

HOUSHUO JIANG

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EDUCATION:

- 2000 Johns Hopkins University, Baltimore, Maryland, Ph.D. (Oceanography)
- 1998 Johns Hopkins University, Baltimore, Maryland, M.A. (Oceanography)
- 1996 Nanjing University, Nanjing, Jiangsu, China, M.S. (Atmospheric Dynamics & Mesoscale Meteorology)
- 1993 Nanjing University, Nanjing, Jiangsu, China, B.S. (Meteorology)

PROFESSIONAL EXPERIENCE:

- 11/2017 – present Senior Scientist, Woods Hole Oceanographic Institution
- 04/2011 – 11/2017 Associate Scientist with Tenure, Woods Hole Oceanographic Institution
- 01/2007 – 04/2011 Associate Scientist w/o Tenure, Woods Hole Oceanographic Institution
- 12/2002 – 01/2007 Assistant Scientist, Woods Hole Oceanographic Institution
- 04/2002 – 11/2002 Postdoctoral Investigator, Woods Hole Oceanographic Institution
- 10/2000 – 03/2002 Postdoctoral Scholar, Woods Hole Oceanographic Institution
- 09/1996 – 09/2000 Research Assistant, Johns Hopkins University, Baltimore, MD
- 09/1997 – 12/1999 Teaching Assistant, Johns Hopkins University, Baltimore, MD
- 09/1991 – 07/1996 Research Assistant, Nanjing University, Nanjing, Jiangsu, China
- 09/1994 – 07/1995 Teaching Assistant, Nanjing University, Nanjing, Jiangsu, China

PROFESSIONAL AFFILIATIONS:

- American Society of Limnology and Oceanography (ASLO)
- American Geophysical Union (AGU)
- American Physical Society (APS)
- The Society for Integrative & Comparative Biology (SICB)

RESEARCH INTERESTS:

- Small-scale biological-physical interactions in the plankton
- Behavioral, physical, and sensory ecology of marine organisms
- Plankton fluid dynamics; Bio-fluid dynamics; Ecological fluid dynamics
- Applied computational fluid dynamics
- Mesoscale atmospheric numerical modeling over the ocean

PROFESSIONAL ACTIVITIES:*Inside WHOI (Non-Education Related):*

- AOP&E Department Chair Search Committee (December 2015 – February 2016)
- WHOI Advisory Committee Member for the OUC-WHOI Joint Research Center (May – December 1, 2015)
- Member of the *Ad Hoc* Review Committee for the Innovative Technology Awards (October 2013)
- Member of the *Ad Hoc* Review Panel for the Ocean Life Institute Awards (August 2009)
- Information Technology Advisory Committee Member (March 2005 – January 2009)
- AOP&E Department Chair Search Committee (December 2008)
- Member of the *Ad Hoc* Promotion Committee for Assistant to Associate Scientist (June – September 2007)
- AOP&E Department Seminar Coordinator (January 2004 – March 2005)

Outside WHOI:

- Guest Associate Editor for Physical Oceanography – Research Topic “Multi-scale fluid physics in oceanic flows: new insights from laboratory experiments and numerical simulations” in the journal *Frontiers in Marine Science*
- Handling Editor for the journal *Frontiers in Earth Science (Marine Geoscience Section)*
- Guest Editor for the special issue “Ecological fluid dynamics” in the journal *Fluids*
- Topical Advisory Panel Member for the journal *Fluids*
- Guest Associate Editor for Marine Ecosystem Ecology – Research Topic “Small scale spatial and temporal patterns in particles, plankton, and other organisms” in the journal *Frontiers in Marine Science*
- Editorial Board Member for the journal *Surveys in Geophysics* (March 2004 – March 2009)

Session co-chair (TS47 – Biological-Physical Interaction at Individual Plankter Scale), 2005 Aquatic Sciences Meeting, February 20 – 25, 2005, Salt Lake City, Utah, USA

Journal reviewer for: *American Naturalist*; *Aquatic Biology*; *Bioinspiration & Biomimetics*; *Biological Bulletin*; *Bulletin of Mathematical Biology*; *Fluids*; *Hydrobiologia*; *Integrative & Comparative Biology*; *Journal of the Acoustical Society of America*; *Journal of Experimental Biology*; *Journal of Fish Biology*; *Journal of Fluid Mechanics*; *Journal of Geophysical Research – Oceans*; *Journal of Mathematical Biology*; *Journal of Plankton Research*; *Journal of Sea Research*; *Journal of the Royal Society Interface*; *Journal of Theoretical Biology*; *Limnology & Oceanography*; *Limnology & Oceanography: Fluids and Environments*; *Marine Biology*; *Marine Ecology Progress Series*; *Ocean Modelling*; *PLOS ONE*; *Proceedings of the Royal Society B: Biological Sciences*; *Quarterly Journal of the Royal Meteorological Society*; *Surveys in Geophysics*; *Theoretical & Computational Fluid Dynamics*

Proposal reviewer for The National Science Foundation (NSF): ANT–Antarctic Biology & Medicine; IOS–Neural Systems Cluster–Activation; IOS–Physiological & Structural Systems Cluster–Physiological Mechanisms & Biomechanics; OCE–Biological Oceanography; OCE–Major Research Instrumentation; OCE–Ocean Technology & Interdisciplinary Coordination; OCE–Physical Oceanography

Panelist for The National Science Foundation (NSF) URoL:EN Program

Proposal reviewer for The Army Research Office

Proposal reviewer for The US Department of Energy's Wind Energy Technologies Office (WETO)

Proposal reviewer for The Research Council of Norway

Proposal reviewer for The Natural Environment Research Council of UK

PARTICIPATION IN EDUCATION PROGRAM:

Guest lecturer (April 26, 2019) for MIT Course 12.823 Modeling Biol & Phys of Ocean (Instructors: Dennis McGillicuddy & Glenn Flierl, Spring 2019)

AOP&E Department Representative on the Postdoctoral Scholar Selection Committee at WHOI (December 2015 – July 2018; November – December 2020)

Chair of the AOP&E Department Postdoctoral Mentoring Committee (July 2016 – July 2018)

Member of the AOP&E Department Postdoctoral Mentoring Committee (December 2015 – July 2018)

Participated in preparing questions and answers and in grading the exams for MIT-OE Written Doctoral Part I Qualifying Examination (Hydrodynamics, January 2003; January 2006)

