

# John O. Dabiri

## Contact Information

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## Education

### **Ph.D., Bioengineering with minor in Aeronautics (4/2005)**

California Institute of Technology, Pasadena, CA

Thesis: Unsteady fluid mechanics of starting-flow vortex generators with time-dependent boundary conditions

Advisor: Morteza (Mory) Gharib

### **M.S., Aeronautics (6/2003)**

California Institute of Technology, Pasadena, CA

### **B.S.E. *summa cum laude*, Mechanical and Aerospace Engineering (6/2001)**

Princeton University, Princeton, NJ

## Professional Experience

### **Stanford University**

#### **Full Professor with tenure (7/2015 – Present)**

Civil & Environmental Engineering and Mechanical Engineering

#### **Director, Catalyst for Collaborative Solutions (11/2016 – Present)**

#### **Senior Fellow (8/2012 – 6/2013)**

Center for Turbulence Research

### **California Institute of Technology**

#### **Professor with tenure (11/2010 – Present)**

Associate Professor with tenure (8/2009 – 10/2010); Assistant Professor (5/2005 – 8/2009)

Aeronautics and Bioengineering

#### **Dean of Undergraduate Students (7/2014 – 6/2015)**

Director, Center for Bioinspired Wind Energy (11/2010 – 6/2015)

Chairman of the Faculty (1/2013 – 6/2014)

## Research Fellowships and Assistantships

Bioengineering, California Institute of Technology (9/2001 – 4/2005)  
Mechanical, Industrial and Manufacturing Eng., University of Toledo, OH (6/2001 – 9/2001)  
Mechanical and Aerospace Engineering, Princeton University (9/1998 – 6/2001)  
Aeronautics, California Institute of Technology (6/2000 – 8/2000)

## Research Grants

Woods Institute for the Environment “Bird Conservation in Wind Energy Parks by Leveraging the Avian Optomotor Response” (2017-2019, PI: Dabiri)  
TomKat Center for Sustainable Energy “A commercial wind farm testbed for performance prediction and optimization tools” (2016-2018, PI: Dabiri)  
Precourt Institute for Energy “Renewable Energy Systems Integration (RESI): Prototyping an Optimized Energy Infrastructure as Living Laboratory” (2016-2018, PI: Dabiri)  
National Science Foundation (Particulate and Multiphase Processes) “Multiscale interactions between active particles and stratified fluids during collective vertical migration” (2015-2018, PI: Dabiri)  
National Science Foundation (Fluid Dynamics) “Fluid mechanical basis of universal natural propulsor bending patterns” (2015-2018, PI: Dabiri)  
National Science Foundation (Instrument Development for Biological Research) “Diver-operated imaging platform with complementary systems for quantifying aquatic organism interactions” (2015-2018, PI: Dabiri)  
Gordon and Betty Moore Foundation “Wind farm in Igiugig Alaska” (2013-2018, PI: Dabiri)  
United States - Israel Binational Science Foundation “Drift-mediated mixing” (2012-2016, US PI: Dabiri)  
Office of Naval Research “A wind energy solution for military base operations” (2012-2015, PI: Dabiri)  
Gordon and Betty Moore Foundation “Feasibility study of vertical axis turbines and arrays in rural communities located in Alaska’s wild salmon systems” (2012-2013, PI: J. Peng)  
National Science Foundation (Biological Oceanography) “Turbulence and suspension feeding: a new approach using the lobate ctenophore *Mnemiopsis leidyi*” (2011-2014, PI: Dabiri)  
Gordon and Betty Moore Foundation “Center for Bio-inspired Engineering” (2010-2016, PI: Dabiri)  
Office of Naval Research (Physical Sciences) “Beyond mimicry: bio-inspired propulsion via passive mechanisms” (2009-2014, PI: Dabiri)  
National Science Foundation (Fluid Dynamics) “Flexible swimmers: reverse engineering a jellyfish” (2009-2011, PI: Dabiri)  
National Science Foundation (Fluid Dynamics) “Optimizing flexible swimmers—from jellyfish to engineered propulsors” (2008-2011, PI: Dabiri)  
National Science Foundation (Biological Oceanography) “Biomixing—a controversial mechanism influencing dynamics of marine ecosystems?” (2008-2010, PI: M. Dawson)  
Office of Naval Research (Physical Sciences) “Optimal propulsion for hybrid screw-based, bio-inspired systems” (2008-2011, PI: Dabiri)  
National Science Foundation (Physiological and Structural Systems) “In situ measurement of vertebrate swimming in natural environments” (2008-2009, PI: M. Gordon)

National Science Foundation (Energy for Sustainability) “Bio-inspired fluid dynamic energy conversion” (2007-2011, PI: Dabiri)

National Science Foundation (Ocean Technology) “Phase two development of a self-contained underwater velocimetry apparatus” (2007-2009, PI: Dabiri)

Office of Naval Research SBIR “Biomimetic sonobuoy” (2007-2010, PI: Triton Systems, Inc.)

National Science Foundation (Biological Oceanography) “Prediction of medusan predatory roles based on quantitative studies of animal-fluid interactions” (2006-2009, PI: Dabiri)

## **Honors and Awards**

### **Research Achievement**

Biomedical Engineering Distinguished Seminar, Boston University (2017)

Distinguished Mathematics Lecture, University of Oregon (2017)

Dourdeville Lecture, Brown University (2016)

Invited Speaker, Defense Science Board 60th Anniversary (2016)

Editorial Board, Journal of Fluid Mechanics (2016)

Invited Speaker, National Academy of Engineering Annual Meeting, Section 10 (2015)

Laura Randall Schweppe Endowed Lecture, University of Texas (2015)

Best Paper (Wind Energy), ASME Turbo Expo (2014)

Fellow, American Physical Society (2014)

Winner, American Physical Society Gallery of Fluid Motion (2014)

Member-at-Large, American Physical Society Division of Fluid Dynamics ExComm (2014)

Roddam Narasimha Distinguished Lecture, Indian Institute of Technology (2014)

Defense Science Study Group (2014)

Invitee, World Economic Forum Annual Meeting (2014)

Winner, American Physical Society Gallery of Fluid Motion (2013)

MIT Technology Review Magazine “TR35” Innovators Under 35 (2013)

Midwest Mechanics Seminar Series Speaker (2013)

Member-at-Large, U.S. National Committee for Theoretical and Applied Mechanics (2013)

Denis and Jean Wiesenburg Distinguished Lecturer, University of Southern Mississippi (2013)

Bloomberg Businessweek Magazine “Technology Innovator” (2012)

Senior Fellow, Stanford University Center for Turbulence Research (2012)

MacArthur Fellow (2010)

T. Francis Ogilvie Lectureship in Ocean Engineering, MIT (2010)

Presidential Early Career Award for Scientists and Engineers (2009)

Enzo Levi Lecture, National University of Mexico (2009)

Popular Science Magazine “Brilliant 10” Scientists (2008)

Office of Naval Research Young Investigator Award (2008)

Invitee, Summit of Experts in Biomechanics, U.S. National Committee for Biomechanics (2007)

Donald Coles Prize for Best Experiment, California Institute of Technology (2005)

Winner, American Physical Society Gallery of Fluid Motion (2004)

Oral Presentation Award, Southern California Biomedical Engineering Symposium (2002)

Sigma Xi National Research Honor Society Book Award, Princeton University (2001)

John Marshall II Memorial Prize for Independent Research, Princeton University (2001)

Morgan W. McKinzie Senior Thesis Prize Finalist with Distinction, Princeton University (2001)

Grade of A with Distinction (A+), B.S.E. Thesis, Princeton University (2001)

Nominee, Marcella and Joel Bonsall Prize for Technical Writing, California Institute of Technology (2000)

**Graduate Fellowships**

Y. C. Fung Fellowship, California Institute of Technology (2001 – 2005)  
Department of Defense Science and Engineering Graduate Fellowship (2001 – 2004)  
Ford Foundation Graduate Fellowship (2001, declined)  
Sir Frank Whittle Rolls Royce Fellowship in Propulsion, MIT (2001, declined)  
Presidential Graduate Fellowship, Princeton University (2001, declined)  
National Finalist, Hertz Foundation Fellowship (2001)

**Academic and Leadership Achievement**

Harold Willis Dodds Achievement Award, Princeton University (2001)  
Finalist, Pyne Prize, Princeton University (2001)  
National Finalist, Rhodes Scholarship (2001)  
National Finalist, British Marshall Scholarship (2001)  
Outstanding Academic Achievement in the B.S.E. Program, Princeton University (1998 – 2000)  
Academic Excellence in Engineering Coursework, Princeton Black Graduate Caucus (1999)  
Academic Achievement in Engineering, National Association of Minority Engineers (1999)

**Service and Mentoring Achievement**

Professor of the Month (February), California Institute of Technology (2012)  
Outstanding Paper, Freshman Summer Institute, California Institute of Technology (2002)  
Tau Beta Pi National Engineering Honor Society Prize (2001)  
George Bienkowski Memorial Prize, Princeton University (2001)

**Miscellaneous Honors and Awards**

OZY Rising Stars (2015)  
C-Suite Quarterly Innovation NextGen 10 (2013)  
LA Weekly Magazine Best of LA (2013)  
THE Magazine 50 Innovative Men of the Year (2012)  
Ebony Magazine “Power 100” Most Influential Black Americans (2010)  
Convocation Address, California Institute of Technology (2010)  
Richard C. Biedebach Lecture, California Institute of Technology (2009)  
William Randolph Hearst Scholarship, Princeton University (1997 – 2001)  
Samuel Bayard Dod Scholarship, Princeton University (1997 – 2001)  
The Boeing Company Undergraduate Scholarship (2000)  
Class of 1907 Scholarship, Princeton University (2000)  
National Achievement Scholarship (1997)  
National Merit Scholarship Commendation (1997)

