

# STEM BYTES SEMINARS

Spring 2021 | 12:00 - 1:00 pm PT | Zoom | Open to the USC community

**Tuesday, January 26**



## Amanda Meyer

### Mapping inter-organ protein communication in homeostasis and disease

**Abstract:** Multiple organ failure syndrome suggests unknown secreted factors may mediate healthy inter-organ communication amongst our organ systems. Proximity labeling of secreted proteins offers an approach to identify novel signaling networks in homeostasis and disease. This proposal will utilize a novel mouse model system enabling systematic biotinylation of the secretome with a broad spectrum of cell types focusing on identifying novel endocrine factors in adipose-mediated metabolic regulation.

**Bio:** Amanda Meyer is a third year Molecular Biology PhD student studying adipose tissue biology in the McMahon lab. Amanda is interested in phenotypic plasticity and adipose tissue secretory response to the environment.

[Register Here](#)

**Wednesday, February 10**



## Talia Evans

### Drivers of Subsurface Deoxygenation in the Southern California Current System

**Abstract:** The California Current System (CCS) supports ecologically and economically important populations of finfish and marine invertebrates, and climate change threatens these populations with increased temperatures, more acidic waters, and lower oxygen concentrations. We found that the mean oxygen concentration in the southern, subsurface CCS decreased by 25% from 1993 to 2018, which can be attributed to the contributions of six water masses that feed the CCS, though they originate far afield in the Pacific Ocean.

**Bio:** Talia Evans is a third year PhD student in James Moffett's lab studying chemical oceanography. Their lab investigates the distributions of trace concentrations of iron, sulfur, iodine and copper, in large, open ocean Oxygen Deficient Zones as well as hypoxic continental shelves. Though these compounds are prone to contamination and oxidation, they are important nutrients and/or toxins that shape the biology and chemistry of marine ecosystems. This spring, the lab is going to sea off the coast of Oregon to study hypoxia and benthic fluxes of iron and iodine, a cruise Talia is helping to plan.



## Kareesa Kron

### Reducing CO2 using Organic Photoredox Catalysts

**Abstract:** Reducing anthropogenic CO2 levels using organic photoredox catalysts is promising due to their reduced reliance on heavy metals and low energy demands. By modelling these catalysts with density functional theory and other more recently developed methods, we can describe the underlying electronic properties that dictate catalytic activity and predict new catalysts to reduce CO2.

**Bio:** Kareesa Kron is a third year PhD student in Chemical Engineering whose research focuses on applying recent molecular modeling tools to the problem of reducing CO2. They are serving as the Vice President of Web Resource Management and Outreach Coordinator for Women in Chemical Engineering and have recently developed and shared a lesson plan based on molecular modelling for high school environmental science teachers. Overall, Kareesa is focused on combining their interests in environmental activism and computational catalyst modelling to educate those outside of academia about how chemical engineering can be used to combat environmental problems.

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**Tuesday, February 23**



## Katie Sayre

### Growing Older in the Bush: what modern hunter-gatherers can teach us about human aging

**Abstract:** We often associate growing older with declines in physical and mental health—but most of what we know about human aging comes from work with sedentary industrialized populations, like the USA. In this talk, I will discuss what we can learn about human aging by working with more physically active subsistence-level populations.

**Bio:** Katie Sayre is a fourth year PhD student in the Integrative and Evolutionary Biology (IEB) graduate program at USC. Katie has a BA from the University of Texas at Austin (2013) and an MA from the University of Arizona (2017). At USC, Katie works with Dr. Dave Raichlen in the Evolutionary Biology of Exercise lab. Katie's research uses an evolutionary medicine perspective to explore how patterns of physical activity impact how we grow older.



## Zachary Dunn

### T Cells Engineered to Eradicate Cancer

**Abstract:** T cells are essential to the immune system, protecting the body from foreign substances and cancerous cells. In malignant disease, cells have developed mechanisms to evade natural defenses. By manipulating and harnessing the power of T cells, researchers have revolutionized the treatment of certain cancers using adoptive T cell therapy. It is our goal to create and modify adoptive T cell therapies to expand the proportion of patients that benefit from these exciting treatments. I will discuss T cell anticancer immunity, current adoptive T cell therapies, and future directions of the field.

**Bio:** After graduating summa cum laude from the University of California Riverside, Zachary entered the chemical engineering PhD program at USC as a USC Rose Hills Foundation Fellow. In the Center for Immunoengineering lab, Zachary develops novel therapies that activate the immune system to fight cancer. Outside of the lab, Zachary is a USC Office of Health Promotions Strategy Community Health Organizer, a member of the USC Men's Club Soccer team, and an avid reader.

[Register Here](#)

**Wednesday, March 10**



## Emily Aguirre

### Genotype-by-Environment Effects on the Epibiome of the Endangered Staghorn Coral, *Acropora Cervicornis*

**Abstract:** Recent microbiome studies across taxa have revealed the influence of host genotype on microbial recruitment and maintenance, yet studies exploring host-specific associates in Scleractinian corals are scant. Here, we investigated (1) host-specific differences in *Acropora cervicornis* (Staghorn coral) epibiomes from a common garden nursery and (2) environmentally-induced epibiome shifts, one year after transplantation.

**Bio:** Emily Aguirre is a Los Angeles native and first-generation, Central American graduate. She holds an A.A.S in Chemical Technology, a B.S. in Microbiology and is currently an NSF fellow, working on her Ph.D. Emily's research interests are driven by her broad interest in host-microbe interactions. Currently, she is investigating nutrient exchange between marine bacteria, symbiotic algae and corals. When not engaged in research, Emily is committed to mentoring students on a similar track and helping them navigate through college and beyond. Parallel to mentoring, Emily also enjoys communicating science to the public, and has published several pop-sci articles for the Daily Chela, and is currently serving as an organizing committee member for ComSciCon-LA 2021.