2003 WHOI Summer Lecture Series for Summer Student & Minority Fellows. Jiang, H. Hydrodynamics of copepods, July 17, 2003

2008 WHOI Summer Lecture Series for Summer Student & Minority Fellows. Jiang, H. Hydrodynamic signal perception by the copepod *Oithona plumifera*, July 7, 2008

AOP&E Department Representative on the Summer Student Fellowship Selection Committee at WHOI (January 2009 – January 2012)

STUDENTS AND POSTDOCTORAL RESEARCHERS ADVISED:

Ludivine Sanchez Arias, visiting Ph.D. student from University of Utah, September 2021 – August 2022. Research Topic: *Swimming behavior and hydrodynamics of cryptomonads*

Xianfei Zhang, visiting Ph.D. student from Hohai University in China, October 2019 – October 2020. Research Topic: *Numerical simulation of stratified fluid flow*

Abigail Tyrell, visiting Ph.D. student from School of Marine and Atmospheric Sciences, Stony Brook University (Committee Member, July 2016 – March 2020)

Dr. Shannon R. Davis, WHOI postdoctoral investigator, June 2012 – present (co-advised with Drs. Larry Pratt and Tom Farrar)

Dr. Kit Yu Karen Chan, WHOI postdoctoral scholar, October 2012 – March 2014 (co-advised with Dr. J. Pineda)

Dr. Kakani Katija Young, WHOI postdoctoral scholar/investigator, September 2010 – April 2014

Wei Zhang, visiting Ph.D. student from Zhejiang University in China, December 2014 – August 2016. Research Topic: *Laboratory experimental and computational fluid dynamics investigations of deep-sea hydrothermal plumes*

Xubo Zhang, visiting Ph.D. student from Tongji University in China, September 2014 – January 2016 (co-advised with Dr. Jian Lin). Research Topic: *Quantitative image analysis of deep-sea hydrothermal plumes*

Heather Beem, Ph.D. 2014, MIT/WHOI Joint Program – Ocean Engineering (Committee Member, March 2011 – August 2014)

- Mark A. Rapo, Ph.D. 2009. Rapo, M. A. (2009), CFD study of hydrodynamic signal perception by fish using the lateral line system, PhD thesis, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, USA.
- R. Thomas Sayre-McCord, WHOI summer undergraduate student fellow from The University of North Carolina at Chapel Hill, the summer of 2011 (co-advised with Dr. S. Beaulieu). Research Topic: *Analysis of kinematics and generated water flow by swimming zooplankton*
- Miles Borgen, a summer undergraduate student fellow from Western Washington University, the summer of 2011 (co-advised with Dr. S. Gallager). Research Topic: *Swimming kinematics and water flow generation by the lobster larvae through ontogeny*
- Simon Freeman, (austral) summer undergraduate student fellow from New Zealand, worked in WHOI for three months in the winter of 2004 (co-advised with Dr. M. Grosenbaugh). Research Topic: *Computation fluid dynamics simulation of vortex shedding from a fish-like body*

PARTICIPATION IN CRUISES:

- Damariscotta River Estuary Mysid Field Survey: *R/V IRA C.*, July 25-29, 2022
- Wilkinson Basin Krill, Copepod and Pteropod Field Survey: *R/V TIOGA*, November 29, 2011
- Wilkinson Basin Krill and Copepod Field Survey: *R/V TIOGA*, July 15, 2011

PAPERS IN REFEREED JOURNALS (* denotes a student or postdoc as 1st author):

- [68] **Jiang, H.** and Pechenik, J. A. (2022) Hydrodynamic role of substrate attachment in shaping the suspension-feeding current created by the marine gastropod *Crepidula fornicata*. *Invertebrate Biology*, e12383, doi:10.1111/ivb.12383
- [67] Murphy, C. T., Marx, M., Martin, W. N., **Jiang, H.**, Lapsertis, J. M., French, A. N., Simmons, N. B. and Moore, M. J. (2022) Feeling for food: can rostro-mental hair arrays sense hydrodynamic cues for foraging North Atlantic right whales? *The Anatomical Record*, 1-15, doi:10.1002/ar.24858
- [66] **Jiang, H.** (2021) Numerical simulation of self-propelled steady jet propulsion at intermediate Reynolds numbers: effects of orifice size on animal jet propulsion. *Fluids*, 6, 230, doi:10.3390/fluids6060230
- [65] **Jiang, H.** and Johnson, M. D. (2021) Swimming behavior of cryptophyte prey affects prey preference of the ambush-feeding ciliate *Mesodinium rubrum*. *Aquatic Microbial Ecology*, 86, 169-184
- [64] Nayak, A. R., **Jiang, H.**, Byron, M. L., Sullivan, J. M., McFarland, M. N. and Murphy, D. W. (2021) Editorial: Small scale spatial and temporal patterns in particles, plankton, and other organisms. *Frontiers in Marine Science*, 8, 669530, doi:10.3389/fmars.2021.669530
- [63] *Tyrell, A. S., **Jiang, H.** and Fisher, N. S. (2021) Effects of seawater viscosity and temperature on the movement of the marine dinoflagellate *Prorocentrum minimum*. *Aquatic Microbial Ecology*, 86, 21-28
- [62] **Jiang, H.**, Costello, J. H. and Colin, S. P. (2021) Fluid dynamics and efficiency of colonial swimming via multijet propulsion at intermediate Reynolds numbers. *Physical Review Fluids*, 6, 013103, doi:10.1103/PhysRevFluids.6.013103
- [61] Alkhafaji, A. A., Selim, O. M., Amano, R. S., Strickler, J. R., Hinow, P., **Jiang, H.**, Sikkil, P. C., and Kohls, N. (2021) Mass transfer performance of a marine zooplankton olfactometer. *Journal of Energy Resources Technology*, 143, 112102, doi:10.1115/1.4049602
- [60] Pratt, L. J., Albright, E. J., Rypina, I. and **Jiang, H.** (2020) Eulerian and Lagrangian comparison of wind jets in the Tokar Gap region. *Fluids*, 5, 193, doi:10.3390/fluids5040193
- [59] **Jiang, H.** (2020) An elastic collision model for impulsive jumping by small planktonic organisms. *Fluids*, 5, 154, doi:10.3390/fluids5030154
- [58] *Tyrell, A. S., **Jiang, H.** and Fisher, N. S. (2020) Copepod feeding strategy determines response to seawater viscosity: videography study of two calanoid copepod species. *Journal of Experimental Biology*, 223, jeb220830, doi:10.1242/jeb.220830
- [57] **Jiang, H.** and Paffenhöfer G.-A. (2020) Vortical feeding currents in nauplii of the calanoid copepod *Eucalanus pileatus*. *Marine Ecology Progress Series*, 638, 51-63
- [56] **Jiang, H.** and Edson, J. B. (2020) Characterizing marine atmospheric boundary layer to support offshore wind energy research. *J. Phys.: Conf. Ser.*, 1452, 012027, doi:10.1088/1742-6596/1452/1/012027
- [55] Davis, S. R., Farrar, J. T., Weller, R. A., **Jiang, H.** and Pratt, L. J. (2019) The land-sea breeze of the Red Sea: Observations, simulations, and relationships to regional moisture transport. *Journal of Geophysical Research: Atmospheres*, 124, 13803-13825
- [54] Giuffre, C., Hinow, P., **Jiang, H.** and Strickler, J. R. (2019) Oscillations in the near-field feeding current of a calanoid copepod are useful for particle sensing. *Scientific Reports*, 9, 17742, doi:10.1038/s41598-019-54264-1
- [53] Carrillo, A., Van Le, D., Byron, M., **Jiang, H.** and McHenry, M. (2019) Canal neuromasts enhance foraging in zebrafish (*Danio rerio*). *Bioinspiration and Biomimetics*, 14, 035003, doi:10.1088/1748-3190/ab0eb5