## Publications

*Students and Postdoctoral Scholars underlined.*

84. Miller MA, Duvvuri S, Brownstein ID, Lee M, **Dabiri JO**, Hultmark M (2017) “Vertical axis wind turbine experiments at full dynamic similarity,” submitted.
83. Hezaveh SH, Bou-Zeid E, **Dabiri JO**, Kinzel M, Cortina G, Martinelli L (2017) “Increasing VAWT wind farm power density using synergistic clustering,” submitted.
82. Hui I, Cain BE, **Dabiri JO** (2017) “Public receptiveness of vertical axis wind turbines,” submitted.
81. Lucas KN, **Dabiri JO**, Lauder GV (2017) “DPIV-derived pressure fields predict locomotor forces and torques produced by a fish-like, flexible foil model,” submitted.
80. Costello JH, Colin SP, Gemmell BJ, **Dabiri JO** (2017) “Vortex generation and manipulation during linear swimming by the hydromedusa *Eutonina indicans*,” submitted.
79. Schlueter-Kuck KL, **Dabiri JO** (2017) “Identification of individual coherent sets associated with flow trajectories using Coherent Structure Coloring,” *Chaos* 27: 091101. [http://dabirilab.com/s/ScKuDa\\_Chaos17.pdf](http://dabirilab.com/s/ScKuDa_Chaos17.pdf)
78. Nawroth JC, Guo H, Koch E, Heath-Heckman EA, Hermanson JC, Ruby E, **Dabiri JO**, Kanso E, McFall-Ngai M (2017) “Motile cilia create fluid-mechanical microhabitats for the active recruitment of the host microbiome,” *Proceedings of the National Academy of Sciences of the USA* 114 (36): 9510-9516. [http://dabirilab.com/s/NaGuetal\\_PNAS17.pdf](http://dabirilab.com/s/NaGuetal_PNAS17.pdf)
77. **Dabiri JO** (2017) “Biomechanics: How fish feel the flow,” *Nature* 547: 406-407. [http://dabirilab.com/s/Da\\_Nature17.pdf](http://dabirilab.com/s/Da_Nature17.pdf)
76. Craig AE, **Dabiri JO**, Koseff JR (2017) “Low order physical models of vertical axis wind turbines,” *Journal of Renewable and Sustainable Energy* 9: 013306. [http://dabirilab.com/s/CrDaKo\\_JRSE17.pdf](http://dabirilab.com/s/CrDaKo_JRSE17.pdf)
75. Abkar M, **Dabiri JO** (2017) “Self-similarity and flow characteristics of vertical-axis wind turbine wakes: An LES study,” *Journal of Turbulence* 18 (4): 373-389. [http://dabirilab.com/s/AbDa\\_JOT17.pdf](http://dabirilab.com/s/AbDa_JOT17.pdf)
74. Araya DB, Colonius T, **Dabiri JO** (2017) “Transition to bluff body dynamics in the wake of vertical-axis wind turbines,” *Journal of Fluid Mechanics* 813: 346-381. [http://dabirilab.com/s/ArCoDa\\_JFM17.pdf](http://dabirilab.com/s/ArCoDa_JFM17.pdf)

73. Schlueter-Kuck KL, **Dabiri JO** (2017) “Coherent structure coloring: identification of coherent structures from sparse data using graph theory,” *Journal of Fluid Mechanics* 811: 468-486.  
[http://dabirilab.com/s/ScDa\\_JFM17.pdf](http://dabirilab.com/s/ScDa_JFM17.pdf)
72. Gemmell BJ, Fogerson S, Costello JH, Morgan JR, **Dabiri JO**, Colin SP (2016) “How the bending kinematics of swimming lampreys build negative pressure fields for suction thrust,” *Journal of Experimental Biology* 219: 3884-3895.  
[http://dabirilab.com/s/Geetal\\_JEB16.pdf](http://dabirilab.com/s/Geetal_JEB16.pdf)
71. Brownstein ID, Kinzel M, **Dabiri JO** (2016) “Performance enhancement of downstream vertical-axis wind turbines,” *Journal of Renewable and Sustainable Energy* 8: 053306.  
[http://dabirilab.com/s/BrKiDa\\_JRSE16.pdf](http://dabirilab.com/s/BrKiDa_JRSE16.pdf)
70. Craig AE, **Dabiri JO**, Koseff JR (2016) “Flow kinematics in variable-height rotating cylinder arrays,” *Journal of Fluids Engineering* 138 (11): 111203.  
[http://dabirilab.com/s/CrDaKo\\_JFE16b.pdf](http://dabirilab.com/s/CrDaKo_JFE16b.pdf)
69. Schlueter-Kuck KL, **Dabiri JO** (2016) “Pressure evolution in the shear layer of forming vortex rings,” *Physical Review Fluids* 1: 012501.  
[http://dabirilab.com/s/ScDa\\_PRF16.pdf](http://dabirilab.com/s/ScDa_PRF16.pdf)
68. Craig AE, **Dabiri JO**, Koseff JR (2016) “A kinematic description of the key flow characteristics in an array of finite-height rotating cylinders,” *Journal of Fluids Engineering* 138 (7): 071208.  
[http://dabirilab.com/s/CrDaKo\\_JFE16.pdf](http://dabirilab.com/s/CrDaKo_JFE16.pdf)
67. Ryan KJ, Coletti F, Elkins CJ, **Dabiri JO**, Eaton JK (2016) “Three-dimensional flow field around and downstream of a subscale model rotating vertical-axis wind turbine,” *Experiments in Fluids* 57: 38.  
<http://dabirilab.com/s/RyCoElDaEa EIF16.pdf>
66. Kinzel M, Araya DB, **Dabiri JO** (2015) “Turbulence in vertical-axis wind turbine canopies,” *Physics of Fluids* 27: 115102.  
[http://dabirilab.com/s/KiArDa\\_POF15.pdf](http://dabirilab.com/s/KiArDa_POF15.pdf)
65. Gemmell BJ, Colin SP, Costello JH, **Dabiri JO** (2015) “Suction-based propulsion as a basis for efficient animal swimming,” *Nature Communications* 6: 8790.  
[http://dabirilab.com/s/GeCoCoDa\\_NComm15.pdf](http://dabirilab.com/s/GeCoCoDa_NComm15.pdf)
64. Araya DB, **Dabiri JO** (2015) “VAWT in a falling soap film,” *Physics of Fluids* 27: 091108.  
[http://dabirilab.com/s/ArDa\\_POF15.pdf](http://dabirilab.com/s/ArDa_POF15.pdf)

63. Costello JH, Colin SP, Gemmell BJ, **Dabiri JO**, Sutherland KR (2015) "Multi-jet propulsion organized by clonal development in a colonial siphonophore," *Nature Communications* 6: 8158.  
[http://dabirilab.com/s/CoCoGeDaSu\\_NComm15.pdf](http://dabirilab.com/s/CoCoGeDaSu_NComm15.pdf)
62. Araya DB, **Dabiri JO** (2015) "A comparison of wake measurements in motor-driven and flow-driven turbine experiments," *Experiments in Fluids* 56: 150.  
[http://dabirilab.com/s/ArDa\\_EIF15.pdf](http://dabirilab.com/s/ArDa_EIF15.pdf)
61. **Dabiri JO**, Greer JR, Koseff JR, Moin P, Peng J (2015) "A new approach to wind energy: opportunities and challenges," *AIP Conference Proceedings* 1652: 51-57.  
[http://dabirilab.com/s/DaGrKoMoPe\\_AIPCP15.pdf](http://dabirilab.com/s/DaGrKoMoPe_AIPCP15.pdf)
60. Araya DB, Craig AE, Kinzel M, **Dabiri JO** (2014) "Low-order modeling of wind farm aerodynamics using leaky Rankine bodies," *Journal of Renewable and Sustainable Energy* 6: 063118.  
[http://dabirilab.com/s/ArCrKiDa\\_JRSE14.pdf](http://dabirilab.com/s/ArCrKiDa_JRSE14.pdf)
59. Wilhelmus MM, **Dabiri JO** (2014) "Observations of large-scale fluid transport by laser-guided plankton aggregations," *Physics of Fluids* 26: 101302.  
[http://dabirilab.com/s/WiDa\\_POF14.pdf](http://dabirilab.com/s/WiDa_POF14.pdf)
58. Naworth JC, **Dabiri JO** (2014) "Induced drift by a self-propelled swimmer at low Reynolds numbers," *Physics of Fluids* 26: 091108.  
[http://dabirilab.com/s/NaDa\\_POF14.pdf](http://dabirilab.com/s/NaDa_POF14.pdf)
57. **Dabiri JO** (2014) "Emergent aerodynamics in wind farms," *Physics Today* 67 (10): 66-67. [http://dabirilab.com/s/Da\\_PT14.pdf](http://dabirilab.com/s/Da_PT14.pdf)
56. Sutherland KR, Costello JH, Colin SP, **Dabiri JO** (2014) "Ambient fluid motions influence swimming and feeding by the ctenophore *Mnemiopsis leidyi*," *Journal of Plankton Research* 0(0): 1-13. doi:10.1093/plankt/fbu051.  
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55. Bazilevs Y, Korobenko A, Deng X, Yan J, Kinzel M, **Dabiri JO** (2014) "FSI modeling of vertical-axis wind turbines," *Journal of Applied Mechanics* 81 (8): 081006.  
[http://dabirilab.com/s/Ba\\_etal\\_JAM14.pdf](http://dabirilab.com/s/Ba_etal_JAM14.pdf)
54. O'Farrell C, **Dabiri JO** (2014) "Nested contour-dynamic models for axisymmetric vortex rings and vortex wakes," *Journal of Fluid Mechanics* 748: 521-548.  
[http://dabirilab.com/s/OFDa\\_JFM14b.pdf](http://dabirilab.com/s/OFDa_JFM14b.pdf)
53. Lucas KN, Johnson N, Beaulieu W, Cathcart E, Tirrell G, Colin SP, Gemmell BJ, **Dabiri JO**, Costello JH (2014) "Bending rules," *Nature Communications* 5: 3293.  
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52. **Dabiri JO**, Bose S, Gemmell BJ, Colin SP, Costello JH (2014) “An algorithm to estimate unsteady and quasi-steady pressure fields from velocity field measurements,” *Journal of Experimental Biology* 217: 331-336.  
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51. O’Farrell C, **Dabiri JO** (2014) “Pinch-off of non-axisymmetric vortex rings,” *Journal of Fluid Mechanics* 740: 61-96.  
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50. Whittlesey RW, **Dabiri JO** (2013) “Optimal vortex formation in a self-propelled vehicle,” *Journal of Fluid Mechanics* 737: 78-104.  
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49. Gemmell BJ, Costello JH, Colin SP, Stewart C, **Dabiri JO**, Tafti D, Priya S (2013) “Passive energy recapture in jellyfish contributes to propulsive advantage over other metazoans,” *Proceedings of the National Academy of Sciences of the USA* 110 (44): 17904-17909.  
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48. Costello JH, Colin SP, Villanueva A, Smith C, Priya S, **Dabiri JO**, Blottman JB (2012) “Biomimetic and live jellyfish reveal the mechanistic advantages of a flexible bell margin,” *PLoS ONE* 7 (11): e48909.  
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47. Kinzel M, Mulligan Q, **Dabiri JO** (2012) “Energy exchange in an array of vertical-axis wind turbines,” *Journal of Turbulence* 13 (38): 1-13.  
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46. Nawroth JC, Lee H, Feinberg AW, Ripplinger CM, McCain ML, Grosberg A, **Dabiri JO**, Parker KK (2012) “A tissue-engineered jellyfish with biomimetic propulsion,” *Nature Biotechnology* 30: 792-797 (Cover Article).  
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45. O’Farrell C, **Dabiri JO** (2012) “Perturbation response and pinch-off of vortex rings and dipoles,” *Journal of Fluid Mechanics* 704: 280-300.  
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44. Sutherland KR, **Dabiri JO**, Koehl MAR (2011) “Simultaneous field measurements of ostracod swimming behavior and background flow,” *Limnology and Oceanography: Fluids and Environment* 1: 135-146.  
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43. Katija K, Colin SP, Costello JH, **Dabiri JO** (2011) “Quantitatively measuring in situ flows using a self-contained underwater velocimetry apparatus (SCUVA),” *Journal of Visualized Experiments* 56: e2615.  
[http://web.stanford.edu/~jodabiri/largeweb/KaCoCoDa\\_JOVE11.mov](http://web.stanford.edu/~jodabiri/largeweb/KaCoCoDa_JOVE11.mov)



