word-word meaning similarity.

Attributes/skills/background sought in undergraduate:

- Some experience with computer programming (required)
- Python language experience (preferred)
- Differential equations (preferred)
- Linear algebra (preferred)
- Basic statistics (preferred)

Mentoring Plan: I mentored two graduate students and five undergraduates at my previous institution; in all cases, regardless of student rank, I met with my mentees for at least one-half to one hour per week. If the student is an Ecampus student, then we will conduct the weekly meeting via Google Hangout or Skype. Students can always reach me outside of regular meeting times via the Slack app; I give all my students of any rank an account in my Lab Slack channel.

Workshop Dates: Neither

Contact: kevin.brown@oregonstate.edu
Mentor: Andriy Morgun

Department: Pharmaceutical Sciences

Research Focus: role of microbiome in different human diseases, systems biology, cancer, diabetes, immunodeficiency

Potential Student Project:

Current research includes reconstruction and analysis of trans-kingdom networks from microbial metagenomics and host transcriptomics in animal and clinical systems. The successful candidate for the undergraduate research position will be executing research projects in systems biology/medicine focused on the analysis of pharmacogenomics, metagenomics, transcriptomics, and metabolomics. Other data derived from human samples and experimental animals is also studied.

Attributes/skills/background sought in undergraduate:

The position will include computational analysis on next generation sequencing data and network biology. Preference will be given to students familiar with at least one of the following: R, Python, Perl, MatLab, C++/C, or Java. Preference will be given to students also familiar with basic laboratory techniques (e.g., laboratory maintenance, DNA/RNA extraction, cell culture studies) in previous research or coursework.

Mentoring Plan:

• at least once a week with me
• graduate student and postdoctoral scholar are available for more frequent meetings

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: andriy.morgun@oregonstate.edu
Mentor: Megan Pratt

Department: Extension - Family Community Health & Human Development & Family Sciences

* able to mentor an E-campus student

Research Focus: My work focuses on how early learning settings can support families with young children.

Potential Student Project: 1) One project I work on is an evaluation study of an enhanced storytime program that is designed to teach parents of preschoolers about social emotional development and parenting skills, while also be fun and educational for children, too.

2) Another project I work on is a series of ongoing research reports about child care and education in Oregon. We are working to translate the report findings into short infographics and one-page summaries to share with policy makers and practitioners.

Attributes/skills/background sought in undergraduate: Responsive to email & timely to meetings (required)
Detail orientated (required)
Hard working (required)
Bilingual - English/Spanish (preferred)

Mentoring Plan: I would commit to meeting once a week with the awardee for the duration of the quarter. I am open to mentoring an Ecampus student, and we would meet the same frequency via videoconferencing (e.g., skype or Webex). With both in person and Ecampus students, I would plan to also communicate frequently via email as well.

Workshop Dates: Neither (advertise on website only)

Contact: megan.pratt@oregonstate.edu
Mentor: Yumie Takata

Department: Nutrition/BPHS

* able to mentor an E-campus student

Research Focus: Investigating which nutritional/lifestyle factors affect one's cancer risk using human health data

Potential Student Project:

The first project looks at whether consuming dairy products affects one’s risk of developing colorectal cancer in the US. You will engage in data analysis and/or literature review.

The second project looks for genes linked to one’s food choices. For example, lactose intolerance is caused by lack of activity of lactase, an enzyme digesting lactose. So, we can predict one’s dairy consumption based on lactase gene type. You will look for other genes linked to food choices through literature search.

Attributes/skills/background sought in undergraduate: Interest/familiarity in nutrition and genetics (required); basic information search skills (required); good organization skills (required); strong oral and written communication skills (required); knowledge in research designs and statistics (preferred); and proficiency in MS office packages (preferred)

Mentoring Plan: As a mentor, I am available to meet once a week (or more as needed). For Ecampus students, I am available to meet virtually once a week (ore more as needed) using WebEx.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: yumie.takata@oregonstate.edu
Mentor: Brianne Kothari

Department: Human Development and Family Sciences (OSU Cascades)

* able to mentor an E-campus student

Research Focus: Child Welfare Research, Child Well-Being and Resilience Research

Potential Student Project: Project focused on Children and Youth In at At-Risk for Foster Care - Engage in a project with a very active community group to ensure that every child and youth in and at-risk for foster care has the strengths, resources, and supports they need to thrive

Youth and Siblings in Foster Care - Get involved with an existing multi-method, multi-agent longitudinal dataset to better understand the mental health and well-being trajectories of youth in foster care

Attributes/skills/background sought in undergraduate:

Required: Strong interest in child welfare and child well-being research; good communication skills (written and verbal); strong organizational, analytic and critically thinking skills; positive attitude and a willingness to learn.

Preferred: Previous research and/or data analytic experience

Mentoring Plan: I would plan to meet weekly with student. I would also make sure that student has the opportunity to meet and engage with colleagues, coworkers and/or graduate students.

I would plan to use platforms like WebEx when needed as well.

Workshop Dates: Neither

Contact: brianne.kothari@osucascades.edu
Mentor: Cathleen Brown Crowell

Department: Kinesiology/Biological and Population Health Sciences

Research Focus: I use human motion analysis to study forces related to injuries in athletes and older adults.

Potential Student Project: Students could participate in several ongoing projects. They may collect biomechanical data on older adults completing balance exercises in our lab. They may process data assessing landing forces, joint power, and ligament laxity in recreational athletes with chronic ankle instability. They may screen data on the epidemiology of overuse injuries in Division I athletes in an injury registry. Students will receive a broad experience in data collection, processing, and analysis for human subjects.

Attributes/skills/background sought in undergraduate:

- Coursework in human anatomy and biomechanics
- Interest in sports medicine and human movement

Mentoring Plan: I will plan on meeting with the student once per week, and a PhD student could also meet with them once per week or more as needed.

Workshop Dates: Neither

Contact: cathleen.crowell@oregonstate.edu
Mentor: Shannon Lipscomb

Department: Human Development and Family Science (Cascades Campus)

Research Focus: Fostering resilience among children, families, and communities facing adversity.

Potential Student Project: In the Roots of Resilience research project we are evaluating the effects of a trauma-informed professional development program for early childhood teachers. We collect data with children and early childhood teachers/child care providers all around Central Oregon. We also analyze data, and code videos of adult-child interactions. This is a fun and dynamic team. In the TRACEs project, we support local non-profits and agencies to measure resilience among children, youth, and adults.

Attributes/skills/background sought in undergraduate:

- Strong organizational skills
- Initiative and motivation
- Kindness and compassion
- General computer and internet skills (required)
- Friendly interpersonal skills for engaging with teachers, children, and teammates (required)
- Experience and comfort with data, such as making charts and tables, and/or posters (preferred)

Mentoring Plan: I plan to meet with the mentee individually 3 times per quarter. Additionally, we meet once per week as a research team, and the faculty research assistant would also work directly with the mentee at least once per week.

