

# Geoff Stanley

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## Education

Doctor of Philosophy, University of Oxford (2018)

Atmospheric, Oceanic, & Planetary Physics

Thesis: *Tales from Topological Oceans.*

Supervisor: David Marshall

Master of Science, University of Victoria (2013)

School of Earth and Ocean Sciences

Thesis: *From winds to eddies to diapycnal mixing of the deep ocean: the abyssal meridional overturning circulation driven by the surface wind-stress.*

Supervisors: Oleg Saenko and Andrew Weaver

Bachelor of Mathematics, University of Waterloo (2011)

Mathematical Physics & Pure Mathematics

Dean's Honours List, With Distinction, Double Major

## Academic Employment

2019 - present: Postdoctoral Fellow

School of Mathematics and Statistics, University of New South Wales

Supervisor: Trevor McDougall

## Journal Articles

**Stanley, G. J.**, T. E. Dowling, M. E. Bradley, D. P. Marshall 2019: Ertel potential vorticity versus Bernoulli potential on approximately neutral surfaces in the Antarctic Circumpolar Current. *Journal of Physical Oceanography*; *submitted*.

O. Padget, **G. Stanley**, J. K. Willis, A. Fayet, A. Shoji, L. Maurice, B. Dean, H. Kirk, I. Juarez-Martinez, S. Bond, R. Freeman and T. Guilford 2019: Shearwaters know the direction and distance home, but fail to encode intervening obstacles after free-ranging foraging trips. *Proceedings of the National Academy of Sciences*; *in press*.

Groeskamp, S., de Lavergne, C., Holmes, R., Tamsitt, V., Frenger, I., Chapman, C.C., Newsom, E., **Stanley, G.J.**, 2019. Climate recorded in seawater: A workshop on water-mass transformation analysis for ocean and climate studies. *Bull. Amer. Meteor. Soc.* BAMS-D-19-0153.1. 10.1175/BAMS-D-19-0153.1

Stanley, G.J., 2019b. The exact geostrophic streamfunction for neutral surfaces. *Ocean Modelling* 138, 107–121. 10.1016/j.ocemod.2019.04.002

**Stanley, G.J.**, 2019a. Neutral surface topology. *Ocean Modelling* 138, 88–106. 10.1016/j.ocemod.2019.01.008

Cheng, R., Jackson, D.M., **Stanley, G.J.**, 2018. Combinatorial Aspects of the Quantized Universal Enveloping Algebra of  $sl_{n+1}$ . *Annals of Combinatorics*. doi:10.1007/s00026-018-0404-2

**Stanley, G.J.,** Saenko, O.A., 2014. Bottom-Enhanced Diapycnal Mixing Driven by Mesoscale Eddies: Sensitivity to Wind Energy Supply. *Journal of Physical Oceanography* 44, 68–85. doi:10.1175/JPO-D-13-0116.1

## Conference Proceedings and Seminars

**Stanley G. J.,** The topology of neutral surfaces and their exact geostrophic streamfunction, September 3, 2019. University of Toronto, Toronto ON, Canada. (*Talk*).

**Stanley G. J.,** The topology of neutral surfaces and their exact geostrophic streamfunction, August 2, 2019. Woods Hole Oceanographic Institution Geophysical Fluid Dynamics Summer School, Woods Hole, MA, USA. (*Talk*).

**Stanley, G. J.,** T. E. Dowling, M. E. Bradley, D. P. Marshall, Ertel Potential Vorticity versus Bernoulli Potential on Approximately Neutral Surfaces in the Antarctic Circumpolar Current, July 13, 2019. Montreal, Canada. (*Poster*).

**Stanley G. J.,** The topology of neutral surfaces and their exact geostrophic streamfunction, July 10, 2019. Montreal, Canada. (*Talk*).

**Stanley G. J.,** The topology of neutral surfaces and their exact geostrophic streamfunction, May 21, 2019. Institute for Marine and Antarctic Studies, Hobart, Australia. (*Talk*).

**Stanley G. J.,** The topology of neutral surfaces and their exact geostrophic streamfunction, March 7, 2019. University of New South Wales, Sydney, Australia. (*Talk*).

Water Mass Transformation for Ocean Physics and Biogeochemistry February 4–6, 2019. UNSW Sydney, NSW, Australia. (*Participant*)

**Stanley G. J.,** Neutral Surface Topology, PODS X, October 22, 2018. Kona, HI, USA. (*Talk*).

**Stanley G. J.,** An exact geostrophic stream function on a neutral surface, Ocean Modelling Group, September 9, 2016. Liverpool, UK. (*Talk*).

**Stanley G. J.** and D. P. Marshall, Inferring Large-Scale Bottom Velocity from Sparse Data, Ocean Sciences Meeting, Abstract Number OD14B-2421, February 21–26, 2016. New Orleans, LA, USA. (*Poster*)

**Stanley G. J.** and D. P. Marshall, Predicting Bottom Velocities from Deep ARGO, IUGG General Assembly, June 22–July 2, 2015. Prague, Czech Republic. (*Talk*)

**Stanley G. J.** and N. R. Lebovitz, The Most Minimal Seed for the Onset of Shear Turbulence, Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution, August 19, 2014. Woods Hole, MA, USA. (*Talk*).

