

## Sönke Johnsen

### Education:

- University of North Carolina at Chapel Hill: Ph.D., Biology, 1996, 1990-1996  
“The Optical Design of the Photic System of Ophiuroids”  
Dr. William M. Kier, advisor.
- Swarthmore College: B.A. with Distinction, Mathematics, 1988, 1984-1988  
Phi Beta Kappa and National Merit Scholarship.

### Professional experience:

- Associate Professor, Biology Department, Duke University, Durham, NC. 2007-  
Assistant Professor, Biology Department, Duke University, Durham, NC. 2001-2007  
Adjunct Scientist, Nicholas School of the Environment, Duke University 2003-  
Adjunct Scientist, Woods Hole Oceanographic Institution. 2002-2005  
Assistant Scientist, Woods Hole Oceanographic Institution. 2000-2001  
Postdoctoral Scholar, Woods Hole Oceanographic Institution, 1999-2000  
Dr. Laurence P. Madin, advisor.
- Postdoctoral Fellow, Harbor Branch Oceanographic Institution, 1997-1998  
Dr. Edith A. Widder, advisor.
- Lecturer, Department of Biology, University of North Carolina at Chapel Hill. 1996-1997  
National Science Foundation Pre-Doctoral Fellow, Department of Biology, 1991-1994  
University of North Carolina at Chapel Hill.

### Awards, honors, and fellowships:

- Paul Illg Distinguished Lecturer, Friday Harbor Laboratories 2010  
Schmidt-Nielsen Memorial Lecturer, Duke University 2010  
University Distinguished Teaching Award, Duke University 2006  
Julius Thomas Hansen Lecturer, University of California, Berkeley 2005  
George A. Bartholomew Award for Research in Comparative Physiology, 2001  
Society for Integrative and Comparative Biology.
- Woods Hole Postdoctoral Scholarship, Woods Hole Oceanographic Institution. 1999-2000  
Harbor Branch Postdoctoral Fellowship, Harbor Branch Institution. 1997-1998  
Campus-Wide Dissertation Award, University of North Carolina at Chapel Hill. 1996  
Dissertation Improvement Award, National Science Foundation. 1994-1995  
Pre-Doctoral Fellowship, National Science Foundation. 1991-1994  
Merit Fellowship, University of North Carolina at Chapel Hill. 1990-1991

**Research grants (other PIs not listed):**

<p>“Dynamic Camouflage in Benthic and Pelagic Cephalopods: An interdisciplinary approach to crypsis based on color, reflection, and bioluminescence” Office of Naval Research \$7,341,938</p>	2009-2014
<p>“Bioluminescence in the Deep-sea Benthos” NOAA Ocean Exploration, \$424,807 (= \$81,607 + 11 days ship/submersible time at \$31,200/day).</p>	2009-2010
<p>“Midwater animal models: Optical measurement of metabolic transitions in transparent pelagic biota”, National Science Foundation, ~\$650,000</p>	2009-2012
<p>“Deep Down Under: Exploration of Australia’s deep waters” ARC and private support (~\$500,000 USD and 3 years of ship and submersible time) (many coPIs)</p>	2007-2009
<p>“Operation Deep-Scope 2007: Characterization of cliff ecosystems using new technologies” NOAA Ocean Exploration, \$361,500 (= \$55,500 + 12 days ship/submersible time at \$25,500/day).</p>	2007-2008
<p>"Selective invisibility based on the differing temporal resolutions of sea turtles and billfish under low light conditions" NOAA/NMFS, \$15,306.</p>	2005-2006
<p>"Operation Deep-Scope 2005" NOAA Ocean Exploration, \$328,905 (= \$44,705 + 14 days ship/submersible time at \$20,300/day).</p>	2005-2006
<p>"Transparency: ultrastructural and biochemical modification in muscular and ocular tissues" National Science Foundation, \$410,000.</p>	2005-2008
<p>"Mathematical model of the visual abilities of sea turtles and pelagic fishes" NOAA/NMFS, \$39,470.</p>	2003-2004
<p>"Characterization of deep-sea communities using advanced optical techniques" NOAA Ocean Exploration, \$296,377 (= \$52,777 + 12 days ship/submersible time at \$20,300/day).</p>	2004
<p>"Integrative and Comparative Vision Research" National Science Foundation, \$6,000.</p>	2003
<p>"Perception of bioluminescent signals underwater" Office of Naval Research, \$12,004.</p>	2002-2003