42. Katija K, Beaulieu WT, Regula C, Colin SP, Costello JH, **Dabiri JO** (2011) “Quantification of flows generated by the hydromedusa *Aequorea victoria*: A Lagrangian coherent structure (LCS) analysis,” *Marine Ecology Progress Series* 435: 111-123. [http://dabirilab.com/s/KaBeReCoCoDa\\_MEPS11.pdf](http://dabirilab.com/s/KaBeReCoCoDa_MEPS11.pdf)
41. **Dabiri JO** (2011) “Potential order-of-magnitude enhancement of wind farm power density via counter-rotating vertical-axis wind turbine arrays,” *Journal of Renewable and Sustainable Energy* 3: 043104. [http://dabirilab.com/s/Da\\_JRSE11.pdf](http://dabirilab.com/s/Da_JRSE11.pdf)
40. Ruiz LA, Whittlesey RW, **Dabiri JO** (2011) “Vortex-enhanced propulsion,” *Journal of Fluid Mechanics* 668: 5-32 (Focus Article). [http://dabirilab.com/s/RuWhDa\\_JFM11.pdf](http://dabirilab.com/s/RuWhDa_JFM11.pdf)
39. Colin SP, Costello JH, Hansson LJ, Titelman J, **Dabiri JO** (2010) “Stealth predation: the basis of the ecological success of the invasive ctenophore *Mnemiopsis leidyi*,” *Proceedings of the National Academy of Sciences of the USA* 107 (40): 17223-17227 (Cover Article). [http://dabirilab.com/s/CoCoHaTiDa\\_PNAS10.pdf](http://dabirilab.com/s/CoCoHaTiDa_PNAS10.pdf)
38. Whittlesey RW, Liska SC, **Dabiri JO** (2010) “Fish schooling as a basis for vertical-axis wind turbine farm design,” *Bioinspiration and Biomimetics* 5: 035005. [http://dabirilab.com/s/WhLiDa\\_BB10.pdf](http://dabirilab.com/s/WhLiDa_BB10.pdf)
37. Breitburg DL, Crump BC, **Dabiri JO**, Gallegos CL (2010) “Ecosystem engineers in the pelagic realm: Habitat alteration by species ranging from microbes to jellyfish,” *Integrative and Comparative Biology* 50 (2): 188-200. [http://dabirilab.com/s/BrCrDaGa\\_ICB10.pdf](http://dabirilab.com/s/BrCrDaGa_ICB10.pdf)
36. **Dabiri JO** (2010) “The role of vertical migration in biogenic ocean mixing,” *Geophysical Research Letters* L11602, doi:10.1029/2010GL043556. [http://dabirilab.com/s/Da\\_GRL10.pdf](http://dabirilab.com/s/Da_GRL10.pdf)
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34. **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* 213 (8): 1217-1225. [http://dabirilab.com/s/DaCoKaCo\\_JEB10.pdf](http://dabirilab.com/s/DaCoKaCo_JEB10.pdf)
33. O’Farrell C, **Dabiri JO** (2010) “A Lagrangian approach to identifying vortex pinch-off,” *Chaos* 20: 017513. [http://dabirilab.com/s/OFDa\\_Chaos10.pdf](http://dabirilab.com/s/OFDa_Chaos10.pdf)

32. Feitl KE, Millett AF, Colin SP, **Dabiri JO**, Costello JH (2009) "Functional morphology and fluid interactions during early development of scyphomedusae," *Biological Bulletin* 217: 283-291. [http://dabirilab.com/s/FeMiCoDaCo\\_BB09.pdf](http://dabirilab.com/s/FeMiCoDaCo_BB09.pdf)
31. Rosenfeld M, Katija K, **Dabiri JO** (2009) "Circulation generation and vortex ring formation by static conic nozzles," *Journal of Fluids Engineering* 131 (9): 091204. [http://dabirilab.com/s/RoKaDa\\_JFE09.pdf](http://dabirilab.com/s/RoKaDa_JFE09.pdf)
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## Invited Lectures

89. “Next-generation wind energy,” *Energy @ Stanford and SLAC*, September 12, 2017, Stanford, CA.
88. “The role of fluid forces in aquatic animal morphogenesis,” *Biomedical Engineering Distinguished Seminar, Boston University*, September 8, 2017, Boston, MA.
87. “Opportunities and challenges for next-generation wind energy,” *Dana M. Dourdeville Lecture on Engineering in Service to Society, Brown University*, November 11, 2016, Providence, RI.
86. “Opportunities and challenges for next-generation wind energy,” *Mechanical and Aerospace Engineering Seminar Series, The Ohio State University*, October 28, 2016, Columbus, OH.
85. “Leveraging biology for persistent undersea sensing,” *Defense Science Board 60th Anniversary*, September 20, 2016, Washington, D.C.
84. “Opportunities and challenges for next-generation wind energy,” *Seminar Series on Issues in Environmental Science, Technology and Sustainability, Stanford University*, June 30, 2016, Stanford, CA.
83. “Do swimming animals mix the ocean?” *Earth System Science Seminar Series, Stanford University*, May 4, 2016, Stanford, CA.
82. “Opportunities and challenges for next-generation wind energy,” *New Faculty Seminar, Stanford University*, April 26, 2016, Stanford, CA.
81. “Opportunities and challenges for next-generation wind energy,” *National Academy of Engineering Annual Meeting, Mechanical Engineering Section*, October 5, 2015, Washington, D.C.
80. “Opportunities and challenges for next-generation wind energy,” *Energy @ Stanford and SLAC*, September 10, 2015, Stanford, CA.
79. “Ocean mixing by swimming animals,” *Laura Randall Schweppe Endowed Lecture, University of Texas*, May 14, 2015, Port Aransas, TX.
78. “Jellyfish-inspired engineering,” *Math and Physics Guest Lecture, Azusa Pacific University*, April 6, 2015, Azusa, CA.
77. “Bioinspired wind energy: from fish schools and sea grass to better wind farms,” *Keck Science Department Seminar, Claremont Colleges*, November 20, 2014, Claremont, CA.
76. “Bioinspired wind energy: from fish schools and sea grass to better wind farms,” *Physics Colloquium, University of Texas at Austin*, November 5, 2014, Austin, TX.

75. “The roles of flexibility, vorticity, and pressure in efficient propulsion,” *World Congress of Biomechanics*, July 6-11, 2014, Boston, MA.
74. “Bioinspired wind energy: from fish schools and sea grass to better wind farms,” *O. M. Stewart Colloquium, University of Missouri at Columbia*, April 28, 2014, Columbia, MO.
73. “Bioinspired wind energy: from fish schools and sea grass to better wind farms,” *Roddam Narasimha Distinguished Lecture, Indian Institute of Technology Gandhinagar*, January 31, 2014, Ahmedabad, India.
72. “A new school of thought for wind energy technology,” *Mechanical Engineering Seminar, Stanford University*, December 10, 2013, Palo Alto, CA.
71. “Do swimming animals mix the ocean?,” *American Physical Society Division of Fluid Dynamics Annual Meeting*, November 24-26, 2013, Pittsburgh, PA.
70. “Bioinspired wind energy: from fish schools and sea grass to better wind farms,” *Midwest Mechanics Seminar Series: University of Michigan, Michigan State University, University of Notre Dame, Northwestern University and University of Wisconsin at Madison*, November 4-8, 2013.
69. “Biogenic ocean mixing,” *Workshop on Physical-Biological Interactions*, October 6-11, 2013, Eilat, Israel. Delivered by M. Martinez-Ortiz.
68. “Bioinspired wind energy: from fish schools and sea grass to better wind farms,” *Midwest Mechanics Seminar Series: Purdue University, University of Illinois at Urbana-Champaign, Illinois Institute of Technology, Iowa State University, University of Minnesota*, September 23-27, 2013.
67. “Do swimming animals mix the ocean?,” *Miller Institute Interdisciplinary Symposium, UC Berkeley*, June 7-9, 2013, Marshall, CA.
66. “Do swimming animals mix the ocean?,” *Marine Science Seminar Series, Duke University*, May 1, 2013, Durham, NC.
65. “Do swimming animals mix the ocean?,” *Denis and Jean Wiesenburg Distinguished Lecture in Ocean Science, University of Southern Mississippi*, April 23, 2013, Hattiesburg, MS.
64. “Bio-inspired propulsion,” *Mechanical Engineering Seminar Series, Vanderbilt University*, April 19, 2013, Nashville, TN.
63. “Jellyfish-inspired engineering,” *Evolutionary Morphology Seminar Series, University of Chicago*, February 7, 2013, Chicago, IL.