- [52] Zhao, L., Zhang, W., He, Z., Tan, L. and **Jiang, H.** (2019) The process of mass transport for a buoyant plume in linearly stratified environment. *Journal of Shanghai Jiao Tong University*, 53, 473-479 (in Chinese with an abstract in English)
- [51] Lou, Y., He, Z., **Jiang, H.** and Han, X. (2019) Numerical simulation of two coalescing turbulent forced plumes in linearly stratified fluids. *Physics of Fluids*, 31, 037111, doi:10.1063/1.5087534
- [50] Uttieri, M., Nihongi, A., Hinow, P., Motschman, J., **Jiang, H.**, Alcaraz, M. and Strickler, J. R. (2019) Copepod manipulation of oil droplet size distribution. *Scientific Reports*, 9, 547, doi:10.1038/s41598-018-37020-9
- [49] *Zhang, X., Lin, J. and **Jiang, H.** (2019) Time-dependent variations in vertical fluxes of hydrothermal plumes at mid-ocean ridges. *Marine Geophysical Research*, 40, 245-260
- [48] He, Z., *Zhang, W., **Jiang, H.**, Zhao, L. and Han, X. (2018) Dynamic interaction and mixing of two turbulent forced plumes in linearly stratified ambience. *Journal of Hydraulic Engineering*, 144(12), 04018072, doi:10.1061/(ASCE)HY.1943-7900.0001545
- [47] **Jiang, H.**, Kulis, D. M., Brosnahan, M. L. and Anderson, D. M. (2018) Behavioral and mechanistic characteristics of the predator-prey interaction between the dinoflagellate *Dinophysis acuminata* and the ciliate *Mesodinium rubrum*. *Harmful Algae*, 77, 43-54
- [46] Du Clos, K. and **Jiang, H.** (2018) Overcoming hydrodynamic challenges in suspension feeding by juvenile *Mya arenaria* clams. *Journal of the Royal Society Interface*, 15, 20170755, doi:10.1098/rsif.2017.0755
- [45] *Zhang, W., He, Z. and **Jiang, H.** (2017) Scaling for turbulent viscosity of buoyant plumes in stratified fluids: PIV measurement with implications for submarine hydrothermal plume turbulence. *Deep-Sea Research Part I: Oceanographic Research Papers*, 129, 89-98
- [44] **Jiang, H.** and Johnson, M. D. (2017) Jumping and overcoming diffusion limitation of nutrient uptake in the photosynthetic ciliate *Mesodinium rubrum*. *Limnology and Oceanography*, 62, 421-436
- [43] *Zhang, W., Zhao, L., He, Z., Lin, T., Tan, L. and **Jiang, H.** (2016) Characteristics of plumes in linearly stratified salt-water. *Advances in Water Science*, 27, 602-608 (in Chinese with an abstract in English)
- [42] Paffenhöfer, G.-A. and **Jiang, H.** (2016) Comment: On phytoplankton perception by calanoid copepods. *Limnology and Oceanography*, 61, 1163-1168
- [41] Gemmell, B. J., **Jiang, H.** and Buskey, E. J. (2015) A tale of the ciliate tail: investigation into the adaptive significance of this sub-cellular structure. *Proceedings of the Royal Society B*, 282, 20150770, doi:10.1098/rspb.2015.0770
- [40] *Katija, K., Colin, S. P., Costello, J. H. and **Jiang, H.** (2015) Ontogenetic propulsive transitions by medusae *Sarsia tubulosa*. *Journal of Experimental Biology*, 218, 2333-2343
- [39] *Davis, S. R., Pratt, L. J. and **Jiang, H.** (2015) The Tokar Gap jet: Regional circulation, diurnal variability and moisture transport based on numerical simulations. *Journal of Climate*, 28, 5885-5907
- [38] Reed, D. C., Breier, J. A., **Jiang, H.**, Anantharaman, K., Klausmeier, C. A., Toner, B. M., Hancock, C., Speer, K., Thurnherr, A. M. and Dick, G. J. (2015) Predicting the response of the deep-ocean microbiome to geochemical perturbations by hydrothermal vents. *The ISME Journal*, 9, 1857-1869
- [37] Stewart, W. J., Nair, A., **Jiang, H.** and McHenry, M. J. (2014) Prey fish escape by sensing the bow wave of a predator. *Journal of Experimental Biology*, 217, 4328-4336
- [36] **Jiang, H.** and Breier, J. A. (2014) Physical controls on mixing and transport within rising submarine hydrothermal plumes: A numerical simulation study. *Deep-Sea Research Part I: Oceanographic Research Papers*, 92, 41-55
- [35] Kjørboe, T., **Jiang, H.**, Gonçalves, R. J., Nielsen, L. T. and Wadhwa, N. (2014) Flow disturbances generated by feeding and swimming zooplankton. *Proceedings of the National Academy of Sciences of the USA*, 111, 11738-11743
- [34] Gemmell, B. J., **Jiang, H.** and Buskey, E. J. (2014) A new approach to micro-scale particle image velocimetry (μ PIV) for quantifying flows around free-swimming zooplankton. *Journal of Plankton Research*, 36, 1396-1401
- [33] Chen, C., Li, R., Pratt, L., Limeburner, R., Beardsley, R.C., Bower, A., **Jiang, H.**, Abualnaja, Y., Xu, Q., Lin, H., Liu, X., Lan, J. and Kim, T. (2014) Process modeling studies of physical mechanisms of the formation of an anticyclonic eddy in the central Red Sea. *Journal of Geophysical Research: Oceans*, 119, 1445-1464
- [32] *Chan, K. Y. K., **Jiang, H.** and Padilla, D. K. (2013) Swimming speed of larval snail does not correlate with size and ciliary beat frequency. *PLoS ONE* 8(12): e82764. doi:10.1371/journal.pone.0082764
- [31] *Katija, K. and **Jiang, H.** (2013) Swimming by medusae *Sarsia tubulosa* in the viscous vortex ring limit. *Limnology and Oceanography: Fluids and Environments*, 3, 103-118
- [30] Ralston, D. K., **Jiang, H.** and Farrar, J. T. (2013) Waves in the Red Sea: response to monsoonal and mountain gap winds. *Continental Shelf Research*, 65, 1-13
- [29] Kjørboe, T. and **Jiang, H.** (2013) To eat and not be eaten: optimal foraging behavior in suspension feeding copepods. *Journal of the Royal Society Interface*, 10, 20120693, doi:10.1098/rsif.2012.0693
- [28] Gemmell, B. J., **Jiang, H.**, Strickler, J. R. and Buskey, E. J. (2012) Plankton reach new heights in effort to avoid predators. *Proceedings of the Royal Society B*, 279, 2786-2792

