

Andrew F. Thompson

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Research Interests

My research focuses broadly on mixing and transport processes in turbulent geophysical flows in the ocean and atmosphere. I have used simple numerical models, laboratory experiments and observational data with theory to better understand how small- and mesoscale ocean phenomena affect large-scale transport and circulation. Recent projects include:

- The role of topography on jet formation and steering,
- Near-surface transport properties near the Antarctic Peninsula,
- Eddy heat fluxes in equilibrated baroclinic turbulence,
- Analysis of turbulent diapycnal mixing in Drake Passage.

Education

2006 Ph.D. in Oceanography, Scripps Institution of Oceanography
2002 M.Phil. in Fluid Flow, University of Cambridge
2001 Certificate of Advanced Study in Mathematics, University of Cambridge
2000 B.A. in Engineering Sciences, Dartmouth College

Professional Experience

2006 - present Senior Research Associate, University of East Anglia
2002 - 2006 Graduate Research Assistant, Scripps Institution of Oceanography
2000 - 2002 Keasbey Memorial Fellow, Trinity College, University of Cambridge

Award and Honors

2006 Outstanding Student Paper Award, AGU Ocean Sciences Meeting
2006 California Space Institute Grant Fellowship
2005 Phi Beta Kappa Graduate Fellowship
2003 Woods Hole Oceanographic Institution Geophysical Fluid Dynamics Fellowship
2002 National Defense Science and Engineering Graduate (NDSEG) Fellowship, tenure 2002-2005
2000 Keasbey Memorial Scholarship, tenure 2000-2002

Publications

Refereed Journals

- Thompson, A. F., The role of topographical and planetary β on jet formation. *In preparation*.
- Thompson, A. F. & Young, W. R., 2007. Baroclinic eddy heat fluxes: zonal flows and energy balance. Accepted in the Savannah Special Issue of *Journal of Atmospheric Sciences*.
- Thompson, A. F., Gille, S. T., MacKinnon, J. A. & Sprintall, J., 2007. Spatial and temporal patterns of small-scale mixing in Drake Passage. *Journal of Physical Oceanography*, **37**, 572-592.
- Thompson, A. F. & Young, W. R., 2006. Scaling baroclinic eddy fluxes: vortices and energy balance. *Journal of Physical Oceanography*, **36**, 720-738.
- Thompson, A. F. & Veronis, G., 2005. Diffusively-driven overturning of a stable density gradient. *Journal of Marine Research*, **63**, 291-313.
- Thompson, A. F., Huppert, H. E., Worster, M. G. & Aitta, A., 2003. Solidification and compositional convection of a ternary alloy. *Journal of Fluid Mechanics*, **497**, 167-199.
- Thompson, A. F., Huppert, H. E. & Worster, M. G., 2003. Appendix: A global conservation model for diffusion-controlled solidification of a ternary alloy. *Journal of Fluid Mechanics*, **483**, 191-197.

Non-Refereed Publications

- Thompson, A. F., 2006. Eddy fluxes in baroclinic turbulence. Ph.D. dissertation. University of California, San Diego.
- Thompson, A. F., 2003. Diffusively-driven overturning from a stable density gradient. Proceedings of the Geophysical Fluid Dynamics Program.
- Thompson, A. F., 2002. Aspects of the solidification of a ternary alloy. Master Thesis. University of Cambridge.

Presentations

- Thompson, A. F., Heywood, K. J, Thorpe, S. E., Renner, A. & Trasviña Castro, A. *Topographically-steered jets at the tip of the Antarctic Peninsula*. IUGG XXIV, Perugia, (talk), 2007.
- Heywood, K. J., Thorpe, S. E., Thompson, A. F., Renner, A. & Trasviña Castro, A. *The Antarctic Slope Front: what happens at the tip of the Antarctic Peninsula*. EGU General Assembly, Vienna, (talk), 2007.
- Thompson, A. F. & Young, W. R. *Baroclinic eddy fluxes: vortices and β -plane jets*. Physical Oceanography Dissertation Symposium, Honolulu, HI, (talk), 2006.
- Thompson, A. F., Gille, S. T., MacKinnon, J. A. & Sprintall, J. *Spatial and temporal patterns of small-scale mixing in Drake Passage*. AGU, Ocean Science Meeting, Honolulu, HI, (talk), 2006.

