

Professor David Philip Marshall



Personal details

Present appointment: *Professor of Physical Oceanography, Atmospheric, Oceanic and Planetary Physics*
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Degrees

Apr 2007: *MA (by special resolution), University of Oxford*
Jan 1993: *PhD in Physical Oceanography, Imperial College, University of London*
thesis: *Dynamics of the North Atlantic Subtropical Gyre*
Aug 1989: *BSc in Physics (1st class), Imperial College, University of London*

Employment

Apr 2007 - present: *Professor of Physical Oceanography, University of Oxford*
Sep 2003 - Mar 2007: *Professor of Oceanography, University of Reading*
Oct 2000 - Aug 2003: *Reader in Oceanography, University of Reading*
Oct 1994 - Sep 2000: *Lecturer, University of Reading*
Oct 1992 - Sep 1994: *Post Doctoral Research Associate, Massachusetts Institute of Technology*

Other appointments

Sep 2018 - Aug 2019: *Associate Head, Department of Physics, University of Oxford*
Aug 2016 - Dec 2018: *Adjunct Professor, IMAS, University of Tasmania*
Aug 2013 - Jul 2018: *Head of Sub-Department, Atmospheric, Oceanic and Planetary Physics, University of Oxford*
Oct 2008 - Sep 2012: *Co-director of 21st Century Ocean Institute, James Martin 21st Century School, University of Oxford*
Apr 2007 - present: *Professorial Fellow in Oceanography, St Hugh's College, University of Oxford*
Sep 1991 - Sep 1992: *Research Fellow, Massachusetts Institute of Technology*

Honours

Sep 2017: *Elected Member, Academia Europaea*
Aug 2014: *Elected Fellow, Institute of Physics*
Jul 2014: *Appleton Medal and Prize, Institute of Physics*
Jul 2011: *Editors' Citation for Excellence in Refereeing, Geophysical Research Letters, American Geophysical Union*
Sep 2010: *31st Victor P. Starr Memorial Lecture, Massachusetts Institute of Technology*
Oct 2002: *Philip Leverhulme Prize, Leverhulme Foundation*
Jun 2002: *Fellowship (award for young scientists), Challenger Society*
Oct 1994: *Elected Fellow, Royal Meteorological Society*
Jun 1989: *P. A. Sheppard Prize in Atmospheric Physics, Imperial College, University of London*
Jun 1989: *Dora Belasco Prize in Meteorology, University of London*
Jun 1987: *Matthews Memorial Prize in Physics, Imperial College, University of London*

Sea-going experience

Aug 2013 - Sep 2013: JC090 cruise, mooring recovery and turbulence profiling for OSMOSIS project, aboard RRS James Cook (19 days)

Academic service

External

June 2021 - : *NEMO Eddy Closure Working Group*
May 2021 - : *IPSL Scientific Advisory Committee*

Jul 2020 - Jul 2021: Co-organiser, *Physics of the Ocean* Summer School, Badhonnef (cancelled due to COVID)

Dec 2020 - : *National Oceanography Science and Technology Advisory Board*

Sep 2020 - Jul 2020: Panel member, NERC REF (Evaluation of NERC Centres)

Sep 2018: Co-Chair, External Review Panel, Graduate Program in Ocean Science, Ocean University of China, Qingdao.

Apr 2018 - present: *Programme Board*, CLASS National Capability Programme, NERC

Mar 2018 - present: Member, REF 2021 Panel 7 Earth Systems and Environmental Sciences

Mar 2018: Co-organiser, NERC/Met Office School, *Oceans in Weather and Climate*, Exeter

Jan 2018 - present: Associate Editor, *Ocean Modelling*

Nov 2017 - Sep 2020: Proposal evaluation panel member, *ANR CES 01 - Milieux et Biodiversité : Terre Fluide et Solide*, France

Jul 2017: Co-organiser, *Physics of the Ocean* Summer School, Badhonnef

Apr 2015: *Francqui Prize Jury*, Francqui Foundation, Brussels

Mar 2015: Co-organiser, NERC/Met Office School, *Oceans in Weather and Climate*, Exeter

Oct 2014 - present: External expert, *NEMO Developers Committee*

Sep 2014: Chair, *External Review Panel*, Scottish Association for Marine Science

Jul 2013: Organising committee, *US AMOC/RAPID International Science Meeting*, Baltimore

Apr 2012 - Sep 2013: Panel member, NERC REF (Evaluation of NERC Centres)

Oct 2011 - Sep 2014: Council, Royal Meteorological Society

Oct 2010 - Sep 2014: External examiner, *BSc/MOcean in Oceanography*, University of Southampton

Jun 2010: NERC *Climate System Theme Evaluation Committee*

Jun 2010 - Jul 2018: NERC *National Oceanography Centre Association Board*

Jan 2010 - Jun 2014: NERC *Peer Review College*, Pool of Chairs

Dec 2009: NOAA *CVP Proposal Review Panel*, United States

Sep 2009: NWO *Climate Feedbacks Proposal Review Panel*, Netherlands

Mar 2009: NERC *National Oceanography Centre Focus Group*

Jan 2009: NOAA *AMOC Proposal Review Panel*, United States

Dec 2008 - Apr 2017: NERC *High Performance Computing Steering Committee* (chair since Oct 2013)

Dec 2008: *Ad Hoc Committee*, Woods Hole Oceanographic Institution, United States

Nov 2008: Scottish Funding Council *International Assessment Panel*.

Jul 2008 - Dec 2009: NERC *Peer Review College*

Jun 2008 - Sep 2008: Expert Reviewer, *Research Assessment Exercise Panel 17*.