- [27] **Jiang, H.** (2011) Why does the jumping ciliate *Mesodinium rubrum* possess equatorially located propulsive ciliary belt? *Journal of Plankton Research*, 33, 998-1011 (**Featured article**)
- [26] **Jiang, H.** and Kiørboe, T. (2011) The fluid dynamics of swimming by jumping in copepods. *Journal of the Royal Society Interface*, 8, 1090-1103
- [25] **Jiang, H.** and Kiørboe, T. (2011) Propulsion efficiency and imposed flow fields of a copepod jump. *Journal of Experimental Biology*, 214, 476-486
- [24] Cardenas, M. B. and **Jiang, H.** (2011) Wave-driven porewater and solute circulation through rippled elastic sediment under highly transient forcing. *Limnology and Oceanography: Fluids and Environments*, 1, 23-37
- [23] Kiørboe, T., **Jiang, H.** and Colin, S. P. (2010) Danger of zooplankton feeding: the fluid signal generated by ambush-feeding copepods. *Proceedings of the Royal Society B*, 277, 3229-3237
- [22] **Jiang, H.**, Farrar, J. T., Beardsley, R. C., Chen, R. and Chen, C. (2009) Zonal surface wind jets across the Red Sea due to mountain gap forcing along both sides of the Red Sea. *Geophysical Research Letters*, 36, L19605, doi:10.1029/2009GL040008
- [21] *Rapo, M. A., **Jiang, H.**, Grosenbaugh, M. A. and Coombs, S. (2009) Using computational fluid dynamics to calculate the stimulus to the lateral line of a fish in still-water. *Journal of Experimental Biology*, 212, 1494-1505
- [20] **Jiang, H.** and Paffenhöfer G.-A. (2008) Hydrodynamic signal perception by the copepod *Oithona plumifera*. *Marine Ecology Progress Series*, 373, 37-52
- [19] Cardenas, M. B., Cook, P. L. M., **Jiang, H.** and Traykovski, P. (2008) Constraining denitrification in permeable wave-influenced marine sediment using linked hydrodynamic and biogeochemical modeling. *Earth and Planetary Science Letters*, 275, 127-137
- [18] **Jiang, H.** and Strickler, J. R. (2007) Copepod flow modes and modulation: a modelling study of the water currents produced by an unsteadily swimming copepod. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 362, 1959-1971
- [17] **Jiang, H.** and Grosenbaugh, M. A. (2006) Numerical simulation of vortex ring formation in the presence of background flow with implications for squid propulsion. *Theoretical and Computational Fluid Dynamics*, 20, 103-123
- [16] **Jiang, H.** and Strickler, J. R. (2005) Mass density contrast in relation to the feeding currents in calanoid copepods. *Journal of Plankton Research*, 27, 1003-1012
- [15] **Jiang, H.** and Osborn, T. R. (2004) Hydrodynamics of copepods: a review. *Surveys in Geophysics*, 25, 339-370
- [14] **Jiang, H.** and Paffenhöfer, G.-A. (2004) Relation of behavior of copepod juveniles to potential predation by omnivorous copepods: an empirical-modeling study. *Marine Ecology Progress Series*, 278, 225-239
- [13] **Jiang, H.**, Osborn, T. R. and Meneveau, C. (2002) Chemoreception and the deformation of the active space in freely swimming copepods: a numerical study. *Journal of Plankton Research*, 24, 495-510
- [12] **Jiang, H.**, Osborn, T. R. and Meneveau, C. (2002) Hydrodynamic interaction between two copepods: a numerical study. *Journal of Plankton Research*, 24, 235-253
- [11] **Jiang, H.**, Meneveau, C. and Osborn, T. R. (2002) The flow field around a freely swimming copepod in steady motion: Part II numerical simulation. *Journal of Plankton Research*, 24, 191-213
- [10] **Jiang, H.**, Osborn, T. R. and Meneveau, C. (2002) The flow field around a freely swimming copepod in steady motion: Part I theoretical analysis. *Journal of Plankton Research*, 24, 167-189
- [9] **Jiang, H.**, Meneveau, C. and Osborn, T. R. (1999) Numerical study of the feeding current around a copepod. *Journal of Plankton Research*, 21, 1391-1421
- [8] Lü, K. and **Jiang, H.** (2002) Effects of upper and low-level jets and condensation process of moisture on evolution of occluded frontal circulation. *Acta Meteorologica Sinica*, 60, 660-667 (in Chinese with an abstract in English)
- [7] **Jiang, H.** and Lü, K. (2000) Occluded frontal circulation in upper and lower-level jets. *Plateau Meteorology*, 19, 265-276 (in Chinese with an abstract in English)
- [6] Lü, K. and **Jiang, H.** (1999) Influences of upper and low-level jets and condensation process of moisture on evolution of warm front circulation. *Acta Meteorologica Sinica*, 57, 681-693 (in Chinese with an abstract in English)
- [5] **Jiang, H.** and Lü, K. (1998) The nonlinear long-waves excited by topography in a shear flow. *Plateau Meteorology*, 17, 231-244 (in Chinese with an abstract in English)
- [4] Lü, K. and **Jiang, H.** (1998) Influences of interaction of external source with solitary wave on blocking. *Journal of Applied Meteorological Science*, 9, 431-440 (in Chinese with an abstract in English)
- [3] Lü, K. and **Jiang, H.** (1998) Localized thermal forcing and formation of large amplitude quasi-steady disturbances. *Acta Meteorologica Sinica*, 56, 424-435 (in Chinese with an abstract in English)
- [2] Lü, K. and **Jiang, H.** (1997) Interaction of topography with solitary Rossby waves in a near-resonant flow. *Journal of Meteorological Research*, 11, 204-215

