

Kakani Katija

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Moss Landing, CA 95039

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EDUCATION

California Institute of Technology, Pasadena, CA April 2010
Doctor of Philosophy, Bioengineering Option

California Institute of Technology, Pasadena, CA June 2005
Master of Science, Aeronautics Option

University of Washington, Seattle, WA June 2004
Bachelor of Science, Aeronautics and Astronautics

RESEARCH EXPERIENCE

Principal Engineer/Investigator, Monterey Bay Aquarium Research Institute 2017-present
Mesobot: Robot to study the ocean interior Co-PIs: D Yoerger, S Rock, BH Robison
3D(dt)R: In situ reconstruction of 3D, temporally varying surfaces
JellyMove: Movement ecology of jellies in Monterey Bay Co-PI: J Goldbogen

Research Associate, National Museum of Natural History, Smithsonian Institution 2017-present

Postdoctoral Fellow, Monterey Bay Aquarium Research Institute 2015-2017
DeepPIV: Flow from the surface to seafloor Co-PIs: AD Sherman, BH Robison
Biomechanics and ecology of deep sea invertebrates Co-PIs: BH Robison, J Barry, KO Osborn
Invertebrate (squid, jellies) TAG development Co-PIs: TA Mooney, KA Shorter

Research Associate, Hopkins Marine Station, Stanford University 2014-2015
Fluid transport mechanisms of swimming animals Co-PIs: JH Costello, SP Colin

Postdoctoral Scholar & Investigator, Woods Hole Oceanographic Institution 2010-2012, 2013-2014
Biogenic mixing by schooling organisms Co-PIs: H Jiang, P Wiebe, G Lawson, C Cenedese

Graduate Researcher, California Institute of Technology 2004-2010
Self-contained underwater velocimetry apparatus (SCUVA) Advisor: JO Dabiri
Lagrangian coherent structures (LCS) for bio-propulsion Advisor: JO Dabiri
Vortex ring interactions with heart valve leaflets Advisor: M Gharib

Undergraduate Researcher, University of Washington 2003-2004
Effects of acceleration profiles on Rayleigh-Taylor flow Advisor: RE Breidenthal
Mars Gravity Biosatellite Advisor: AP Bruckner

TEACHING EXPERIENCE

Visiting Scientist/Lecturer (2013, 2015)
Stanford@SEA, Stanford University Professor: BA Block

Visiting Lecturer/Adjunct Professor (2012-2013)
Physics I for non-majors, Bridgewater State University

Undergraduate Research Mentor (2011-present)

Ariel Harned, Mechanical Engineering, George Washington Univ 2017

Nadege Aoki, Biology, Cornell University 2016-2017

Natalia Mushegian, Molecular and Envir. Biology, Univ. of Calif., Berkeley 2016

Genevieve Flaspohler, Computer Engineering, University of Michigan 2015-2016

Alexa Baumer, Mechanical Engineering, George Washington University	2015
Sarah Black, Ocean Engineering, Florida Atlantic University	2015
Amanda Fay, Marine Science, California State University, Monterey Bay	2015
Mary Colleen Hannon, Marine Biology and Zoology, Humboldt State University	2014
Thomas Sayre-McCord, Physics, University of North Carolina, Chapel Hill	2011
Miles Borgen, Environmental Science, Western Washington University	2011

Graduate Research Mentor (2015-present)

Genevieve Flaspohler, Applied Ocean Physics and Engineering, WHOI/MIT	2016-present
Diana Li, Biology, Stanford University	2015-present

Guest Lecturer (2009-present)

TED Talks for Marine Conservation, Calif. State Univ. Monterey Bay	Professor: KJ Nickols
Biol. and Phys. Oceanography, Calif. State Univ. Monterey Bay	Professor: KJ Nickols
Biophysical Interactions, Woods Hole Oceanographic Institution	Professor: JK Llopiz
Biomechanics, California Institute of Technology	Professor: SE Fraser
Biology, Loyola Marymount University	Professor: RS Houston
Bio-inspired Design, California Institute of Technology	Professor: JO Dabiri
Marine Biology, Providence College	Professor: JH Costello

Teaching Assistant, California Institute of Technology (2004-2005)

Fluid Mechanics (Ae, ME, CE, APhys 101)	Professor: M Gharib
Experimental Methods (Ae, ME, CE 104)	Professor: JO Dabiri

INDUSTRY EXPERIENCE

Systems Engineer, Woods Hole Oceanographic Institution **2012-2013**
Alvin Upgrade **Supervisor: D Peters**

- Updated weights database, writing stability calculations code using the database, and computing weekly and mission-specific stability calculations

Systems Engineer, NASA Ames Research Center **2004**
Advanced Animal Habitat on International Space Station **Supervisor: P Espinosa**

- Responsibilities included writing requirements and hardware documentation on the potable water system and attending meetings with NASA and Lockheed Martin senior engineers

Systems Engineer, University of Washington **2002-2004**
University of Washington's Aerospace Plane **Advisor: C Vaughan**

- Oversaw 60 students in Senior Design project to develop Space Shuttle replacement vehicle that culminated in design of reusable launch vehicle.
- Managed power, weight and cost budgets, schedule (two quarter-long project), wrote interface documentation, requirements, and organized final reports and presentations