62. "A new approach to wind energy," *California Energy Commission*, December 14, 2012, Sacramento, CA.
61. "Do swimming animals mix the ocean?," *Gordon and Betty Moore Foundation*, December 11, 2012, Palo Alto, CA.
60. "Flexibility and vortex shedding in live and robotic jellyfish," *Fluid and Elasticity Conference*, November 14-16, 2012, La Jolla, CA.
59. "Jellyfish-inspired engineering," *CiBER-IGERT Seminar, UC Berkeley*, November 8, 2012, Berkeley, CA.
58. "Vortex-enhanced propulsion," *Center for Turbulence Research Tea, Stanford University*, November 2, 2012, Palo Alto, CA.
57. "Bioinspired wind energy: from fish schools and eel grass to wind farm," *Fluid Mechanics Seminar Series, Stanford University*, October 30, 2012, Palo Alto, CA.
56. "Jellyfish-inspired Engineering," *Comparative Physiology Invited Speaker Series, University of British Columbia*, October 22, 2012, Vancouver, Canada.
55. "Nature's propulsion methods," *29th Symposium on Naval Hydrodynamics*, August 26-31, 2012, Gothenburg, Sweden.
54. "A global approach to wind energy," *Global Alliance of Technological Universities Workshop*, December 7-8, 2011, Mumbai, India.
53. "Jellyfish-inspired engineering," *Department of Physics and Astronomy Colloquium, Pomona College*, February 28, 2012, Pomona, CA.
52. "A new approach to wind energy," *Mechanical Engineering Seminar Series, Carnegie Mellon University*, November 18, 2011, Pittsburgh, PA.
51. "Lagrangian fluid dynamic models for analysis of planktonic predator-prey systems and small-scale fluid motions," *Workshop on Coherent Structures in Dynamical Systems*, May 16-20, 2011, Leiden, Netherlands.
50. "Jellyfish-inspired engineering," *California State University at Dominguez Hills*, April 7, 2011, Carson, CA.
49. "Organisms causing flow: Darwinian mixing," *2011 Journal of Experimental Biology Symposium*, March 14-18, 2011, Cambridge, United Kingdom. Delivered by K. Katija.
48. "A new approach to wind energy," *Center for Environmental and Applied Fluid Mechanics Seminar, Johns Hopkins University*, March 5, 2011, Baltimore, MD.

47. “Vertical-axis wind turbines revisited,” *Los Alamos National Laboratory Turbine-Turbine Interaction Workshop*, March 2-3, 2011, Los Alamos, NM.
46. “Jellyfish-inspired propulsion,” *Society for Integrative and Comparative Biology Symposium: Bioinspiration: Applying Mechanical Design to Experimental Biology*, January 3-7, 2011, Salt Lake City, UT.
45. “Do swimming animals mix the ocean?,” *Center for Fluid Mechanics, Turbulence, and Computation, Brown University*, November 2, 2010, Providence, RI.
44. “Do swimming animals mix the ocean?,” *Monterey Bay Aquarium Research Institute Seminar*, October 20, 2010, Monterey Bay, CA.
43. “Do swimming animals mix the ocean?,” *Ecology and Evolutionary Biology Seminar, University of California at Los Angeles*, October 6, 2010, Los Angeles, CA.
42. “Order-of-magnitude enhancement of wind power density via optimized vertical-axis wind turbine arrays,” *Resnick Institute Sustainable Energy and Infrastructure Forum*, September 16-17, 2010, Pasadena, CA.
41. “Using vortices for locomotion,” *University of Minnesota Institute for Mathematics and Its Applications Workshop on Natural Locomotion in Fluids and on Surfaces: Swimming, Flying, and Sliding*, June 1-5, 2010, Minneapolis, MN.
40. “Unsteady hydrodynamics in bio-inspired propulsion,” *T. Francis Ogilvie Lecture, Massachusetts Institute of Technology*, May 7, 2010, Cambridge, MA.
39. “Fish schooling as a basis for vertical axis wind turbine farm design,” *First World Summit on Small Wind Turbines*, March 19, 2010, Husum, Germany. Delivered by R.W. Whittlesey.
38. “A Darwinian mechanism for biogenic ocean mixing,” *Ecology Seminar Luncheon, Scripps Institution of Oceanography*, March 10, 2010, La Jolla, CA.
37. “Jellyfish-inspired Engineering,” *Alabama School for Math and Science*, November 19, 2009, Mobile, AL.
36. “A Darwinian mechanism for biogenic ocean mixing,” *Colloquium Series, Dauphin Island Sea Lab*, November 19, 2009, Dauphin Island, AL.
35. “Jellyfish-inspired Engineering,” *Civil and Environmental Engineering Seminar, Stanford University*, November 13, 2009, Palo Alto, CA.
34. “A Darwinian mechanism for biogenic ocean mixing,” *Hopkins Marine Station Seminar, Stanford University*, November 12, 2009, Palo Alto, CA.



33. “Jellyfish-inspired Engineering,” *Virginia Air and Space Museum Sigma Lecture*, November 3, 2009, Hampton, VA.
32. “Unsteady hydrodynamics in bio-inspired propulsion,” *NASA Langley Research Center*, November 3, 2009, Hampton, VA.
31. “Jellyfish-inspired Engineering,” *Cabrillo Marine Aquarium Friends Lecture*, September 18, 2009, San Pedro, CA.
30. “Fluid dynamic constraints on morphology and propulsion of medusa at low Reynolds numbers,” *Thematic Conference on Gelatinous Plankton of the Adriatic Sea, University of Dubrovnik*, May 12-13, 2009, Dubrovnik, Croatia.
29. “A Darwinian mechanism for biogenic ocean mixing,” *Environmental Fluid Mechanics and Hydrology Seminar, Stanford University*, May 4, 2009, Palo Alto, CA.
28. “Unsteady hydrodynamics in bio-inspired propulsion,” *2009 Enzo Levi Lecture, National University of Mexico*, April 24, 2009, Mexico City, Mexico.
27. “Jellyfish-inspired Engineering,” *Earnest C. Watson Lecture, California Institute of Technology*, April 22, 2009, Pasadena, CA.
26. “Unsteady hydrodynamics in bio-inspired propulsion,” *College of Engineering Seminar, University of Michigan*, February 19, 2009, Ann Arbor, MI.
25. “Unsteady hydrodynamics in bio-inspired propulsion,” *IGERT Seminar Series, Cornell University*, January 22, 2009, Ithaca, NY.
24. “The role of fluid forces in aquatic animal morphogenesis,” *Minisymposium on Flow-Biology Interactions, International Conference of the American Society of Civil Engineers Engineering Mechanics Institute*, May 18-21, 2008, Minneapolis, MN.
23. “Lagrangian studies of animal swimming and aquatic predator-prey interactions,” *Applied Mechanics Colloquium, Harvard University*, April 23, 2008, Cambridge, MA.
22. “Lagrangian studies of animal swimming and aquatic predator-prey interactions,” *Mechanics Seminar Series, Massachusetts Institute of Technology*, April 22, 2008, Cambridge, MA.
21. “The role of fluid forces in aquatic animal morphogenesis,” *Biophysics Seminar Series, Princeton University*, April 21, 2008, Princeton, NJ.
20. “Lagrangian studies of animal swimming and aquatic predator-prey interactions,” *Biomechanics Seminar Series, University of California at San Diego*, April 9, 2008, La Jolla, CA.

19. “Lagrangian studies of animal swimming and aquatic predator-prey interactions,” *Focus Session on the Fluid Dynamics of Animal Motion, American Physical Society March Meeting*, March 10-14, 2008, New Orleans, LA.
18. “Measuring unsteady efficiency and performance of biological and bio-inspired propulsors,” *Aerospace and Mechanical Engineering, University of Southern California*, November 14, 2007, Los Angeles, CA.
17. “Measuring unsteady efficiency and performance of biological and bio-inspired propulsors,” *Aeronautics and Astronautics, University of Washington*, November 5, 2007, Seattle, WA.
16. “Measuring unsteady efficiency and performance of biological and bio-inspired propulsors,” *Mechanical Engineering, Stanford University*, October 16, 2007, Palo Alto, CA.
15. “Measuring unsteady efficiency and performance of biological and bio-inspired propulsors,” *Colloquium on Nature-Inspired Fluid Mechanics*, October 8-9, 2007, Darmstadt, Germany.
14. “Vorticity-free analyses of animal swimming measurements,” *Symposium on Dynamics and Control of Aquatic Locomotion, SIAM Dynamical Systems Meeting*, May 28-June 1, 2007, Snowbird, UT.
13. “Jellyfish-inspired diagnostics for heart failure and vehicle propulsive efficiency,” *Center for Biologically Inspired Design, Georgia Institute of Technology*, April 23, 2007, Atlanta, GA.
12. “Non-invasive studies of animal propulsion and sensing,” *Aerospace Engineering and Engineering Mechanics, San Diego State University*, April 12, 2007, San Diego, CA.
11. “Non-invasive studies of animal propulsion and sensing,” *Mechanical and Aerospace Engineering, University of California at Los Angeles*, January 19, 2007, Los Angeles, CA.
10. “The role of animal-fluid interactions in shaping medusan morphological diversity,” *Ecology and Evolutionary Biology, University of California at Irvine*, October 13, 2006, Irvine, CA.
9. “Estimating locomotive forces from wake measurements,” *World Congress of Biomechanics*, July 29-August 4, 2006, Munich, Germany.
8. “Progress toward the non-invasive determination of animal swimming and feeding dynamics,” *15th U.S. National Congress on Theoretical and Applied Mechanics*, June 25-30, 2006, Boulder, CO.