- [1] Lü, K. and **Jiang, H.** (1996) Forced solitary Rossby waves in a near-resonant flow in the presence of topography. *Acta Meteorologica Sinica*, 54, 142-153 (in Chinese with an abstract in English)

BOOK CHAPTERS AND CONFERENCE PAPERS (* denotes a student or postdoc as 1st author):

- *Zhang, W., He, Z., Zhao, L. and **Jiang, H.** (2016) Assessing the local isotropy of a turbulent plume in linearly stratified saltwater using PIV data. Paper submitted to *20th Australasian Fluid Mechanics Conference*, Perth, Australia, December 5 – 8, 2016
- Jiang, H.** (2004) Numerical simulation of the flow field at the scale size of an individual copepod. In *Handbook of scaling methods in aquatic ecology: measurement, analysis, simulation*, Seuront, L.J. and Strutton, P.G., Eds., CRC Press, 479-491

INVITED LECTURES, TALKS, AND SEMINARS:

- Short summer course “Small-scale biological-physical interactions in the plankton” taught to undergraduate students at Shandong University Weihai Campus, Weihai, China, July 29 – August 1, 2019
- Seminar at Oceanic Modeling and Observation Laboratory, School of Marine Science, Nanjing University of Information Science and Technology, Nanjing, China, November 29, 2018. Title: Fluid dynamics of deep-sea hydrothermal plumes (in Chinese)
- Seminar at College of Oceanography, Hohai University, Nanjing, China, November 28, 2018. Title: Fluid dynamics of deep-sea hydrothermal plumes (in Chinese)
- Seminar at the State Key Laboratory in Marine Pollution – City University of Hong Kong, Hong Kong, China, November 6, 2014. Title: Observing microplankton behavior and interaction at sub-mm scales with a high-resolution high-speed imaging system
- Seminar at School of Geographic and Oceanographic Sciences, Nanjing University, Nanjing, China, August 4, 2014. Title: Numerical simulation and laboratory modeling of deep-sea hydrothermal plumes (in Chinese)
- Seminar at Zhejiang University Ocean College, Hangzhou, China, December 20, 2013. Title: Toward a mechanistic understanding of the jumping behavior of marine copepods
- Seminar at Second Institute of Oceanography of the State Oceanic Administration, Hangzhou, China, December 19, 2013. Title: Numerical investigation of hydrothermal plume hydrodynamics
- International Workshop of Harmful Algae Blooms and Eutrophication, December 16 – 17, 2013, Zhejiang University, Hangzhou, China. (Invited talk). Title: Observing microzooplankton swimming behavior and imposed flow at sub-mm scales
- Seminar in Applied and Computational Mathematics, Department of Mathematical Sciences, University of Wisconsin - Milwaukee, November 13, 2013. Title: The fluid dynamics of jumping in zooplankton
- Seminar at School of Geographic and Oceanographic Sciences, Nanjing University, Nanjing, China, July 6, 2012. Title: Marine zooplankton individual behavior and its role in marine ecosystems (in Chinese)
- The Fluid•DTU seminar, Department of Physics, Technical University of Denmark, September 20, 2011. Title: The fluid dynamics of jumping in zooplankton
- WHOI, Biology Department Thursday Seminars, May 5, 2011. Title: Toward a mechanistic understanding of the jumping behavior of zooplankton
- Schweppe Lecture, The University of Texas at Austin Marine Science Institute. (1) Technical seminar, February 1, 2011, Title: Toward a mechanistic understanding of the jumping behavior of copepods; (2) Public lecture, February 3, 2011 (cancelled due to an unusual winter weather condition for southern Texas), Title: Tiny water currents, swirls and jets inside a scoop of seawater: a journey into the zooplankton world
- International Summer School on Turbulence, Plankton and Marine Snow, September 1 – 5, 2008, Vilanova i la Geltrú, 08800 Barcelona, Spain. (Invited lecturer for the Summer School). Title: Using CFD to investigate the copepod hydrodynamics and associated small-scale biological-physical-chemical interactions
- Hatsopoulos Microfluids Seminar, November 29, 2005, Dept. of Mechanical Engineering, MIT. Title: Hydrodynamics of copepod swimming, feeding and sensing
- Environmental Fluid Mechanics Seminar, October 27, 2005, Dept. of Civil and Environmental Engineering, MIT. Title: Small-scale biological-physical interactions in copepods
- Warnemünde Turbulence Days 2005, September 28 – 30, 2005, Baltic Sea Research Institute Warnemünde, Germany. Jiang, H. (Invited speaker for the workshop). Title: Hydrodynamics of copepods
- Seminar on September 26, 2005 at the Danish Institute of Fisheries Research, Charlottenlund, Denmark. Title: Hydrodynamics of copepods
- Society for Experimental Biology Annual Main Meeting. July 11 – 15, 2005, Universitat Autònoma de Barcelona, Barcelona, Spain. Jiang, H. (Invited speaker for Session A9 – Environmental constraints on locomotion and energetics in aquatic organisms.) Abstract: Jiang, H. and Strickler, J. R., Flow modes and modulation of the water currents produced by free-swimming calanoid copepods. *Comparative Biochemistry and Physiology Part A* 141 (2005) S163 – S164