Dec 2007: NERC/Microsoft *Programme Working Group*

Sep 2007: Scientific committee, *Unstructured Mesh Ocean Modelling Workshop*, London

Aug 2007: External review panel, Los Alamos National Laboratory Ocean Climate Modelling Programme

Apr 2007 - Jul 2020: *Programme Advisory Group*, RAPID-WATCH Directed Programme, NERC

Mar 2007: Organising committee, *CLIVAR Subpolar Gyre Workshop*, Kiel

Nov 2006: Organising committee, *Unstructured Mesh Modelling Workshop*, Miami

Apr 2006: CFCAS Network Review Committee, Ottawa

Jan 2006 - Nov 2006: Writing team and implementation group, NERC RAPID-WATCH directed programme (allocated funding of £16M over 7 years).

Oct 2005: Organising committee, *Unstructured Mesh Modelling Workshop*, Bremerhaven

Aug 2005 - Jul 2011: *Management committee*, Imperial College Ocean Model

Apr 2004: Convenor, *Small and mesoscale ocean processes and their impact on the large-scale*, European Geophysical Union General Assembly, Nice

Apr 2004: Organising Committee, *CLIVAR Atlantic Predictability Workshop*, Reading

Feb 2004 - present: Editorial Board, *Dynamics of Atmospheres and Oceans*

July 2003 - Jun 2005: NERC *Peer Review College*

Apr 2003 - Jan 2005: Guest Editor, *Deep Sea Research* Special Issue

Apr 2003: Convenor, *Small and mesoscale ocean processes and their impact on the large-scale*, European Geophysical Union General Assembly, Nice

Jan 2003 - Jun 2007: *CLIVAR Atlantic Implementation Panel*

Sep 2002 - Jun 2003: NERC *Marine Science Peer Review Committee*

Sep 2000 - Mar 2003: *Nansen Medal Committee*, European Geophysical Society

Apr 2000 - Mar 2003: *Secretary for Oceanography*, European Geophysical Society

Apr 2000: Convenor, *The global ocean circulation*, European Geophysical Society General Assembly, Nice

Dec 1999 - Apr 2001: NERC *Working Group on Rapid Climate Change*

Aug 1999: Convenor, *Thermocline ventilation*, World Ocean Circulation Experiment International Workshop on the Atlantic, Kiel

Apr 1999: Convenor, *Small and mesoscale ocean processes and their impact on the large-scale*, European Geophysical Union General Assembly, The Hague

Various dates: External Examiner for 30 PhD students (Stockholm, University of Tasmania, Utrecht, Brest, McGill, Sydney, UPMC Paris, Cambridge, East Anglia, Keele, Imperial College London, University College London, Liverpool, Louvain-la-Neuve, Oxford, Plymouth, Southampton)

Various dates: Referee for *Cambridge University Press, Chaos, Solit. Fract., Deep Sea Res., Dynam. Atmos. Oceans, Geophys. Astrophys. Fluid Dynam., Fluids, Geophys. Res. Lett., J. Climate, J. Fluid Mech., J. Geophys. Res., J. Mar. Res., J. Phys. Oceanogr., Kluwer, Nature, Nature Geoscience, Ocean Dynam., Ocean Modell., Paleoclimates, Princeton University Press, Proc. Nat. Acad. Sci., Proc. Roy. Soc., Q. J. Roy. Meteor. Soc., Science, Surveys Geophys., Tellus, Weather, Agence Nationale de la Recherche, Canadian Foundation for Climate and Atmospheric Sciences, Canadian National Science and Engineering Research Council, Engineering and Physical Science Research Council, Leverhulme Trust, National Oceanic and Atmospheric Administration, National Science Foundation, Natural Environment Research Council, Netherlands Organization for Scientific Research*

University of Oxford

Oct 2021 - present: Academic Committee

Oct 2019 - present: Doctoral Training Programme Management Committee

Oct 2018 - Jul 2019: Associate Head, Department of Physics

Dec 2017 - Jun 2018: Chair, NERC Demand Management Decision Panel

Oct 2017 - Sep 2020: *Finance Committee*, St Hugh's College

Oct 2016 - present: Governing Body representative, *Alumni Association Board*, St Hugh's College

Oct 2016 - Aug 2019: *Development Board*, Department of Physics

Jun 2016: Keynote speaker, *Physics Alumni Garden Party*, Oxford

Apr 2016: Keynote speaker, *Alumni Weekend in North America*, Washington D.C.

Nov 2015 - Nov 2017: Co-organiser and Host, AOPP Annual Alumni Event at the Royal Society

Oct 2014 - Jul 2018: *Nominations Committee*, Department of Physics

Oct 2013 - Jul 2014: Finals Examiner, Department of Physics

Aug 2013 - Jul 2018: Head of Sub-Department, Atmospheric, Oceanic and Planetary Physics

Jul 2013 - Aug 2019: *Physics Management Committee*

Sep 2012 - Feb 2013: *Halley Chair Appointment Committee*

Oct 2012 - Jan 2013: *Geochemistry Chair Appointment Committee*

Sep 2009 - Jul 2012: Convenor, *Atmospheric, Oceanic and Planetary Physics Seminar Series*

Aug 2012: *Athena SWAN Bronze Award*, Department of Physics

Sep 2010 - Sep 2012: Chair, *Athena Swan Working Group*, Department of Physics

Nov 2009 - present: *Hurry Prize Committee*, St Hugh's College

Jul 2009 - Sep 2015: *Remuneration Committee*, St Hugh's College

May 2009 - Sep 2012: Chair, *Oxford Supercomputing Centre Management Committee*

Apr 2009 - Sep 2010: *Personnel Committee*, Department of Physics

Jul 2008: Discretionary Increment Committee, Department of Physics

Jan 2008 - Apr 2009: *Oxford Supercomputing Centre Advisory Group*

Apr 2007 - present: *Governing Body*, St Hugh's College

Various dates: Internal examiner for 8 DPhil students.

