James B. Girton

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POSITION

Principal Oceanographer, Ocean Physics Dept., Applied Physics Laboratory, University of Washington.
Affiliate Assistant Professor, School of Oceanography, University of Washington.

EDUCATION

◇ **Ph. D. in Oceanography, 2001**, University of Washington, Seattle, WA.
Dissertation: Dynamics of Transport and Variability in the Denmark Strait Overflow.
Advisor: Thomas B. Sanford.

◇ **B.A. in Physics with Honors, 1993**, Swarthmore College, Swarthmore, PA.

HONORS AND AFFILIATIONS

NOAA Climate and Global Change Postdoctoral Fellowship, 2002–2004.

Office of Naval Research Graduate Fellowship, 1993–1996.

Reviewer for *Journal of Physical Oceanography*, *Journal of Geophysical Research—Oceans*, *Journal of Marine Research*, *Ocean Modelling*, *Tellus*, *Deep-Sea Research*, *Oceanography*, *Continental Shelf Research*, *Geophysical Research Letters*, and *Ocean Science*. Associate Editor for *Journal of Atmospheric and Oceanic Technology*.

Proposal reviewer and panelist for National Science Foundation (Physical Oceanography and Antarctic Integrated System Science) and national research councils of Norway, Australia, and the UK.

Member of AGU (1996–); TOS (1996–); AMS (2005–); Sigma Xi (1993–2011); IEEE OE (1993–1995).

CURRENT AND PAST FUNDED RESEARCH PROJECTS

◇ **Principal Investigator** (2004–present):

· Robotic network for exploration under ice shelves (Paul J. Allen Foundation, 2016–): Autonomous vehicle study of melting under the Pine Island Glacier, Antarctica. With Pierre Dutrieux (LDEO), Craig Lee and Luc Rainville (APL-UW), and Knut Christianson (UW ESS).

· Southern Ocean Wave Glider (NSF, 2016–): Study of waves, air–sea fluxes, and upper-ocean currents from a wave-powered surface vehicle. With Jim Thomson (APL-UW).

· SMILE (a Submesoscale MIxed-Layer Eddies experiment; NSF, 2015–): Field study using drifting autonomous arrays and ship-towed profiler surveys to characterize the upper-ocean restratification following atmospheric mixing events. With Eric Kunze (NorthWest Research) and Tom Farrar (WHOI).

· West Antarctic CDW Pathways (NSF, 2014–): Profiling float studies of ocean–shelf transport and mixing process in the Amundsen Sea seasonal ice zone.

· NASA Science Teams: OSTST and SWOT SDT (2013–). Internal tides from satellite altimetry, with applications to future swath altimetry data. With M. Alford and Z. Zhao (APL-UW).

· Samoan Passage (NSF, 2011–): Moorings, ship surveys, and modeling of the flow and mixing processes in the Samoan Passage. With Matthew Alford (APL-UW).

· DIMES (NSF, 2007–2016): Finestructure profiling float shear and strain measurements in a Southern Ocean tracer release experiment. With Jim Ledwell and DIMES investigators.

· Boundary Mixing (NSF, 2007–2010): High-resolution internal wave and nepheloid layer measurements in Monterey Canyon. With Erika McPhee-Shaw and Eric Kunze.

· Archipelago Straits (ONR, 2005–2008): Internal tide and throughflow dynamics studied with profiling floats and moorings in straits within the Philippines. With Matthew Alford.

- Denmark Strait Overflow (NASA, 2005–2008): Investigations of surface eddies in satellite data as a proxy for variability in the underlying gravity current.
- AESOP (ONR, 2005-2009): Observations of internal tides near Monterey Bay and comparison with high-resolution regional models. With Eric Kunze and AESOP investigators.
- EDDIES (NSF, 2005-2007): Finescale measurements from an array of EM-APEX floats for comparison with tracer release mixing estimates. With Jim Ledwell.
- EM-APEX/CBLAST (ONR, 2005–2006): Technical and scientific evaluation of a new profiling float incorporating electromagnetic velocity sensors, including new observations of the upper-ocean's response to Hurricane Frances. Collaboration with Tom Sanford and Jim Price.