Workshop Dates: Neither

Contact: shannon.lipscomb@osucascades.edu
**Mentor:** Matthew Robinson and Sean Newsom

**Department:** Biological and Population Health Sciences

**Research Focus:** Our laboratory investigates muscle metabolism in response to obesity, dietary fat and exercise.

**Potential Student Project:** We have on-going projects into how muscle metabolism is impaired with obesity and improved by exercise using human, mouse and cell cultures. 1) Impact of lipid treatments on mitochondrial metabolism in cell cultures. Role includes growing cells and measuring mitochondrial activity. 2) Changes to muscle mitochondria with exercise and obesity in mice. Role includes measuring muscle samples for mitochondria. 3) Assist in sample and data collection from human exercise studies on obesity.

**Attributes/skills/background sought in undergraduate:**

- Software skills including Word, Excel, Powerpoint (required)
- Wet-laboratory experience such as western blot, PCR, or cell culture (preferred)

**Mentoring Plan:** The URSA Engage student will have weekly interactions with the mentor and laboratory team including 1) weekly laboratory meetings 2) working alongside other lab members (graduate & undergraduate students) in the laboratory 3) individual meetings every 2 weeks with the mentors.

**Workshop Dates:** Neither

**Contact:** matthew.robinson@oregonstate.edu
**Mentor:** Diana Rohlman

**Department:** Environmental and Occupational Health

* able to mentor an E-campus student

**Research Focus:** My research focuses on how our environment can impact our health, both negatively and positively.

**Potential Student Project:** How we study disasters is just as important as what and who we study. Students can evaluate ethical research and develop research methodologies for use after disasters. The way we talk determines how well our message is understood. Students would help refine public health messaging. Students may also research different chemical classes; we are still finding out where they are coming from and how they impact health. Focus: Air quality, disaster research, environmental health, indigenous health

**Attributes/skills/background sought in undergraduate:**

- Efficient with attention to detail
- Familiarity with Microsoft office products such as Word, Excel, and Powerpoint (required)
- Basic knowledge of building tables, charts and graphs (preferred)

**Mentoring Plan:** I like to meet weekly with students. At the beginning of the term (first 3 weeks), we will set up a timeline for the project, as well as the products that we hope to complete within that time frame. In following meetings, we will discuss the work completed in the previous week, and set goals for the upcoming week. These meetings will also cover topics necessary to complete the work. For example, primers on how to cite scholarly articles, or how to organize literature searches, or adhere to IRB guidelines. These topics will be identified in the first 2-3 weekly meetings, and can be added as needed throughout the project.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** diana.rohlman@oregonstate.edu
**Mentor:** David Dallas

**Department:** Nutrition, Biological and Population Health Sciences

**Research Focus:** Milk protein digestion in infants, bioactive antimicrobial and immunomodulatory peptides, mass spec.

**Potential Student Project:** Identification of bioactive peptides from human milk and digested human milk samples from term and preterm infants. The student could be involved in our ongoing research isolating peptides released from human milk proteins. We will analyze these peptide fragments with mass spectrometry and perform data analysis. We will test human milk and digestion samples for antimicrobial and immunomodulatory activity using bacterial and cell assays. We will then fractionate active samples using prep-LC.

**Attributes/skills/background sought in undergraduate:**

Preferred:
- Having taken basic chemistry, biology or nutrition courses
- Any lab experiences

**Mentoring Plan:** I will meet with the student once a week. The student will also be individually mentored by three post-doctoral fellows and a graduate student researcher.

**Workshop Dates:** Neither

**Contact:** dave.dallas@oregonstate.edu
**Mentor:** Sam Logan

**Department:** Kinesiology

**Research Focus:** Literature search and review, data collection and entry, creating data-based graphs

**Potential Student Project:** 1) Examine pediatric physical therapists' perceptions and experiences of conversations with caregivers about disability and motorized wheelchairs. 2) Effect of Zumbini on the physical activity behaviors of young children with and without disabilities. 3) Effect of a modified ride-on car intervention on the behaviors and development of young children with disabilities. 4) Quantitative content analysis of undergraduates' definition of disability.

**Attributes/skills/background sought in undergraduate:**

- Interest in child development and disability studies (required)
- Compelling reason why conducting research is important to their professional development and/or career goals (required)

**Mentoring Plan:** I will be responsible for mentoring and interacting with the Engage Student during the research experience. I will meet individually with the Engage Student on a bi-weekly basis to check in on her progress (30 minutes), and a graduate student will meet with the Engage Student on a weekly basis (30 minutes). I believe in using a scaffolding mentoring approach. I will ensure that Engage Student completes research activities throughout the funding period that provide a challenge in order to provide opportunities for success, while simultaneously encouraging them to expand their knowledge and research skill set. This will ensure the Engage Student has a positive experience that contributes to their professional development. The Engage Student and I will co-create a timeline of activities to be completed. The Engage Student will attend and participate in weekly lab meetings that includes myself, as well as graduate and undergraduate research assistants (60 minutes). This will provide the Engage Student with experience in a collaborative research setting and provide an opportunity for her to explain her progress since the last meeting and ask questions.

**Workshop Dates:** Neither

**Contact:** sam.logan@oregonstate.edu
**Mentor:** Denise Hynes

**Department:** Health Management and Policy/SOBE

*able to mentor an E-campus student*

**Research Focus:** Health care access, quality, and cost burden. Focus on adult chronic health conditions.

**Potential Student Project:** 1) Learning and working with data collection procedures and data management design using Research Data Capture (REDCAP), a web-based data collection management system used by a growing and broad range of academic and health care systems for research data management. 2) Assisting with literature searches, management and review using on-line bibliographic information systems including PubMed, etc., and literature management software. Content focus to include connected health innovations.

**Attributes/skills/background sought in undergraduate:**

- Motivated to learn and intellectually curious (required)
- Enjoys working with data (required)
- Interest in health care (preferred)
- Solid organizational skills and good time management (preferred)

**Mentoring Plan:** I am willing to meet with a student awardee once per week and to be available by email or Skype/webex.

As I spend two days per week in Portland at the US Department of Veterans Affairs Health Care System, I am also willing to meet in Portland or communicate via Skype/WebEx/Zoom, depending upon student location and availability.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** hynesd@oregonstate.edu
Mentor: Jennifer Beamer

Department: Biological and Population Sciences

Research Focus: The development and support of inclusive community-based physical activity and exercise programs

Potential Student Project: IMPACT for Life is a community-based physical activity and exercise program for adults with disabilities. In effort to build and support inclusive practices with our community-based physical activity partners, we are currently developing a needs assessment to identify perceptions and knowledge, as well as current practices, regarding the promotion of adults with disabilities in physical activity programs.

