



Dr. Tamara Frank, Team Leader

Associate Professor, Deep Sea Biology Laboratory
Nova Southeastern University

Areas of Research: Visual physiology of deep-sea animals; visual adaptations to bioluminescence in both pelagic and benthic animals

Biographical Information: Dr. Tammy Frank is an associate professor at Nova Southeastern University Oceanographic Center. Her educational background includes a Bachelor's degree from California State University, Long Beach, and Master's and Doctorate degrees from the University of California, Santa Barbara. In 1992, Dr. Frank moved to Florida and, after falling in love with the climate, has lived there ever since. She has been chief scientist on 50 research cruises, and participated on 45 more as a lucky hitchhiker, conducting work off the coasts of the

Bahamas, California, the Canary Islands, Cuba, Costa Rica, Florida, Iceland, Hawaii and Samoa. In addition to conducting her research, she teaches Anatomy and Physiology to undergraduates, and marine physiology and deep-sea biology to graduate students.

“What happens in the deep sea affects everything that happens on the surface, and what happens on the surface affects what happens in the deep sea,” said Dr. Frank. “You can't influence one part of the ecosystem without impacting the global ecosystem.”

Dr. Frank is the chief scientist on this research cruise. Her duties include choosing the locations for the dives, setting the schedule for the day so that ROV dives, Medusa deployments and net trawls each have their time slot and are properly catalogued; and making sure that everything that is collected is properly catalogued and gets to the right person for study. Dr. Frank will also be conducting onboard research on live deep-sea crustaceans (shrimp and crabs) that are collected.

The toughest part about going to sea for Dr. Frank is leaving behind her two sweet puppies. “They let me sleep in their bed every night,” Dr. Frank said. “They only weigh 12 to 14 pounds, so there's plenty of room for me. Having to sleep on shipboard without them is tough.”

More information: <http://www.nova.edu/ocean/research/labs/frank.html>



Dr. Heather Bracken-Grissom

Florida International University-Biscayne Bay Campus

Areas of Research: Evolution, biodiversity, conservation

Biographical Information: Dr. Bracken-Grissom is fundamentally interested in the evolution of marine invertebrates. More specifically, she specializes in studying decapod crustaceans, which include shrimp, lobsters, and crabs. Her interest in invertebrates blossomed early in her college career and continued through her postdoctoral studies at Brigham Young University.

The Bracken-Grissom Lab, which she established at Florida International University, uses molecular techniques to study the relationships, origins, biodiversity, ecology and evolution of these animals. Much of Dr. Bracken-Grissom's

research has been conducted in the Gulf of Mexico, Caribbean, western Atlantic and eastern Pacific Ocean where she has had the opportunity to help organize and participate in several major research expeditions.

Her current role in *Creep into the Deep* will be to use genetic techniques to study the visual systems (eyes) of deep sea animals. Specifically, she is interested in how animals “see” in the dark and detect bioluminescence. When Dr. Bracken-Grissom isn’t in the lab, field, or office, she’s participating in triathlons and almost anything outdoors related.

More information: <http://www.brackengrissomlab.com/>



Dr. Sönke Johnsen

Professor, Duke University

Areas of Research: Vision, bioluminescence, and camouflage.

Biographical Information: Growing up, Dr. Johnsen had no interest in biology, though he always loved the ocean. He studied physics, math, and art in college, and graduated with no idea what to do next. So he hitchhiked through Oregon, taught kindergarten and dance, and worked as a freelance carpenter for a number of years. It was only when he decided to go back to school that he took a second look at biology and was accepted into a Biology program at the University of North Carolina in Chapel Hill. After getting his Ph.D., he worked with Edie Widder at an oceanographic institution in Florida and then took a job at Woods Hole Oceanographic Institution on Cape Cod. His first research cruise was to the Gulf of

Maine: the seas were rough, the ship smelled, and Dr. Johnsen was seasick, but he knew he’d found his calling. When he’s not traveling the planet, he teaches sensory biology at Duke University and manages a lab of students that also like to wander. At home, he helps his wife with her 20-acre horse farm, tutors his teenage daughter in chemistry and math, and writes books on optics and vision. His latest book will be about life in the open ocean. His role in this cruise is to photograph and measure the bioluminescence of the animals that the robot submarine collects from the bottom of the ocean.

More information: <http://sites.biology.duke.edu/johnsenlab/people/sjohnsen.html>



Dr. Charles G. Messing

Professor, Halmos College of Natural Sciences and Oceanography
NOVA Southeastern University

Areas of Research: The ecology and evolution of living crinoids (sea lilies and feather stars), deep-sea coral reefs and rocky-bottom habitats.

Biographical Information: Born in the Bronx, New York, Dr. Messing discovered his interest in science during trips he took as a child to the American Museum of Natural History. He first wanted to be a paleontologist and study dinosaurs, but by junior high school found his real interest in strange marine creatures. In college he majored in Biological Science and later earned his Doctorate in Biological Oceanography at the University of Miami’s Rosenstiel School of Marine and Atmospheric

Science. While a graduate student there, Dr. Messing made his first deep submersible dive, aboard Alvin. He has since led or participated in over 30 research and educational expeditions in places as far away as Papua New Guinea and Ecuador.

Dr. Messing's role in *Creep into the Deep* will be to identify the different kinds of bottom-dwelling marine creatures that the expedition encounters, perhaps including species that have never before been seen. His other research revolves around understanding the distribution and ecology of deep-water invertebrates such as corals, echinoderms and sponges, and the evolution and ecology of crinoids.

Beside his work in the deep sea, Dr. Messing is a writer, actor, illustrator and educator. He has written and hosted science television programs, and performed in a one-man play as the artist and sculptor Michelangelo.

More information: <https://charles-messing.squarespace.com/>



Dr. Edie Widder

President/Senior Scientist, Ocean Research and Conservation Association

Areas of Research: Bioluminescence and ocean conservation

Biographical Information: Dr. Widder is a biologist and deep-sea explorer. She uses her expertise in oceanographic research and technological innovation to help reverse marine ecosystem destruction worldwide.

In 2005, Dr. Widder co-founded the Ocean Research and Conservation Association (ORCA), a non-profit organization dedicated to the protection and restoration of marine ecosystems and the species they sustain.

A specialist in bioluminescence (the light chemically produced by many ocean organisms), Dr. Widder has been a leader in helping to design and invent new submersible instrumentation and equipment to enable unobtrusive deep-sea observations. In many cases, the technology did not exist to aid Dr. Widder with her work so she had to create her own tools and devices. Working with engineers, she designed a variety of systems which enable humans to see beneath the waves in new ways. One of these is the Eye-in-the-Sea (EITS). By using red light, which is invisible to most deep-sea animals, the EITS camera can see without being seen. Another is the electronic jellyfish or e-jelly, which imitates a bioluminescent display that attracts or lures large predators. It was the EITS and the e-jelly used on a platform (called the Medusa) that captured the first images ever recorded of a giant squid in its natural habitat in 2012. During *Creep into the Deep*, Dr. Widder will be using the Medusa to observe animals on the ocean bottom unobtrusively.

Deep sea animals aren't the only species Dr. Widder loves. Her dog, Yankee Doodle, comes to work with her every day.

"He does his part to help save the ocean by helping to pick up trash on the beach," Dr. Widder said.

More information: http://www.teamorca.org/cfiles/about_edie.cfm

Creep Into The Deep is a WhaleTimes Inc. virtual exploration designed to help young adults and teachers discover vision and bioluminescence on the floor of the deep sea. To learn more about this program, visit either the WhaleTimes or the Oregon Coast Aquarium's Oceanscape Network websites.