PREVIOUS RESEARCH EXPERIENCE

◇ **Post-Doctoral** (2002–2004):

- Studies of overflow dynamics including hydraulics, entrainment and friction in MITgcm simulations and field observations from the Denmark Strait, Faroe Bank Channel, and Luzon Strait.
- Hawaii Ocean Mixing Experiment (HOME) Nearfield phase, R/V *Wecoma*, investigating the generation and dissipation of internal tides at the Hawaiian Ridge.

◇ **Doctoral** (1996–2001): Investigations of the Denmark Strait Overflow using historical current meters, satellite AVHRR, and rapid high-resolution surveys of velocity and hydrographic properties using expendable current profilers (XCP) on two cruises.

◇ **Other Graduate Field Experience**: R/V *Discovery*, Faroe Bank Channel, 2000; R/V *Wecoma*, Mendocino Escarpment, 1997; Towed transport meter (TTM3) work from R/V *Poseidon*, Denmark Strait, 1996; R/V *Akademik Lavrentyev*, Sea of Okhotsk, 1995.

◇ **Undergraduate**: NSF REU fellow, University of Hawaii, Summer 1992; Internship at GFDL/Princeton University with Kirk Bryan, Summer 1991.

TEACHING AND ADVISING

(1) Graduate advisor for Brian Chinn (Ph.D., 2015), Byron Kilbourne (Ph.D., 2015), and Samantha Terker (neé Brody; Ph.D., 2012). (2) Postdoctoral supervisor for Gunnar Voet. (3) On graduate student committees for Alex Sinclair (Electrical Engineering), Katie Morrice (M.S., 2011, Moss Landing Marine Labs) and Zoli Szuts (Ph.D., 2008). (4) Advisor for summer undergraduate research students Krysta Yousoufian (Space Grant, 2007 and 2008), Jacob Shoudy (SG, 2012), Jesse Ashworth-Marin (SG, 2014), Zach Larson (SG, 2016), and Benjamin Post (2016). (5) Teaching Assist. for Intro. Phys. Oceanogr. (MIT–WHOI Joint Program, Joyce and Ferrari, 2003; and UW, Hautala, 1996). (6) Volunteer Instructor, Ocean Inquiry Project, 2001. (7) Science Advisor for pre-service K–12 teacher course, UW Bothell, C. Kubota, 1998.

EDUCATION AND PUBLIC OUTREACH

(1) Presentations on oceanography and careers to elementary classes at John Stanford International School and Queen Anne Elementary School, Seattle, 2012–14. (2) Science fair judge, 2015–16. (3) Demonstrator at Seattle Center's Science EXPO, June 2012, and Polar Science Weekend, 2015–16. (4) Contributor to Samoan Passage cruise blog, 2012, 2014.

RECENT COLLABORATORS

Matthew Alford (SIO); Glenn Carter (UH); Eric D'Asaro (APL-UW); Pierre Dutrieux (LDEO); Pierre Flament (UH); Blair Greenan (BIO); Terry Joyce (WHOI); Rolf Käse (IfM Hamburg); Jody Klymak (U. Victoria); Eric Kunze (NorthWest Research Associates); Jim Ledwell (WHOI); Craig Lee (APL-UW); Sonya Legg (GFDL); Erika McPhee-Shaw (MLML); Alberto Naveira Garabato (Univ. Southampton); Helen Phillips (U. Tasmania); Kurt Polzin (WHOI); Larry Pratt (WHOI); Jim Price (WHOI); Tangdong Qu (IPRC/UH); Tom Sanford (APL/UW); David Smeed (NOC); Lou St. Laurent (WHOI); Leif Thomas (Stanford); Jim Thomson (APL-UW); John Toole (WHOI); Jack Whitehead (WHOI); Zhongxiang Zhao (APL-UW).

PUBLICATIONS

Cusack, J., A. C. Naveira Garabato, D. Smeed, and J. Girton, Observation of a large lee wave in the Drake Passage, *J. Phys. Oceanogr.*, submitted, 2016.

von Appen, W.-J., D. Mastropole, R. S. Pickart, H. Valdimarsson, S. Jónsson, and J. Girton, On the nature of the mesoscale variability in Denmark Strait, *J. Phys. Oceanogr.*, submitted, 2016.

