

# Oceans Research Center

## Director:

(<https://ees.cas.lehigh.edu/content/jill-mcdermott/>) **Jill McDermott**  
(<https://ees.cas.lehigh.edu/content/jill-mcdermott/>), Ph.D.  
Frank Hook Associate Professor, Earth and Environmental Sciences  
Research interests: deep-sea volcanic and hydrothermal processes, water and gas chemistry, mineral solubility, chemical oceanography, microbial energetics.

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oceanographic sampling and experimentation in collaboration with international scientists. Multiple Lehigh undergraduate and graduate students who have joined these expeditions are now pursuing professional careers or advanced degrees (e.g., Research Assistantships at the Smithsonian Institution and the Harvard Medical School, environmental consulting, engineering, and Ph.D. programs in oceanography and related fields).

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## Core Faculty

Santiago Herrera, Ph.D.

Frank Hook Assistant Professor, Biological Sciences  
Research interests: deep-sea ecology, evolution, vulnerable marine ecosystems, biological oceanography, bioinformatics.

Michael Layden, Ph.D.

Associate Professor, Biological Sciences  
Research: cnidarian neural regeneration, development, nervous system evolution.

John Paul Balmonte, Ph.D.

Assistant Professor, Earth and Environmental Sciences  
Research interests: marine and freshwater microbial ecology, biogeochemistry, environmental change, carbon cycling, bioinformatics.

## Mission

The Lehigh Oceans Research Center hosts collaborative networks of ocean scientists that expand into new research domains within and beyond the University. The Center's interdisciplinary research combines oceanographic fieldwork, laboratory measurements and experiments, and scientific computing.

## Research

Lehigh Oceans researchers study the interplay between the ocean system and the life within it. Specifically, Center researchers apply their expertise to inform the management of deep-sea marine ecosystems vulnerable to climate change and other threats, define the role of marine microbes in regulating the carbon cycle, link fundamental chemical, geological, and biological processes that play a critical role in the sustenance of life on Earth, and identify the mechanisms of animal development, regeneration, and evolution. The Center's research advances the United Nations Sustainable Development Goals (SDG), especially those regarding Climate Action (SDG 13), Life Below Water (SDG 14), and Partnerships for the Goals (SDG 17).

Research groups within the Center conduct international collaborative work worldwide and are funded by the National Oceanic and Atmospheric Administration and its Sea Grant programs, the National Aeronautics and Space Administration, the National Science Foundation, the National Institutes of Health, the National Marine Sanctuaries Foundation, and the Schmidt Ocean Institute.

## Education

The Center faculty are committed to educating and mentoring diverse students, broadening participation of historically marginalized populations in STEM, and providing students with experiential learning opportunities. Center faculty recruit undergraduate and graduate students through the Rapidly Accelerated Research Experience (RARE; <https://hhmi.cas.lehigh.edu/content/rare>) and the AGU Bridge program (<https://www.agu.org/bridge-program>) to join research groups and pursue careers in ocean sciences. Center faculty have engaged undergraduate and graduate students in over 20 major ocean research expeditions which provide rich experiential learning, career development, and professional networking opportunities. Students learn through deep-sea submersible and remotely operated vehicle dives. They perform