Young, W. R. & Thompson, A. F. *Beta plane jets and equilibration of baroclinic eddies*. AGU, Ocean Science Meeting, Honolulu, HI, (invited talk), 2006.

Thompson, A. F. & Linden, P. F. *Stratification of a closed region containing two buoyancy sources*. 58th Annual Meeting of the Division of Fluid Dynamics, Chicago, IL, (talk), 2005.

Thompson, A. F. & Young, W. R. *Scaling baroclinic eddy fluxes: vortices and energy balance*. 15th Conference on Atmospheric and Oceanic Fluid Dynamics, Cambridge, MA, (poster), 2005.

Thompson, A. F., Huppert, H. E., Worster, M. G. & Aitta, A. *Solidification and compositional convection of a ternary alloy*. Int. Congress of Theoretical and Applied Mechanics, Warsaw, (talk), 2004.

Thompson, A. F. & Young, W. R. *Scaling baroclinic eddy fluxes*. Global Circulation and the Atmosphere, CalTech, Pasadena, CA, (poster), 2004.

Seminars

Coherent structures in baroclinic turbulence: vortices, jets and storm tracks.

Physical Oceanography & Climate Seminar, National Oceanography Centre, Southampton, U.K., 2007

Department of Meteorology, University of Reading, U.K., 2007

School of Environmental Sciences, University of East Anglia, U.K., 2006

Spatial and temporal patterns of diapycnal mixing in Drake Passage

Department of Oceanography, CICESE, Ensenada, Mexico, 2005

Diffusively driven overturning from a stable density gradient

Institute of Theoretical Geophysics, University of Cambridge, Cambridge, U.K., 2003

Physical Oceanography Theory Seminar, Scripps Institution of Oceanography

Fall 2002, Fall 2003, Spring 2004, Winter 2005, Fall 2005, Spring 2006

Cruise experience

Antarctic Drifter Experiment: Links to Isobaths and Ecosystems (ADELIE), Antarctic Peninsula, RRS James Clark Ross, February 2007

SIO High Resolution XBT/XCTD Network, Drake Passage, R/V Laurence M. Gould, March 2005

Global Ocean Ecosystem Dynamics (GLOBEC) Program, Georges Bank, R/V Oceanus, August 1999

Schools and Workshops

Two-dimensional Turbulence, Lorentz Center, University of Leiden, The Netherlands, March 2007.

Alpine Summer School: "Transport in Geophysical Flows, Ten Years After", Valle d'Aosta, Italy, June 2004

Geophysical and Environmental Fluid Dynamics School, University of Cambridge, U.K., September 2001

Teaching experience

Teaching assistant: *Introduction to Fluid Dynamics* (graduate course), September - December, 2004

Activities

Reviewer for Journal of Fluid Mechanics

Reviewer for Journal of Physical Oceanography

Reviewer for National Science Foundation

Member American Geophysical Union

Member American Physical Society

Member Challenger Society for Marine Science

Organizer, Physical Oceanography Distinguished Lecturer Series, 2005

President, Students@SIO, 2005-2006

Vice-President, Students@SIO, 2005

Volunteer, Scripps Community Outreach Program for Education (SCOPE), 2004-2005

Volunteer, Ocean Science Bowl, 2003, 2004

Member, Dartmouth Class of 2000 Executive Committee, 2000 - 2005

Graduate and Postgraduate Advisors

Postdoctoral Advisor: Professor Karen Heywood, University of East Anglia

Doctoral Advisor: Professor William Young, Scripps Institution of Oceanography

Master Advisors: Professor Herbert Huppert & Dr. Grae Worster, University of Cambridge

References

Prof. William R. Young

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