FUNDING AWARDS

National Science Foundation: Ocean Technology and Interdisciplinary Coordination: Mesobot (PI with D. Yoerger at WHOI and Co-PIs B Robison and B Hobson; \$431,534)	2017-2020
Monterey Bay Aquarium Research Institute: DeepPIV: From the surface to the benthos (Co-PI with A Sherman, \$263,237)	2017-2018

Monterey Bay Aquarium Research Institute: DeepPIV: Feasibility study to expand from 2D to 3D flow measurements (Co-PI with A Sherman; \$9,000)	2017-2018
Monterey Bay Aquarium Research Institute: DeepPIV (Co-PI with A. Sherman; \$315,533)	2016-2017
National Science Foundation: Instrument Development for Biological Research: ITAG (PI with A. Mooney at WHOI; \$74,623)	2016-2019
Monterey Bay Aquarium Research Institute: DeepPIV (Co-PI with A. Sherman; \$192,467)	2015-2016
Monterey Bay Aquarium Research Institute: SquidJet, MBA/MBARI Partnership (with G. Matsumoto, \$5,000)	2015-2016
Green Innovative Technology Award (with A Mooney, T Hurst, K Shorter; \$74,328)	2012-2014
National Geographic Society Emerging Explorer Award (\$10,000)	2011
WHOI Interdisciplinary Research Award (Co-PI with H Jiang, G Lawson, P Wiebe; \$98,109)	2011-2013
National Geographic Society Expeditions Council Grant (\$14,120)	2011-2012
Green Innovative Technology Award (Co-PI with H Jiang, N Farr, R Schmitt; \$74,614)	2010-2012
ASLO Ocean Sciences Meeting Travel Grant – Declined	2010
NSF Graduate Student Research Fellowship	2009-2010
ICTAM/USNC Travel Grant	2008
ASEE National Defense Science and Engineering Graduate Fellowship	2006-2009
Graduate Research Assistantship, California Institute of Technology	2004-2006
Mary Gates Endowment for Students, Research and Leadership Grant	2003-2004
NSF/CSEM Success in Engineering and Math Scholarship	2003
Lance Erik Fogde Endowed Scholarship, Aeronautics and Astronautics	2003-2004
University of Washington Opportunity Grant	2002-2003
United States Federal Pell Grant	2000-2002

FIELD EXPERIENCE

MBARI Benthic research cruises with Jim Barry: DeepPIV, ascidian feeding ecology	2016-
Tagging and kinematic measurements of jellyfish, Monterey Bay	2015-
MBARI Midwater research cruises with Bruce Robison: DeepPIV, microplastics, larvacean filtration, tomopteris biomechanics	2015-
Tagging, PIV, and kinematic measurements of squid, Horta, Azores, Portugal	May 2014
Cruise from Honolulu to Palmyra Atoll on R/V Seamans for Stanford@SEA	March 2014
Bio-inspired Design, California Institute of Technology	May 2013
Tagging, PIV, and kinematic measurements of squid, Horta, Azores, Portugal	March 2013
PIV and kinematic measurements of swimming pteropods, Wilkinson Basin	Dec 2011
PIV measurements of swimming krill and copepods on R/V Tioga, Wilkinson Basin	July 2011
SCUVA measurements on colonial gelatinous zooplankton, Liquid Jungle Lab, Panama	March 2011
PIV measurements on cubomedusae, Queensland, Australia	Jan 2010
Adriatic Sea cruise on R/V Nase More in Adriatic Sea	May 2009
Biomixing investigation in Tourist Lake, Palau	Oct 2008
SCUVA measurements on Cyanea and Ctenophora, Woods Hole, MA	Aug 2008
Gelatinous zooplankton cruise on R/V Nase More in Adriatic Sea	May 2008
Biomixing investigation in Tourist Lake, Palau	Jan 2008

SCUVA measurements on Cyanea, Woods Hole, MA
 SCUVA measurements on medusae, Friday Harbor, WA

Aug 2007
 March 2007

PUBLICATIONS and PATENTS (* - shared first authorship)

Katija K*, Choy CA*, Sherlock RE, Sherman AD, Robison BH (2017). "From the surface to the seafloor: How giant larvaceans transport microplastics into the deep sea." *Science Advances*, e1700715.

Katija K, Sherlock RE, Sherman AD, Robison BH (2017). "New technology reveals role of giant larvaceans in oceanic carbon cycling." *Science Advances*, e1602374.

Katija K, Sherman AD, Robison BH (2016). "DeepPIV: Fluid visualizations from the ocean surface to the seafloor." *APS-DFD Gallery of Fluid Motion*, doi:10.1103/APS.DFD.2016.GFM.V0085.

Fossette S, **Katija K**, Goldbogen JA, Bograd S, Patry W, Howard MJ, Knowles T, Haddock SHD, Bedell L, Hazen EL, Robison BH, Mooney TA, Shorter KA, Bastian T, Gleiss AC (2016). "How to tag a jellyfish? A methodological review and guidelines to successful jellyfish tagging." *Journal of Plankton Research*, doi:10.1093/plankt/fbw073.

Katija K (2015). "Morphology alters fluid transport and the ability of organisms to mix oceanic waters." *Journal of Integrative and Comparative Biology*, **55(4)**: 698-705.