University of Reading

Apr 2006 - Mar 2007: *Physics Degree Working Group*

Jan 2006 - Mar 2007: *Walker Institute Scientific Steering Group*

Feb 2005 - Jun 2006: *Theme in Waves Steering Committee*

Dec 2005 - Apr 2006: *Physics/Meteorology Degree Working Group*

Jun 2005 - Mar 2007: *Departmental Management Group*

Jun 2005 - Jan 2006: *Higher Degree Tutor*

Apr 2005 - Mar 2007: *Theme in Earth System Science Management Group*

Oct 2003 - Mar 2007: *IT Advisory Group*

Oct 2003 - Mar 2007: *Research Infrastructure Subcommittee*

Oct 2003 - Mar 2007: *Council*, School of Meteorology, Mathematics and Physics

Oct 2003 - Sep 2006: *Higher Degree Board*, Department of Meteorology

Jul 2003 - Jan 2007: *Computing Manager*, Department of Meteorology

Feb 2002 - Sep 2002: *Meteorology Faculty Search Committee*

Oct 2000 - Mar 2007: New Lecturer Mentor

Oct 2000 - Jan 2001:	<i>Laboratory Review Working Group</i> , Department of Meteorology
Feb 2000 - Apr 2000:	<i>Joint Infrastructure Fund Working Group</i> , Department of Meteorology
Jan 2000 - Sep 2002:	<i>Faculty of Science Postgraduate Committee</i>
Nov 1999 - Jun 2000:	<i>New Meteorology Degrees Implementation Group</i>
Sep 1999 - Sep 2002:	<i>Higher Degree Tutor</i> (to about 50 research students)
Jun 1999 - Sep 2002:	Chair, <i>Higher Degree Board</i> , Department of Meteorology
Jun 1999 - Sep 2002:	<i>Higher Degree Forum</i> , Department of Meteorology
Jul 1998 - Jun 1999:	<i>Seminar Coordinator</i> , Department of Meteorology
Apr 1998 - Mar 2007:	<i>Fluids Laboratory Manager</i> , Department of Meteorology
Apr 1998 - Sep 2000:	<i>Laboratory Committee</i> , Department of Meteorology
Oct 1997 - Jun 1999:	<i>House Committee</i> , Department of Meteorology
Dec 1994 - Jun 1998:	Chair, <i>Staff-Student Committee</i> , Department of Meteorology
Dec 1994 - Jun 1998:	<i>Student Feedback Coordinator</i> , Department of Meteorology
Dec 1994 - Jun 1998:	<i>Faculty of Science Joint Committee</i>
Various dates:	Tutor to 21 Undergraduate Students and 16 Masters Students
Various dates:	Member of 35 PhD thesis committees
Various dates:	Internal Examiner for 17 PhD students

Research contracts

Community programme

Jan 2007 - Dec 2014:	<i>RAPID-WATCH</i>	£16M
	Bryden, Marshall, Sutton, Wood, Marotzke, Srokosz	

Funded projects

Sep 2020 - Aug 2023:	<i>SNAP-DRAGON</i>	£1 216 623
	NERC (CoI)	
Oct 2019 - Sep 2021	<i>TICTOC</i>	£377 411
	NERC (acting PI following relocation of original PI, Laure Zanna)	
Nov 2019 - Oct 2023:	<i>SO-CHIC</i>	€51 123
	EU (CoI)	
Sep 2014 - Sep 2017:	<i>Implementation and optimisation of geostrophic parameterisations in ocean circulation models</i>	£286 937
	NERC (CoI; led by University of Edinburgh)	
Oct 2013 - Aug 2019:	<i>UK-OSNAP</i>	£402 652
	NERC (Oxford PI; led by NOC)	
Nov 2013 - Mar 2014:	<i>Southern Ocean Modelling</i>	£40 000
	Met Office (PI)	
Oct 2011 - Mar 2016:	<i>TEA-COSI</i>	£335 847
	NERC (CoI; led by NOC)	
Apr 2011 - Sep 2015:	<i>OSMOSIS</i>	£99 933
	NERC (Oxford PI; led by University of Reading)	
May 2011 - Apr 2012:	<i>Numerical modelling of ocean circulation using a vorticity-potential method</i>	£50 204
	NERC (PI)	
Oct 2010 - Sep 2013:	<i>New framework for parameterising ocean eddies: energetics, conservation and flow stability</i>	£329 273
	NERC (PI; with Imperial College)	
Apr 2010 - Dec 2015:	<i>UK GEOTRACES</i>	£1 018 896
	NERC (CoI; led by Earth Sciences)	
Feb 2009 - Jan 2012:	<i>Role of ocean eddies in glacial cycles</i>	£364 436
	NERC	
Oct 2008 - Mar 2012:	<i>21st Century Ocean Institute</i>	£300 000
	James Martin 21st Century School	
Oct 2008 - Dec 2011:	<i>Adjoint sensitivity of sea level and inter-basin transports to forcing and circulation anomalies</i>	£411 347
	NERC (PI, with Helen Johnson)	
Apr 2008 - Sep 2010:	<i>Carbon Cycle Modelling, Assimilation and Prediction</i>	£207 774
	NERC (Oxford PI; subcontracted from CEH)	
Jul 2007 - Mar 2010:	<i>DESIRE</i>	£259 718
	NERC (Oxford PI; led by BAS)	
Aug 2005 - Sep 2010:	<i>Next-generation unstructured mesh ocean circulation modelling</i>	£385 029
	NERC (Reading/Oxford PI; led by Imperial College)	