Attributes/skills/background sought in undergraduate:

- Required: Attention to details, good organizational skills, dependable, and willingness to learn scientific research.
- Preferred: Knowledge in using Excel (spreadsheet programming)

Mentoring Plan: Students will meet with the research team (which includes myself and 2-3 graduate students) at least once per week for one hour. As project details evolve, additional meetings can be expected.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: jennifer.beamer@oregonstate.edu
Mentor: Carolyn Mendez-Luck and Jeff Luck

Department: Health Management & Policy

* able to mentor an E-campus student

Research Focus: Long-term care: family caregiving and care institutional settings like nursing homes.

Potential Student Project: 1) Focus groups with caregivers of persons with dementia who are Latino, Caucasian, American Indian, or LGBTQ. Involves primary data collection. 2) Data analysis of qualitative interviews with Latino older adults who receive care from a family member. Spanish proficiency required. 3) Research proposal writing on diabetes clinical trial intervention or survey of informal caregiving. 4) Analysis of quantitative data and report preparation on Oregon nursing facilities. 5) Assisting with manuscript writing.

Attributes/skills/background sought in undergraduate:

- Strong organizational, writing and communication skills - required
- Exposure to quantitative or qualitative methods in prior work or courses - preferred

Mentoring Plan: The awardee will attend weekly research team meetings. The awardee will work under the direction of graduate research assistants throughout the week. The mentors will meet with the awardees monthly to discuss the awardee's research experience and specific project related activities. An E-campus awardee will follow this same schedule of meetings, but via WebEx.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: carolyn.mendez-luck@oregonstate.edu
Mentor: Sean Newsom and Matt Robinson

Department: Kinesiology

Research Focus: Our laboratory investigates muscle metabolism in response to obesity, dietary fat and exercise.

Potential Student Project: We have several on-going projects to identify how muscle metabolism is impaired with obesity and improved by exercise using humans, mouse models and cultured muscle cells. Student roles may include: growing muscle cells and measuring mitochondrial activity, measuring changes to muscle mitochondria with exercise and obesity in mice and humans, and assisting graduate students with general laboratory activities (e.g., plate assays, western blot).

Attributes/skills/background sought in undergraduate:

Required: Software skills including Word, Excel, PowerPoint.

Preferred: Wet-laboratory experience (such as western blot, PCR, cell culture).

Mentoring Plan: The URSA Engage awardee will have weekly interactions with the mentor and laboratory team including 1) weekly laboratory meetings 2) working alongside other lab members (graduate & undergraduate students) in the laboratory 3) individual meetings every 2 weeks with mentors.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: sean.newsom@oregonstate.edu
Mentor: William Massey

Department: Kinesiology/School of Biological and Population Health Sciences

Research Focus: The aim of my work is to examine how physical activity, play, and sport impact child development.

Potential Student Project:
Project One - Social Fitness Club: Our lab runs a once a week fitness program for homeless youth. Potential mentees would be trained to help facilitate our 8-week spring session. Mentees would also work alongside graduate students to complete research and evaluation on the program.

Project Two - Recess Outcomes Study: The purpose of this study is to examine how the quality of recess impacts child development in schools. Mentees would be trained to help collect and analyze study data.

Attributes/skills/background sought in undergraduate:

Preferred qualities include:
1.) an undergraduate degree interests in public health, kinesiology, psychology, or education;
2.) previous experience working with children and youth;
3.) organized;
4.) dependable;
5.) independent work habits

Mentoring Plan: Mentees would be required to attend weekly lab meetings geared towards the planning and implementation of research and scholarly activities. These meetings will be inclusive of the faculty PI/mentor, PhD students, and other students working on a given project. Aside from this, one hour per week would be designated for the URSA student to meet with the designated mentor. In circumstances where the mentor is out of town, a PhD student would fill this role.

Workshop Dates: Neither

Contact: william.massey@oregonstate.edu
Mentor: Chong Fang

Department: Chemistry

Research Focus: The Fang Lab develops and implements a laser technique to take molecular movies of colorful proteins

Potential Student Project: Computer-based molecular dynamics simulations of the chromophore inside fluorescent proteins to reveal H-bonding network and close contacts around the active site. Such structural constraints provide a mechanistic understanding of the protein functions. Measuring the fluorescence quantum yield of photosensitive molecules in solution. How bright can they be and how can we tune their colors? Characterize materials in solution that can make thin-film electronics.

Attributes/skills/background sought in undergraduate: Required: Interest, self-motivation, inquisitive nature of knowing why, some chemistry, math, physics, and computer background. Preferred: Knowing spectroscopy, making solution samples, some instrument and computer software skills

Mentoring Plan: I plan to meet with the undergraduate mentee at least once a week (we have a weekly main group meeting on Thursday late afternoon and the undergraduate researchers are all regular attendees), and a graduate student will be the designated contact to manage the schedule of the mentee in the lab. A project will be discussed in detail at the beginning of the URSA Engage project, to be carried out realistically within the time schedule of the program and the student’s; 5 hours/week lab work, and to have mutual benefit. The undergraduate student will be encouraged to e-mail the graduate student mentor as well as myself if help is needed and when research milestones are achieved.

Workshop Dates: Neither (advertise on website only)

Contact: Chong.Fang@oregonstate.edu
Mentor: Matt Andrews

Department: Biochemistry and Biophysics

Research Focus: Using hibernation strategies to increase organ availability for patients awaiting transplants.

Potential Student Project: During hibernation body temperature is only a few degrees above 0–∞C, oxygen consumption is 2% of normal, and heart rate can be as low as 3-10 beats/minute. Students will apply these hibernation strategies for the following organ preservation projects:
1. Testing how cells and tissues survive long-term cooling.
2. Developing hibernation-based aqueous solutions to extend organ storage time.
3. Determine which solutions give the best organ viability after prolonged storage and transplantation.

Attributes/skills/background sought in undergraduate: Required:
Interest in biomedical research.
At least one term of Organic Chemistry when program starts in 2019.
Not afraid of blood or working with rats.
Know how to use MS Power Point and XL.
Preferred:
3-4 hour blocks of time during the week.
Has completed the first year Introductory Biology series by the time the program starts in 2019.

Mentoring Plan: Undergraduate student researchers would meet with the mentor for 4-6 hours each week. These research opportunities would be in the form of: 1.) Regular planning meetings with the mentor, 2.) Joint lab meetings with the group of Dr. Adam Higgins in CBEE, and 3.) Hands-on work in the mentor’s research lab in the Department of Biochemistry and Biophysics (2034 ALS).

Workshop Dates: Neither

Contact: Matt.Andrews@oregonstate.edu
Mentor: Jaga Giebultowicz

Department: Integrative Biology

Research Focus: We investigate links between circadian rhythms, aging, and brain using fruit flies as model organism

Potential Student Project:

1. Devices emitting blue LED light are increasingly popular but the long term effects of exposure to blue light are unknown. Prospective student may investigate how blue light affect longevity and gene expression in fruit flies.

