

# **Curriculum Vitae**

## **Brian K. Arbic**

Assistant Professor  
Department of Oceanography  
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### **Education**

2000 PhD in Physical Oceanography  
MIT-WHOI Joint Program in Oceanography  
Massachusetts Institute of Technology, Cambridge, Massachusetts  
Woods Hole Oceanographic Institution, Woods Hole, Massachusetts

1988 B.S. in Physics (with distinction; high honors) and in Mathematics  
University of Michigan, Ann Arbor, Michigan

### **Employment History**

2008-present Assistant Professor, Department of Oceanography and Center for Ocean-Atmospheric Prediction Studies, Florida State University

2005-2008 Research Associate, Institute for Geophysics, Jackson School of Geosciences, The University of Texas at Austin  
Tenure-track research scientist position

2003-2005 Research Staff Member, Atmospheric and Oceanic Sciences Program, Princeton University  
Faculty sponsor: Professor Jorge Sarmiento

2001-2003 Visiting Scientist, Atmospheric and Oceanic Sciences Program, Princeton University  
Hosting scientists: Dr. Stephen Garner, Dr. Robert Hallberg

1994-2000 Graduate Student Research Assistant, MIT-WHOI Joint Program in Oceanography

Doctoral thesis supervisor: Professor Glenn Flierl

Advisor, pre-thesis graduate project: Dr. W. Brechner Owens

1993-1994 Research Assistant, Geology Department, University of Michigan  
Supervisor: Professor Kenji Satake

1990-1992 United States Peace Corps Volunteer, West Africa  
Taught math and physics in rural secondary schools, first in Liberia (evacuated due to civil war), then in Ghana.

1985-1988 Research Assistant, Physics Department, University of Michigan  
Honors thesis supervisor: Dr. Mark Skalsey

1984-1989 Miscellaneous  
Worked several odd jobs to finance undergraduate education and self.

### **Publications and Submissions—Student Advisees in Bold**

Several manuscripts in preparation.

Arbic, B.K., A.J. Wallcraft, and E.J. Metzger (2009c), Concurrent simulation of the eddy general circulation and tides in a global ocean model, in review for a special issue of *Ocean Modelling* in memory of Peter Killworth.

Scott, R.B., B.K. Arbic, E.P. Chassignet, A.C. Coward, M. Maltrud, A. Srinivisan, and **A. Varghese** (2009), Total kinetic energy in four global eddy ocean circulation models and over 5000 current meter records, in review for a special issue of *Ocean Modelling* in memory of Peter Killworth.

Goff, J.A., and B.K. Arbic (2009), Global prediction of abyssal hill roughness statistics for use in ocean models from digital maps of paleo-spreading rate, paleo-ridge orientation, and sediment thickness, in press for a special issue of *Ocean Modelling* in memory of Peter Killworth.

Arbic, B.K., and C. Garrett (2009), A coupled oscillator model of shelf and ocean tides, in press for a special “Tides in Marginal Seas” issue of *Continental Shelf Research* in memory of Alexei Nekrasov.

Arbic, B.K., R.H. Karsten, and C. Garrett (2009b), On tidal resonance in the global ocean and the back-effect of coastal tides upon open-ocean tides, in press for a special issue of *Atmosphere-Ocean* in honor of Chris Garrett.

Cummins, P.F., R.H. Karsten, and B.K. Arbic (2009), The semi-diurnal tide in Hudson Strait: A resonant channel oscillation, in press for *Atmosphere-Ocean*.

Arbic, B.K., J.F. Shriver, P.J. Hogan, H.E. Hurlburt, J.L. McClean, E.J. Metzger, R.B. Scott, **A. Sen**, O.M. Smedstad, and A.J. Wallcraft (2009a), Estimates of bottom flows and bottom boundary layer dissipation of the oceanic general circulation from global high resolution models, *Journal of Geophysical Research*, **114**, C02024, doi:10.1029/2008JC005072.

Arbic, B.K., J.X. Mitrovica, D.R. MacAyeal, and G.A. Milne (2008), On the factors behind large Labrador Sea tides during the last glacial cycle and the potential implications for Heinrich events, *Paleoceanography*, **23**, PA3211, doi:10.1029/2007PA001573.

Scott, R.B., B.K. Arbic, C.L. Holland, **A. Sen**, and B. Qiu (2008), Zonal versus meridional velocity variance in satellite observations and realistic and idealized ocean circulation models, *Ocean Modelling*, **23**, doi:10.1016/j.ocemod.2008.04.009, 102-112.