Apr 2005	- Sep 2008:	<i>Attribution of Climate Change Signals in the Atlantic</i> NERC (PI; with Proudman Laboratory)	£175 987
Oct 2004	- Sep 2007:	<i>Separation of Oceanic Boundary Layers</i> NERC (PI; with Imperial College)	£132 270
May 2003	- Apr 2009:	<i>Monitoring array along the western margin of the North Atlantic</i> NERC (CoI; led by Proudman Laboratory)	£629 375
Jan 2002	- Dec 2004:	<i>Participation in MESO</i> NERC (PI)	£30 752
Jun 2001	- May 2004:	<i>North Atlantic ocean-atmosphere interaction</i> NERC (PI; with Brian Hoskins)	£145 533
Apr 2000	- Mar 2003:	<i>Parameterisation of geostrophic ocean turbulence</i> NERC (PI)	£121 241
Oct 1998	- Sep 2000:	<i>Transport of water masses in eastern North Atlantic</i> NERC (PI)	£25 355
Jul 1997	- Dec 1998:	<i>Processes in boundary current separation</i> Met Office (PI)	£51 176
Jan 1996	- Jun 2000:	<i>Semigeostrophic modelling of Gulf Stream and its interaction with bottom topography</i> NERC (PI)	£118 311
Oct 1995	- Sep 1998:	<i>Dynamics of zonal jets</i> Univ. Reading Research Endowment Fund (PI)	£26 050

Research students

Current

Oct 2020	- present:	Rosie Eaves (with James Maddison)
Oct 2019	- present:	Andrew Styles (with Mike Bell)
Oct 2019	- present:	Jamie Rees (with Irene Moroz, Mike Bell, Peter Read)
Oct 2019	- present:	Kate Mauer (<i>Richards Scholar</i> ; with James Maddison)
Mar 2019	- present:	James Boneham (with Helen Johnson)
Mar 2019	- present:	Fraser Goldsworth (with Helen Johnson)
Oct 2016	- present:	Ke Zhao

Degree awarded

Oct 2016	- May 2022:	Twm Jonathan (with Helen Johnson, Mike Bell)
Oct 2014	- May 2020:	Laura Cimoli (<i>Clarendon Scholar</i> ; with Helen Johnson)
Oct 2013	- Apr 2018:	Geoff Stanley (<i>Clarendon Scholar</i>)
Oct 2013	- Dec 2017:	Graeme MacGilchrist (with Helen Johnson)
Oct 2013	- Jul 2017:	Tomas David (with Laure Zanna)
Oct 2012	- Sep 2016:	Ed Doddridge (<i>Rhodes Scholar</i>)
Oct 2012	- Jan 2016:	Mark Forshaw (MRes; with James Maddison, Helen Johnson)
Oct 2011	- Jun 2015:	Liam Brannigan (with George Nurser, Alberto Naveira Garabato)
Oct 2008	- Jan 2013:	Helen Pillar (with Helen Johnson)
Oct 2007	- Dec 2010:	James Maddison (with Peter Read)
Oct 2006	- Nov 2011:	Amrita Shrivastava
Oct 2006	- Sep 2010:	Sarka Tukova
Oct 2005	- Sep 2009:	Lesley Allison (with Helen Johnson)
Oct 2004	- Aug 2008:	Kuniko Yamazaki (with Myles Allen)
Oct 2003	- Sep 2007:	James Percival (with Nancy Nichols)
Oct 2001	- Oct 2004:	David Munday
Oct 2000	- Nov 2003:	Stuart Moore
Jan 1999	- Dec 2001:	Helen Johnson
Jan 1999	- Jan 2002:	Jeff Polton
Oct 1996	- Sep 1999:	Susan Adcock
Oct 1995	- Jun 1998:	James Stephens
Oct 1994	- Dec 1997:	Malcolm Roberts

Post-docs

Apr 2021	- Mar 2024:	Ryan Patmore
Jan 2021	- Jan 2024:	Rita Markina
Oct 2017	- May 2019:	Julian Mak
Apr 2016	- May 2019:	Yavor Kostov
Oct 2010	- Jun 2013:	James Maddison

Mar 2009 - Nov 2010: Stuart Daines
 Feb 2009 - Jan 2012: Xiaoming Zhai
 Jun 2007 - May 2008: Rena Czeschel
 Oct 2006 - Apr 2011: Jemma Shipton
 Oct 2006 - Sep 2009: Lucy Bricheno
 Sep 2005 - May 2008: Lars Czeschel
 Oct 2004 - Dec 2014: David Munday
 Jun 2003 - Dec 2003: Manoj Joshi
 Jun 2001 - Dec 2002: Maarten Ambaum
 Oct 1999 - Sep 2002: Susan Adcock
 Jul 1998 - Dec 1998: James Stephens
 Jan 1995 - Apr 2000: Claire Tansley

Research fellows hosted

Oct 2017 - Mar 2018: Ali Mashayek (*NERC Independent Research Fellow*)
 Mar 2009 - Sep 2011: Laure Zanna (*James Martin Fellow*)
 Feb 2009 - Apr 2010: Adam Candy (*James Martin Fellow*)
 Apr 2005 - Mar 2007: Helen Johnson (*Royal Society University Research Fellow*)

Summer students, visiting students

Daniel Shipley, Talia Tamarin, Catherine Jones, Russell Hay, Bendix Vogel, Helen Pillar, Ronan Paugam, Marlos Goes, Adam Candy, Caroline Bain, Gabriella Villani, Han-Seul Lee, Mads Poulsen, Jonas Blüthgen

Refereed publications

ResearcherID B-6767-2009; ORCID 0000-0002-5199-6579; h-index 34; total citations 3476 (Web of Science)

Submitted

111. Marshall, D. P., and X. Zhai, 2022: Southern Ocean eddy-induced overturning and circumpolar transport inferred from eddy energy and its residence time. *Ocean Dynam.*, to be resubmitted.
110. Cimoli, L., A. Mashayek, H. L. Johnson, D. P. Marshall, A. C. Naveira Garabato, C. B. Whalen, C. Vic, M. H. Alford, J. A. MacKinnon, L. D. Talley, 2022: Significance of diapycnal mixing within the Atlantic Meridional Overturning Circulation. *Geophys. Res. Lett.*, to be resubmitted.
109. Kostov, Y., M.-J. Messias, H. L. Johnson, and D. P. Marshall, 2022: Fast mechanisms linking the Labrador Sea with subtropical Atlantic overturning. *Clim. Dynam.*, submitted.