"Biologically Inspired Underwater Navigation Based on Geomagnetism" Office of Naval Research, \$99,956.	2002-2003
"Development of a Large Area Plankton Imaging System" National Science Foundation, \$499,820.	2002-2004
"Development of a Portable Underwater Hyperspectral Radiometer", Cecil H. and Ida M. Green Technology Foundation, \$30,700.	2000-2002
"Eutrophication in Waquoit Bay: Effects on Visual Predation", Rinehart Coastal Research Center, \$31,792.	2000-2001

### **Publications:**

Johnsen, S., and K. J. Lohmann (in prep). Magnetic resonance evidence for magnetite-based magnetoreceptors in the brain of a sea turtle.

Nilsson, D. E., Warrant, E. J., Hanlon, R., Shashar, N., Johnsen, S. (in prep). Why giant squid have giant eyes. To be submitted to *Current Biology*.

Johnsen, S. and Kier, W. M. (in prep). Ultrastructural correlates of transparency in the glass catfish *Kryptopterus minor*.

Matz, M. V. S., Johnsen, S., and N. J. Marshall (in prep). Ecology of animal fluorescence.

Smith, S. D., Johnsen, S., and M. D. Rausher (in prep). The evolution of red flowers via gene loss, changes in enzyme function and trans-regulatory evolution in *Iochroma*.

Sweeney, A. M., Alieva, N., Matz, M. V. S., and S. Johnsen (in prep). Molecular evolution of protein glass and the innovation of acute optics in squid.

Marlow, H., Speiser, D. I., Matus, D., Johnsen, S., Seaver, E. C., and M.Q. Martindale (in prep) The evolution of a complex trait: Photoreception in the Metazoa.

Frank, T. M., Johnsen, S., Widder, E. A., Haddock, S. H. D. (in prep) Vision and bioluminescence in the deep-sea benthos.

Tedore, C. A., and S. Johnsen (in review). The function of male-male threat displays in the jumping spider *Lyssomanes viridis*. *Behavioural Processes*.

Marshall, N. J. and S. Johnsen (in press). Camouflage in Marine fish. In *Animal Camouflage: Current issues and new perspectives*. Cambridge University Press: Cambridge UK.

Baldwin, J. L., and S. Johnsen (in press). The effects of molting on the visual acuity of the blue crab *Callinectes sapidus*. *Journal of Experimental Biology*.