7. “Non-invasive studies of animal propulsion and sensing,” *Mechanical Engineering, Stanford University*, May 9, 2006, Palo Alto, CA.
6. “Non-invasive studies of animal swimming and feeding,” *Center for Interdisciplinary Research in Fluid Physics Seminar, University of California at Santa Barbara*, March 1, 2006, Santa Barbara, CA.
5. “Mechanics of biological propulsion,” *Global Enterprise for Micro-Mechanics and Molecular Medicine Colloquium*, October 11-13, 2005, Boston, MA.
4. “Optimal vortex ring formation in biological flows,” *Conference on Vortex Rings and Filaments in Classical and Quantum Systems*, June 6-10, 2005, Trieste, Italy.
3. “Jellyfish swimming and the dynamics of animal vortex wakes, revisited,” *International Congress of Physiological Sciences*, March 28-30, 2005, Pasadena, CA.
2. “Optimal vortex formation as a unifying principle for biological fluid transport,” *Mechanical and Aerospace Engineering, Princeton University*, December 13, 2004, Princeton, NJ.
1. “Optimal vortex formation as a unifying principle in biological propulsion,” *Mechanical and Industrial Engineering, University of Illinois at Urbana-Champaign*, November 8, 2004, Urbana, IL.

## Conference Proceedings and Abstracts

Students and Postdoctoral Scholars underlined.

129. Schlueter-Kuck KL, **Dabiri JO** (2017) "Identification of individual coherent sets associated with flow trajectories using Coherent Structure Coloring," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
128. Troutman V, **Dabiri JO** (2017) "Non-spherical object tracking utilizing DDPIV for ocean measurements," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
127. Cardona JL, **Dabiri JO** (2017) "Toward field measurements of tree kinematics in wind," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
126. Brownstein ID, **Dabiri JO** (2017) "Aerodynamic interactions between pairs of vertical-axis wind turbines," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
125. Xu N, **Dabiri JO** (2017) "Characterization of jellyfish turning using 3D-PTV," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
124. Houghton IA, **Dabiri JO** (2017) "Swarm-scale eddies generated by collective swimmers," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
123. Costello JH, Colin SP, **Dabiri JO**, Leftwich MC (2017) "Role of body surface pressure and kinematics in fish turning," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
122. Miller MA, Duvvuri S, Brownstein ID, Lee M, **Dabiri JO**, Hultmark M (2017) "Vertical axis wind turbine experiments at full dynamic similarity," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Denver, CO.
121. Schlueter-Kuck KL, **Dabiri JO** (2016) "Coherent structure coloring: identification of coherent structures from sparse flow trajectories using graph theory," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
120. Troutman V, **Dabiri JO** (2016) "Development of a diver-operated single camera volumetric velocimetry system," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.

119. Xu N, Dabiri JO (2016) “Simultaneous measurements of jellyfish bell kinematics and flow fields using PTV and PIV,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
118. Craig AE, Dabiri JO, Koseff JR (2016) “Low order physical models of vertical axis wind turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
117. Brownstein ID, Dabiri JO (2016) “3D-PTV around operational wind turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
116. Nawroth JC, Guo H, Ruby E, **Dabiri JO**, McFall-Ngai M, Kanso E (2016) “Be together, not the same: Spatiotemporal organization of different cilia types generates distinct transport functions,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
115. Houghton IA, Dabiri JO (2016) “Measurements of fluid transport by controllable vertical migrations of plankton,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
114. Abkar M, **Dabiri JO** (2016) “An LES study of vertical-axis wind turbine wakes aerodynamics,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Portland, OR.
113. Xu N, Dabiri JO (2016) “How pacemaker numbers affect swimming behavior in jellyfish,” *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Portland, OR.
112. Lucas KN, **Dabiri JO**, Lauder GV (2016) “Pressure field measurements in the study of fish-like swimming,” *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Portland, OR.
111. **Dabiri JO, Brownstein ID** (2015) “Optimization of wind farm performance using low-order models,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
110. Araya DB, Dabiri JO (2015) “Transition to bluff body dynamics in the wake of vertical-axis wind turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
109. Craig AC, Dabiri JO, Koseff JR (2015) “Patterns of 3D flow in a rotating cylinder array,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.

108. Brownstein ID, **Dabiri JO** (2015) “In situ particle tracking around kW sized wind turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
107. Colin SP, Gemmell BJ, Costello JH, Morgan JR, **Dabiri JO** (2015) “Efficient swimmers use bending kinematics to generate low pressure regions for suction-based swimming thrust,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
106. Zenit R, **Dabiri JO** (2015) “The dynamics of a vortex ring crossing a density interface,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
105. Lucas KN, **Dabiri JO**, Lauder GV (2015) “Application of PIV-based pressure measurements to the study of aquatic propulsion,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
104. Costello JH, Colin SP, Gemmell BJ, **Dabiri JO**, Sutherland KR (2015) “Multi-jet propulsion organized by clonal development in a colonial siphonophore,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
103. Schlueter KL, **Dabiri JO** (2015) “Pressure evolution in the shear layer of vortex rings as an indicator of pinch-off,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
102. Nawroth JC, **Dabiri JO** (2015) “Hydrodynamic interactions of bacteria and particles with ciliated surfaces,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Boston, MA.
101. Hezaveh SH, Bou-Zeid E, Lohry M, Martinelli L, Kinzel M, **Dabiri JO** (2015) “Multiscale simulations of vertical-axis wind turbines using offline-coupled LES and URANS,” *International Conference on Model Integration across Disparate Scales in Complex Turbulent Flow Simulation*, June 15-17, 2015, State College, PA.
100. Nawroth JC, Guo H, **Dabiri JO**, Kanso E, McFall-Ngai MJ (2014) “Beyond the mucus escalator: Complex ciliary hydrodynamics in disease and function,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
99. Wilhelmus MM, Collins S, Nawroth JC, Gemmell BJ, **Dabiri JO** (2014) “A hybrid numerical-experimental study of fluid transport by migrating zooplankton aggregations,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.

98. Araya DB, Dabiri JO (2014) "Velocity measurements in the wake of laboratory-scale vertical axis turbines and rotating circular cylinders," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
97. Brownstein ID, Araya DB, Kinzel M, Dabiri JO (2014) "In situ measurements of the flow around a single vertical-axis wind turbine," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
96. Schlueter KL, Braun NO, Dabiri JO (2014) "A pressure-based analysis of vortex ring pinch-off," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
95. **Dabiri JO**, Lucas KN, Thornycroft PJM, Lauder GV (2014) "PIV-based pressure, force, and torque measurements of a robotic model swimmer," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
94. Kinzel M, Araya DB, Dabiri JO (2014) "Comparison between vertical-axis wind turbine arrays and plant canopies," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
93. Craig AE, Dabiri JO, Koseff JR (2014) "Mean and turbulent flow development through an array of rotating elements," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Francisco, CA.
92. Ryan KJ, Coletti F, **Dabiri JO**, Eaton JK (2014) "Three-dimensional velocity measurements around and downstream of a rotating vertical-axis wind turbine," *ASME Turbo Expo*, June 16-20, Dusseldorf, Germany.
91. Sutherland KR, Costello JH, Colin SP, Dabiri JO (2014) "Ambient fluid motions influence swimming and feeding by the ctenophore Mnemiopsis leidyi," *ASLO/AGU Ocean Sciences Meeting*, February 20-24, Honolulu, HI.
90. Nawroth JC, Dabiri JO (2013) "The Hawaiian bobtail squid as a model system for selective particle capture in microfluidic systems," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
89. Kinzel M, Araya D, Dabiri JO (2013) "Kinetic energy transport in a vertical-axis wind turbine array," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
88. Coletti F, Ryan L, **Dabiri JO**, Eaton J (2013) "Three-dimensional velocity measurements around a rotating vertical axis wind turbine," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.

87. Araya D, Dabiri JO (2013) “Experimental investigation of the wake characteristics of flow-powered and motorized laboratory-scale wind turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
86. Pierce B, Moin P, **Dabiri JO** (2013) “Evaluation of drag forcing models for vertical axis wind turbine farms,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
85. Craig AE, Zeller R, Zarama FJ, Weitzman J, **Dabiri JO**, Koseff JR (2013) “The horizontal planar structure of kinetic energy in a model vertical-axis wind turbine array,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
84. Whittlesey RW, Dabiri JO (2013) “Optimal propulsive efficiency of vortex enhanced propulsion,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
83. Martinez-Ortiz M, Dabiri JO (2013) “Local fluid transport by planktonic swarms,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
82. O’Farrell C, Dabiri JO (2013) “Nested contour-dynamic models for axisymmetric vortex rings and vortex wakes,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Pittsburg, PA.
81. Nawroth JC, Lee H, Feinberg AW, Ripplinger CM, McCain ML, Grosberg A, Dabiri JO, Parker KK (2012) “Learning from real and tissue-engineered jellyfish: How to design and build a muscle-powered pump at intermediate Reynolds numbers,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
80. Whittlesey RW, Dabiri JO (2012) “Total energetic efficiency of a passively-pulsed underwater vehicle,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
79. O’Farrell C, Dabiri JO (2012) “Perturbation response of vortex rings and dipoles,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
78. Kinzel M, Araya D, Dabiri JO (2012) “The influence of rotor configurations on the energy production in an array of vertical-axis wind turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
77. Martinez-Ortiz MP, Dabiri JO (2012) “Scalar transport by planktonic swarms,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.