Published

108. Styles, A. F., M. J. Bell, D. P. Marshall, and D. Storkey, 2022: Spurious forces can dominate the vorticity budget of ocean gyres on the C-grid. *J. Adv. Model. Earth Systems*, doi: 10.1029/2021MS002884.
107. Stanley, G. J., and D. P. Marshall, 2022: Why mean potential vorticity cannot be materially conserved in the eddying Southern Ocean. *J. Phys. Oceanogr.*, 52, doi: 10.1175/JPO-D-21-0195.1.
106. Mak, J., D. P. Marshall, G. Madec, and J. R. Maddison, 2022: Acute sensitivity of global ocean circulation and heat content to eddy energy dissipation time-scale. *Geophys. Res. Lett.*, 49, e2021GL097259.
105. Melet, A. V., R. W. Hallberg, and Marshall, D. P., X. Zhai, 2021: The role of ocean mixing in the climate system. In: *Ocean Mixing — Drivers, Mechanisms and Impacts*, 5-34, M. Meredith and A. Naveira Garabato, Eds., doi: 10.1016/B978-0-12-821512-8.00009-8.
104. Kostov, Y., H. L. Johnson, D. P. Marshall, P. Heimbach, G. Forget, N. P. Holliday, M. S. Lozier, F. Li, H. Pillar, T. Smith, 2021: Distinct sources of interannual subtropical and subpolar Atlantic overturning variability. *Nature Geosci.*, doi:10.1038/s41561-021-00759-4.
103. Goldsworth, F. W., D. P. Marshall, D. P., and H. L. Johnson, 2021: Symmetric instability in cross-equatorial western boundary currents. *J. Phys. Oceanogr.*, 51, 2049-2067.
102. MacGilchrist, G., H. L. Johnson, C. Lique, and D. P. Marshall, 2021: Demons in the North Atlantic: Variability of deep ocean ventilation. *Geophys. Res. Lett.*, 48, e2020GL092340.
101. Yang, Z., X. Zhai, D. P. Marshall, and G. Wang, 2021: An Idealised Model Study of Eddy Energetics in the Western Boundary 'Graveyard'. *J. Phys. Oceanogr.*, 51, 1265-1282.
100. Yu, X., A. C. Naveira Garabato, A. P. Martin, and D. P. Marshall, 2021: The annual cycle of upper-ocean potential vorticity and its relationship to submesoscale instabilities. *J. Phys. Oceanogr.*, 51, 385-402.
99. Hewitt, H. T., M. Roberts, P. Mathiot, A. Biastoch, E. Blackley, E. P. Chassignet, B. Fox-Kemper, P. Hyder, D. P. Marshall; E. Popova, A.-M. Treguier, L. Zanna, A. Yool, Y. Yu, R. Beadling, M. Bell, T. Kuhlbrodt, T. Arsouze, A. Bellucci, F. Castruccio, B. Gan, D. Pustrasahan, C. D. Roberts, L. Van Roekel, and Q. Zhang, 2020: Resolving and Parameterising the Ocean Mesoscale in Earth System Models. *Curr. Clim. Change Rep.*, 6, 137-152.