2. Changes in brain metabolism increase the risk of developing Alzheimer’s disease in humans. We observed similar changes in fly brains. Prospective student may genetically manipulate the expression of metabolic genes in flies and measure how this affects brain aging

Attributes/skills/background sought in undergraduate:

- Ability to focus on experimental task - required
- Teamwork - required
- Interest in genetics - preferred
- Curiosity - preferred

Mentoring Plan: I will meet with awardee once a week. Additionally, awardee will participate in our weekly lab meeting to get familiar with other lab members and projects in the lab. Finally, awardee will be trained and assisted by senior research assistant in all lab routines and specific experiments.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: giebultj@oregonstate.edu
Mentor: Matthew Graham

Department: Physics

Research Focus: We at look at exotic electron behaviors in new materials (lasers, electronics, solar, nanomaterials).

Potential Student Project: The proposed research resolves ultrafast (10 fs to 1 ns) electron dynamics on the ultrasmall (1 um) length scales. 1) What processes promote carrier dissociation in nanoscale solar cells? Students will acquire spectrally resolved absorption & photocurrent movies of nanomaterials. 2) Organic solar cells have large spatial inhomogeneity in their electron relaxation and transport dynamics, how can we understand and boost device efficiency? Students will determine optoelectronic properties.

Attributes/skills/background sought in undergraduate:

- Motivated students who want a full immersion experience in the scientific process with a young & vibrant scientific team
- A basic understanding of light and electricity (preferred)
- Interest in microscopy, electronics, quantum mechanics and/or lasers (required)
- Comfortable with simple data analysis and graphing (required)
- Willingness to attend and present at our weekly group meetings (required)
- Ability to work both independently and as part of a large team of graduate students (required)
- Studying physics or closely related field is most appropriate

Mentoring Plan: Student(s) will formally meet with PI mentor every 1-2 weeks (although I will often drop in on you in lab), and 2 times per week with your graduate student advisor. Group meetings are held weekly. The student will present a 5-minute short outline of their project to the group, and give a 20-minute talk at the conclusion. Students are encouraged to make a 'work-schedule' with graduate students to ensure help is available.

There is a comprehensive list of safety training requirements, including laser safety training. All work in our lab in undertaken with the intent of eventual publication. In the past, these projects have continued on a summer research projects and help students fulfill the physics senior thesis requirement.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: graham@physics.oregonstate.edu
**Mentor:** Rebecca Vega Thurber

**Co-mentor:** Thomas Sharpton, Departments of Statistics and Microbiology

**Department:** Microbiology

**Research Focus:** Our labs generate new methods to study the dynamics and evolution of animal microbiomes and viromes.

**Potential Student Project:** This student will learn to make high throughput sequencing libraries, bioinformatically analyze complex microbial and viral datasets, and integrate these data to discover statistical patterns that clarify biological processes. Options for projects include: analysis of stochastic changes in microbiome data, assessment of how well model organisms predict microbiome changes in human clinical populations, viral metagenomics of model organisms, and identification of antagonisms in host microbiomes.

**Attributes/skills/background sought in undergraduate:**

- Ideally, we would like a student who wants to work at the interface of microbiology, virology, and statistics. Coding, statistical analysis, and R studio skills are preferred.

**Mentoring Plan:** In my lab I require at minimum that students meet with me or their student/postdoc mentor once a week. Furthermore, I require that students who conduct work in my lab attend our weekly laboratory meeting. We work very hard with the undergraduates to find a time that everyone can come and participate. Since this position will be co-mentored we aim to have the student also meet with Dr. Sharpton or their Sharpton lab/mentor at least once a month.

**Workshop Dates:** Neither

**Contact:** rvegathurber@gmail.com
**Mentor:** David Roundy  

**Department:** Physics  

**Research Focus:** My research focus is on computational physics, predicting equilibrium properties of fluids.  

**Potential Student Project:** A student could work on developing Monte Carlo simulations that use the so-called broad histogram Monte Carlo approach, to apply the principles of statistical mechanics to predict equilibrium properties of materials.  

**Attributes/skills/background sought in undergraduate:**  

- Physics major  
- Interest in programming  

**Mentoring Plan:** I would meet weekly with the student and expect the student to also attend weekly group meetings.  

**Workshop Dates:** Neither  

**Contact:** roundyd@physics.oregonstate.edu
**Mentor:** Alvaro Estevez

**Department:** Biochemistry and Biophysics

**Research Focus:** Mechanisms of neuronal death in central nervous systems pathologies.

**Potential Student Project:** 1) Develop new methods to improve the differentiation and purification of motor neurons derived from human induced pluripotent stem cells. 2) Determine the oxidative modification of proteins in motor neurons differentiated from induced pluripotent stem cells from ALS patients and healthy controls by immunofluorescence, Western blot and mass spectrometry. 3) Investigating signaling pathways in neuronal cultures involved in oxidant induced death.

We have several projects that students expending 5 hours a week can carry out in collaboration with other more experienced undergraduate students in the lab.

**Attributes/skills/background sought in undergraduate:**

- Self-motivation
- Curiosity
- Willingness to learn
- Resilience
- Being responsible, respectful, and trustworthy
- High work ethic

**Mentoring Plan:** I plan to personally mentor the student(s) as I always do. My lab does not have graduate students or postdocs. We have a very experienced lab manager and we work in close collaboration with Dr. Maria C. Franco.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** alvaro.estevez@oregonstate.edu
**Mentor:** Bo Sun

**Department:** Physics

**Research Focus:** How physical interactions between tumors and tissues direct the progression of tumors.

**Potential Student Project:** Monitor tumor invasion in artificial tissues. This involves constructing lab models of tumors and imaging their progression.

**Attributes/skills/background sought in undergraduate:**

- Basic wet chemistry lab skills (preferred)

**Mentoring Plan:** The student will be working closely with an experienced graduate student, on average once a week. I will also have one-to-one meeting with the student every other week to track the progress. The meetings will have the format of progress reports, including student-prepared presentations and input from other members in the group.

**Workshop Dates:** Neither

**Contact:** sunb@onid.orst.edu
**Mentor:** Sally Hacker

**Department:** Integrative Biology

**Research Focus:** Coastal ecology with an emphasis on plants and animals and their interactions with the environment

**Potential Student Project:** 1) What is the role of plants in shaping coastal habitats, particularly dunes and eelgrass beds? 2) Why is eelgrass declining in Oregon estuaries? 3) When and how did a new hybrid species form from two invasive dune grass species in the Pacific Northwest? 4) Are dune plants nutrient limited, and if so, why? 5) Do dunes store carbon and help decrease CO2 in the atmosphere?

**Attributes/skills/background sought in undergraduate:**

- Willing to process plant and soil samples in the lab (required)
- Willing to enter data into a database on a computer (required)
- Interest in learning molecular techniques (preferred but no experience required)
- Interest in helping with fieldwork on the coast (preferred)

**Mentoring Plan:** I can meet with the student at least once every other week. The student would be paired with a PhD graduate student who will check in with them at least once a week during the time they are conducting research in my lab.