- International Cross-Disciplinary Symposium on Physics and Biology. March 3 – 7, 2005, Oslo, Norway. Jiang, H., Flow modes and modulation of the water currents produced by free-swimming calanoid copepods
- The 57th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, November 21 – 23, 2004, Seattle, WA. Jiang, H. and Strickler, J. R., Flow modes and modulation in copepod generated flows. (Invited mini-symposium talk)
- SIAM Conference on Applications of Dynamic Systems, May 27 – 31, 2003, Snowbird, UT. Jiang, H., Biological-physical interactions at the scale size of an individual copepod. (Invited mini-symposium talk)
- Interactions between the hydrodynamics and chemoreception in calanoid copepods: a numerical approach. Jiang, H., University of Wisconsin – Milwaukee, Center for Great Lakes Studies and the Great Lakes WATER Institute, May 2001
- Theoretical and numerical studies of the hydrodynamics and chemoreception in calanoid copepods. Jiang, H., Skidaway Institute of Oceanography, Savannah, GA, May 2001

MEETING ABSTRACTS AND TALKS:

- Talk given at the Fluids and Marine Ecology (FAME) Workshop on October 10, 2022, WHOI. Talk title: Jiang, H., Laboratory studies on behavior and fluid flow of marine organisms
- WFIP3 short talk on June 13, 2022. Talk title: Jiang, H., WRF modeling of hub-height wind for offshore wind turbines
- AOP&E COFDL seminar on May 27, 2022. Talk title: Jiang, H., How do marine tintinnid ciliates feed?
- WHOI Marine Microplastics Initiative seminar on November 3, 2021. Talk title: Jiang, H., Behavioral aspects of ciliates encountering microplastics
- AOP&E COFDL seminar on December 20, 2019. Talk title: Jiang, H., Laterally distributed multi-jet propulsion in a colonial siphonophore at intermediate Reynolds numbers
- NAWEA/WindTech 2019 Conference, October 14 – 16, 2019, University of Massachusetts – Amherst. Talk title: Jiang, H. and Edson, J.B., Characterizing marine atmospheric boundary layer to support offshore wind energy research
- Microscale Ocean Biophysics 5.0, January 11 – 16, 2019, Whistler, Canada. Talk title: Jiang, H., How does the dinoflagellate *Dinophysis acuminata* capture the ciliate *Mesodinium rubrum*?
- AOP&E COFDL seminar on September 28, 2018. Talk title: Jiang, H., Time-resolved PIV investigation of turbulent buoyant plumes in linearly stratified saltwater
- ASLO 2017 Aquatic Sciences Meeting, Honolulu, Hawaii, February 26 – March 3, 2017. Abstract title: Jiang, H. and Johnson, M. D., Jumping and overcoming diffusion limitation of nutrient uptake in the photosynthetic ciliate *Mesodinium rubrum*
- AOP&E COFDL seminar on October 7, 2016. Talk title: Jiang, H., Physical ecology of the photosynthetic, bloom-forming, jumping ciliate *Mesodinium rubrum*
- AGU, ASLO, and TOS, 2016 Ocean Sciences Meeting, February 21 – 26, 2016, New Orleans, Louisiana. Abstract title: Jiang, H., Wheeler, J.D., and Anderson, E.J., Tethered by self-generated flow: Mucus string augmented feeding current generation in larval oysters
- AOP&E COFDL seminar on January 15, 2016. Talk title: Jiang, H., Development and testing of a high-speed microscale imaging system for exploration of harmful algal behavior and interactions
- 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, Massachusetts, November 22 – 24, 2015. Talk title: Jiang, H., Gemmell, B., and Buskey, E., The fluid dynamics of the ciliate *Pseudotontonia* sp. jumping by ‘tail’ contraction
- The Eighth Symposium on Harmful Algae Long Beach, California, November 15 – 19, 2015. Talk title: Jiang, H., Brosnahan, M., Kulis, D., and Anderson, D., Development and testing of a high-speed microscale imaging system for exploration of harmful algal behavior and interactions
- ASLO 2015 Aquatic Sciences Meeting, February 22 – 27, 2015, Granada, Spain. Abstract 1: Gemmell, B. J., Jiang, H., Strickler, J. R. and Buskey, E. J., A tale of the ciliate tail: investigation into the adaptive significance of this unique ultrastructure; Abstract 2: Strickler, J. R., Jiang, H., Motschman, J., Horn, S., Keithrafferty, C., Nihongi, A. and Alcaraz, M., *Acartia grani* and its interactions with oil droplets
- AGU Fall Meeting, December 15 – 19, 2014, San Francisco, CA. Zhang, W., He, Z. and Jiang, H., Experimental study on hydrothermal plume dynamics in a stratified salt water tank
- The 2nd Seafloor Observation Symposium, November 8 – 10, 2014, Xiamen, China. Jiang, H. Observing microplankton behavior and interaction at sub-mm scales with a high-resolution high-speed imaging system
- ASLO, TOS, and AGU, 2014 Ocean Sciences Meeting, February 23 – 28, 2014, Honolulu, Hawaii. Abstract 1: Jiang, H., Gemmell, B.J., Strickler, J.R. and Buskey, E.J., Observing zooplankton swimming behavior and imposed flow at sub-mm scales; Abstract 2: Gemmell, B.J., Jiang, H. and Buskey, E.J., Exploring a new approach to micro-scale particle image velocimetry (PIV) for quantifying flow around free-swimming microzooplankton; Abstract 3: Strickler, J.R., Hinow, P., Jiang, H., Motschman, J. and Alcaraz, M., Sub-millimeter scale phenonema near the vibrating mouthparts of calanoid copepods