98. MacGilchrist, G., H. L. Johnson, D. P. Marshall, C. Lique, M. Thomas, L. Jackson, and R. Wood, 2020: Locations and mechanisms of ocean ventilation in the high-latitude North Atlantic. *J. Climate*, 33, 10113-10131.
97. Stanley, G. J., T. E. Dowling, M. E. Bradley, and D. P. Marshall, 2020: Ertel potential vorticity versus Bernoulli potential on approximately neutral surfaces in the Antarctic Circumpolar Current. *J. Phys. Oceanogr.*, 50, 2621-2648.
96. Ni, Q., X. Zhai, G. Wang, and D. P. Marshall, 2020: Random movement of mesoscale eddies in the global ocean. *J. Phys. Oceanogr.*, 50, 2341-2357.
95. Cimoli, L., C. C. Caulfield, H. L. Johnson, D. P. Marshall, A. Mashayek, A. C. Naveira Garabato, and C. Vic, 2019: Sensitivity of deep ocean mixing to local internal wave breaking and mixing efficiency. *Geophys. Res. Lett.*, 43, 14622-14633.
94. Poulsen, M. B., M. Jochum, J. R. Maddison, D. P. Marshall, and R. Nuterman, 2019: A geometric interpretation of Southern Ocean eddy form stress. *J. Phys. Oceanogr.*, 49, 2553-2570.
93. Kostov, Y., H. L. Johnson, and D. P. Marshall, 2019: AMOC sensitivity to surface buoyancy fluxes: the role of air-sea feedback mechanisms. *Climate Dynam.*, 53, 4521-4537.
92. Johnson, H. L., P. Cessi, D. P. Marshall, F. Schloesser, and M. A. Spall, 2019: Recent contributions of theory to our understanding of the Atlantic Meridional Overturning Circulation. *J. Geophys. Res. Oceans*, 124, 5376-5399.
91. Lozier, M. S., F. Li, S. Bacon, F. Bahr, A. S. Bower, S. A. Cunningham, M. F. de Jong; L. de Steur, B. deYoung, J. Fischer; S. F. Gary, B. J. W. Greenan, N. P. Holliday, A. Houk, L. Houpert, M. E. Inall, W. E. Johns, H. L. Johnson, C. Johnson, J. Karstensen, G. Koman, I. LeBras, X. Lin; N. Mackay, D. P. Marshall, H. Mercier, M. Oltmanns, R. S. Pickart, A. Ramsey, D. Rayner, F. Straneo, V. Thierry, D. J. Torres, R. G. Williams, C. Wilson, J. Yang, I. Yashayaev, and J. Zhao, 2019: A sea change in our view of overturning in the Subpolar North Atlantic. *Science*, 363, 516-521.
90. Doddridge, E. W., and D. P. Marshall, 2018: Implications of eddy cancellation for nutrient distribution within subtropical gyres. *J. Geophys. Res. Oceans*, 123, 6720-6735.
89. Mak, J., J. R. Maddison, D. P. Marshall, and D. R. Munday, 2018: Implementation of a geometrically and energetically constrained mesoscale eddy parameterization in an ocean circulation model. *J. Phys. Oceanogr.*, 48, 2363-2382.
88. Pillar, H. R., H. L. Johnson, D. P. Marshall, P. Heimbach, and S. Takao, 2018: Impacts of Atmospheric Reanalysis Uncertainty on AMOC Estimates at 25°N. *J. Climate*, 31, 8719-8744.
87. David, T. W., L. Zanna, and D. P. Marshall, 2018: Eddy-mixing entropy and its maximization in forced-dissipative geostrophic turbulence. *J. Stat. Mech.*, 2018, 073206.
86. Ferreira, D., P. Cessi, H. Coxhall, A. de Boer, H. A. Dijkstra, S. S. Drijfhout, T. Eldevik, N. Harnik., F. McManus, D. P. Marshall, J. Nilsson, F. Roquet, T. Schneider, and R. C. Wills, 2018: Atlantic-Pacific asymmetry in deep water formation. *Annu. Rev. Earth Planet. Sci.*, 46, 327-352.
85. Brannigan, L., D. P. Marshall, A. Naveira Garabato, A. J. G. Nurser, and J. Kaiser, 2017: Submesoscale instabilities in mesoscale eddies. *J. Phys. Oceanogr.*, 47, 3061-3085.
84. Ferrari, R., L.-P. Nadeau, D. P. Marshall, L. C. Allison, and H. L. Johnson, 2017: A model of the ocean overturning circulation with two closed basins and a reentrant channel. *J. Phys. Oceanogr.*, 47, 2887-2906.
83. MacGilchrist, G., D. P. Marshall, H. L. Johnson, C. Lique, and M. Thomas, 2017: Characterising the chaotic nature of ocean ventilation. *J. Geophys. Res.*, 122, 7577-7594.
82. Marshall, D. P., and H. L. Johnson, 2017: Relative strength of the Antarctic Circumpolar Current and Atlantic Meridional Overturning Circulation. *Tellus A*, 69, 1338884.
81. Lozier, M. S., S. Bacon, A. S. Bower, S. A. Cunningham, M. F. de Jong; L. de Steur, B. deYoung, J. Fischer; S. F. Gary, B. J. W. Greenan, P. Heimbach, N. P. Holliday, L. Houpert, M. E. Inall, W. E. Johns, H. L. Johnson, J. Karstensen, F. Li, X. Lin; N. Mackay, D. P. Marshall, H. Mercier, P. G. Myers, R. S. Pickart, H. R. Pillar, F. Straneo, V. Thierry, R. A. Weller, R. G. Williams, C. Wilson, J. Yang, J. Zhao, and J. D. Zika, 2017: Overturning in the Subpolar North Atlantic Program: a new international ocean observing system. *Bull. Am. Meteorol. Soc.*, 98, 737-752.
80. David, T. W., D. P. Marshall, and L. Zanna, 2017: The statistical nature of turbulent barotropic ocean jets. *Ocean Modell.*, 113, 34-49.
79. Mak, J., D. P. Marshall, J. R. Maddison, and S. D. Bachman, 2017: Emergent eddy saturation from an energy constrained eddy parameterisation. *Ocean Modell.*, 112, 125-138.
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Other publications

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- 2013: Book review: "Buoyancy-driven flows" by Eric Chassignet, Claudia Cenedese and Jacques Verron (Eds.). *Theor. Comput. Fluid Dyn.*, **27**, 733-734.
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17. Joshi, M., Marshall, D. P., and B. J. Hoskins, 2003: A new coupled model for addressing North Atlantic ocean-atmosphere interaction. *COAPEC Newsletter*, **3**, 2-3.
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15. Johnson, H. L., and D. P. Marshall, 2002: Thermohaline circulation changes: a new quantitative theory. *Bull. Amer. Met. Soc.*, **83**, 347-348.
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13. Marshall, D. P., 2000: Physics of thermocline ventilation in the North Atlantic. *Report of the WOCE North Atlantic Workshop. WOCE Report No.169/2000*, 64-66.

12. Marshall, D. P., and C. E. Tansley, 1999: The processes important in boundary current separation. U. K. Meteorological Office technical report, 40pp.
11. Marshall, D. P., 1998: Book review: "The Oceans and Climate" by Grant Bigg. *Q. J. Roy. Met. Soc.*, 124, 1013-1014.
10. Marshall, D. P., and A. Adcroft, 1998: On the form stress exerted by piecewise-constant coastlines on model boundary currents. *Sigma*, 22, 6-7.
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8. Lee, M.-M., D. P. Marshall, and R. G. Williams, 1997: Parameterising the eddy transfer of water masses. *11th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society*, 48-49.
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2. Marshall, D., 1992: *Dynamics of the North Atlantic Subtropical Gyre*. PhD Thesis, Imperial College, University of London, 206pp.
1. Marshall, D., 1991: On the zonal penetration of the Gulf Stream. *8th Conference on Waves and Stability, American Meteorological Society*, 161-164.