**Workshop Dates:** Neither

**Contact:** hackers@science.oregonstate.edu
**Mentor:** Malgorzata Peszynska

**Department:** Mathematics

* able to mentor an E-campus student

**Research Focus:** Mathematical modeling of real-life phenomena.

**Potential Student Project:** 1. Modeling using differential equations with analytical methods. 2. Modeling with computational techniques applied to differential equations. 3. Applications of mathematics to groundwater flow and contamination. 4. Using real data to calibrate mathematical models.

**Attributes/skills/background sought in undergraduate:**

**Required:**
- Strong motivation to apply yourself and persevere
- Completed calculus
- Plans to take MTH 256 (Linear Algebra)
- Does not need to be a math major, but needs to “like” math

**Preferred:**
- Coursework in mathematics beyond calculus
- Interest in using technology to solve and/or illustrate the solutions to real-life problems

**Mentoring Plan:** I can devote 1h/week. One of my graduate students could meet occasionally with the student in the case I am travelling or am overcommitted.

**Workshop Dates:** Neither

**Contact:** mpesz@math.oregonstate.edu
**Mentor:** Gary Merrill

**Department:** Biochemistry/Biophysics

**Research Focus:** Enzymatic and regulatory roles of redox enzymes in preventing and treating cancer.

**Potential Student Project:** 1) Identification of liver enzymes responsible for converting the chemotherapeutic drug doxorubicin to the cardiotoxic metabolite doxorubicinol. 2) Cloning, expression and purification of recombinant human carbonyl reductases, and characterization of their effectiveness in converting doxorubicin to doxorubicinol. 3) Transcriptome analysis of genes that require the tumor suppressor protein p53 and an intact thioredoxin system to be induced following gamma irradiation of mice.

**Attributes/skills/background sought in undergraduate:**

- Basic math skills (working with exponents, solving $y=mx+b$ problems) are required.
- College biology or AP high school biology and retention of key concepts is required.
- College general chemistry is required.
- College organic chemistry is preferred; a basic knowledge of valence and bonding is required.
- College coursework in cell and molecular biology is preferred, a basic knowledge of proteins, nucleic acids, and their building block is required.
- Availability to work in the afternoon/early evening and commit at least 2- to 3-hr blocks of time is required.

**Mentoring Plan:** The PI will meet with mentee once a week for the first several weeks and then meet with the mentee once every two weeks for the duration of the fellowship, except for April 15-May 31, when the PI will be out of the country and will rely on a senior graduate student to supervise the mentee.

The graduate student will meet with and work with the mentee at least once a week throughout the fellowship period.

**Workshop Dates:** Neither

**Contact:** merrillg@onid.orst.edu
Mentor: Sarah Gravem and Bruce Menge

Department: Integrative Biology

Research Focus: Community ecology of intertidal ecosystems, sea star wasting disease, food webs, climate change.

Potential Student Project: Field work on intertidal species including experiments on species interactions, surveys of biodiversity, collecting and deploying instruments. Student will learn experimental design, species identification, field sampling techniques.

Laboratory work including processing samples collected in the field, fabricating experimental equipment, managing data, and processing photos. Students will learn experimental design, Microsoft excel, photo analysis software and some statistical techniques

Attributes/skills/background sought in undergraduate:

- Ability to do physically demanding work in the intertidal (hiking with a heavy backpack, scrambling over slippery rocks, exposure to elements) while maintaining a good attitude.
- Attention to detail and meticulous organization during data collection, sample processing, and data management.
- Flexible schedule. We often leave very early or come home late at night because of low tides. Ideally the student would be available from 4am to noon most days during spring quarter for early morning tides.
- An enthusiasm for science and curiosity about the natural world!

Mentoring Plan: We will make a weekly schedule for the student to work on laboratory projects at approximately 5 hours per week until March. From March to June we expect the student to join us on early morning trips to the coast on average once per week, or more if their schedule allows. For laboratory work the student will primarily meet with technicians, graduate students and a post-doc. For field work the student will join me and the other laboratory members on trips to the coast. We are happy to have the student continue to work with us throughout the summer. The hands-on nature of our work precludes us from taking an e-campus student.

Workshop Dates: November 5, 5:00 to 6:30 PM

Contact: gravems@oregonstate.edu
**Mentor:** Patrick Ball

**Co-mentor:** Bruce S. Seal, PhD; Adjunct and Part-time Instructor in Biology OSU Cascades

**Department:** Biology (OSU Cascades)

**Research Focus:** Analyze microbial community structure, function, diversity, and abundance from various environments.

**Potential Student Project:** Projects involving microbial analyses of free-ranging animal species feces have been initiated at Cascades. The hypothesis is that indigenous species of non-toxin producing, anaerobic and aerobic bacteria have potential probiotic properties. The project involves enriching animal feces for bacterial spores, which are potentially non-toxin producing bacteria, that could be utilized as probiotics for animal. Additional hypothesis is the discovery of previously undiscovered bacterial species.

**Attributes/skills/background sought in undergraduate:**

- Minimum skills required are completion of classes in basic biology, completion of a class in microbiology or molecular biology is preferred, but not a necessity. Basic microbiology and molecular biology skills will be acquired during the project.

**Mentoring Plan:** The mentoring plan includes meeting with the student at least twice a week or more for one to three hours as required for maintenance of lab materials, e.g., bacterial cultures and nucleic acid amplification products analyses, etc. Also, reading scientific publications will be assigned that pertain to the project that will be discussed with the student. Dr. Ball will enlist the assistance of adjunct instructor Dr. Bruce Seal who is also well-versed in microbiological and molecular biology techniques and mentoring students to meet with the student.

**Workshop Dates:** Neither

**Contact:** pat.ball@osucascades.edu
Mentor: Blessing Emerenini

Department: Mathematics

* able to mentor an E-campus student

Research Focus: Using simple mathematical models to describe a biological situation and the interpreting results.

Potential Student Project: Topic: Modeling and Investigating persistence and extinction in a superspreading event Description: Superspreading events have been reported for many infectious disease outbreaks such as Ebola. To control a superspreading in an epidemic, there is need to understand the disease persistence and extinction. For the URSA program, I am proposing a project in mathematical biology involving model formulation, analysis and simulations to investigate persistence and extinction in a superspreading event.

Attributes/skills/background sought in undergraduate:

- Basic knowledge in calculus and algebra (required)
- Basic computer knowledge (required)
- Ordinary differential equations (preferred but not required)

Mentoring Plan: As a mentor, I commit to do the following:

1. Serve as a mentor for URSA Engage program and provide guidance, oversight, and encouragement.

2. Provide feedbacks regarding the awardee's mentorship contract, progress, and experience

3. Meet in person or communicate regularly with my mentee to review their progress and help them work toward identified goals. I plan to meet with the URSA Engage awardees once every week for at least 1 hour long.

Week 1-2

- I plan to start with coaching the awardee with basic concepts that will be required for successfully carrying out the specified research. These basic concepts will be like a refreshing course, based on what they are already used to.