Mooney, T.A.*, **K. Katija***, K.A. Shorter*, T. Hurst, J. Fontes, and P. Afonso (2015). "ITAG: An eco-sensor for fine-scale behavioral measurements of soft-bodied marine invertebrates." *Animal Biotelemetry*, **3**: 31.

Katija K, S.P. Colin, J.H. Costello, and H. Jiang (2015). "Ontogenetic propulsive transitions by medusae *Sarsia tubulosa*." *Journal of Experimental Biology*, **218**: 2333-2343.

Lucas K, Colin SP, Costello JH, **Katija K**, Klos E (2013). "Fluid interactions that enable stealth predation by the upstream foraging hydromedusa *Craspedacusta sowerbyi*." *Biological Bulletin*, vol. 225(1), pp. 60-70.

Katija K, Jiang H (2013). "Swimming by medusae *Sarsia tubulosa* in the viscous vortex ring limit." *Limnology and Oceanography: Fluids and Environments*, vol. 3, pp. 103-118.

Colin SP, Costello JH, **Katija K**, Seymour J, Kiefer K (2013). "Propulsion in Cubomedusae: Mechanisms and Utility." *PIOs One*, vol. 8(2), e56393.

Katija K (2012). "Biogenic inputs to ocean mixing." *Journal of Experimental Biology*, vol. 215, pp. 1040-1049.

Katija K, Colin SP, Dabiri JO, Costello JH (2011). "Quantitatively measuring in situ flows using a self-contained underwater velocimetry apparatus (SCUVA)." *Journal of Visualized Experiments*, vol. 56, e2615.

Katija K, Colin SP, Dabiri JO, Costello JH (2011). "Comparison of flows generated by *Aequorea victoria*: A coherent structure analysis." *Marine Ecological Progress Series*, vol. 435, pp. 111-123.

Dabiri JO, **Young KK**, Costello JH, Colin SP (2011) "Self-contained underwater velocimetry apparatus." *US Patent*, No. 7864305.

Dabiri JO, Colin SP, **Katija K**, Costello JH (2010). "A wake-based correlate of swimming performance and foraging behavior in seven co-occurring jellyfish species." *Journal of Experimental Biology*, vol. 213(8), pp. 1217-1225.

Katija K, Dabiri JO (2009). "A viscosity-enhanced mechanism for biogenic ocean mixing." *Nature*, vol. 460, pp. 624-626.

Rosenfeld M, **Katija K**, Dabiri JO (2009) "Circulation generation and vortex ring formation by static conic nozzles." *Journal of Fluids Engineering*, vol. 131(9).

Katija K, Dabiri JO (2008) "Real-time field measurements of aquatic animal-fluid interactions using a self-contained underwater velocimetry apparatus (SCUVA)." *Limnology and Oceanography: Methods*, vol. 6, pp. 162-171.

Shadden SC, **Katija K**, Rosenfeld M, Marsden JE, Dabiri JO (2007) "Transport and stirring induced by vortex formation." *Journal of Fluid Mechanics*, vol. 593, pp. 315-331.

PUBLICATIONS in PREPARATION (underline – advised student; * - shared first authorship)

Katija K, Troni, G, Sherman AD, Robison BH (2017). "New technology enables three-dimensional visualizations of complex mucus and gelatinous structures in the deep sea."

Katija K, Sherman AD, Lord J, Barry J, Robison BH (2017). "DeepPIV: Enabling measurement of small-scale fluid motion from the surface to the seafloor."

Flaspohler G, Shorter KA, **Katija K**, Mooney TA, Hurst T, Fontes J, Afonso P (2017). "Evaluation of swimming behavior in veined squid *Lolligo forbesi* using simultaneous video and ITAG instrumentation. In preparation.

Aoki N*, Mushegian N*, **Katija K**, Osborn K (2017). "Biomechanics of swimming by pelagic polychaetes of the genus *Tomopteris*."

Katija K, Hannon MC, Colin SP, Costello JH (2017). "Jet propulsion in calycophoran and physonect siphonophores." In preparation.

CONFERENCE PROCEEDINGS (* - invited talk, underline – advised student)

Katija K, Sherman AD, Robison BH (2017). "Giant larvaceans: Differences in tail kinematics lead to enhanced filtration rates in mucus houses." *Society of Integrative and Comparative Biology Annual Meeting*, January 5-8, New Orleans, LA.

Katija K, Sherman AD, Robison BH (2016). "Giant larvaceans: Biologically equivalent flapping flexible foils exhibit bending modes that enhance fluid transport." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.

Aoki N, Mushegian N, **Katija K**, Osborn KJ (2016). "A kinematic description of locomotion in the marine polychaete genus *Tomopteris*." *Smithsonian Institute Summer Undergraduate Research Symposium*, August 5, Washington DC.

Osborn KJ, Aoki N, Mushegian N, Biancani L, **Katija K** (2016). "A closer look at tomopterid biology." *12th International Polychaete Conference*, August 1-5, Cardiff, Wales.

Yoerger DR, Llopiz JK, Wiebe PH, Govindarajan AF, German CR, Robison BH, **Katija K**, Rock S (2016). "The Mesobot: a robot for investigating the ocean interior." *ASLO Ocean Sciences Meeting*, February 21-26, New Orleans, LA.