Teaching

Lecture courses

Jan 2020	- present:	<i>B7/S7 Classical Mechanics</i> Advanced lectures on Lagrangian and Hamiltonian mechanics
Jan 2020	- present:	<i>C5 Atmospheric Physics</i> Lectures on geophysical fluid dynamics
May 2018 :		<i>C5 Atmospheric Physics</i> Lectures on observing and modelling weather and climate
Jan 2015	- present:	<i>Large-Scale Ocean Circulation</i> Graduate Lectures on Physical Oceanography
Oct 2015	- Mar 2017:	<i>Proposal writing, surface energy exchange</i> Ad-hoc teaching for the Doctoral Training Programme
Oct 2010	- Jun 2015:	<i>B1 Flows, fluctuations and complexity</i> Lectures on fluid dynamics and dynamical systems, tutorials/collections for <i>St Peters, Mansfield, Balliol, Merton Colleges</i>
Oct 2007	- May 2012:	<i>C5 Atmospheric Physics</i> Lectures on geophysical fluid dynamics, ocean circulation and climate
Oct 2004	- Dec 2006:	<i>MT37F Oceanography</i> Undergraduate lectures
Oct 2003	- Mar 2007:	<i>MT24A Atmosphere and Ocean Dynamics</i> Undergraduate lectures, laboratory demonstrations, problems classes
Oct 2003	- Dec 2003:	<i>MT721 Atmospheric Analogues</i> Undergraduate fluids laboratory
Oct 2000	- Oct 2004:	<i>MSc Tutorials</i> Small-group tuition/problem solving
Apr 1998	- Jul 2002:	<i>MT301 Fluid Motion</i> Undergraduate lectures, laboratory demonstrations, problems classes
Oct 1996	- Apr 1997:	<i>MSc Tutorials</i> Small-group tuition, problem solving
Jan 1996	- Dec 2001:	<i>MTB17 Atmospheric Analogues</i> Postgraduate fluids laboratory
Apr 1995	- Jul 2002:	<i>MT623 Ocean Science</i> Undergraduate lectures
Apr 1995	- Jun 1995:	<i>MT301 Fluid Motion</i> Undergraduate laboratory demonstrations
Jan 1995	- Mar 1999:	<i>MT831 Ocean Dynamics</i>

Jan 1995 - Mar 1997: Undergraduate lectures
MTB21 Oceanography
Postgraduate lectures

Other teaching

Jul 2021: Co-organiser and lecturer, *Physics of the Ocean Summer School*, Badhonnef
Sep 2019: Lecturer, *NCAS Climate Summer School*, Cambridge
Mar 2018: Co-organiser and lecturer, *Oceans in Weather and Climate School*, Exeter
Sep 2017: Guest lecturer, *NCAS Climate Summer School*, Cambridge
Jul 2017: Co-organiser and lecturer, *Physics of the Ocean Summer School*, Badhonnef
Jun 2016: Invited Lecturer, *European Earth System and Climate Modelling School*, Helsinki
Sep 2015: Guest lecturer, *NCAS Climate Summer School*, Cambridge
Mar 2015: Co-organiser, *NERC/Met Office School, Oceans in Weather and Climate*, Exeter
Jul 2014: Invited lecturer, *Physics of the Ocean Summer School*, Badhonnef
Feb 2013: Invited Lecturer, *Waves and Instabilities in Geophysical and Astrophysical Flows Winter School*, Les Houches
Jun 2012: Invited Lecturer, *European Earth System and Climate Modelling School*, Kos
Sep 2011: Guest lecturer, *NCAS Climate Summer School*, Cambridge
Sep 2009: Guest lecturer, *NCAS Climate Summer School*, Cambridge
Sep 2007: Principal lecturer, *Netherlands CCR Summer School*, Les Diablerets
Sep 2007: Guest lecturer, *UJCC-NCAS Climate Modelling Summer School*, Cambridge
Aug 2006: Invited faculty and lecturer, *Summer School in Modern Mathematical Methods in Physical Oceanography*, Breckenridge, Colorado
Jul 2004: Invited lecturer, *Oceanography, Lakes and Rivers Summer School*, Lisbon
Sep 2003: Principal lecturer, *Netherlands CCR Summer School*, Les Diablerets
Sep 2001 - Sep 2006: Core Lecturer, *Geophysical and Environmental Fluid Dynamics Summer School*, University of Cambridge
Jul 2001: Visiting Fellow, *Summer School in Geophysical Fluid Dynamics*, Woods Hole
Sep 2000: Invited lecturer, *NERC Summer School, Geophysical and Environmental Fluid Dynamics*, Cambridge
Jul 2000: Invited lecture, *CARTUM Summer School*, Bidston
Various dates: Supervisor, 23 MPhys/BSc dissertations, 17 MSc dissertations/team projects

Evidence of teaching quality

Jun 2014: Shortlisted, OUSU student-led teaching award for *Best Lecturer in Mathematical, Physical and Life Sciences Division*, University of Oxford
Feb 2003: Nominated, *Award for Teaching Excellence*, University of Reading

On evaluation forms returned from University of Reading lecture modules (1997-2007):

- 93% of students (249/269) found the lectures *clear* or *very clear*.
- 92% of students (247/269) found the lectures *interesting* or *very interesting*.