Week 3-4

- I plan that by the week 3-4, the student will have to read up articles relating to the proposed project

Week 5-8
The project is divided into 3 sections suitable for a 1st year or 2nd year student, the three sections of the proposed project are modeling, mathematical analysis and simulations. The challenging section is on building a mathematical model, and this is where the student will gain some useful and career-relevant skills, hence I plan to devote weeks 5 - 8 to mentor student on this area.

Week 9-10

- The second section of the project (Mathematical Analysis) will be the focus for these 2 weeks. I plan on coaching the student on critical/logical thinking, proving simple related theorems and their applications.

Week 11-12

- The third section of the proposed project will be the focus for these two weeks, (i.e. Computer Simulation). It is important that students get to have a feel of their work, by visualizing their results. I have existing computer code which the student can use to test his/her model. I plan to also mentor the student on how to test the parameter sensitivity.

Week 13

- The focus of this week is to coach the student on research writing. This is another useful and career-relevant skills. The awardee should be able to communicate his/her thoughts and findings through his/her writings.

Week 14-15

- I plan to mentor the student into writing up his/her findings, and if possible make a poster or talk presentation in one of the departmental seminars.

**Workshop Dates:** November 5, 5:00 to 6:30 PM

**Contact:** emerenib@oregonstate.edu
**Mentor:** Claudia Maier  

**Department:** Chemistry  

**Research Focus:** Mass spectrometry for the exploration of molecular biosystems with relevance to health and disease.

**Potential Student Project:** 1) Mass spectrometry for analyzing metabolites in brain tissues. 2) Mass spectrometry for analyzing metabolites with possible relevance to the gut brain axis. 3) Mass spectrometry for analyzing plant phytochemicals in botanical extracts for neuroprotection and cognitive enhancement

**Attributes/skills/background sought in undergraduate:**

- Ability to work accurately and precisely in an analytical laboratory
- Good quantitative skills
- Familiarity with common software

**Mentoring Plan:** Our mentoring plan includes teaming of the URSA Engage awardee with a postdoctoral scholar and/or advanced graduate student for day-to-day mentoring. The URSA Engage awardee will also be encouraged to join our group meetings which are usually held at least once a week (often Fridays at 3 pm). In addition, the project team will meet with the PI at least every other week to discuss project progress and challenges. These meetings shall help to ensure project progress and assist in the preparation of scholarly work (posters). The URSA Engage awardee is also encouraged to present the research in our group meetings and at local conferences (including the Oregon Academy of Science Symposium).

**Workshop Dates:** November 5, 5:00 to 6:30 PM  

**Contact:** claudia.maier@oregonstate.edu
Mentor: Elisar Barbar

Department: Biochemistry and Biophysics

Research Focus: Structure/function studies of large disordered complexes involved in motility and viral replication.

Potential Student Project:
Protein purification involve expression in bacteria, cell lysis, affinity purification, gel electrophoresis and size exclusion chromatography. The proteins of interest are:
1) Purification of proteins related to rabies and Ebola viruses
2) Purification of proteins related to dynein motor proteins.

Attributes/skills/background sought in undergraduate:
Motivated, hard worker, interested in learning new things, attention to details,

Preferred: experience working in a research lab, have taken organic chemistry lab

Mentoring Plan: I interact daily with all my students. The undergraduate mentee will be working directly with a graduate student. We have weekly lab meetings that the mentee will be invited to attend. The mentee will be required to give one formal presentation to the lab at the end of each quarter.

Workshop Dates: Neither

Contact: barbare@oregonstate.edu
**Mentor:** Kristina Smith

**Department:** Biology (OSU Cascades)

**Research Focus:** I study gene regulation and epigenetics using fungal model organisms.

**Potential Student Project:**
1) Bioinformatic analysis of whole genome data to understand the role proteins that control chromosome structure play in controlling gene transcription. You will run command line software and become familiar with using genome browsers to visualize whole genome data.
2) Genetic engineering to add fluorescent tags to proteins of interest. This is part of a larger goal of understanding how certain genes in the fungus are never expressed except under specific growth conditions.

**Attributes/skills/background sought in undergraduate:** I require a self-motivated, highly curious mentee.

**Mentoring Plan:** I will meet with the mentee at least once per week for two hours. I will be the sole mentor for the project, and will meet with the student as much as necessary to guide them through 5 hours of work per week.

**Workshop Dates:** Neither

**Contact:** Kristina.Smith@osucascades.edu
**Mentor:** Devon Quick

**Department:** Integrative Biology

**Research Focus:** I investigate how students think and learn about science and themselves as scientists.

**Potential Student Project:** Using survey data, tracking/analyzing student responses about their science thinking or their science identity development over time. Observing teaching practices and tracking how faculty are changing over time. Examining student learning after introduction of new learning resources/technology.

**Attributes/skills/background sought in undergraduate:**

- Ability to observe behavior and record information.
- Interest in thinking about how people learn.
- Knowledge of/Desire to learn how to use Excel/Google forms.
- Interest in learning about teaching practices.
- Organized and attentive to details.
- Reliable and trustworthy.

**Mentoring Plan:** I will meet with student once weekly in person on campus to discuss the project and how to proceed.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** devon.quick@oregonstate.edu, 5417371702
**Mentor:** Sandra Loesgen

**Department:** Chemistry

**Research Focus:** Drug Discovery: We explore microbial natural products for their application against human diseases.

**Potential Student Project:**
Project 1: We have received local endophytic fungi and would like to screen them for antibiotic activity. Students will grow the fungi on various media, explore their chemistry, test for antibiotic activity with cell based assays and establish the fungal taxonomy by genomic fingerprinting.

Project 2: We have isolated local soil bacteria and would like to screen them for antifungal, antibiotic, and anti-tumor activity. Students learn to culture bacteria, perform chemical and biological screens.

**Attributes/skills/background sought in undergraduate:**
- Strong work ethics (~ 8-10h week), Interest in an individual project.
- Background in microbiology, chemistry.
- skills: patience, curiosity, interest to work with microbes, interest in chemical identification and separations.

**Mentoring Plan:** Individual mentoring and training: The student will be part of the Loesgen Lab, located Gilbert Hall, in the Department of Chemistry at OSU and closely working with Gisela, a second year graduate student in the Department of Chemistry and with the PI, Sandra Loesgen.

The Loesgen Lab will train the student in all aspects on natural products chemistry: HPLC, LCMS, chromatography, NMR analysis. Sandra Loesgen will work with the student to develop the scholar’s creativity, knowledge, communication skills, initiative, and perseverance, as these are the qualities that help scientists excel in their careers. Weekly 1:1 meetings, written term project goals as well as weekly group meeting with research presentations by all undergraduate and graduate students of the McPhail/Loesgen Labs will ensure timely research feedback and discussion. (UG students present twice a term). The PI will work closely with the student, instructing him/her in talk and poster preparations and on opportunities for outreach and engagement.