76. Araya D, **Dabiri JO** (2012) “Low-order flow modeling of vertical-axis wind turbine arrays,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
75. Taylor KA, **Dabiri JO** (2012) “Start-up dynamics of vertical-axis turbines,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
74. Fu M, **Dabiri JO** (2012) “Flow behavior around counter-rotating turbines in steady flow,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, San Diego, CA.
73. Colin SP, Sutherland KR, Costello JH, **Dabiri JO** (2012) “Effects of foraging mode and turbulence on the encounter rates of the lobate ctenophore *Mnemiopsis Leidy*,” *ASLO/AGU Ocean Sciences Meeting*, February 20-24, Salt Lake City, UT.
72. Sutherland KR, **Dabiri JO**, Costello JH, Colin SP (2012) “Fluid interactions during predation by the invasive ctenophore *Mnemiopsis Leidy*,” *ASLO/AGU Ocean Sciences Meeting*, February 20-24, Salt Lake City, UT.
71. Whittlesey RW, **Dabiri JO** (2011) “Improving propulsive efficiency through passive mechanisms using a Starling vortex generator,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Baltimore, MD.
70. Martinez-Ortiz MP, **Dabiri JO** (2011) “Laboratory studies of ocean mixing by microorganisms,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Baltimore, MD.
69. Nawroth JC, **Dabiri JO** (2011) “Lessons learned from the jellyfish: Fluid transport at intermediate Reynolds numbers,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Baltimore, MD.
68. Kinzel M, Mulligan Q, **Dabiri JO** (2011) “Quantitative full-Scale wind turbine flow measurements,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Baltimore, MD.
67. O’Farrell C, **Dabiri JO** (2011) “The formation of vortex rings from elliptical nozzles,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Baltimore, MD.
66. Mulligan Q, Kinzel M, **Dabiri JO** (2011) “Wind resource evaluation at the Caltech Field Laboratory for Optimized Wind Energy,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Baltimore, MD.

65. Nawroth JC, Dabiri JO (2011) “Jellyfish-inspired fluid transport at intermediate Reynolds numbers,” *48th Annual Technical Conference of The Society of Engineering Sciences*, October 12-14, Evanston, IL.
64. **Dabiri JO** (2010) “Caltech’s Fish-inspired Wind Farm: Results from the first summer,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Long Beach, CA.
63. Kinzel M, Dabiri JO (2010) “A compact Self-Contained Underwater Velocimetry Apparatus (SCUVA) for in situ field measurements in daytime,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Long Beach, CA.
62. Nawroth JC, Dabiri JO (2010) “Learning from jellyfish: Fluid transport in muscular pumps at intermediate Reynolds numbers,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Long Beach, CA.
61. O’Farrell C, Dabiri JO (2010) “The stability of a family of vortex rings,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Long Beach, CA.
60. Sutherland KR, Dabiri JO, Koehl MAR (2010) “Marine ostracod swimming behavior in the benthic boundary layer under different field flow conditions,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Long Beach, CA.
59. Whittlesey RW, Dabiri JO (2010) “Passively pulsed propulsion of aquatic vehicles,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Long Beach, CA.
58. 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.
57. Nawroth JC, Dabiri JO (2010) “Adaptive phenotypic plasticity in juvenile Scyphomedusae facilitates effective animal-fluid interaction,” *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Seattle, WA.
56. Breitburg DL, Crump BC, Dabiri JO, Gallegos CL (2010) “Ecosystem engineers in the pelagic realm: Habitat alteration by species ranging from microbes to jellyfish,” *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Seattle, WA.
55. 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.

54. O'Farrell C, **Dabiri JO** (2009) "A Lagrangian approach to identifying vortex pinch-off," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Minneapolis, MN.
53. Whittlesey RW, **Dabiri JO** (2009) "Fish schooling as a basis for wind farm design," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Minneapolis, MN.
52. **Dabiri JO**, Colin SP, Katija K, Costello JH (2009) "A wake-based correlate of swimming performance in seven jellyfish species," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 22-24, Minneapolis, MN.
51. Peng J, **Dabiri JO** (2009) "A fluid mechanical model for mixing in a plankton predator-prey system," *European Geosciences Union General Assembly*, April 19-24, Vienna, Austria.
50. Colin SP, Costello JH, Hansson LJ, Titelman, J, **Dabiri JO** (2009) "Fluid interactions of the lobate ctenophore *Mnemiopsis leidyi*," *American Society of Limnology and Oceanography Aquatic Sciences Meeting*, January 25-30, Nice, France.
49. **Dabiri JO**, Peng J, Colin SP, Costello JH (2009) "A new fluid dynamic model for analysis of planktonic predator-prey systems and small-scale fluid motions," *American Society of Limnology and Oceanography Aquatic Sciences Meeting*, January 25-30, Nice, France.
48. Nawroth JC, Ripplinger CM, Feinberg AW, **Dabiri JO**, Parker KK (2009) "Optical mapping of electrical impulse propagation in the striated muscle of live jellyfish," *Program of European Neuroscience Schools*, January 11-18, Obergurgl, Austria.
47. Peng J, **Dabiri JO** (2009) "A fluid mechanical model for current-generated feeding of jellyfish and the effect of prey size and escape forces," *Society for Integrative and Comparative Biology Annual Meeting*, January 3-7, Boston, MA.
46. **Dabiri JO** (2008) "The 'upstream wake' of swimming and flying animals revealed by Lagrangian Coherent Structures," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Antonio, TX.
45. 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.
44. Peng J, **Dabiri JO** (2008) "A fluid mechanical model for current-generating, feeding jellyfish," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Antonio, TX.

43. Ruiz L, **Dabiri JO** (2008) "Propulsive performance comparison of a steady and unsteady self-propelled swimmer," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Antonio, TX.
42. Miller MD, **Dabiri JO** (2008) "Potential vortex model for wind power extraction," *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, San Antonio, TX.
41. **Dabiri JO**, Peng J (2008) "The 'upstream wake' of swimming and flying animals and its correlation with propulsive efficiency," *International Congress of Theoretical and Applied Mechanics*, August 25-29, Adelaide, Australia.
40. Katija K, **Dabiri JO** (2008) "Scaling of wake energy and propulsive efficiency of two representative jellyfish species: *Aurelia* and *Mastigias*," *International Congress of Theoretical and Applied Mechanics*, August 25-29, Adelaide, Australia.
39. Peng J, Miller MD, **Dabiri JO** (2008) "The fluid mechanical basis of jellyfish feeding and the effects of prey size and escape forces," *International Congress of Theoretical and Applied Mechanics*, August 25-29, Adelaide, Australia.
38. Trevino LA, **Dabiri JO** (2008) "Experimental comparison of a steady and unsteady self-propelled swimmer," *International Congress of Theoretical and Applied Mechanics*, August 25-29, Adelaide, Australia.
37. Regula C, Colin SP, **Dabiri JO**, Costello JH, Katija K (2008) "Feeding determinants in the cruising hydromedusae *Aequoria victoria*," *Proceedings of the American Society of Limnology and Oceanography 2008 Ocean Sciences Meeting*, March 2-7, Orlando, FL.
36. Peng J, **Dabiri JO** (2008) "Optimal stroke patterns for a model jellyfish swimmer with thin, flexible body," *Society for Integrative and Comparative Biology Annual Meeting*, January 2-8, San Antonio, TX.
35. Katija K, **Dabiri JO** (2008) "Comparing the energetics of jellyfish motion: laboratory and field measurements using a Self-Contained Underwater Velocimetry Apparatus (SCUVA)," *Society for Integrative and Comparative Biology Annual Meeting*, January 2-8, San Antonio, TX.
34. **Dabiri JO**, Colin SP, Costello JH (2007) "Fluid dynamic constraints on morphology and propulsion of medusae at low Reynolds numbers," Session on Ontogeny and Fluid Dynamics, *American Geophysical Union Fall Meeting*, December 10-14, San Francisco, CA.
33. Katija K, **Dabiri JO** (2007) "Comparing the energetics of jellyfish motion: laboratory and field measurements using a Self-Contained Underwater Velocimetry Apparatus (SCUVA)," Session on Ontogeny and Fluid Dynamics, *American Geophysical Union Fall Meeting*, December 10-14, San Francisco, CA.

32. Weston J, Colin SP, Costello JH, **Dabiri JO** (2007) “Developmental changes in the form and function of rowing hydromedusae,” Session on Ontogeny and Fluid Dynamics, *American Geophysical Union Fall Meeting*, December 10-14, San Francisco, CA.
31. Feitl KE, Millett AF, Costello JH, Colin SP, **Dabiri JO** (2007) “Functional morphology and fluid interactions during early development of scyphomedusae,” Session on Ontogeny and Fluid Dynamics, *American Geophysical Union Fall Meeting*, December 10-14, San Francisco, CA.
30. **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.
29. 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.
28. Peng J, **Dabiri JO** (2007) “Optimal stroke patterns for a model jellyfish swimmer with thin, flexible body,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, Salt Lake City, UT.
27. Trevino LA, **Dabiri JO** (2007) “Experimental comparison of steady and unsteady propulsion of a self-propelled swimmer,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 18-20, Salt Lake City, UT.
26. 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, Brisbane, Australia.
25. Peng J, **Dabiri JO** (2007) “Hydrodynamic force evaluation based on vortex structure,” *Southern California Symposium on Flow Physics*, April 7, Pasadena, CA.
24. 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.
23. Katija K, **Dabiri JO** (2007) “Tethering versus free-swimming: a wake analysis of *Aurelia aurita*,” *Society for Integrative and Comparative Biomechanics Annual Meeting*, January 3-7, Phoenix, AZ.
22. Costello JH, Colin SP, **Dabiri JO** (2007) “Morphological diversity of medusan lineages in shaped by animal-fluid interactions,” *Proceedings of the American Society of Limnology and Oceanography 2007 Aquatic Sciences Meeting*, February 4-9, Santa Fe, NM.