Mastropole, D., R. S. Pickart, H. Valdimarsson, K. Våge, K. Jochumsen, and J. Girton, On the Hydrography of Denmark Strait, *J. Geophys. Res.*, submitted, 2016.

Chinn, B. S., J. B. Girton, and M. H. Alford, The impact of observed variations in the shear-to-strain ratio of internal waves on inferred turbulent diffusivities, *J. Phys. Oceanogr.*, in press, 2016.

Zhao, Z., M. H. Alford, J. B. Girton, L. Rainville, and H. L. Simmons, Global observations of open-ocean mode-1 M2 internal tides. *J. Phys. Oceanogr.*, *46*, 1657–1648, 2016.

Voet, G., M. H. Alford, J. B. Girton, G. S. Carter, J. B. Mickett, and J. M. Klymak, Warming and weakening of the Abyssal Flow through Samoan Passage. *J. Phys. Oceanogr.*, *46*, 23892401, 2016.

Kilbourne, B. F., and J. B. Girton, Surface boundary layer evolution and near-inertial wind power input, *J. Geophys. Res.*, *120*, 75067520, 2015.

Voet, G., J. B. Girton, M. H. Alford, G. S. Carter, J. M. Klymak, and J. Mickett, Pathways, volume transport and mixing of abyssal water in the Samoan Passage, *J. Phys. Oceanogr.*, *45*, 562–588, 2015.

Kilbourne, B. F., and J. B. Girton, Quantifying high-frequency wind energy flux into near-inertial motions in the Southeast Pacific, *J. Phys. Oceanogr.*, *45*, 369–386, 2015.

Carranza, M., S. Gille, P. Franks, J. B. Girton, and K. Johnson, Mixed-layer depth and Chl-a variability in the Southern Ocean, *ICES J. Mar. Sci.*, submitted, 2014.

von Appen, W.-J., I. M. Koszalka, R. S. Pickart, T. W. N. Haine, D. Mastropole, M. G. Magaldi, H. Valdimarsson, J. Girton, K. Jochumsen, and G. Krahmann, The East Greenland Spill Jet as an important component of the Atlantic Meridional Overturning Circulation, *Deep-Sea Res. I*, *92*, 75–84, 2014.

Terker, S. R., J. B. Girton, E. Kunze, J. M. Klymak, and R. Pinkel, Observations of the Internal Tide on the California Continental Margin near Monterey Bay. *Cont. Shelf Res.*, *82*, 60–71, 2014.

Alford, M. H., J. B. Girton, G. Voet, G. S. Carter, J. B. Mickett, and J. M. Klymak, Turbulent mixing and hydraulic control of abyssal water in the Samoan Passage, *Geophys. Res. Lett.*, *40*, 1–7, doi:10.1002/grl.50684, 2013.

Joyce, T. M., L. N. Thomas, W. K. Dewar, and J. B. Girton, Eighteen Degree Water formation within the Gulf Stream during CLIMODE, *Deep-Sea Res. II*, *91*, 1–10, 2013.

Terker, S. R., T. B. Sanford, J. H. Dunlap, and J. B. Girton, The EM-POGO: A simple, absolute velocity profiler, *Deep-Sea Res. II*, *85*, 220–227, 2013.

Zhao, Z., M. H. Alford, and J. B. Girton, Mapping low-mode internal tides from multi satellite altimetry. *Oceanography*, *25*(2):4251, 2012.

Kunze, E., C. MacKay, E. E. McPhee-Shaw, K. Morrice, J. B. Girton, and S. R. Terker, Turbulent mixing and exchange with interior waters on sloping boundaries. *J. Phys. Oceanogr.*, *42*, 910–927, 2012.

Chinn, B. S., J. B. Girton, and M. H. Alford, Observations of internal waves and parametric subharmonic instability in the Philippines archipelago. *J. Geophys. Res.*, *117*, C05019, doi:10.1029/2011JC007392, 2012.