- AOP&E COFDL seminar on January 17, 2014. Title: Jiang, H., Numerical investigation of hydrothermal plume hydrodynamics and transport
- Society for Integrative and Comparative Biology (SICB) 2014 Meeting, January 3 – 7, 2014, Austin, TX. Abstract: Chan, K. Y. K., Padilla, D. K. and Jiang, H., Organismal-, ciliary- motion and resulting fluid disturbances of freely swimming veligers
- AGU Fall Meeting, December 9 – 13, 2013, San Francisco, CA. Davis, S. R., Pratt, L. J. and Jiang, H., The Tokar Gap jet: Analysis and impacts of a coastal gap wind
- International Workshop on Trait-based Approaches to Ocean Life, August 26 – 28, 2013, Copenhagen, Denmark. Jiang, H. Why does the jumping ciliate *Mesodinium rubrum* possess equatorially located propulsive ciliary belt?
- ASLO Summer 2012 Aquatic Sciences Meeting, July 8 – 13, 2012, Lake Biwa, Otsu, Shiga, Japan. Jiang, H., Katija, K., Lawson, G. and Wiebe, P., The flow field generated by the copepod *Calanus finmarchicus* during swimming and jumping
- The 2nd Symposium of Deep Sea Research and Earth System Sciences, July 2 – 4, 2012, Shanghai, China. Jiang, H. and Lin, J. Computational fluid dynamics simulation of a seafloor hydrothermal plume (in Chinese)
- Biological Flow: A Conference to Celebrate the 70th Birthday of Timothy J. Pedley. Department of Applied Mathematics and Theoretical Physics, University of Cambridge, UK, April 2 – 3, 2012. Talk titles: (1) Jiang, H. and Kiørboe, T., Impulsive generation of viscous vortex rings and propulsion at “low” Reynolds numbers; (2) Kiørboe, T. and Jiang, H., Copepodology for the ornithologist: how suspension feeding zooplankton optimize their fitness
- AGU Fall Meeting, December 5 – 9, 2011, San Francisco, CA. Jiang, H., Breier, J. A., Dick, G. J. and Toner, B. M. Computational fluid dynamics simulation of the rising portion of a seafloor hydrothermal plume
- 5th International Zooplankton Production Symposium, March 14 – 18, 2011, Pucón, Chile. Talk title: Jiang, H., Kiørboe, T. and Colin, S. C. Toward a mechanistic understanding of the jumping behavior of copepods
- ASLO 2011 Aquatic Sciences Meeting, February 13 – 18, 2011, San Juan, Puerto Rico. Gemmill, B. J., Jiang, H. and Buskey, E. J. Flying plankton? copepods take to the sky in effort to avoid predators
- Aspen conference: Microenvironments modulating biological interactions in the ocean, January 16 – 21, 2011, Aspen Center for Physics, Aspen, CO. Talk title: Jiang, H. and Kiørboe, T., The fluid dynamics of swimming by jumping in copepods
- WHOI-GFD program summer-school talk on August 9, 2010. Title: Jiang, H., Feeding and swimming currents and jumping vortices in planktonic copepods
- AOP&E COFDL seminar on May 21, 2010. Title: Jiang, H., Copepods ‘blow (or kick)’ viscous vortex rings for jumping: Theory, PIV observation, and CFD simulation
- American Geophysical Union (AGU), American Society of Limnology and Oceanography (ASLO) and The Oceanography Society (TOS), 2010 Ocean Sciences Meeting, February 22 – 26, 2010, Portland, OR. Jiang, H., Why does the jumping ciliate *Mesodinium rubrum* possess equatorially located propulsive ciliary belt?
- The 2009 Gordon Conference on Coastal Ocean Circulation, June 7 – 12, 2009, Colby-Sawyer College, New London, NH. Abstract: Jiang, H., Farrar, J. T., Beardsley, R. C., Chen, R., and Chen, C., Two types of Red Sea coastal mountain gap wind jets and their effects on the wind and thermohaline forcing over the Red Sea
- AOP&E COFDL seminar on May 8, 2009. Title: Mesoscale atmospheric modeling of the winds over the Red Sea
- Society for Integrative and Comparative Biology (SICB) 2009 Meeting, January 3 – 7, 2009, Boston, MA. Abstract: Jiang, H., Grosenbaugh, M. A., Janssen, J., and Strickler, J. R., Hydrodynamic imaging of a self-propelling zooplankton prey by the lateral line system of a fish: A computational fluid dynamics study
- AOP&E departmental seminar on September 24, 2008. Title: Hydrodynamic signal perception by the copepod *Oithona plumifera*
- American Geophysical Union (AGU), American Society of Limnology and Oceanography (ASLO), The Oceanography Society (TOS) and the Estuarine Research Federation (ERF), 2008 Ocean Sciences Meeting, March 2 – 7, 2008, Orlando, Florida. Abstract: Jiang, H. and Paffenhöfer, G.-A., Computational fluid dynamics simulations of protist sinking, swimming, jumping, or interacting with each other
- Society for Integrative and Comparative Biology (SICB) 2008 Meeting, January 2 – 6, 2008, San Antonio, TX. Abstract: Rapo, M. A., Jiang, H., and Grosenbaugh, M. A., Computational fluid dynamics simulations of a vibrating sphere nearby a benthic fish in still and moving water
- AOP&E COFDL seminar on June 28, 2007. Title: Direct comparison between numerical simulation and field observation for turbulent flow over large wave orbital scale ripples
- EUROMECH Colloquium 488, The influence of fluid dynamics on the behaviour and distribution of plankton. June 13 – 15, 2007, University of Liverpool, Liverpool, UK. Jiang, H., Numerical simulation of flow created by protists sinking, swimming or interacting with each other
- ASLO 2007 Aquatic Sciences Meeting, February 4 – 9, 2007, Santa Fe, NM. Jiang, H., Strickler, J.R. and Paffenhöfer, G.-A. Revisit to mechanical energy consumption of the swim-and-sink behavior of calanoid copepods