21. **Dabiri JO** (2006) “A vorticity-free approach to wake-based swimming/flying force estimation,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Tampa, FL.
20. Peng J, **Dabiri JO** (2006) “Identification of vortex structures in the wake of swimming and flying animals,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Tampa, FL.
19. 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.
18. Shadden SC, Katija K, **Dabiri JO**, Marsden JE (2006) “Transport induced by vortex formation,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 19-21, Tampa, FL.
17. Peng J, **Dabiri JO** (2006) “Determination of vortex structures in the wake of swimming and flying animals,” *World Congress of Biomechanics*, July 29-August 4, Munich, Germany.
16. Katija K, Gharib M, **Dabiri JO** (2006) “Flow-induced flutter of prosthetic heart valves,” *World Congress of Biomechanics*, July 29-August 4, Munich, Germany.
15. **Dabiri JO** (2005) “On the estimation of swimming and flying forces from wake measurements,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Chicago, IL.
14. 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.
13. Shadden SC, **Dabiri JO**, Marsden JE (2005) “Geometry of unsteady flows,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 20-22, Chicago, IL.
12. Thomas AMP, **Dabiri JO**, Mohseni K, Burdick JW (2005) “Synthetic jet propulsion for small underwater vehicles,” *14th International Symposium on Unmanned Untethered Submersible Technology*, August 21-24, Durham, NH.
11. **Dabiri JO**, Colin SP, Costello JH, Gharib M (2005) “Flow patterns generated by oblate medusan swimmers: *in situ* observation and analysis,” *Proceedings of the American Society of Limnology and Oceanography 2005 Aquatic Sciences Meeting*, February 20-25, Salt Lake City, UT.

10. **Dabiri JO**, Gharib M (2004) “Fluid transport by pulsed-jet swimmers: entrainment and added mass in vortex wakes,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Seattle, WA.
9. Krueger PS, **Dabiri JO**, Gharib M (2004) “The formation number of vortex rings formed in the presence of uniform background co-flow,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 21-23, Seattle, WA.
8. **Dabiri JO**, Morell R, Thompson N, Gharib M (2003) “Vortex rings as an essential feature of animal swimming,” *International Symposium on Aqua Bio-mechanisms*, September 14-17, Honolulu, HI.
7. Krueger PS, **Dabiri JO**, Gharib M (2003) “Swimming performance limits in vortex ring-based propulsive mechanisms,” *International Symposium on Aqua Bio-mechanisms*, September 14-17, Honolulu, HI.
6. **Dabiri JO**, Milano M, Gharib M (2003) “Generalization and optimization of biological and biomimetic ejection mechanisms,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 23-25, East Rutherford, NJ.
5. **Dabiri JO**, Gharib M (2002) “Toward empirical evaluation of left ventricle function: a novel mathematical mapping,” *Joint Meeting of the IEEE Engineering in Medicine and Biology Society and the Biomedical Engineering Society*, October 23-26, Houston, TX.
4. **Dabiri JO**, Krueger PS, Gharib M (2002) “The effect of uniform background flow on vortex ring formation and pinch-off,” *Bulletin of the American Physical Society Division of Fluid Dynamics Meeting*, November 24-26, Dallas, TX.
3. **Dabiri JO** (2002) “Ejection mechanisms and kinematics of the left ventricle,” *Proceedings of the 2002 Southern California Biomedical Engineering Symposium*, January 18, Los Angeles, CA.
2. **Dabiri JO** (2000) “Analysis of ejection mechanisms and vortex dynamics during hydrozoan jelly locomotion,” *Proceedings of the 2000 California Institute of Technology Fellowship Seminars*, August 15 and September 18, Pasadena, CA.
1. **Dabiri JO** (1999) “Analysis and optimization of small-scale rotor blades using computational fluid dynamics and experimental methods,” *Proceedings of the Ninth NASA Space Grant Conference*, August 15, Hoboken, NJ.

## Patents and Patent Applications

- “Self-Contained Underwater Velocimetry Apparatus” U.S. Patent No. 7,864,305  
“Two-Dimensional Array of Turbines” U.S. Patent No. 8,545,168  
“Methods and systems for comparing vertical axis turbine arrays and providing configurations thereof” U.S. Patent No. 8,949,097 and 9,399,981  
“V-shaped arrangements of turbines” U.S. Patent No. 9,175,669  
“Devices and methods for harvesting power from arrays of wind turbines” U.S. Patent No. 9,214,811  
“Tissue-engineered pumps and valves and uses thereof” U.S. Patent No. 9,669,141

## Teaching Experience

### Stanford University

#### **Instructor (2015 – present)**

- Fluid Mechanics (Mechanical Engineering). Taught 2016-2017.  
Mechanics of Fluids (Civil and Environmental Engineering). Taught 2015-2016.  
Physics of Wind Energy (Civil and Environmental Engineering and Mechanical Engineering).  
*Newly developed course.* Taught 2015-2016.  
Principles of Mechanical Measurements (Mechanical Engineering). *Newly developed course.*  
Taught 2016-2017.

### California Institute of Technology

#### **Instructor (2005 – 2015)**

- Biological Flows: Propulsion (Aeronautics/Bioengineering 242; one-term course). *Newly developed course.* Taught 2005-2006, 2006-2007, 2010-2011.  
Biomechanics (Bioengineering 5/105; one-term course). Taught 2009-2010, 2011-2012. *Taught as a Freshman Seminar in 2011-2012.*  
Experimental Methods (Aeronautics/Applied Physics 104; three-term course). Taught 2007-2008, 2008-2009. *New laboratory component in 2008-2009.*  
Fluid Mechanics (Mechanical Engineering 19; two-term course). Taught 2011-2012, 2013-2014.

#### **Participating Faculty (2006)**

- Frontiers in Dynamical Systems (Control and Dynamical Systems 273).

#### **Guest Lecturer (2002 – 2005)**

- Bio-fluid Mechanics (Bioengineering/Aeronautics 243, 2003 – 2005).  
Advanced Fluid Mechanics (Aeronautics 201, 2002).

#### **Research Co-mentor (2002 – 2004)**

- Summer Undergraduate Research Fellowship Program

### Princeton University

#### **Study Hall Instructor (2000 – 2001)**

- Freshman Physics and Mathematics



**Tutor (1998 – 2000)**

Freshman Physics and Mathematics

**Laboratory Instructor (1998 – 1999)**

Introduction to Computer Science

**Professional Service**

Member, U.S. National Committee for Theoretical and Applied Mechanics, (2013 – present)

Member, American Physical Society Division of Fluid Dynamics ExComm (2014 – present)

Guest Editor, *Proceedings of the National Academy of Sciences* (2012 – present)

Editorial Board, *Journal of Fluid Mechanics* (2016 – present)

Editorial Board, *Journal of the Royal Society Interface* (2014 – present)

Co-Chairman (with T. Zohdi), AmeriMech Symposia, U.S. National Committee for Theoretical and Applied Mechanics, (2015 – present)

Referee (2005 – present)

*Bioinspiration and Biomimetics, Chaos, Computers and Fluids, European Journal of Fluid Mechanics, Experimental Mechanics, Experiments in Fluids, Geophysical Research Letters, Integrative and Comparative Biology, International Journal of Marine Sciences, Journal of Computational Physics, Journal of Experimental Biology, Journal of Fluid Mechanics, Journal of Fluids and Structures, Journal of Nonlinear Science, Journal of Visualization, Nature Energy, Ocean Modelling, Physical Review Letters, Physics Letters A, Physics of Fluids, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society A, Research Letters in Ecology, Scientia Marina, Theoretical and Computational Fluid Dynamics, National Science Foundation (mail and panel review), U.S. Agency for International Development*

Advisory Council, Princeton University Department of Mechanical and Aerospace Engineering (2015 – present)

Board of Advisors, University of California at Riverside Department of Mechanical Engineering (2016 – present)

External Research Advisory Committee, Cabrillo Marine Aquarium (2007 – present)

Organizing Committee, International Conference on Theoretical and Applied Mechanics (2016)

Defense Science Study Group (2014 – 2015)

Organizing Committee, SIAM Conference on Applications of Dynamical Systems (2013)

Guest Editor, Special Issue on Wind Energy, *Journal of Turbulence* (2013)

American Physical Society Committee on Media and Science Relations (2013 – 2014)

American Physical Society Andreas Acrivos Award Committee (2010 – 2011, 2015 – 2016; Chair, 2011; Vice Chair, 2015)

Organizing Committee, American Physical Society Division of Fluid Dynamics 2010 Meeting (2006 – 2010)

Minisymposium Co-Organizer, “Wind Energy Fluid Dynamics,” American Physical Society Division of Fluid Dynamics Meeting (2011)

Minisymposium Co-Organizer, “Biological Perspectives on Locomotion,” American

Physical Society Division of Fluid Dynamics Meeting (2010)  
Minisymposium Organizer, “Lagrangian Coherent Structures in Fluid Flows,” American  
Physical Society Division of Fluid Dynamics Meeting (2008)  
Handling Editor, *Theoretical and Computational Fluid Dynamics* (2007 – 2009)  
Guest Editor, Special Issue on Lagrangian Coherent Structures, *Chaos* (2009)

## **Academic Service**

### **Stanford University**

Director, Catalyst for Collaborative Solutions (2016 – present)  
Long-Range Planning Area Steering Group for Research (2017 – present)  
Elected Member, Senate of the Academic Council (2017 – 2019)  
Committee on Undergraduate Admissions and Financial Aid (2017 – present)  
Committee on Graduate Student Experience, Mechanical Engineering (2016 – present; Co-chair  
2016)  
Vision Committee, Civil and Environmental Engineering (2017 – present)  
Frontiers in Civil and Environmental Engineering Seminar Series Committee (2016 – present)  
Faculty Resource Advisor, DARE (Diversifying Academia, Retaining Excellence) Doctoral  
Fellowship Program (2016 – present)  
Selection Advisory Committee, DARE (Diversifying Academia, Retaining Excellence) Doctoral  
Fellowship Program (2016 – present)  
Faculty Athletics Fellow, Men’s Soccer Team (2016 – present)  
Center for Turbulence Research Steering Committee (2015 – 2017)  
Graduate Curriculum Committee, Mechanical Engineering (2015 – 2016)  
Coordinator, Fluid Mechanics Seminar Series (Winter term, 2015 – 2016)

