



R.I.T.

Chester F. Carlson

College of Science

Center for **IMAGING** SCIENCE

Seminar Series

The red and the black: Bioluminescence and the color of animals in the deep sea

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Auditorium of the Center for Imaging Science

The colors of deep-sea species are generally assumed to be cryptic, but it is not known how cryptic they are and under what conditions. This study measured the color of approximately 70 deep-sea species, both pelagic and benthic, and compared the results with two sets of predictions: 1) optimal crypsis under ambient light, 2) optimal crypsis when viewed by bioluminescent "searchlights". The reflectances of the pelagic species at the blue-green wavelengths important for deep-sea vision were far lower than the predicted reflectances for crypsis under ambient light and closer to the zero reflectance prediction for crypsis under searchlights. This suggests that bioluminescence is more important than ambient light for the visual detection of pelagic species at mesopelagic depths. The reflectances of the benthic species were highly variable and a relatively poor match to the substrates on which they were found. However, estimates of the contrast sensitivity of deep-sea visual systems suggest that even approximate matches may be sufficient for crypsis in visually complex benthic habitats. Body coloration was generally uniform, but many crabs had striking patterns that may serve to disrupt the outlines of their bodies..

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Speaker Biography

All my life, I never wanted to be a biologist. After choosing a college solely on the fact that a family friend's hardware store was in the same town, I began a major in Physics. An Algebra professor who danced and told funny stories about pathological geniuses convinced me to change my major to Mathematics. I added a major in art, mostly abortive because I refused to take art history, and left college disenchanting with education.

I then worked as a daycare provider and kindergarten teacher for Quakers, a freelance carpenter, and a dance teacher for three year olds. It was during this last job that I met Sarah, the daughter of Scott Gilbert, who wrote the developmental biology textbook used by most colleges. After hitch-hiking across the Pacific Northwest, I decided that I needed more education. A friend and I went through the alphabet. Deciding that a career in art was likely to be a raw deal, settled on Biology and met with Scott Gilbert and Rachel Merz. Rachel suggested good places to go to graduate school and Scott got me a job with a friend of his, Stuart Kauffman.

Luckily, the job with Stu required no knowledge of biology and several graduate schools admitted me despite the same lack. I went to UNC, and after a year of reading and drawing picture of bugs on the lawn, I decided that biology was "okay". With little knowledge but high enthusiasm, I chose a high-risk, low-benefit project that I left behind the moment I handed in my thesis. My advisor, Bill Kier <<http://www.bio.unc.edu/faculty/kier/>>, pointed me to oceanic zooplankton, we both thought about transparency, and I applied to two oceanographic institutions, both of which turned me down. I cleaned fish tanks for a year, applied again, and both now accepted me. I went on my first research cruise to the Gulf of Maine with Edie Widder <<http://www.hboi.edu/marinesci/biolum.html>>. It was stormy, the ship smelled, and I was seasick. It was the best time of my life. Five years later, I have yet to look back.