**Training from OSU resources:**
- Comprehensive laboratory orientation and safety training in Chemistry.
- Biosafety level 2 training and blood-borne pathogen training by EH&S.
- Extensive training in OSU’s NMR facility
- Web-based course in Ethics and Conduct in Research offered through the Research Office.

**Anticipated Achievements of the URSA engage award:**
Recent awardees (Cassie Lew, Nathan Coddington, Katie Chen, Molly Austin) are either in
graduate or professional schools, or currently still in the lab, working on their individual projects.

**Workshop Dates:** November 5, 5:00 to 6:30 PM

**Contact:** sandra.loesgen@oregonstate.edu
**Mentor:** Ryan Mehl

**Department:** Biochemistry and Biophysics

**Research Focus:** Our lab focuses on engineering proteins with genetic code expansion allowing use of any amino acids.

**Potential Student Project:** Our lab has four research areas, two will be described here.
1) Most diseases and develop proteins nitrated at tyrosine residues. One project will make these nitrated proteins and determine their role in disease states.
2) There are many reasons that researchers want to attach chemical functionality to proteins but the majority of these coupling reactions are slow. Here new amino acids will be made that have the fastest known coupling chemistry and then evaluated for their reactivity.

**Attributes/skills/background sought in undergraduate:** Smart
Motivated
Work effectively with others
Organized

**Mentoring Plan:** The undergraduate mentee will have meetings with me (Ryan Mehl) once per week. These meetings will be used to discuss results and plan future experiments. The mentee will organize an outline of the proposed work before starting and conclude the research period with a formal written document of the work. The mentee will work closely with a graduate student or postdoc in the lab (lab mentor) until they are trained adequately to work independently. The mentee will be required to keep daily notes of the research progress which will be monitored and reviewed by both the me and the lab mentor.

**Workshop Dates:** Neither (advertise on website only)

**Contact:** ryan.mehl@oregonstate.edu
Mentor: Hoewoon Kim

Department: Mathematics

* able to mentor an E-campus student

Research Focus: Partial Differential Equations, Probability, and Stability Problems

Potential Student Project: Project 1: Mathematical and physical understanding of the motion of incompressible fluids (e.g. water) in the interior and exterior of a sphere in the three dimensional space through basic differential equations such as diffusion and Laplace equations.

Project 2: Stability Problem deals with the following interesting question: "Under what conditions a mathematical object satisfying a certain property approximately must be close to an object satisfying the property exactly?"

Attributes/skills/background sought in undergraduate: 1. Basic background of ordinal differential equations of first and second order. (required)
2. Basic partial differential equations such as diffusion and Laplace equations. (preferred)

Mentoring Plan: We, me and the student, will meet up once per week in the half of the period for this program and there will be 2-3 meetings a week for the rest of it.

For the distant students we'll communicate by emails, messages, and calls such as Skype for 2-3 meeting a week.

In each meeting we'll talk about the summary of the previous work, progress of original research topic, and plans for the next week.

Workshop Dates: Neither (advertise on website only)

Contact: kimho@math.oregonstate.edu, 5417375140
**Mentor:** Heather Broughton  
**Department:** Biology (Cascades)  

**Research Focus:** Veterinary medicine, disease ecology, physiology, One Health.  

**Potential Student Project:** Red wolves (*Canis rufus*) are a critically endangered species. As such, remaining populations are heavily managed by US Fish and Wildlife Services and participating zoological institutions in order to promote species recovery. To aid in these ongoing efforts, this project will help to establish normal clinical baselines for several important health metrics (biochemical, hematological, and enteric), which will aid veterinary evaluation and identification of diseases critical to species survival.  

**Attributes/skills/background sought in undergraduate:**  
- Student must be comfortable with/show previous experience with regards to animal handling (required).  
- Student must be adept at following directions in a potentially stressful field environment (required).  
- This project is ideal for a pre-veterinary student or one interested in pursuing a career in wildlife management or conservation (preferred).  
- Some statistical background, namely experience using R Studio, is preferred.  

**Mentoring Plan:** Data collection for this project will begin in late Fall 2018/early Winter 2019. In addition to aiding zoo staff and veterinarians at Point Defiance Zoo and Aquarium in yearly health exams and diagnostic sample collection for their captive population of red wolves (*Canis rufus*), the interested student will also be primarily responsible for analyzing data from those health assessments to establish clinical reference intervals for the wolf population. Interested students should contact the faculty mentor immediately to be included in veterinary evaluations and sample collection, and will be expected to meet with the faculty mentor weekly throughout winter and spring term for evaluation of diagnostic samples; application of physical exam exclusion criteria to create a normal reference population; statistical analyses; and preparation of a scientific poster to be presented at the 3rd Annual Cascades Research and Scholarship Symposium on May 22, 2019.  

**Workshop Dates:** Neither  

**Contact:** heather.broughton@osucascades.edu, (307)760-8206
Mentor: Maria Clara Franco

Department: Biochemistry and Biophysics

Research Focus: My lab is focused on finding novel targets for the treatment of nervous system tumors

Potential Student Project:
- Determining how tyrosine nitration, an oxidative modification to proteins, regulates growth of tumors of Schwann cells
- Characterizing novel antibodies for nitrated proteins
- Studying how tyrosine nitration regulates energy metabolism in nervous system tumors
- Identifying nitration sites of endogenous nitrated proteins

Attributes/skills/background sought in undergraduate:
- Hard working and excited about doing research
- Team player
- Basic math skills

Mentoring Plan: I have an open door policy. I will personally meet with the students at least once a week to discuss results, plan experiments and guide the students throughout the URSA experience and beyond, if they decide to stay doing research in my lab.

Workshop Dates: Neither

Contact: maria.franco@oregonstate.edu, 541-737-4997
**Mentor:** May Nyman

**Department:** Chemistry

**Research Focus:** uranium cluster chemistry

**Potential Student Project:** I am seeking one undergraduate who will work with a PhD student to explore aqueous uranium chemistry with a goal to improve separation processes used in nuclear energy to recycle nuclear fuel. Nuclear energy is a vital piece of the puzzle to reduce carbon emissions and potentially reverse global climate change. The project involves preparing solutions and characterizing them by a number of techniques including NMR and X-ray techniques, and growing crystals!

**Attributes/skills/background sought in undergraduate:** Required: chemistry major or in a related field that applies chemistry. The candidate must have a good work ethic, good communication skills, and willingness to work responsibly and neatly in the lab. Although we use depleted uranium (meaning low radioactivity), there is an extra level of vigilance required to work in a trustworthy manner.

**Mentoring Plan:** URSA students in my lab will be expected to attend our group meetings, once every two weeks, and eventually present research updates. I will meet with the students and their graduate student mentors once per week, and also on an as-need basis. I would like the student to come to lab 2-3 times weekly, and stay for at least two hours. As he/she becomes more independent in tasks, the work schedule can become more flexible including weekends. Initially, he/she should set up a schedule with the graduate student mentor, so that the mentor can be available for assistance. Training required includes ‘handling radioactive isotopes’ provided by the EH&S.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** [may.nyman@oregonstate.edu](mailto:may.nyman@oregonstate.edu) / 541-737-1116
Mentor: Patrick Chappell

Department: Biomedical Sciences

Research Focus: We focus on the role of the intracellular clock on neuron function, reproduction, and cancer.