- Jackson, E. and S. Johnsen (2011). Orientation to objects in the sea urchin *Strongylocentrotus purpuratus* depends on apparent and not actual object size. *Biological Bulletin (Woods Hole)* **220**, 86-88.
- Holt, A., Sweeney, A. M., Johnsen, S., and D. E. Morse (2011). A highly-distributed Bragg stack with unique geometry provides effective camouflage for Loliginid squid eyes. *Proceedings of the Royal Society: Interface*
- Speiser, D. I., Eernisse, D. and S. Johnsen (2011). Chitons eye have calcitic lenses and provide spatial vision. *Current Biology* **21**, 665-670.
- Sweeney, A. M., Boch, C. A., Johnsen, S., and D. E. Morse (2011). Twilight spectral dynamics and the coral reef invertebrate spawning response. *Journal of Experimental Biology* **214**, 770-777. **(featured article)**
- Bhandiwad, A., and S. Johnsen (2011). The effects of salinity and temperature on the transparency of the grass shrimp *Palaemonetes pugio*. *Journal of Experimental Biology* **214**, 709-716.
- Shashar, N., Johnsen, S., Lerner, A., Sabbah, S., Chiao, C-C., Mähger, L. M., and R. T. Hanlon (2011). Underwater linear polarization- physical limitations to biological functions. *Philosophical Transactions of the Royal Society of London, Series B* **366**, 649–654.
- Johnsen, S., Marshall, N. J., and E. A. Widder (2011). Polarization sensitivity as a contrast enhancer in pelagic predators: Lessons from *in situ* polarization imaging of transparent zooplankton. *Philosophical Transactions of the Royal Society of London, Series B* **366**, 655–670. **(cover article)**
- Speiser, D. I., Loew, E. R., and S. Johnsen (2011). Spectral sensitivity of the concave mirror eyes of scallops: The influence of habitat and longitudinal chromatic aberration. *Journal of Experimental Biology* **214**, 422-431.
- Costello, M. J., Johnsen, S., Frame, L., Gilliland, K. O., Metlapally, S., and D. Balasubramanian (2010). Multilamellar spherical particles as potential sources of excess light scattering in human age-related nuclear cataracts. *Experimental Eye Research* **91**, 881-889.
- Yerramilli, D., and S. Johnsen (2010). Spatial vision in the purple sea urchin *Strongylocentrotus purpuratus* (Echinoidea). *Journal of Experimental Biology* **213**, 249-255. **(cover and featured article)**
- Baldwin, J. L., and S. Johnsen (2009). The importance of color in mate choice in the blue crab *Callinectes sapidus*. *Journal of Experimental Biology* **212**, 3762-3768.
- Leech, D. M. and S. Johnsen (2009). Light, Biological Receptors. In *Encyclopedia of Inland Waters*, (ed. G. E. Likens). Vol 2, pp 671-681.

- Speiser, D. I., and S. Johnsen (2008). Comparative morphology of the mirror-based eyes of scallops (Pectinoidea). *American Malacological Bulletin* **26**: 27-34. **(cover article)**
- Matz, M. V., Frank, T. M., Marshall, N. J., Widder, E. A., Johnsen, S. (2008) Giant deep-sea protist produces bilaterian-like traces. *Current Biology* **18**: 1849-1854.
- Costello, M. J., Johnsen, S., Gilliland, K. O., Metlapally, S., Ramamurthy, B., Krishna, P. V., Balasubramanian, D. (2008) Ultrastructural analysis of damage to nuclear fiber cell membranes in advanced age-related cataracts from India. *Experimental Eye Research*. **87**: 147-158.
- Speiser, D. I., and S. Johnsen (2008). Scallops visually respond to the presence and speed of virtual particles. *Journal of Experimental Biology*. **211**: 2066-2070.
- Metlapally, S., Costello, M. J., Gilliland, K. O., Ramamurthy, B., Krishna, P. V., Balasubramanian, D., and S. Johnsen (2008). Analysis of nuclear lens fiber cell cytoplasmic texture in advanced cataractous lenses from Indian subjects using Debye-Bueche theory. *Experimental Eye Research*. **86**: 434-444.
- Gilliland, K. O., Johnsen, S., Metlapally, S., Costello, M. J., Ramamurthy, B., Krishna, P. V. and D. Balasubramanian (2008). Mie Light Scattering Calculations for Multilamellar Bodies in Indian Age-Related Nuclear Cataracts. *Molecular Vision* **14**: 572-582.
- Johnsen, S., and K. J. Lohmann (2008). Magnetoreception in animals. *Physics Today*. **61(3)**: 29-35.
- Gagnon, Y. L., Shashar, N., Warrant, E. J., and S. Johnsen (2007). Light scattering from pelagic zooplankton: measurements at different angles and modeling corresponding sighting distances. *Journal of Experimental Biology* **210**: 3728-3735.
- Sweeney, A., Haddock, S. H. D., and S. Johnsen (2007). Comparative visual acuity of coleoid cephalopods. *Integrative and Comparative Biology* **47**: 808-814.
- Johnsen, S., Mattern, E., and T. Ritz (2007). Light-dependent magnetoreception: quantum catches and opponency mechanisms of possible photosensitive molecules. *Journal of Experimental Biology* **210**: 3171-3178.
- Martin, C. H. and S. Johnsen (2007). A Field Test of the Hamilton-Zuk Hypothesis in the Trinidadian guppy (*Poecilia reticulata*). *Behavioral Ecology and Sociobiology* **61**: 1897-1909.
- Johnsen, S. (2007). Does new technology inspire new directions? Examples drawn from pelagic visual ecology. *Integrative and Comparative Biology* **47**: 799-807.

