

CEMI WINTER NEWSLETTER



2023



WHAT IS CEMI?

The “Center for Environmental Microbial Interactions” was founded in 2012. Initially led by Dianne Newman, the CEMI was created as a place where researchers interested in microbial science from across Caltech could gather and collaborate. CEMI’s mission is to enable Caltech researchers to tackle important problems involving microbes in bold and innovative ways.

Victoria Orphan took over as director of CEMI in 2020. Dr.



Orphan is the James Irvine professor of Environmental Science and Geobiology

and the Allen V.C and Lenabelle Davis Leadership Chair. She is passionate about the microbial symbioses and methane cycling in the deep ocean. Her lab studies a wide range of unique environments and the microbes that inhabit them, from chemosynthetic ecosystems on the ocean floor, to seagrass beds in Newport bay.

CEMI BY THE NUMBERS

106 Total Pilot Projects

38 labs

>400 members

IMPORTANT DEADLINES AND DATES

Pilot Grant proposals are requested annually in June, and due in September. Applications are currently closed. Travel and Training grants are due in the summer and winter, usually around June and December. The current winter deadline is December 22nd.

CEMINAR

CEMIinar occurs on the second Wednesday of each month in Chen 130 from 4-5 PM. This event features two 30-minute talks from different CEMI labs. CEMIinar will resume 1/10/24.

SAVE THE DATE!

The spring science symposium and poster session will be March 8th, 2024.

FACES OF CEMI

Say hello to some new faces or get to know someone better.



Shaelyn Silverman is the 2022 Caldwell Fellow. She received her bachelor’s degree in Cell/Cellular and Molecular Biology, Neuroscience from the University of Colorado Boulder in 2017, and began pursuing her PhD in

Geobiology at Caltech in 2018. Shae researches in the labs of both Alex Sessions and Victoria Orphan, combining stable isotope biogeochemistry and microbial physiology to analyze the turnover of Marine particulate organic matter. Shae is an active participant in Go Outdoors, helping to write and facilitate outreach modules for use by Pasadena educators. She also runs marathons and

ultramarathons in her spare time, and recently completed a rim-to-rim-to-rim run of the Grand Canyon.



Ana Duarte Montano is a 2023 CEMI WAVE Fellow from the Biochemistry program at Smith College. Over the course of her fellowship Ana identified, cloned, and characterized monoclonal antibodies capable of interacting with the receptor-binding domains of sarbecoviruses. She also helped contribute to the expanding body of research surrounding the mosaic-8 RBD-nanoparticle. Ana was mentored by Professor Pamela Bjorkman.



Stella Baldwin is a 2023 CEMI WAVE Fellow from the Geological and Earth Sciences/Geosciences program at the University of Southern California. During her fellowship she utilized fluorescence in-situ hybridization (FISH) to visualize the genetic variation of the 16s rRNA of ANME-2b species, and BONCAT to directly target metabolic genes. Stella was mentored by Professor Victoria Orphan and Postdoc Dan Utter. Stella's passions extend beyond STEM, as she is a flutist in USC's

Trojan Marching Band.

CEMI SPOTLIGHT

Nominate a CEMI postdoc or graduate student to see them featured in this section!



Zach Lonergan is a BBE postdoc in the laboratory of Dianne Newman. Originally from West Virginia, he completed his undergraduate studies at West Virginia Wesleyan College and his PhD in Microbiology and Immunology at Vanderbilt University in the lab of Eric Skaar. His thesis focused on understanding mechanisms employed by bacteria to acquire nutrient metals during infections. For his postdoc, Zach investigates how microbes survive exposure to the radical nitric oxide, which is both

a component of the host immune response and an intermediate of microbial anaerobic metabolisms. In his free time, Zach enjoys running and hiking Southern California trails followed by a craft beer and re-runs of Survivor.

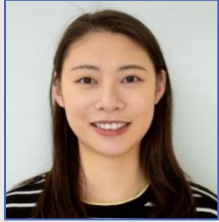


Hannah Way is a 4th year GPS graduate student in geobiology working in the lab of Jared Leadbetter. She was born and raised in Southern California and received her B.S. in Microbiology from UC Riverside, where she studied microbial pathogens of citrus and grape. Hannah currently works with a unique co-culture of chemolithoautotrophic manganese oxidizing microbes, exploring their complex metabolic machinery, and visualizing the structures of the manganese oxide

nodules they produce. Hannah participates in outreach within the GPS department and in the community with the Caltech Turtle club. When she's not in the lab, Hannah can usually be found at home painting, drawing, or hanging out with her bearded dragon.

NEW FACES

Meet the 2023-2024 first year Graduate Student Fellows!



Yihan (Olive) Cheng – Chemical Engineering

Columbia University 2023



Catherine Griffin – Bioengineering

Massachusetts Institute of Technology 2023



Manuel Holguin – Biochemistry and Molecular Biophysics

UC Irvine 2023



Elizabeth (Liz) Hughes – Bioengineering

University of Michigan 2023



Doran Sekaran – Biology

University of Columbia 2023



Clara Seo – Chemistry

Amherst College 2021



Akanksha Yadav – Bioengineering

Max Planck Institute for Biophysical Chemistry 2021

Indian Institute of technology, Bombay 2019

2023 PILOT GRANT RECIPIENTS

Congratulations to the 2023 Pilot grant recipients!



PI	Student	Project Title
Frances Arnold	Ryen O'Meara	Elucidating the biodegradation of dimethylsilanediol by soil microbes
Tsui-Fen Chou	Kate Radford	Structural studies on <i>Runella zea</i> prokaryotic Argonaute protein
Gözde Demirer	Chiara Berruto	Reoptimizing plant microbiomes through exudate engineering
Rustem Ismagilov	Natalie Wu-Woods	Exploration of the aging Parkinson's microbiome
Smruthi Karthikeyan	Grace Solini	An integrated-omics approach to assess carbon fluxes in soil microbiomes under drought stress
Richard Murray	Yan Zhang	Cell-free systems as a universal platform for phage production
Dianne Newman	John Ciemniecki	Quantifying the basal power requirement during microbial energy-limitation in the lab
Victoria Orphan	Magdalena Mayr	Aerobic short-chain alkane oxidation with novel particulate Cu-monooxygenases on carbonates at methane seeps
Ned Ruby	Liu Yang	Understanding the responses of bacteria growth dynamics to the host environment
Mikhail Shapiro	Josh Chen	Toward injectable sub-mm wireless living electronic sensors
Kaihang Wang	Tomasz Gawda	Multiplex generation of chimeric bacterial strains via conjugation and CRISPR-associated transposons

OUTREACH OPPORTUNITIES

Want to get involved in microbiology focused outreach? There are lots of opportunities at Caltech in many different divisions!

Go Outdoors is a GPS outreach program that helps connect Caltech students with teachers in the Pasadena community. Volunteers have the opportunity to help create lesson plans, assist with classroom visits and facilitate fieldtrips for K-12 students. If you would like to volunteer, visit the Go Outdoors webpage at go-outdoors.caltech.edu.

Go To Sea is a developing outreach program spearheaded by the Orphan lab. This group works closely with an educator at Blair high school to facilitate classroom visits, and to chaperone a cumulative Caltech campus visit in the spring. If you would like to get involved, contact rwipfler@caltech.edu to sign up.

Do you participate in an outreach program that wasn't mentioned here? We'd love to hear about it!

Got questions, comments, corrections, or suggestions? Contact Vera or Hannah at hway@caltech.edu or vbeilins@caltech.edu

For questions about grants or events, contact Kristy Nguyen at kristyn@caltech.edu