Zhao, Z., M. H. Alford, J. Girton, T. M. S. Johnston, and G. Carter, Internal tides around the Hawaiian Ridge estimated from multisatellite altimetry. *J. Geophys. Res.*, 116(C12039), doi:10.1029/2011JC007045, 2011.

Sanford, T. B., J. F. Price, and J. B. Girton. Upper Ocean Response to Hurricane Frances (2004) Observed by Profiling EM-APEX Floats. *J. Phys. Oceanogr.*, *41*, 1041–1056, June 2011.

Girton, J. B., B. S. Chinn, and M. H. Alford. Internal wave climates of the Philippine seas. *Oceanography*, *24* (1), 100–111, March 2011.

Arango, H., J. Levin, E. Curchetser, A. Moore, W. Han, A. L. Gordon, C. M. Lee, and J. B. Girton. Development of a hindcast/forecast model for the Philippine archipelago. *Oceanography*, *24* (1), March 2011.

Ledwell, J., L. St. Laurent, J. B. Girton, and J. Toole. Diapycnal mixing in the Antarctic Circumpolar Current. *J. Phys. Oceanogr.*, *41* (1), 241–246, January 2011.

MacKinnon, J. A., M. H. Alford, P. Bouruet-Aubertot, N. Bindoff, S. Gille, J. B. Girton, M. C. Gregg, R. Hallberg, E. Kunze, A. C. Naveira Garabato, H. Phillips, R. Pinkel, K. Polzin, T. B. Sanford, H. L. Simmons, and K. G. Speer. Using global arrays to investigate internal-waves and mixing. In J. Hall, D. Harrison, and D. Stammer, editors, Proceedings of the OceanObs09: Sustained Ocean Observa- tions and

Information for Society Conference, Venice, Italy, 21-25 September 2009, volume 1 of ESA Publication WPP-306, 2010.

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Girton, J. B., and T. B. Sanford, EM-APEX observations in a mode-water eddy: Internal waves, mean velocity structure, and upper-ocean mixing, *Eos Trans. AGU*, *87* (36), Ocean Sci. Meet. Suppl., Abstract OS13H-05, 2006.

Dunlap, J. H., J. B. Girton, E. Kunze, C. M. Lee, J. P. Martin and T. B. Sanford, Along-Flux-Path Modifications to Internal Tides Generated at Kaena Ridge: Energy Budget Between the Ridge Crest and 4500-m Isobath, *Eos Trans. AGU*, *87* (36), Ocean Sci. Meet. Suppl., Abstract OS36A-04, 2006.

Girton, J. B., L. Pratt, J. F. Price and D. Sutherland, Is the Faroe Bank Channel Overflow hydraulically controlled?, *J. Phys. Oceanogr. 36* (12), pages 2340–2349, 2006.

Klymak, J. M., J. N. Moum, J. D. Nash, E. Kunze, J. B. Girton, G. S. Carter, C. M. Lee, T. B. Sanford and M. C. Gregg, An estimate of tidal energy lost to turbulence at the Hawaiian Ridge, *J. Phys. Oceanogr*, *36* (6), 1148–1164, 2006.

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Qu, T., J. B. Girton and J. A. Whitehead, Deepwater overflow through Luzon Strait, *J. Geophys. Res.*, *111* (C1), C01002, 10.1029/2005JC003139, 10 January 2006.

Sanford, T. B., J. H. Dunlap, J. A. Carlson, D. C. Webb, and J. B. Girton, Autonomous velocity and density profiler: EM-APEX, *Proceedings of the IEEE/OES Eighth Working Conference on Current Measurement Technology*, 152–156, 28–29 June 2005.

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Käse, R. H., J. B. Girton and T. B. Sanford, Structure and variability of the Denmark Strait Overflow: Model and Observations, *J. Geophys. Res.*, *108* (C6), 3181, doi:10.1029/2002JC001548, 2003.

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Girton, J. B., and T. B. Sanford, Velocity profile measurements of the Denmark Strait Overflow, *Int. WOCE Newslett.*, *37*, 28–30, 1999.