- Cummings, M. M. and S. Johnsen (2007). Light in the rocky shores. Pp. 327-331 in *Encyclopedia of Tidepools and Rocky Shores*, (M. Denny and S. Gaines Eds.), University of California Press.
- Sweeney, A. M., Des Marais, D. L., Ban, Y. A. and S. Johnsen (2007). Evolution of Graded Refractive Index in Squid Lenses. *Journal of the Royal Society Interface* **4**: 685-698.
- Costello, M. J., Johnsen, S., Gilliland, K. O., Freel, C. D., and C. Fowler (2006). Predicted light scattering from particles observed in human age-related nuclear cataracts using Mie scattering theory. *Investigative Ophthalmology and Visual Science*. **48**: 303-312.
- Leech, D. and S. Johnsen (2006). UV vision and the Feeding Ecology of Juvenile Bluegill Sunfish, *Lepomis macrochirus*. *Canadian Journal of Fisheries and Aquatic Sciences*. **63**: 2183-2190.
- Tuthill, J. and S. Johnsen (2006) Polarization sensitivity in the red swamp crayfish *Procambarus clarkii* enhances the detection of moving transparent objects. *Journal of Experimental Biology*. **209**:1612-1616.
- Johnsen, S., Kelber, A., Warrant, E. J., Sweeney, A. M., Lee, R. H. Jr., Hernández-Andrés, J. (2006). Crepuscular and nocturnal illumination and its effects on color perception by the nocturnal hawkmoth *Deilephila elpenor*. *Journal of Experimental Biology* **209**: 789-800 **(cover and featured article)**.
- Johnsen, S. and K. J. Lohmann (2005). The physics and neurobiology of magnetoreception. *Nature Reviews Neuroscience* **6**: 703-712 (invited review).
- Johnsen S. (2005). Visual ecology on the high seas. *Marine Ecology Progress Series* **287**: 281-285 (invited article).
- Johnsen, S. (2005). The red and the black: Bioluminescence and the color of animals in the deep sea. *Integrative and Comparative Biology* **45**: 234-246. (invited article).
- Blevins, E., and S. Johnsen (2004). Spatial vision in the echinoid genus *Echinometra*. *Journal of Experimental Biology* **207**: 4249-4253.
- Gilliland, K. O., Freel, C. D., Johnsen, S., Fowler, C., and M. J. Costello (2004). Distribution, spherical structure and predicted Mie scattering of multilamellar bodies in human age-related nuclear cataracts . *Experimental Eye Research* **79**: 563-576.
- Marsili, S., Salganik, R. I., Albright, C. D., Freel, C. D., Johnsen, S., Peiffer, R. L., and M. J. Costello (2004). Cataract formation in a strain of rats selected for high oxidative stress. *Experimental Eye Research*. **79**: 595-612.
- Johnsen, S. and H. M. Sosik (2004). Shedding light on light in the ocean. *Oceanus* **43**: 24-28. (invited article).