Katija K, Shorter A, Flaspohler G, Mooney TA, Hurst T, Fontes J, Afonso P (2016). "ITAG: A fine-scale measurement platform to inform organismal response to a changing ocean." *ASLO Ocean Sciences Meeting*, February 21-26, New Orleans, LA.

Katija K, Sherman A, Graves D, Klimov D, Keczy C, Robison BH (2016). "Elucidating Small-Scale Animal-Fluid Interactions in the Deep Sea." *ASLO Ocean Sciences Meeting*, February 21-26, New Orleans, LA.

Katija K, Sherman A, Graves D, Klimov D, Keczy C, Robison BH (2016). "Revealing the structure and function of deep-sea, giant larvacean mucus houses." *Society of Integrative and Comparative Biology Annual Meeting*, January 3-7, Portland, OR.

Baumer A, Leftwich MC, **Katija K** (2016). "Larvacean locomotion: a kinematic investigation using ROV-sampled, high-definition videos." *Society of Integrative and Comparative Biology Annual Meeting*, January 3-7, Portland, OR.

***Katija K**, Sherman A, Graves D, Klimov D, Keczy C, Robison BH (2015). "DeepPIV: Measuring in situ biological-fluid interactions from the surface to the benthos." *American Geophysical Union Fall Meeting* in session *Quantifying complex ecohydraulic interactions using field, flume, and numerical methodologies*, December 14-18, San Francisco, CA.

Katija K, Sherman A, Graves D, Klimov D, Keczy C, Robison BH (2015). "DeepPIV: Particle image velocimetry measurements using deep-sea remotely operated vehicles." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.

Baumer A, **Katija K**, Leftwich MC (2015). "Larvacean kinematics: a biological model of flapping flexible foils." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.

Black S, Hobson B, Sherman AD, **Katija K** (2016). "Jellies in the ocean: Are they truly drifters?" *19th Annual MBARI Intern Symposium*, August 12, 2015, Moss Landing, CA.

Baumer A, **Katija K** (2016). "Larvacean locomotion: A kinematic investigation." *19th Annual MBARI Intern Symposium*, August 12, 2015, Moss Landing, CA.

***Katija K** (2015). "Biogenic inputs to ocean mixing: evidence from swimming medusae, copepods, and euphausiids." *Unsteady aquatic locomotion with respect to eco-design and mechanics: Society of Integrative and Comparative Biology Meeting*, January 3-7, 2015, West Palm Beach, FL.

Hannon MC, **Katija K** (2014). "Jet-propelled swimming by siphonophores, a colonial gelatinous zooplankton." *SACNAS National Conference*, October 16-18, Los Angeles, CA.

Mooney TA, **Katija K**, Shorter A, Hurst T, Fontes J, Afonso P (2014). "Concurrent measures of fine-scale behaviors and basic oceanographic parameters in the veined squid, *Loligo forbesi*." *5th International Bio-logging Science Symposium*, September 22-27, Strasbourg, France.

***Katija K** (2014). "Surviving in the oceans: Elucidating in situ animal-fluid interactions." *Fluid Dynamics of Living Systems, National Science Foundation*, September 15-16, Arlington, VA.

***Katija K** (2013). "Quantitatively measuring in situ flows using a self-contained underwater velocimetry apparatus (SCUVA)." *2013 U.S. Kavli Frontiers of Science Symposium, National Academy of Sciences*, November 6-8, Irvine, CA.

***Katija K** (2013). "Wake-based studies of jellyfish swimming to inform bio-inspired underwater vehicle design." *Research Coordination Network on Neuromechanics and Dynamics of Locomotion Winter Workshop on Locomotion*, January 16, New Orleans, LA.

***Katija K** (2012). "Jellyfish as models for propulsion." *AmeriMech 2012: Mechanics in Biology*, December 10, Blacksburg, VA.

Katija K, Jiang H, Colin SP, Costello JH (2012). "Ontogenetic propulsive transitions from viscous to inertial flow regimes in the medusae *Sarsia tubulosa*." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.

Katija K, Jiang H, Colin SP, Costello JH (2012). "Ontogenetic propulsive transitions from viscous to inertial flow regimes." *American Society of Limnology and Oceanography Ocean Sciences Meeting*, February 20-24, Salt Lake City, UT.

Katija K, Jiang H, Colin SP, Costello JH (2012). "Ontogenetic propulsive transitions from viscous to inertial flow regimes." *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Charleston, SC.

***Katija K** (2011). "Biogenic inputs to ocean mixing." *Journal of Experimental Biology Symposium – Integrating Biomechanics and Ecology*, March 14-18, 2011, Cambridge, United Kingdom.

Katija K, Colin SP, Costello JH, Dabiri JO (2011). "Effect of in situ background flow on fluid transport by swimming animals." *Aspen Center for Physics Winter Conference on Ocean Biophysics*, January 16-22, Aspen, CO.

Katija K (2010). "Vortex formation and swimming efficiency in seven co-occurring jellyfish species." *WHOI Postdoctoral Symposium*, November 16, 2010.

Katija K, Dabiri JO (2010). "A Darwinian mechanism for biogenic ocean mixing." *American Society of Limnology and Oceanography Ocean Sciences Meeting*, February 22-26, Portland, OR.

Katija K, Dabiri JO (2009). "A Darwinian mechanism for biogenic ocean mixing." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Minneapolis, MN.