**Sen, A.**, R.B. Scott, and B.K. Arbic (2008), Global energy dissipation rate of deep-ocean low-frequency flows by quadratic bottom boundary layer drag: Computations from current-meter data, *Geophysical Research Letters*, **35**, L09606, doi:10.1029/2008GL033407.

Arbic, B.K., and R.B. Scott (2008), On quadratic bottom drag, geostrophic turbulence, and oceanic mesoscale eddies, *Journal of Physical Oceanography*, **38**, 84-103.

Arbic, B.K., P. St-Laurent, G. Sutherland, and C. Garrett (2007b), On the resonance and influence of the tides in Ungava Bay and Hudson Strait, *Geophysical Research Letters*, **34**, L17606, doi:10.1029/2007GL030845.

**PAPER HIGHLIGHTED BY NATURE GEOSCIENCE**

Arbic, B.K., G.R. Flierl, and R.B. Scott (2007a), Cascade inequalities for forced-dissipated geostrophic turbulence, *Journal of Physical Oceanography*, **37**, 1470-1487.

Scott, R.B., and B.K. Arbic (2007), Spectral energy fluxes in geostrophic turbulence: Implications for ocean energetics, *Journal of Physical Oceanography*, **37**, 673-688.

Smith, W.H.F., R. Scharroo, V.V. Titov, D. Arcas, and B.K. Arbic (2005), Satellite altimeters measure tsunamis: Early model estimates confirmed, *Oceanography*, **18**, 11-13.

Arbic, B.K. (2005), Atmospheric forcing of the oceanic semidiurnal tide, *Geophysical Research Letters*, **32**, L02610, doi:10.1029/2004GL021668.

Arbic, B.K., D.R. MacAyeal, J.X. Mitrovica, and G.A. Milne (2004b), Ocean tides and Heinrich events, *Nature*, **432**, 460.

Arbic, B.K., S.T. Garner, R.W. Hallberg, and H.L. Simmons (2004a), The accuracy of surface elevations in forward global barotropic and baroclinic tide models, *Deep-Sea Research II*, **51**, 3069-3101.

Simmons, H.L., R.W. Hallberg, and B.K. Arbic (2004), Internal wave generation in a global baroclinic tide model, *Deep-Sea Research II*, **51**, 3043-3068.

Arbic, B.K., and G.R. Flierl (2004b), Baroclinically unstable geostrophic turbulence in the limits of strong and weak bottom Ekman friction: Application to mid-ocean eddies, *Journal of Physical Oceanography*, **34**, 2257-2273.

Arbic, B.K., and G.R. Flierl (2004a), Effects of mean flow direction on energy, isotropy, and coherence of baroclinically unstable beta-plane geostrophic turbulence, *Journal of Physical Oceanography*, **34**, 77-93.

Arbic, B.K., and G.R. Flierl (2003), Coherent vortices and kinetic energy ribbons in asymptotic, quasi two-dimensional f-plane turbulence, *Physics of Fluids*, **15**, 2177-2189.

Arbic, B.K., and W.B. Owens (2001), Climatic warming of Atlantic intermediate waters, *Journal of Climate*, **14**, 4091-4108.

Dickson, B., J. Hurrell, N. Bindoff, A. Wong, B. Arbic, W.B. Owens, S. Imakawi, and I. Yashayaev (2001), *The world during WOCE*, in *Ocean Circulation and Climate*, edited by G. Siedler, J. Church, and J. Gould, Academic Press, London, pp. 557-583.

Arbic, B.K., S. Hatamian, M. Skalsey, J. Van House, and W. Zheng (1988), Angular correlation test of CPT in polarized positronium, *Physical Review A*, **37**, 3189-3194.

## **Grants and Awards**

2009 Office of Naval Research Grant to Florida State University  
"Toward a global 1/25 degree HYCOM ocean prediction system with tides"  
Co-PI with Eric Chassignet (lead PI) on five-year project for \$2,156,665.  
Project is in collaboration with several scientists at Naval Research Laboratory, Stennis Space Center.

2007 Office of Naval Research Grant to The University of Texas at Austin  
"Effects of small-scale bathymetric roughness on the global internal wave field"  
Co-PI with John Goff (lead PI) on three-year project for \$244,017.