- Johnsen, S., Widder, E. A., and C. D. Mobley (2004). Propagation and perception of bioluminescence: factors affecting the success of counterillumination as a cryptic strategy. *Biological Bulletin* **207**: 1-16.
- Johnsen, S. (2003). Lifting the cloak of invisibility: the effects of changing optical conditions on pelagic cypsis. *Integrative and Comparative Biology* **43**: 580-590.
- Johnsen, S., and K. J. Lohmann (2003). Neurobiology of magnetoreception. In *Encyclopedia of Neuroscience 3<sup>rd</sup> Edition* (G. Adelman, B. H. Smith eds.), Elsevier Science, New York. (invited review)
- Sweeney, A. M., Jiggins, C., and S. Johnsen (2003). Polarized light as a butterfly mating signal. *Nature* **423**: 31-32.
- Johnsen, S. and H. M. Sosik (2003). Cryptic coloration and mirrored sides as camouflage strategies in near-surface pelagic habitats: implications for foraging and predator avoidance. *Limnology and Oceanography* **48**: 1277-1288.
- Avens, L., Wang, J., Johnsen, S., Dukes, P., and K. J. Lohmann (2003). Responses of hatchling sea turtles to rotational displacements. *Journal of Experimental Marine Biology and Ecology* **288**: 111-124.
- Leech, D. and S. Johnsen (2003). Avoidance and UV vision. Pp. 455-484 in *UV Effects in Aquatic Organisms and Ecosystems*, (W. Helbling, H. Zagarese eds.), Royal Society of Chemistry, London. (invited review)
- Johnsen, S. (2002). Cryptic and conspicuous coloration in the pelagic environment. *Proceedings of the Royal Society of London: Biological Sciences* **269**: 243-256. (cover article)
- Johnsen, S. (2001). Hidden in plain sight: the ecology and physiology of organismal transparency. *Biological Bulletin* **201**: 301-138. (invited review and cover article)
- Johnsen, S., and E. A. Widder (2001). Ultraviolet absorption in transparent zooplankton and its implications for depth distribution and visual predation. *Marine Biology* **138**: 717-730.
- Widder, E. A., and S. Johnsen (2000). 3D spatial point patterns of bioluminescent plankton: a map of the minefield. *Journal of Plankton Research* **22**: 409-420.
- Johnsen, S. (2000). Transparent animals. *Scientific American* **282**(2): 62-71.
- Lohmann, K. J., and S. Johnsen (2000). The neurobiology of magnetoreception in vertebrate animals. *Trends in Neurosciences* **23**: 153-159. (invited review)

- Widder, E. A., Johnsen, S., Bernstein, S. A., Case, J. F., and D. J. Neilson (1999). Thin layers of bioluminescent copepods found at density discontinuities in the water column. *Marine Biology (Berlin)* **134**: 429-437.
- Johnsen, S., and E. A. Widder (1999). The physical basis of transparency in biological tissue: ultrastructure and the minimization of light scattering. *Journal of Theoretical Biology* **199**: 181-198.
- Johnsen, S., and W. M. Kier (1999). Shade-seeking behavior under polarized light by the brittlestar *Ophioderma brevispinum*. *Journal of the Marine Biological Association of the United Kingdom* **79**: 761-763.
- Johnsen, S., Balsler, E. J., and E. A. Widder (1999). Light-emitting suckers in an octopus. *Nature* **398**: 113-114. (cover article)
- Johnsen, S., Balsler, E. J., Fisher, E. C., and E. A. Widder (1999). Bioluminescence in the deep-sea cirrate octopod *Stauroteuthis syrtensis* Verrill (Mollusca: Cephalopoda). *Biological Bulletin (Woods Hole)* **197**: 26-39.
- Johnsen, S., and E. A. Widder (1998). The transparency and visibility of gelatinous zooplankton from the north west Atlantic and Gulf of Mexico. *Biological Bulletin (Woods Hole)* **195**: 337-348. (cover article)
- Johnsen, S., and W. M. Kier (1998). Damage due to solar ultraviolet radiation in the brittlestar *Ophioderma brevispinum* (Echinodermata: Ophiuroidea). *Journal of the Marine Biological Association of the United Kingdom* **78**: 681-684.
- Johnsen, S., and E. A. Widder (1998). The transparency and visibility of gelatinous zooplankton. Proceedings of the Fourteenth Conference of the Ocean Optics Society, Kailua-Kona, HI, USA.
- Widder, E. A., and S. Johnsen (1998). Optical imaging, identification and 3D analysis of spatial distribution patterns of bioluminescent plankton. Proceedings of the Fourteenth Conference of the Ocean Optics Society, Kailua-Kona, HI, USA.
- Johnsen, S. (1997). Identification and localization of a possible rhodopsin in the echinoderms *Asterias forbesi* (Asteroidea) and *Ophioderma brevispinum* (Ophiuroidea). *Biological Bulletin (Woods Hole)* **193**: 97-105.
- Johnsen, S. (1994). Extraocular sensitivity to polarized light in an echinoderm. *Journal of Experimental Biology* **195**: 281-291.
- Smith, A. M., Kier, W. M., and S. Johnsen (1993). The effect of depth on the attachment force of limpets. *Biological Bulletin (Woods Hole)* **184**: 338-341.