## Michael Kruger

### The Challenges and Potential Benefits of Electric Aircraft

**Abstract:** Commercial aviation has been growing at an enormous rate over the past decades, and this growth is expected to continue, along with the continued use of hydrocarbon fuels to power the aircraft. Electric propulsion might have the potential to significantly improve the efficiency of aircraft, offsetting some of the adverse environmental effects and reducing the cost of flying, making it more accessible to all.

**Bio:** Michael Kruger is a PhD student doing research in the field of conceptual aircraft design. Michael believes that many of today's most important problems can be solved through technology, which in turn is built off of fundamental science and research. To this end, Michael is investigating novel technologies to improve the efficiency of commercial transport aircraft with the hope of reducing the adverse environmental effects of aviation and making the wonder of flight more accessible to the world.

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**Thursday, March 25**



## Emily Reed

### Characteristics of the brain and their implications for controlling neural behavior

**Abstract:** Our brains drive the decisions we make and are critical to our existence. To better understand the brain, we must make measurements using sensors, which are known as electrodes that detect the electrical activity of the brain through a test called an electroencephalogram (EEG). This talk will explore how we can optimally place the minimum number of sensors to measure the brain dynamics to obtain an accurate representation of the brain.

**Bio:** Emily Reed is in her fourth year of the Electrical Engineering PhD program at USC where she works on understanding how to mathematically characterize and measure brain dynamics. Her research interests include control, optimization, machine learning, and recently quantum computing. Emily graduated Magna Cum Laude with her B.S. in Computer Engineering from The Ohio State University in 2017 and with her M.S. in Electrical Engineering from USC in 2019. She currently serves on the Mentorship Committee for the WiSE PhD Advisory Board and tutors with School on Wheels. Emily enjoys playing golf, competing in triathlons, and supporting the performing arts.



## Elizabeth Ondula

### Computational Agroecology

**Abstract:** Industrial Agriculture is fundamentally unsustainable due to dependence of non-renewable resources and resulted in massive-destructive ecosystem effects. Can computational methods and tools aid in redesigning existing deprived landscapes?

**Bio:** Elizabeth Ondula is an AI Systems researcher who explores the foundations, mechanisms, and models of reinforcement learning agents and their environment including how they can be applied to Agriculture, Education, and Supply Chain problems. Elizabeth enjoys mentoring and teaching students interested in Computer Science and Electrical Engineering fields.

[Register Here](#)

**Friday, April 9**



## Elizabeth Loxterkamp

### The Role of the Vagus Nerve in Sugar Intake

**Abstract:** While we typically think that the taste of sugar is what drives overconsumption of sweet foods, there is a wealth of data that indicate that signaling from the gut to the brain also positively reinforces sugar intake. The vagus nerve appears to be a key player in mediating these signals, and my research focuses on determining how the vagus nerve detects sugar in the gut, and what brain areas this nerve then stimulates.

**Bio:** Elizabeth Loxterkamp is currently studying how communication between the gut and the brain mediate food intake, especially regarding sugars. Elizabeth began her PhD at USC directly after finishing her undergraduate degree in neuroscience at Wellesley College.



## Souvik Kundu

### Energy-efficient deep spiking neural networks: Towards brain-inspired learning

**Abstract:** Brain-inspired computing has gained significant transaction over the past few years due to its operational similarity with biological neurons and promise for energy-efficient computing. Towards that end, we propose a novel brain-inspired learning strategy to further reduce the non-significant spiking activity of spike-based neural networks and thus go one step further towards ultra-low power deep spiking neural networks (SNNs).

**Bio:** Souvik Kundu received his M.Tech degree from IIT Kharagpur, India. Souvik is currently working towards a Ph.D. degree in Electrical and Computer Engineering at the University of Southern California, Los Angeles, California. He worked as a digital design engineer at Texas Instruments India Pvt. Ltd., before joining USC as an Annenberg Fellow. Souvik has also been awarded the best research poster award at the 10th MHI research festival and was one of the 11 finalists in the MHI scholar program 2020.

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**Tuesday, April 20**



## Sonia Maryam Setayesh

**Talk:** To be announced

**Abstract:** To be announced

**Bio:** Sonia Maryam Setayesh is a second year PhD student at the CSI-Cancer Institute where she works on high resolution single cell immune profiling of cancer patients at the CSI-Cancer institute. Sonia's studies focus on the contributions of the localized and systemic immunological responses to clinical outcomes.



## Leili Tavabi

**Multimodal Machine Learning in Mental Health**

**Abstract:** Human verbal and nonverbal behaviors have shown to carry important indicators of mental health disorders. Therefore there has been growing interest towards automated human behavior analysis by leveraging verbal content, facial expressions and speech prosody for computer-aided diagnosis and assessment of mental health disorders. Building automated models can help augment clinical resources to address the gap between the growing need for mental health assistance and the existing resources.

**Bio:** Leili Tavabi is a PhD student at USC Institute for Creative Technologies. Leili focuses on building multimodal machine learning models on human behavioral data in the context of mental health. She was previously a data scientist at Intel Labs where she was introduced to Affective computing and found it interesting enough in which to pursue a PhD. Leili also holds an MS degree in computer science from UCLA (as a symbol of peace :)). Leili is interested in using AI for building solutions to real-world issues with real needs.

[Register Here](#)

**If you are interested in attending these seminars, please register in advance.  
After registering, you will receive a confirmation email from Zoom.**

For any questions and/or concerns, please contact WiSE marketing assistant, Marie Meneses, at [marieste@usc.edu](mailto:marieste@usc.edu).

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