Katija K, Dabiri JO (2009). "A Darwinian mechanism for biogenic ocean mixing." *Southern California Symposium on Flow Physics*, April 18, La Jolla, CA.

Katija K, Dabiri JO (2008). "Mixing efficiency of swimming animals in stratified fluids." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Antonio, TX.

Katija K, Dabiri JO (2008). "Vortex formation and swimming efficiency in seven co-occurring jellyfish species." *International Congress of Theor. and App. Mech.*, August 25-29, Adelaide, Australia.

Katija K, Dabiri JO (2008). "Energetics of jellyfish locomotion determined from field measurements using a self-contained underwater velocimetry apparatus (SCUVA)." *Society of Integrative and Comparative Biology Annual Meeting*, January 2-6, San Antonio, TX.

Katija K, Dabiri JO (2007). "Energetics of jellyfish locomotion determined from field measurements using a self-contained underwater velocimetry apparatus (SCUVA)." *American Geophysical Union Fall Meeting*, December 10-14, San Francisco, CA.

Katija K, Dabiri JO (2007). "Energetics of jellyfish locomotion determined from field measurements using a self-contained underwater velocimetry apparatus (SCUVA)." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, Salt Lake City, UT.

Dabiri JO, **Katija K** (2007). "Progress toward 3D wake structure measurements of aquatic animals using SCUVA." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, Salt Lake City, UT.

Katija K, Dabiri JO (2007) "Real-time field measurements of *Aurelia aurita* using a self-contained underwater velocimetry apparatus (SCUVA)." *Second International Jellyfish Blooms Symposium*, June 24-27, Gold Coast, Australia.

Katija K, Dabiri JO (2007). "Dynamics of tethered versus free-swimming jellyfish: A motivating argument for the Self-Contained Underwater Velocimetry Apparatus (SCUVA)." *Southern California Symposium on Flow Physics*, April 7, Pasadena, CA.

Katija K, Dabiri JO (2007) "Tethering versus free-swimming: A wake analysis of *Aurelia aurita*." *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Phoenix, AZ.

Katija K, Dabiri JO (2006) "Dynamics of tethered versus free-swimming animals: A wake structure comparison." *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Tampa, FL.

Shadden SC, **Katija K**, Dabiri JO, Marsden JE (2006). "Transport induced by vortex formation." *Bulletin of the American Physical Society Division of Fluid Dynamics*, November 19-21, Tampa, FL.

Katija K, Gharib M, Dabiri JO (2006) "Flow-induced flutter of prosthetic heart valves." *World Congress of Biomechanics*, July 29-August 4, Munich, Germany.

Katija K, Gharib M, Dabiri JO (2005) "Characterization of fluid flow through a simplified heart valve model," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Chicago, IL.

Boulware JC, Axup J, **Young KK**, Breidenthal R (2004). "The effects of varying acceleration functions on Rayleigh-Taylor flow in a microgravity environment: A Vomit Comet experiment." *University of Washington's Seventh Annual Undergraduate Research Symposium*, May 14, Seattle, WA.

Young KK, Bruckner A (2004). "The Mars Gravity Biosatellite Project: System architecture and mission summary." *University of Washington's Seventh Annual Undergraduate Research Symposium*, May 14, Seattle, WA.

INVITED SEMINARS

"DeepPIV: Measuring small-scale fluid motion in the deep sea." *Stanford Fluid Mechanics Seminar Series, Stanford University*, November 28th, 2017. Palo Alto, CA.

"New technology enables the study of biomechanics, functional morphology, and ecology of giant larvaceans in the deep sea." *Ocean Sciences Seminar Series, University of California, Santa Cruz*, October 13th, 2017. Santa Cruz, CA.

"New technology enables the study of biomechanics, functional morphology, and ecology of giant larvaceans in the deep sea." *Joint Biology and Physics Seminar Series, Bates College*, September 26th, 2017. Lewiston, ME.

"New technology enables the study of biomechanics, functional morphology, and ecology of giant larvaceans in the deep sea." *Bodega Marine Laboratory Seminar Series, University of California, Davis*, September 6th, 2017. Bodega Bay, CA.

"Animal-fluid interactions in the ocean: How small scale fluid motions have big implications." *Mechanical Engineering Departmental Seminar, University of Colorado, Boulder*, February 23rd, 2017. Boulder, CO.

"Animal-fluid interactions in the ocean: How small scale fluid motions have big implications." *Institutional Seminar, Monterey Bay Aquarium Research Institute*, January 18th, 2017. Moss Landing, CA.

"Animal-fluid interactions in the ocean: How small scale fluid motions have big implications." *Departmental Seminar, Department of Ocean Resources Engineering, University of Hawaii*, December 7th, 2016. Manoa, HI.

"DeepPIV: Measuring small-scale fluid motion in the deep sea." *Inspire ME Seminar, Department of Mechanical and Biomedical Engineering, Boise State University*, November 17th, 2016. Boise, ID.

"Animal-fluid interactions in the ocean: How small-scale fluid motions have big implications." *Biology Seminar Series, Occidental College*, November 15th, 2016. Los Angeles, CA.

"Animal-fluid interactions in the ocean: How small-scale fluid motions have big implications." *Zoology Department Seminar Series, University of British Columbia*, November 9th, 2016. Vancouver, Canada.