Johnsen, S., and W. M. Kier (1993). Intramuscular crossed connective tissue fibers: skeletal support in the lateral fins of squid and cuttlefish. *Journal of Zoology (London)* **231**: 311-338.

Kauffman, S. A., and S. Johnsen (1991). Coevolution to the edge of chaos: Coupled fitness landscapes, poised states and coevolutionary avalanches. *Journal of Theoretical Biology* **149**: 467-505.

Kauffman, S. A., and S. Johnsen (1991). Co-evolution to the edge of chaos. Pp. 325-369 in *Artificial Life II, SFI Studies in the Sciences of Complexity* vol. X (C. Langton, C. Taylor, J. Farmer, S. Rasmussen eds.) Addison-Wesley, New York.

### **First author presentations at meetings:**

American Society of Zoologists Annual Meeting, Atlanta, GA, (with W. M. Kier).	1991
American Society of Zoologists Annual Meeting, Vancouver, BC,	1992
American Society of Zoologists Annual Meeting, Los Angeles, CA.	1993
American Society of Zoologists Annual Meeting, St. Louis, MO.	1995
American Society of Zoologists Annual Meeting, Washington, DC.	1995
Society for Integrative and Comparative Biology Annual Meeting, Albuquerque, NM.	1996
Fourteenth Annual Ocean Optics Meeting, Kona-Kailua, HI, (with E. A. Widder).	1998
Society for Integrative and Comparative Biology Annual Meeting, Denver, CO,	1999
Society for Integrative and Comparative Biology Annual Meeting, Atlanta, GA.	2000
Society for Integrative and Comparative Biology Annual Meeting, Chicago, IL.	2001
Society for Integrative and Comparative Biology Annual Meeting, Anaheim, CA.	2002
Society for Integrative and Comparative Biology Annual Meeting, Toronto, CA.	2003
Society for Integrative and Comparative Biology Annual Meeting, New Orleans, LA.	2004
Society for Integrative and Comparative Biology Annual Meeting, San Diego, CA.	2005
Society for Integrative and Comparative Biology Annual Meeting, Orlando, FL.	2006
Society for Integrative and Comparative Biology Annual Meeting, Phoenix, AZ.	2007
9 <sup>th</sup> International meeting on Light and Color in Nature, Bozeman, MT. (June 25 <sup>th</sup> )	2007
Society for Integrative and Comparative Biology Annual Meeting, San Antonio, TX.	2008
2 <sup>nd</sup> International Conference on Invertebrate Vision, Bäckaskog Castle, Sweden	2008
Society for Integrative and Comparative Biology Annual Meeting, Boston, MA.	2009
Society for Integrative and Comparative Biology Annual Meeting, Seattle, WA.	2010

### **Invited presentations:**

University of Utah, Salt Lake City, UT.	1998
Harbor Branch Oceanographic Institution, Fort Pierce, FL.	1998
Woods Hole Oceanographic Institution, Woods Hole, MA.	1999
Monterey Bay Aquarium and Research Institute, Moss Landing, CA.	1999
University of Florida, Gainesville, FL.	1999
Yale University, New Haven, CT.	2000