Potential Student Project: The neuropeptide Kisspeptin is crucial for pubertal progression and normal reproductive function, in females allowing ovarian estrogen (E2) to exert both positive and negative feedback. One project available is to perform cell perifusions using immortalized neuronal cell lines we generated to explore effects of E2 on secretion. We also study effects of light at night exposure and circadian clock disruption on breast cancer development, and will explore if these initiate DNA damage responses.

Attributes/skills/background sought in undergraduate:

Only a few (but critical) requirements:
1) attendance
2) willingness to learn
3) enthusiasm for science

If those three are present, everything else typically works out very well for the students' experiences.

Mentoring Plan: Depending on the lab project selected, I will typically spend several times a week in active mentoring of undergraduate students. One of my graduate students will also likely spend time providing technical advice and assistance at least twice a week as well. Due to the reliance on generation of results using molecular biological techniques, I will not be able to mentor an E-campus student.

Workshop Dates: November 5 and November 19, 5:00 to 6:30 PM

Contact: patrick.chappell@oregonstate.edu
**Mentor:** Brianna Beechler

**Department:** Biomedical Sciences

**Research Focus:** I study one health - linking human, animal and environmental health.

**Potential Student Project:**
1) Developing and performing an assay to assess the innate immune response to Mycoplasma ovipneumonia - the bacteria that causes pneumonia and population declines in bighorn sheep.  
2) Understanding the role of wildlife in the transmission of antimicrobial resistance genes, using samples collected from wildlife & cattle in Costa Rica.  

**Attributes/skills/background sought in undergraduate:**
I do not require any specific background, however students must be curious, hard-working, and interested in learning about animal health. Students must be willing to learn to work in the lab, as well as how to analyze their data. If interested in developing a project involving animal handling they must be willing to take the required course and undergo additional training.

**Mentoring Plan:** I will meet with the student once per week, and a graduate student will be available to meet with the student weekly as well (if needed).

**Workshop Dates:** Neither

**Contact:** brianna.beechler@oregonstate.edu
Mentor: Natalia Shulzhenko

Co-Mentor: Andrey Morgun

Department: Biomedical Sciences

Research Focus: Chronic inflammatory diseases such as type 2 diabetes, gut immune disorders, cervical cancer

Potential Student Project: The projects may include: effects of microbes and their metabolites on glucose and lipid metabolism, immune cell characterization and effects of cancer genes. After experiments, it will be necessary to collect and analyze data, make calculations, keep records. Responsibilities include laboratory maintenance, molecular biology techniques (DNA and RNA extractions), growing bacteria and cells. This is a great opportunity to receive hands-on laboratory training in a dynamic environment.

Attributes/skills/background sought in undergraduate: Requirements: 10-15 hours/week availability, appropriate communication skills, good organization and attention to detail, some lab experience preferred

Mentoring Plan: The student will be trained and closely working with a postdoc and a PhD student in the laboratory with whom s/he will meet almost every time while performing lab work. Overall guidance will be provided by the faculty during weekly lab meetings when obtained results and project progress will be discussed. The student is expected present results or a scientific paper at least once every term

Workshop Dates: Neither

Contact: Natalia.Shulzhenko@oregonstate.edu, 5417371051
Mentor: Hong Moulton

Department: Biomedical Sciences

Research Focus: Improve delivery of a class of DNA-like molecules to cells for treatment of a range of diseases.

Potential Student Project: Morpholino oligomers (PMO) are a class of DNA-like molecules that have been widely used to knock down gene expression with revolutionary therapeutic potential. PMOs suffer from poor delivery across the cell membrane into cells and have short residence time in blood circulation. The objective of the project is to develop a synthetic method to conjugate PMO to a bioactive small molecule for the enhancement of PMO's cell permeability and residence time in blood circulation.

Attributes/skills/background sought in undergraduate: Major in Chemistry or Chemical Engineering

Mentoring Plan: I plan to meet the student once a week from the start to the end of the project. In addition, a graduate student and the lab manager in the lab will help the student as well.

Workshop Dates: Neither (advertise on website only)

Contact: hong.moulton@oregonstate.edu, Major in Chemistry or Chemical Engineering
**Mentor:** Laurie Bridges

**Department:** Libraries and Press

**Research Focus:** As a librarian, my research focus is on information access and equity.

**Potential Student Project:** Wikipedia is the 5th most visited website in the world, but there are gaps of information (ex. only 17% of biographies are about women). This project will focus on learning about Wikipedia and editing ethics, becoming a Wikipedia editor, and increasing the number and quality of articles about an under-represented topic of interest to the student (for example: women of the west coast, African American Scientists, Latinx musicians, etc.).

**Attributes/skills/background sought in undergraduate:**

- Interest in social justice
- Like to write and edit
- Enjoy research (literature review)
- Attention to detail (track activities and ultimately prepare a guide that will help other university libraries create similar student positions editing Wikipedia)

**Mentoring Plan:** We will meet weekly in the library.

**Workshop Dates:** Neither

**Contact:** laurie.bridges@oregonstate.edu
Mentor: Lindsay Marlow

Department: OSU Library

Research Focus: Learning more about the experiences of first generation college students at Oregon State University.

Potential Student Project:

*Gathering the stories and/or experiences of first generation college students in order to share them with the larger university community in hopes of reducing barriers to success for first generation students.

*Learning about how first generation college students use the Valley Library at Oregon State in order to increase the effectiveness of Library Outreach endeavors and to provide better service to first generation students.

Attributes/skills/background sought in undergraduate:

- Past experience with outreach/promotion efforts (can be thought of broadly)- required
- Strong Written/Oral communication skills- required
- First generation college student (first in their immediate family to pursue a degree at a four-year college or university)- preferred

Mentoring Plan: I plan to meet every week with the undergraduate mentee.

Workshop Dates: November 19, 5:00 to 6:30 PM

Contact: lindsay.marlow@oregonstate.edu
**Mentor:** Dan Faltese

**Department:** New Media – SAC

* able to mentor an E-campus student

**Research Focus:** Cultural analytics: research at the intersection of economics, law, communication, and computation.

**Potential Student Project:** There is potential for students to work on just about any communication project. I am likely best at helping you if you stay closer to new media especially social network sites. Things to know: folks in the field likely don't hold conventional binary opinions about the media.

**Attributes/skills/background sought in undergraduate:**

Most important: curious, driven
Least important: technical skills, high cultural capital

**Mentoring Plan:** I would be happy to meet regularly with students, I am generally available on Wednesdays. For distance students, I can make time to regularly interact via phone or email.

**Workshop Dates:** November 19, 5:00 to 6:30 PM

**Contact:** daniel.faltesek@oregonstate.edu