**Stanley G. J.** and O. A. Saenko, From Winds to Eddies to Diapycnal Mixing over Topography: Driving the Abyssal Meridional Overturning Circulation, National Oceanography Centre, March 19, 2014. Southampton, UK. (*Invited Talk*)

**Stanley G. J.** and O. A. Saenko, Diapycnal mixing parameterized by energy release from mesoscale eddies, IAHS-IAPSO-IASPEI Joint Assembly, Abstract Number P03S3.06, July 22–26, 2013. Gothenburg, Sweden. (*Talk*)

**Stanley G. J.** and O. A. Saenko, On the Energetics of Oceanic Mesoscale Eddies and their Parameterization Modified to Induce Diapycnal Mixing, Fall AGU meeting, December 3–7, 2012. San Francisco, CA, USA. (*Poster*)

**Stanley G. J.** and O. A. Saenko, On the Energetics of Oceanic Mesoscale Eddies and their Parameterization Modified to Induce Diapycnal Mixing, Graduate Climate Conference, October 26–28, 2012. Pack Forest, WA, USA. (*Poster*)

## Teaching Experience

Spring	2016	Tutor for Geophysical Fluid Dynamics (U of Oxford)
Fall	2014	Tutor for Mansfield College, Flows Fluctuations and Complexity (B1.1, U of Oxford)
Fall	2012	Lab Instructor for Oceans and Atmospheres (EOS 110, U of Victoria)
Fall	2011	Marker for Earth System Modelling (EOS 225, U of Victoria)
Fall	2007	Marker for Advanced Calculus 1 (MATH 140, U of Waterloo)

## Computing Skills

**Extensive:** MATLAB, Fortran, Ferret, Ruby, Unix.

**Moderate:** Java, C, Python, Scheme, Mathematica, Maple, R.

## Selected Awards

2014	Geophysical Fluid Dynamics Fellowship	Woods Hole Oceanographic Institution
2013 — 2016	Clarendon Fund Scholarship	U of Oxford
2013 — 2016	Canadian Alumni Scholarship	Linacre College, Oxford
2012	Gagnon Memorial Scholarship	U of Victoria
2011	NSERC Julie Payette Research Scholarship (to the top 24 applicants for MSc funding)	Canada
2011	K.D. Fryer Gold Medal (to one top Math graduate exemplifying good student citizenship)	U of Waterloo
2006 — 2010	René Descartes Scholarship	U of Waterloo
2006 — 2010	Queen Elizabeth II Aim for the Top Scholarship	Ontario
2007, 2008, 2010	NSERC Undergraduate Student Research Awards	Canada
2009	Robert Schaefer Memorial Award	U of Waterloo
2008	President's Research Award	U of Waterloo

## Professional Activities

2015	Scientist aboard the <i>RRS Discovery</i> on the Extended Ellett Line
2015	Reviewer for the Journal of Climate (ad hoc)
2015	Organizer of the AOPP Software Carpentry 2-day workshop
2013 — 2015	Graduate Student Representative, U of Oxford
2010	Undergraduate Representative to the Chair Selection Committee Department of Combinatorics and Optimization, University of Waterloo
2010	Conference Volunteer, Canadian Undergraduate Mathematics Conference

## Research Assistantships

- 2010 Department of Combinatorics and Optimization University of Waterloo  
Project: Straightening formulas in the quantized universal enveloping algebra  $sl_2$   
Supervisor: David M. Jackson
- 2008 Department of Physics and Astronomy, University of Waterloo  
Project: Numerical simulation of entropy evolution in merging galaxy clusters  
Supervisor: Michael Balogh
- 2007 Institute for Quantum Computing, University of Waterloo  
Project: Numerical simulation of a superconducting flux qubit and the fidelity of its quantum state  
Supervisor: Frank Wilhelm
- 2006 Richard Lewar Centre for Excellence, Heart & Stroke Lab, University of Toronto  
Project: Examining the electrophysiological structure of cardiac sodium ion channels  
Supervisor: Peter Backx

## Extracurricular Experience

- 2014 — 2015 Green Student: Technical & Financial Support  
Linacre College, Oxford
- 2012 — 2013 Co-Coordinator of Café Scientifique, a grassroots public science series  
Faculty of Science, University of Victoria
- 2008 — 2010 Residence Don, University of Waterloo Housing and Residence  
Leader and role model to over 100 students for 3 terms; awarded “Rookie of the Term”

## Referees

David Marshall  
Professor of Physical Oceanography  
Atmospheric, Oceanic and Planetary Physics  
Department of Physics, University of Oxford  
Clarendon Laboratory, Parks Road  
Oxford, OX1 3PU, UK  
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Oleg Saenko  
Research Scientist  
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Tim Dowling  
Dynamic Meteorology Professor  
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