Oregon State University, Corvallis, OR.	2000
Wellesley College, Wellesley, MA.	2000
Boston University Marine Program, Woods Hole, MA.	2000
Duke University, Durham, NC.	2001
Mount Holyoke College, South Hadley, MA.	2001
Marine Biological Laboratory, Woods Hole, MA.	2001
Duke University Marine Laboratory, Beaufort, NC.	2001
Bartholomew Award Lecture, Anaheim, CA	2002
University of Maryland, Baltimore Campus, MD.	2002
University of North Carolina at Chapel Hill.	2002
Colloquium for Physical Ecology of Organisms, Roscoff, France.	2002
Swarthmore College Sigma Xi, Swarthmore, PA.	2002
University of Oregon, Coos Bay, OR.	2002
Defense Science Research Council, Washington, DC.	2003
University of Lund, Sweden.	2003
National Eye Institute, Bethesda, MD.	2003
Bartholomew Award Recipients Symposium, New Orleans, LA.	2004
North Carolina State University, Raleigh, NC.	2004
Photonics Center, Duke University	2004
Georgia Tech University, Atlanta, GA.	2004
University of Lund Sensory Ecology Symposium, Sweden.	2004
University of Rhode Island, Kingston, RI	2004
Julius Thomas Hansen Lecture (grad-invited), UC-Berkeley	2005
University of Bergen, Norway	2005
Conference Jacques Monod, Roscoff, France	2005
Rochester Institute of Technology, NY	2006
Wake Forest University, NC	2006
Lund University, Sweden	2006
North Carolina State University (Physics Department)	2006
University of South Carolina, Columbia, SC (grad-invited)	2007
University of North Carolina at Wilmington (grad-invited)	2007
Duke University Marine Laboratory, Beaufort, NC.	2007
Whitney Marine Lab, University of Florida	2007
Old Dominion University, VA (Math Department)	2007
University of North Carolina at Chapel Hill (Biochemistry Dept.)	2008
Polarization Conference, University of Queensland, Australia	2008
University of North Carolina at Chapel Hill (Dept. of Environmental Sci.)	2008
Cornell University, Ithaca, NY	2008
University of Lund Sensory Ecology Symposium, Sweden.	2008
National Intelligence Council, Washington, DC	2009
University of California at Davis	2009
Bodega Bay Marine Laboratory, CA	2009
University of Exeter, United Kingdom	2009
University of Texas at Austin (ONR Workshop)	2009
University of Toronto, Canada	2010
Duke University (Knut Schmidt-Nielsen Memorial Lecture)	2010

University of Pennsylvania, Philadelphia, PA	2010
Janelia Farm, Howard Hughes Medical Institute, Ashburn, VA	2010
Friday Harbor Laboratories, Seattle, WA (Paul Illg Memorial Lectures)	2010
University of North Carolina at Chapel Hill (Medical School)	2010
University of Lund Sensory Ecology Symposium, Sweden.	2010
Scripps Institute of Oceanography, La Jolla, CA (ONR Workshop)	2010
Harvard University, Cambridge, MA	2010
University of North Carolina at Chapel Hill (Math Dept)	2011
Ithaca College, Ithaca, NY	2011

### **Undergraduates, Graduate Students, Postdoctoral Students:**

Dr. Dina Leech:	postdoctoral student
Dr. Sandra Cooke:	postdoctoral student
Dr. Sarah Zylinski:	postdoctoral student
Dr. Yakir Gagnon:	postdoctoral student
Alison Sweeney:	graduate student, NSF Predoctoral and James B. Duke Fellow
Daniel Speiser:	graduate student, NSF Predoctoral and James B. Duke Fellow
Jamie Baldwin:	graduate student, EPA STAR Fellowship (declined)
Cynthia Tedore:	graduate student, NSF Predoctoral and James B. Duke Fellow
Nicholas Brandley:	graduate student, James B. Duke Fellow
Laura Bagge:	graduate student

On committees of: Larisa Avens (UNC), Jon Cohen (NSOE), Ed Venit, Kim Rosvall, Lisa Mangiamele (UNC), Andrij Horodysky (College of William & Mary), Robin Hopkins, Kriti Sharma, Brian Powell, David Steinberg, Courtney Endres (UNC), Tanya Kossler

Undergraduates supervised: Shu Ying Kwan, Emily Pearce, Erin Blevins, Dahl Clark, Christopher Martin, Danielle Cornielle, Cirse Gonzalez, John Tuthill (Swarthmore College), Nicolas Lessios, Rebecca Fink, Lauren Cooke, Divya Yerramilli, Sebastian Larion, Teresa Gross