- AGU Fall Meeting, December 11 – 15, 2006, San Francisco, CA. Jiang, H. and Traykovski, P. A. Direct comparison between numerical simulation and field observation for turbulent flow over large wave orbital scale ripples
- 2006 RipplesDRI Annual Workshop, September 28 – 29, 2006, Woods Hole, MA. Jiang, H. and Traykovski, P. A. Modeling flow over large-wave-orbital-scale ripples: Large-eddy simulation vs. $k-\omega$ URANS
- ASLO Summer Meeting, June 4 – 9, 2006, Victoria, British Columbia, Canada. Jiang, H. and Paffenhöfer, G.-A. On the ecology of *Oithona*. II. An analysis of the temporal-spatial signal perception by *Oithona plumifera*
- AOP&E COFDL seminar on April 21, 2006. Title: Large-eddy simulation of flow over ripples: A preliminary study
- AOP&E departmental seminar on June 15, 2005. Title: Hydrodynamic signal perception in zooplankton
- ASLO 2005 Aquatic Sciences Meeting, February 20 – 25, 2005, Salt Lake City, UT. Jiang, H. and Paffenhöfer, G.-A. Directional information on hydrodynamic signal perception by prey in nauplius-predator encounters
- AOP&E COFDL seminar on December 10, 2004. Title: Unsteady copepod feeding currents and small-scale mixing
- AOP&E COFDL seminar on March 12, 2004. Title: Finite volume vs. finite difference, unstructured grid vs. structured grid: (informal) CFD with examples
- American Society of Limnology and Oceanography (ASLO) and The Oceanography Society (TOS) 2004 Ocean Research Conference, February 15 – 20, 2004, Honolulu, HI. Jiang, H. and Paffenhöfer, G.-A. Relation of behavior of copepod juveniles to potential predation by omnivorous copepods: an empirical-modeling study
- The 56th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, November 23 – 25, 2003, East Rutherford, NJ. Abstract 1: Jiang, H., Meneveau, C. and Osborn T. R. Swimming behavior and flow geometry: a fluid mechanical study of the feeding currents in calanoid copepods; Abstract 2: Jiang, H. and Grosenbaugh, M. A. Numerical simulation of vortex ring formation in the presence of background flow with implications for squid propulsion
- The Second M.I.T. Conference on Computational Fluid and Solid Mechanics, June 17 – 20, 2003, Cambridge, MA. Jiang, H. and Grosenbaugh, M.A. Numerical simulation of vortex ring formation in the presence of background flow with implications for squid propulsion
- AOP&E COFDL seminar on March 14, 2003. Title: A probable ecological function of the multiple-encounter feeding currents in calanoid copepods: a preliminary modeling study
- The 55th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, November 24 – 26, 2002, Dallas, TX. Abstract: Jiang, H. and Grosenbaugh, M.A. Numerical simulation of vortex ring formation in the presence of background flow: implications for squid propulsion
- AOP&E departmental seminar on May 15, 2002. Title: Numerical simulation of vortex ring formation with implications for squid jet propulsion
- American Geophysical Union (AGU) and American Society of Limnology and Oceanography (ASLO), 2002 Ocean Sciences Meeting, February 11 – 15, 2002, Honolulu, Hawaii. Abstract: Jiang, H., Osborn, T. R., and Meneveau, C., A hydrodynamic model for free-swimming copepods: The significance of being self-propelled
- American Society of Limnology and Oceanography, ASLO Aquatic Sciences 2001 in Albuquerque, New Mexico, February 12 – 16, 2001. Abstract: Jiang, H., Osborn, T. R. and Meneveau, C., Theoretical and numerical studies of the hydrodynamics and chemoreception of calanoid copepods
- American Society of Limnology and Oceanography (ASLO), Limnology and Oceanography: Navigating into the next century, February 1 – 5, 1999, Santa Fe, New Mexico. Abstract: Jiang, H., Meneveau, C. and Osborn, T. R., Numerical study of the feeding current around a copepod
- Johns Hopkins Conference in Environmental Fluid Mechanics, April 2 – 4, 1998, Baltimore, Maryland. Abstract: Jiang, H., Meneveau, C. and Osborn, T. R., Direct simulations of the feeding current around a copepod
- American Geophysical Union (AGU) and American Society of Limnology and Oceanography (ASLO), 1998 Ocean Sciences Meeting, February 9 – 13, 1998, San Diego, California. Abstract: Jiang, H., Meneveau, C. and Osborn, T. R., Direct simulations of the feeding current around a copepod
- ICES International Symposium, Recruitment Dynamics of Exploited Marine Populations: Physical-Biological Interactions, September 22 – 24, 1997, Baltimore, Maryland. Abstract: Jiang, H., Meneveau, C. and Osborn, T. R., Bio-physical coupling of predator-prey interactions

WORKSHOPS ATTENDED:

- Fluids and Marine Ecology (FAME) Workshop, October 9 – 11, 2022, WHOI, Woods Hole, MA. The Workshop was a Broader Impact (BI) activity for a project funded by NSF OCE-Biological Oceanography: *RUI: Collaborative Research: Characterizing benthic mysid ecology and animal-fluid interactions in response to background flow, food, and light conditions*
- Virtual MPAS-Atmosphere Tutorial, April 12 – 14, 2021
- The 2020 Joint WRF/MPAS Users' Workshop (Virtual), June 8 – 9, 2020
- Microplastics Town Hall Meeting, WHOI, June 20, 2018

AUV-Based Science Workshop, May 30 – 31, 2018, National Academy of Science, Carriage House, Jonsson Center, Woods Hole, MA

DARPA PALS (Persistent Aquatic Living Sensors) Program Proposers Day Meeting, March 2, 2018, Arlington, VA

The Gordon and Betty Moore Foundation (GBMF) Hydrothermal Vent Plume Project synthesis meeting, University of Michigan, Ann Arbor, MI, May 5 – 6, 2014

International Workshop of Harmful Algae Blooms and Eutrophication, December 16 – 17, 2013, Zhejiang University, Hangzhou, China

International Workshop on Trait-based Approaches to Ocean Life, Copenhagen, Denmark, August 26 – 28, 2013

The Gordon and Betty Moore Foundation (GBMF) Hydrothermal Vent Plume Project mid-point meeting, University of Michigan, Ann Arbor, MI, September 20 – 22, 2012

The Gordon and Betty Moore Foundation (GBMF) Hydrothermal Vent Plume Project kick-off meeting, University of Michigan, Ann Arbor, MI, January 5 – 7, 2011

2006 RipplesDRI Annual Workshop, Woods Hole Oceanographic Institution, Woods Hole, MA, September 28 – 29, 2006

2004 Finite Volume Coastal Ocean Model (FVCOM) Workshop, New Bedford, MA, June 15 – 16, 2004

Weather Research and Forecasting (WRF) Model Summer Tutorial 2004, Boulder, CO, June 28 – July 2, 2004

BASC Workshop on Challenges in Representing Physical Processes in Coupled Atmosphere-Land-Ocean Models, Woods Hole, MA, July 12 – 13, 2004

Workshop: The Next Generation of *in situ* Biological and Chemical Sensors in the Ocean, July 13 – 16, 2003, Woods Hole, MA