“New technology enables the study of biomechanics, functional morphology, and ecology of giant larvaceans in the deep sea.” *Biomechanics Seminar Series, Department of Integrative Biology, University of California, Berkeley*, November 1st, 2016. Berkeley, CA.

“New technology enables the study of biomechanics, functional morphology, and ecology of giant larvaceans in the deep sea.” *Autumn Seminar Series, Hopkins Marine Station, Stanford University*, October 14th, 2016. Pacific Grove, CA.

“Larvaceans in the deep sea: How small-scale fluid motion defines a hidden world.” *Biology and Oceanography Seminar Series, Dalhousie University*, October 8th, 2015. Halifax, Nova Scotia, Canada.

“Revealing the unseen ocean world.” *MBARI Open House*, July 18th, 2015, Monterey, CA.

“Jet or die: Ontogeny and swimming by ambush-feeding medusae.” *UCLA Biology Seminar Series*, June 2nd, 2015, Los Angeles, CA.

“Revealing the footprints of marine organisms.” *TEDWomen*, May 27th-29th, 2015, Monterey, CA.

“Finding the footprints of marine organisms.” *TEDYouth*, November 2014, Brooklyn, NY.

“Jellyfish as models for propulsion and bio-inspired design.” *California State University, Monterey Bay Environmental Science Seminar*, October 20th, 2014, Seaside, CA.

“Elucidating in situ animal-fluid interactions in the ocean.” *Moss Landing Marine Laboratory Seminar*, September 4th, 2014, Moss Landing, CA.

“Jellyfish as models for propulsion and bio-inspired design.” *Stanford University Fluid Mechanics Series*, May 20th, 2014, Palo Alto, CA.

“Jellyfish as models for propulsion and bio-inspired design.” *Stanford University Bioengineering Department Seminar*, January 29th, 2014, Palo Alto, CA.

“Jet or die: Fluid mechanics of swimming by ambush-feeding medusae from viscous to inertial flow regimes.” *University of California, Santa Barbara Mechanical Engineering Department Seminar*, November 12th, 2013, Santa Barbara, CA.

“Jet or die: Ontogeny and swimming by ambush-feeding medusae.” *Whitney Marine Laboratory for Marine Bioscience*, September 20th, 2013, St. Augustine, FL.

“The search for elusive jellyfish: Exploration challenges, accidental encounters, and (painful) lessons learned.” *Whitney Laboratory for Marine Bioscience’s Evenings at Whitney*, September 19th, 2013, St. Augustine, FL.

“The search for elusive jellyfish: Exploration challenges, accidental encounters, and (painful) lessons learned.” *New England Aquarium Lecture Series*, September 12th, 2013, Boston, MA.

“Jet or die: Ontogeny and swimming by ambush-feeding medusae.” *Monterey Bay Aquarium Research Institute Seminar*, July 24th, 2013, Moss Landing, CA.

“Jet or die: Ontogeny and swimming by ambush-feeding medusae.” *Woods Hole Oceanographic Institution Biology Seminar*, July 18th, 2013, Woods Hole, MA.

“Fluid mechanics studies of jellyfish swimming: Informing bio-inspired design and mixing in the ocean.” *Scripps Institution of Oceanography Seminar*, May 27th, 2013, La Jolla, CA.

“Biogenic inputs to ocean mixing: evidence from observations of swimming medusa, copepods, and euphausiids.” *Hopkins Marine Station Seminar, Stanford Univ.*, January 10, 2013, Pacific Grove, CA.

“Biogenic inputs to ocean mixing: evidence from observations of swimming medusa.” *University of Washington, Biology Integrative Biophysics Seminar*, November 26, 2012, Seattle, WA.

“The search for elusive jellyfish: exploration challenges, accidental encounters, and (painful) lessons learned.” *Sea Stories, Explorers Club*, November 10, 2012, New York, NY.

“Alien Deep: How do we make viewers care?” *Blue Ocean Film Festival Panel*, September 28, 2012, Monterey, CA.

“Through the lens of SCUVA.” *Rhode Island Energy and Environmental Leaders Day, Ocean Explorers turned Ocean Interpreters*, May 1, 2012, Kingston, RI.

“Observations of swimming by medusae *Sarsia tubulosa*: from viscous vortex rings to trailing jets.” *Woods Hole Oceanographic Institution Coastal and Ocean Fluid Dynamics Laboratory Seminar*, March 16, 2012, Woods Hole, MA.

“Experimental studies of jellyfish propulsion for bio-inspired design of underwater vehicles.” *WHOI Ocean Science Journalism Fellowship Seminar*, September 14, 2011, Quissett, MA.

“Through the lens of SCUVA.” *National Geographic Society Explorer’s Symposium, Frontiers of Science panel*, June 23, 2011, Washington D.C.

“Biogenic inputs to ocean mixing.” *Princeton University Fluid Mechanics Seminar*, April 29, 2011, Princeton, New Jersey.

“Jellyfish as biogenic ocean mixers and models for propulsion.” *Massachusetts Institute of Technology Ocean Engineering Seminar*, April 25, 2011, Boston, MA.

“Biogenic inputs to ocean mixing.” *University of Washington’s Applied Physics Laboratory and Department of Oceanography Symposium*, April 4, 2011, Seattle, WA.