- 2006 National Science Foundation Grant to The University of Texas at Austin  
"Collaborative Research: Understanding tidal resonances in the present-day and ice-age oceans"  
Co-PI with Samar Khatiwala (Lamont-Doherty Earth Observatory, Columbia) on three year project (UT part \$210,475) .
- 2006 Naval Research Laboratory Contract to The University of Texas at Austin  
"Embedding a forward model of barotropic and baroclinic tides into a high-resolution general circulation model"  
Sole PI on contract which ultimately delivered \$191,771. Laid groundwork for a large part of the 2009 HYCOM grant, which supercedes this contract.
- 1994 NSF Graduate Research Fellowship and AMS Graduate Fellowship  
Awarded, but declined in favor of:
- 1994-1997 ONR-NDSEG Graduate Fellowship  
MIT-WHOI Joint Program, Cambridge and Woods Hole, MA
- 1988 William Williams Undergraduate Physics Thesis Award

### **Experience Working with Postdoctoral Scientists and Students**

- 2009 – Undergraduate summer interns  
--Byron Conley (physics major; co-advised by Patrick Timko)  
--Will Godwin (physics major)  
--Joseph Molinari (entering graduate student in applied math)  
--Brian Rivera (physics major)
- 2008-present – Postdoctoral scientist  
--Patrick Timko
- 2008-present – Learned of success stories from students in Ghana  
--Recently contacted by many of the students I taught in Ghana, who have gone on to success in higher education or in other endeavors, including: founding start-up companies in Ghana and in the US, obtaining MS (International Public Health) in the UK, obtaining PhD (Applied Mathematics) in Canada.
- 2008 – High school student summer intern  
--Anson Varghese (co-advised by Rob Scott). Co-author of Scott et al. 2009 submission to *Ocean Modelling*.
- 2007 – High school student summer intern  
--Ayon Sen (co-advised by Rob Scott). Project led to student first-author paper (Sen et al. 2008, *Geophysical Research Letters*) and student co-author

paper (Arbic et al. 2009, *Journal of Geophysical Research*). Sen entered results in Siemens-Westinghouse Science and Technology Competition, placing 4th in national finals (individual category) out of 1,641 initial entries. Sen also entered results in Intel Science Talent Search, and was named one of 40 national finalists, from 1,602 initial entries.

2006 – High school student summer intern

--Ayon Sen (co-advised by Rob Scott and Christina Holland). Project (which was different than Sen 2007 summer project) led to student co-author paper (Scott et al. 2008, *Ocean Modelling*), and Sen poster presentations at Fall 2006 AGU meeting.

## **Outreach**

Ongoing

--Have delivered numerous presentations on experience as math and science teacher in Peace Corps.

2006

--Authored article on "Tides" for World Book Encyclopedia.  
--Delivered presentation on tides to Texas Education Service Center coordinators (mentors of teachers).  
--Delivered presentation on tides to students at Lake Travis Middle School.

## **Review Experience**

Reviewer of proposals for

National Science Foundation  
Naval Research Laboratory Postdoctoral Fellowship Program  
Netherlands Organization for Scientific Research (NWO)

Reviewer of manuscripts for the scientific journals

Deep-Sea Research (I and II)  
Geophysical Research Letters  
Journal of Geophysical Research—Oceans  
Journal of Physical Oceanography  
Nature Geoscience  
Ocean Dynamics  
Ocean Modelling  
Paleoceanography

## **Service to Wider Community**

Member of recent proposal review panels (within last three years) for National Science Foundation and for NASA.

Co-convener (with Doug Luther) of session "Observing and Modeling Oceanic Internal Tides and their Impact", 2006 AGU Ocean Sciences Meeting, Honolulu, Hawaii.

Member, advisory committee, Zanzibar Channel Project, run by Theiss Research Inc. Project sends American graduate and undergraduate students to work with members of the Zanzibar Institute for Marine Sciences on coastal modeling problems. Travelled to San Diego to assist PI Jurgen Theiss in preparing students for their summer 2009 departures to Zanzibar.

## **Service at The University of Texas at Austin**

Participated extensively in development of Jackson School strategic plan, particularly in areas of climate graduate curriculum development, expansion of climate research, and outreach to developing nations.

Member, search committee, Jackson School search for multiple permanent hires in Climate Systems Science, 2007-2008. Committee made seven offers for permanent positions, five of which were accepted.

## **Research Cruise Experience**

WHOI-directed research cruises in North Atlantic:

- December 1997 PRIMER experiment, R/V Endeavor (4 days)
- July 1997 WOCE experiment, re-occupied 52 West hydrographic section, R/V Knorr (25 days).
- December 1996 GLOBEC experiment, R/V Endeavor (4 days).

## **Professional Memberships**

American Geophysical Union  
American Meteorological Society

## **Professional Conferences and Seminars**

Have attended 33 national and international professional conferences. Invited talks at Fall 2008 AGU meeting, Chris Garrett 65<sup>th</sup> birthday Festschrift.

Have delivered 92 professional hour-long seminars, in venues throughout the United States, United Kingdom, France, and Canada.