High School students supervised: Sarah Fann (North Carolina School of Science and Math), John Thiele

### **Professional service and societies:**

Contributing Editor: *Aquatic Biology*

Reviewer for: *American Journal of Physics, Aquaculture, Aquaculture Research, Behavioral Ecology and Sociobiology, Behavioral Processes, Bioelectromagnetics, Biological Bulletin, Biological Journal of the Linnean Society, Biology Letters, Canadian Journal of Zoology, Current Biology, Current Zoology, Deep Sea Research I, Environmental Biology of Fishes, Ethology, Evolution, Evolution: Education and Outreach, Frontiers in Zoology, HFSP Journal, Investigative*

*Ophthalmology and Visual Science, Journal of Comparative Neurology, Journal of Comparative Physiology, Journal of Ethology, Journal of Experimental Biology, Journal of Fish Biology, Journal of Insect Physiology, Journal of the Optical Society of America A, Journal of Plankton Research, Journal of the Marine Biological Association of the United Kingdom, Marine Biology, Marine Ecology Progress Series, Limnology and Oceanography, Limnology and Oceanography Methods, Molecular Biology and Evolution, Nature, Naturwissenschaften, Oecologia, Oikos, Optics Express, Physical Biology, Physiological Entomology, Physiology and Behavior, PLOS one, Proceedings of the Royal Society: Interface, **Proceedings of the National Academy of Sciences, Proceedings of the Royal Society of London: Series B**, Psychonomic Bulletin and Review, Science, Trends in Ecology and Evolution, Vision Research*

*National Science Foundation  
National Institutes of Health  
Air Force Office of Scientific Research  
National Geographic Society  
Israeli Science Foundation  
Marsden Fund, New Zealand*

Organizer: "Integrative and Comparative Vision Research", Symposium for Annual Meeting of the Society for Integrative and Comparative Biology, Toronto, January 2003 (with Mason Posner and Todd Oakley). Editor of proceedings.

"Integrative Biology of Pelagic Invertebrates ", Symposium for Annual Meeting of the Society for Integrative and Comparative Biology, Phoenix, January 2007 (with Alison Sweeney)

Societies: Sigma Xi  
Society for Integrative and Comparative Biology

committees:	Biology Department Admissions committee	2002
	Nominating committee, Society for Integrative and Comparative Biology	2002
	Scientific Advisory Board, Molecular Sciences Building	2002
	Biology Department Computer Committee	2002-04
	Bartholomew award committee, SICB	2002-04
	Organismal Physiologist Search Committee, UNC-Chapel Hill	2003
	Nominating committee, SICB	2003
	Biology Department Curriculum committee	2003-06
	Biology Department DCMB Faculty Search Committee	2003-04
	Biology Department Executive Steering Committee	2004
	Duke/UNC Oceanographic Consortium Program Advisory Committee	2004-
	Biology Department ADUS evaluation committee	2005
	Structure/Function Core course design committee	2005-06
	Biology Department Teaching Consultation committee	2005-
	Biology Department Performance Review Committee	2006-09
	Honors Thesis Committee, Biology Department	2007
	Biology-Global Health Faculty Search Committee	2007

Neuroscience Major Formation Committee	2007-
Executive Committee of the Graduate Faculty	2008-
Co-chair, Neurobiology and Behavior Search, Biology Department	2008-09
Biology Department Executive Steering Committee	2008-
Chair, re-appointment committee for Manuel Leal	2009
member, re-appointment committee for Nina Sherwood	2010

Officer:	member-at-large, Society for Integrative and Comparative Biology	2006-07
	Director of Graduate Studies, Biology Department	2008-

Faculty advisor:	Duke Postdoctoral Association	2007-
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**Research presented in and interviews given to:** *Science, Science News, New Scientist, Scientific American, Discover Magazine, New York Times, National Geographic, CBC Radio, ABC News, Boston Globe, Pixar (for Finding Nemo), The Magic Treehouse children's book series, and the poetry of John Updike*

**Lay Presentations:** *approximately 10 presentations in the past five years*