“Experimental studies of jellyfish propulsion to understand form and function of swimming animals.” *Woods Hole Oceanographic Institution Coastal and Ocean Fluid Dynamics Laboratory Seminar*, October 8, 2010, Woods Hole, MA.

“Jellyfish as biogenic ocean mixers and models for propulsion.” *Oregon State University Physical Oceanography Seminar Series*, September, 28, 2010, Corvallis, OR.

“Jellyfish as biogenic ocean mixers and models for propulsion.” *University of Washington Fluid Mechanics Seminar Series*, September, 24, 2010, Seattle, WA.

“A Darwinian mechanism for biogenic ocean mixing.” *Occidental College Biology Seminar Series*, January 29, 2010, Los Angeles, CA.

“A Darwinian mechanism for biogenic ocean mixing.” *Naval Undersea Warfare Center Seminar Series*, November 9, 2009, Newport, RI.

“A Darwinian mechanism for biogenic ocean mixing.” *Woods Hole Oceanographic Institution Applied Ocean Physics and Engineering Seminar*, October 21, 2009, Woods Hole, MA.

“Mixing efficiency of swimming animals in stratified flows.” *Virginia Tech Engineering Science and Mechanics Seminar Series*, March 2, 2009, Blacksburg, VA.

HONORS and AWARDS

Assistant Professor of Mechanical Engineering, University of Colorado, Boulder – Declined	2017
Assistant Professor of Zoology, University of British Columbia – Declined	2017
Assistant Professor of Ocean Resources Engineering, University of Hawaii – Declined	2017
Assistant Professor of Biology, Occidental College – Declined	2016
TED Speaker (at TEDYouth and TEDWomen)	2014-2015
Postdoctoral Fellow, Monterey Bay Aquarium Research Institute	2015
Hopkins Marine Station Research Fellow	2014
Kavli Fellow, National Academy of Sciences	2013
National Geographic Society Emerging Explorer	2011

Women's Champion – 1 st Annual Cape Cod Oktoberfest Keg Toss	2011
Devonshire Postdoctoral Fellow, Woods Hole Oceanographic Institution	2010-2012
Assistant Professor of Mechanical Engineering, University of Colorado – Declined	2010
Postdoctoral Fellow, National Renewable Energy Laboratory – Declined	2010
Assistant Professor of Engineering Science and Mechanics, Virginia Tech – Declined	2009
NASA Academy, Ames Research Center	2004
NASA Reduced Gravity Student Flight Opportunities Program	2004
Sigma Gamma Tau: National Aerospace Honor Society	2003
U.S. Olympic Figure Skating Team, Second Alternate	2002
Edy Award for Best U.S. Nationals Performance, Pro Skater's Association	2001
Phi Theta Kappa: National Two-Year College Honor Society	2000
U.S. International Figure Skating Team Member	1999-2003
U.S. Nationals Novice Ice Dancing 1 st Place	1999

PROFESSIONAL SERVICE ACTIVITIES

Research Proposal Reviewer

National Science Foundation Division of Ocean Sciences, Division of Integrative Organismal Systems, National Oceanic and Atmospheric Administration Aquarius, National Geographic Society Expeditions Council

Journal Reviewer

Journal of Experimental Biology, Journal of Geophysical Research, Bioinspiration and Biomimetics, Physics of Fluids, Journal of Fluid Mechanics, Estuaries and Coasts, Marine Technology Society Journal

MEMBERSHIP in PROFESSIONAL SOCIETIES

US Figure Skating, Professional Association of Diving Instructors, American Academy of Underwater Sciences, Divers Alert Network, American Geophysical Union, American Physical Society, Society for Integrative and Comparative Biology, Phi Theta Kappa

SELECTED SYNERGISTIC ACTIVITIES

The Verge Science: [This creature has been pooping microplastics all over the seafloor](#) (09/10/2017)

News Deeply: [Executive Summary: Meet the plankton that eats microplastic](#) (08/18/2017)

The Verge Science: Jacqueline Ronson, [These sea critters trap and remove microplastics from oceans](#) (08/18/2017)

PBS News Hour: Roni Dengler, [Giant plankton eat and transport plastic through the ocean](#) (08/17/2017)

Daily Mail: Cecile Borkhataria, [How pollution makes its way to the ocean floor: Deep-sea footage reveals plastic eaten by tiny plankton sinks to the bottom in fecal pellets](#) (08/16/2017)

National Geographic: Laura Parker, [Ocean life eats tons of plastic – Here's why that matters](#) (08/16/2017)

New Scientist: Michael Le Page, [Weird creatures are spreading polluting plastic through the sea](#) (08/16/2017)

Science News: Helen Thompson, [Giant larvaceans could be ferrying ocean plastics to the seafloor](#) (08/16/2017)

The Scientist: Bob Grant, [Giant plankton may help move plastic pollution to sea floor](#) (08/16/2017)

Seeker: Matt Smith, [Giant larvaceans sweep up and poop out plastic waste in the oceans](#) (08/16/2017)

The Verge: Alessandra Potenza, [Tiny bits of plastic get to the seafloor by hitching rides on snot palaces](#) (08/16/2017)