### **California Institute of Technology**

Dean of Undergraduate Students (2014 – 2015)  
Director, Center for Bioinspired Wind Energy (2010 – 2015)  
Faculty Board (2007 – 2015; Vice Chair, 2011 – 2012; Chair, 2013 – 2014; *ex officio*, 2014 –  
2015)  
Board of Trustees Institute-Alumni Relations Committee (*ex officio*, 2013 – 2015)  
Institute Administrative Council (*ex officio*, 2013 – 2015)  
Committee on Undergraduate Education (*ex officio*, 2013 – 2015)  
Curriculum Committee (*ex officio*, 2013 – 2015)  
Core Curriculum Steering Committee (*ex officio*, 2013 – 2015)  
Convocations Committee (*ex officio*, 2013 – 2015)  
Scholarships and Financial Aid Committee (*ex officio*, 2013 – 2015)  
Student Life and Housing Committee (*ex officio*, 2013 – 2015)  
Undergraduate Academic Standards and Honors Committee (*ex officio*, 2013 – 2015)  
Administrative Management Council (*ex officio*, 2013 – 2014)  
Athenaeum House Committee (*ex officio*, 2013 – 2014)  
Committee on Online Education (2013 – 2014)  
Faculty Committee on Membership and Bylaws (Chair *ex officio*, 2011 – 2012)  
Convocation Committee (*ex officio*, 2011 – 2012)

Summer Undergraduate Research Fellowship Administrative Committee (2009 – 2014)  
Review Committee, Senior Research Fellow, Associate and Lecturer Appointments (2006 – 2015)  
Faculty Co-chair, Graduate Student-Faculty Colloquium (2012)  
Faculty Search Committee, (Applied Physics, 2007 – 2008; Bioengineering, 2006 – 2009; Biology, 2006 – 2010; Mechanical Engineering, 2009 – 2011)  
Faculty Club Advisor, Techers for a Sustainable Future (2013 – 2015)  
Faculty Club Advisor, Caltech Christian Fellowship (2013 – 2015)  
Faculty Club Advisor, Korean Campus Crusade for Christ (2013 – 2015)  
Bioengineering Undergraduate Curriculum Committee (2007 – 2009)  
Graduate Admissions Committee (Aeronautics, 2005 – present; Bioengineering, 2007 – 2008)  
GALCIT Awards Committee (2009)  
GALCIT Machine Shop Committee (2007 – 2008)  
Selection Committee, Richard Bruce Chapman Memorial Award in Hydrodynamics (2009)  
Selection Committee Chair, Demetriades-Tsafka Prize in Bioengineering/Related Fields (2007)  
Panel Member, Academic Job Search, Women-Mentoring-Women Program (2008)  
Panel Member, New Faculty Seminar (2008)  
Panel Member, Caltech Project for Effective Teaching (2007)  
Coordinator, GALCIT Colloquium (2013 – 2014)  
Coordinator, GALCIT Research Conference (2006 – 2007, 2010 – 2011)  
Coordinator, Bioengineering Seminar Series (2005 – 2006)  
Coordinator, Freshman Summer Institute Research Program (2003 – 2008)  
Coordinator, Biomechanics Colloquium (2003 – 2004)  
Student Representative, Option in Bioengineering (2002)  
Graduate Review Board (2002)  
Graduate Student Council Board of Directors (2001 – 2002)

### **Princeton University**

Advisory Council, Mechanical and Aerospace Engineering, Princeton University (2014 – present)  
Alumni Schools Committee, Princeton University (2001 – 2004)  
Undergraduate Engineering Committee, Princeton University (2000 – 2001)  
School of Engineering Leadership Council, Princeton University (2000)

### **Other**

Professional Staff Selection Committee, University of Toledo (2001)

## **Current Graduate Students & Postdoctoral Scholars**

Ian Brownstein, B.S. (Brown University), M.S. (California Institute of Technology)  
Jennifer Cardona, B.S. (Brown University)  
Isabel Houghton, B.S. (University of California at Berkeley)  
Kristy Schlueter, B.S. (University of Notre Dame), M.S. (University of Maryland)  
Valerie Troutman, B.S. (University of Minnesota), M.S. (Stanford University)  
Nicole Xu, B.S. (University of Pennsylvania), M.S. (California Institute of Technology)

## **Former Graduate Students & Postdoctoral Scholars**

Monica Martinez Wilhelmus, Ph.D. (Mechanical Engineering), 2015  
Daniel Araya, Ph.D. (Aeronautics), 2015  
Robert W. Whittlesey, Ph.D. (Aeronautics), 2013  
Clara O'Farrell, Ph.D. (Control and Dynamical Systems), 2013  
Janna C. Nawroth, Ph.D. (Biology), 2012  
Kakani Katija Young, Ph.D. (Bioengineering), 2010  
Lydia Ann Ruiz, Ph.D. (Mechanical Engineering), 2009  
Jifeng Peng, Ph.D. (Bioengineering), 2009  
Madeline Diane Miller, M.S. (Mechanical Engineering), 2009  
Cole D. Lepine, M.S. (Control and Dynamical Systems), 2008  
Ann-Marie Polsenberg-Thomas, Ph.D. (Mechanical Engineering), 2006  
Mahdi Abkar, Postdoctoral Scholar (Mechanical Engineering), 2017  
Matthias Kinzel, Postdoctoral Scholar (Aeronautics), 2014  
Janna C. Nawroth, Postdoctoral Scholar (Bioengineering), 2013  
Kelly Rakow Sutherland, Postdoctoral Scholar (Bioengineering), 2011  
Shawn C. Shadden, Postdoctoral Scholar (Bioengineering), 2006

## **Ph.D. Dissertation Committees**

Daniel Borup, Mechanical Engineering  
Aditya Ghate, Aeronautics and Astronautics  
Rivers Ingersoll, Mechanical Engineering  
Haripriya Mukundarjan, Bioengineering  
Esteban Hufstedler, Aerospace, Caltech  
Bryan Schmidt, Aerospace, Caltech  
Santiago Padron, Aeronautics and Astronautics (Ph.D. 2017)  
Uche Monu, Electrical Engineering (Ph.D. 2017)  
Anna Craig, Mechanical Engineering (Ph.D. 2017)  
Justin Briggs, Materials Science and Engineering (Ph.D. 2017)  
Hsieh-Chen Tsai, Mechanical Engineering, Caltech (Ph.D. 2016)  
Kevin Ryan, Mechanical Engineering (Ph.D. 2016)  
Clara Druzgalski, Mechanical Engineering (Ph.D. 2016)  
Georgios Katsikis, Bioengineering (Ph.D. 2016)  
Reeve Dunne, Mechanical Engineering, Caltech (Ph.D. 2015)  
Julia Cosse, Aeronautics, Caltech (Ph.D. 2014)

Joy Zhao, Electrical Engineering, Caltech (Ph.D. 2014)  
Adrianus Aria, Aeronautics, Caltech (Ph.D. 2013)  
Hesham Azizgolshani, Bioengineering, Caltech (Ph.D. 2013)  
Philipp Boettcher, Aeronautics, Caltech (Ph.D. 2012)  
Wendian Shi, Electrical Engineering, Caltech (Ph.D. 2012)  
Pablo Abad-Manterola, Mechanical Engineering, Caltech (Ph.D. 2011)  
John Meier, Mechanical Engineering, Caltech (Ph.D. 2011)  
Daegyoun Kim, Aeronautics, Caltech (Ph.D. 2010)  
Jeff Krimmel, Mechanical Engineering, Caltech (Ph.D. 2010)  
Philip DuToit, Control and Dynamical Systems, Caltech (Ph.D. 2009)  
Jennifer Franck, Mechanical Engineering, Caltech (Ph.D. 2009)  
Brian Kot, Ecology and Evolutionary Biology, UCLA (Ph.D. 2009)  
Ben Lin, Bioengineering, Caltech (Ph.D. 2009)  
Mike Liu, Bioengineering, Caltech (Ph.D. 2009)  
Emily McDowell, Bioengineering, Caltech (Ph.D. 2009)  
Gwyneth Card, Bioengineering, Caltech (Ph.D. 2008)  
Derek Rinderknecht, Bioengineering, Caltech (Ph.D. 2008)  
Kunihiko Taira, Mechanical Engineering, Caltech (Ph.D. 2008)  
Laurence Loumes, Aeronautics, Caltech (Ph.D. 2007)  
Ann-Marie Polsenberg-Thomas, Mechanical Engineering, Caltech (Ph.D. 2006)  
Shawn Shadden, Control and Dynamical Systems, Caltech (Ph.D. 2006)

### **Undergraduate Research Advisees**

Kelyn Wood (2017, SURI)  
Marina Dimitrov (2017, SURI)  
Carrie von Muench (2016 – 2017)  
Minh Ngo Duc (2016 – 2017, SURI)  
Sara Berg-Love (2016 – 2017, SURI)  
Claudia Brunner (2016)  
Shalini Majumdar (2014)  
Leslie Timms (2014)  
Vivian Huang (2013 – 2014, SURF)  
Nicole Xu (2013, SURF)  
Kelsey Lucas (2013)  
Aditya Bhattaru (2012)  
Matt Fu (2012, SURF, Senior Thesis, Mechanical Engineering)  
Timea Kosztin (2012)  
Katherine Taylor (2012, SURF)  
Anna Craig (2011 – 2012, SURF, Senior Thesis, Applied Physics)  
Megan Larisch (2011, SURF)  
Quinn Mulligan (2011, SURF)  
Brad Saund (2011, SURF)  
Garrett Lewis (2010 – 2011, Senior Thesis, Applied Physics)  
Joseph Laurenti (2010, SURF)  
Caitlin Regan (2010, SURF)

Karthik Balakrishnan (2008 – 2009, Senior Thesis, Mechanical Engineering)  
Brant Belson (2006, SURF)  
Fei Yang (2008, SURF)  
Zhonglin Zhang (2007 – 2008, Senior Thesis, Control and Dynamical Systems)

### **Professional Affiliations**

American Association for the Advancement of Science  
American Geophysical Union  
American Institute for Aeronautics and Astronautics  
American Physical Society  
American Society of Mechanical Engineers  
IEEE Engineering in Medicine and Biology Society  
Sigma Xi National Research Honor Society  
Society for Integrative and Comparative Biology  
Tau Beta Pi National Engineering Honor Society