Wired: Eric Niiler, [Plankton “mucus houses” could pull microplastics from the sea](#) (08/16/2017)
 The Verge: Rachel Becker, [How do you make a jellyfish wear an activity tracker?](#) (08/02/2017)
 Science Friday: [The cephalo-inspired technology of the future](#) (06/23/2017)
 Quartz: Michael Tabb, [This gorgeous deep-sea creature can filter atmospheric carbon and bury it in the ocean](#)
 Cosmos Magazine: Amy Middleton, [Larvacean life: the surprise ocean giants of global carbon capture](#) (05/10/2017)
 KPCC Take 2: Julia Paskin, [Giant zooplankton: Nature’s water filtering, carbon storing enigma](#) (05/10/2017)
 New York Times: Steph Yin, [In disposable mucus houses, these zooplankton filter the oceans](#) (05/03/2017)
 Optics and Photonics: Sarah Michaud, [Lasers capture sea creatures in action](#) (05/10/17)
 BBC World Service, News Day: [How giant larvaceans contribute to transfer of atmospheric carbon to the deep ocean in France elects centrist Macron as its new leader](#) (05/07/2017)
 Science Friday: [The house that snot built](#) (05/05/2017)
 Science News: Susan Milius, [Sea creatures’ sticky “mucus houses” catch ocean carbon really fast](#) (05/04/2017)
 Newsy: Evan Thomas, [Filter-feeding plankton clean carbon out of the oceans](#) (05/03/2017)
 Scientific American: Lydia Chain, [Slime houses of pinky-size plankton cycle carbon](#) (05/03/2017)
 Seeker: Jen Viegas, [Pinky-sized marine animal breaks record for ocean filtration](#) (05/03/2017)
 The Verge: Rachel Becker, [Meet the snot-dwelling sea creatures who help move food through the ocean](#) (05/03/2017)
 TED-Ed: [The surprising \(and invisible\) signatures of sea creatures](#)
 TEDWomen 2015: [Momentum](#) (05/28/2015)
 TEDYouth 2014: [A recap of Session 3 from TEDYouth 2014](#) (11/15/2014)
 Journal of Visualized Experiments: [Featured Scientist: Kakani Katija talks jellyfish and ocean mixing](#) (11/1/2011)
 National Geographic Magazine (and online): Susan Daugherty, [2011 Emerging Explorer](#) (05/17/2011)
 Time Magazine: Adi Narayan, [Churning ocean waters, one jellyfish at a time](#) (08/05/2009)
 New York Times: Henry Fountain, [Microscopic creatures stir the oceans](#) (07/31/2009)
 British Broadcasting Corporation: Victoria Gill, [Jellyfish help to stir the ocean](#) (07/30/2009)
 National Public Radio: Geoff Brumfiel, [Jellyfish may help keep planet cool](#) (07/30/2009)
 National Geographic: Brian Handwerk, [Sea animals change climate via flutters and flaps](#) (07/30/2009)
 Discovery Channel: Michael Reilly, [Jellyfish may affect climate by stirring oceans](#)
 Nature News: Roberta Kwok, [Jellyfish help mix the world’s oceans](#) (07/29/2009)

VOLUNTEER ACTIVITIES

Project Mentor – York Robotics Team **2016-present**

- Serving as project mentor to high school students at York School in Monterey, CA during their FIRST robotics build and competition period
- Assisting students with overall robot design, strategy, and systems engineering

Research Mentor – MBARI’s SURF Program **2015-present**

- Served as research mentor to undergraduate Engineering students Alexa Baumer (George Washington University) and Sarah Black (Florida Atlantic University)
- Provided guidance for their summer research projects focusing on larvacean swimming mechanics and orientation of jellies in currents using AUV-collected video

Research Mentor – CSUMB’s REU Program **2014-present**

- Served as research mentor to undergraduate Biology students Mary Colleen Hannon (Humboldt State University) and Amanda Fay (CSUMB)
- Provided guidance for their summer research projects focusing on swimming by siphonophores and siphon kinematics of deep sea squid

Mentor – WHOI/MIT Graduate and Summer Research Students **2011-2014**

- Served as academic and professional mentor to Heather Beem, a graduate student in Applied Ocean Physics and Engineering
- Served as research mentor to Thomas Sayre-McCord and Miles Borgen, Summer and Minority Undergraduate Research Program participants

Guest Judge - King/Drew Magnet High School Science Fair **2010**

- Participated as guest judge at a medicine and science high school in Los Angeles, CA
- Using a requirements matrix, judged student research posters and selected student participants in the California state-wide science fair

Mentor - Boys and Girls Club **2010**

- Spent four hours per week helping 3rd to 6th grade public school students with homework, reading, and science projects
- Students attending Boys and Girls Club in Pasadena, CA have multicultural background

Divemaster - Sharky's Eco-Dive Center **2009-2010**

- Volunteered weekends to assist introductory scuba diving classes in a pool and open water
- Responsibilities included monitoring student equipment, anxiety level, determining logistics for dive sites, and assisting in emergency situations

Host - Caltech Classroom Connection **2009**

- Hosted laboratory tours for a 3rd grade class from an elementary school in Pasadena, CA
- Introduced students to laboratory techniques, jellyfish, and usefulness of science and math in their everyday lives

Mentor - Zen Divers **2006-2008**

- Teaches east Los Angeles students how to scuba dive, emphasizing math and physics in diving
- Responsibilities include in-water instructor support during diving classes and organizing laboratory tours at Caltech