Examples of student feedback:

- *Genuinely brilliant lecturer, explained everything really well and made the course very interesting.*
- *I found the way that the course felt like a journey through classical mechanics really interesting, and the interludes about the history surrounding the subject was also very interesting. The lecturer was very engaging and explained everything very clearly.*
- *I just want to tell you that you have done a great job at teaching up Fluids, Flows and Complexity! The way you teach is very engaging, and your lecture notes supplement your lectures very well. The pedagogy is just excellent and it plays a great role in keeping us interested in the subject (which I, honestly, was not very keen in studying initially as I am more interested in modern physics). On behalf of all the third years - THANK YOU VERY MUCH!*
- *Thank you for ... being a kind and caring personal tutor and a top class lecturer - your enthusiasm is contagious!*
- *Thank you for being a fantastic tutor and lecturer!*
- *Thanks ... for your brilliant teaching, through which I discovered my interest in oceanography.*
- *Brilliant teaching and approachable. Overall, the best module so far! Thank you!*
- *Excellent lecture technique keeps everyone interested, and easy to follow, even the hard maths.*
- *Made the subject interesting and engaging, the problem classes were especially good for a challenge.*
- *The lecturer, lectures, and demonstrations were brilliant. The Fluid Motion lectures have been my best lectures ever.*

- *Always tries to connect mathematics and theory with the real world - this helps understanding.*
- *Supervision was excellent - getting us to think through what was going on.*
- *I enjoyed all of it - thank you!!*
- *The course was actually very interesting and surprisingly difficult.*
- *Thank you and Martin for the summer school, it was the most amazing experience I've ever had in science!!*

Examples of contributions to teaching and learning development and leadership:

- Development of a new Physics course (compulsory for MPhys students) on Fluid Dynamics and Dynamical Systems theory, with problem sets and detailed solutions/notes for tutors. The Head of Physics at Imperial College has asked for details of this course with a view to proposing something similar there.
- Complete redesign of the Reading Meteorology fluids dynamics teaching at Part 2 level as part of the revamping of the BSc Meteorology degrees in 2002. Implemented a single, extended module across two terms, consisting of an equal split each week between *lectures* with printed notes and numerous computer animations/examples and movies of real fluid flows, *fluid laboratory demonstrations* including rotating and stratified flows, *hands-on problem solving*; also involves a range of assessment methods, such as an open-book multiple-choice test, to assess a wide range of different skills across the module. The new module consistently ranks as one of the most popular across the entire degree in student feedback.
- Managed the revitalisation of the Reading Meteorology Fluid Dynamics Laboratory, including introducing a wide range of new experiments to bring the laboratory up-to-date with current research. This facility offers students vital hands-on experience of real fluid flows, helping them to relate the abstract concepts they learn about in lectures to the real world. The laboratory includes a number of rotating turntables and particle-tracking computer software.

Professional affiliations

Elected member, Academia Europaea
 Fellow, Institute of Physics
 Fellow, Challenger Society for Marine Science
 Fellow, Royal Meteorological Society
 Life Member, American Geophysical Union
 Former Member, American Meteorological Society
 Former Member, European Geophysical Union

Invited conference/keynote talks

Jun 2022: Invited speaker, Gordon Research Conference on Ocean Mixing, Massachusetts
 Oct 2019: Zhoushan Conference on Ocean Eddies and Fronts, Zhejiang Ocean University
 May 2019: Invited speaker, Peking University, Beijing
 Oct 2018: Invited participant, Workshop on *Loss of Balance*, Hamburg
 Oct 2018: Invited speaker, Workshop on *Western Boundary Current Dynamics*, Qingdao
 Jul 2018: Invited participant, Workshop on *Eddy Parameterisation*, Bornö, Sweden
 Jan 2018: Invited participant, Programme on *Mathematical Aspects of Physical Oceanography*, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna
 Sep 2017: Invited speaker, *Southern Ocean Workshop*, Stockholm
 May 2017: Invited speaker, *Energy Transfers in Atmosphere and Ocean Workshop*, Hamburg
 Feb 2016: Invited speaker, *American Geophysical Union Ocean Sciences*, New Orleans
 Nov 2015: Invited speaker, Workshop on *Stochastic Modelling in Geophysical Fluid Dynamics, Data Assimilation, and Non-Equilibrium Phenomena*, London
 Sep 2015: Invited speaker, *Thermohaline Circulation Workshop*, Stockholm
 Apr 2015: Invited speaker, *Energy Transfers in Atmosphere and Ocean Workshop*, Hamburg
 Mar 2015: Invited speaker, *Theoretical Advances in Planetary Flows and Climate Dynamics*, Les Houches
 Feb 2015: Invited speaker, *Southern Ocean Dynamics and Biogeochemistry*, Caltech
 Dec 2014: Invited speaker (2 sessions), *AGU Fall Meeting*, San Francisco
 Jul 2014: Invited speaker, Workshop on *Watermass Transformation*, Bornö, Sweden
 Jul 2013: Invited Speaker, *US AMOC/UK RAPID International Science Meeting*, Baltimore
 May 2011: Invited participant, *Royal Society Workshop, Beyond the Conveyor*, Kavli Institute
 Sep 2010: *Victor Starr Memorial Lecture*, Massachusetts Institute of Technology
 Apr 2009: Invited speaker, *CLIVAR Workshop on Parameterization of Eddies in Ocean Models*, Exeter
 Feb 2009: Invited speaker, DFG Workshop on *Role of the Southern Ocean in the Global Carbon Cycle*, Kiel
 Sep 2008: Invited speaker, *Can we forecast the ocean circulation?* Challenger Society workshop, Bangor
 Apr 2008: Invited speaker, *Yale University Climate Forum*, Yale University
 Apr 2008: Invited speaker, *British Applied Mathematics Symposium*, Manchester
 Sep 2007: Invited speaker, *CLIVAR workshop on Ocean Model Development*, Bergen, Norway
 Sep 2004: Keynote speaker, *Challenger Society Marine Sciences Conference*, Liverpool

May 2004: Invited speaker, *American Geophysical Union Spring Meeting*, Montreal
Apr 2004: Invited speaker, *European Geophysical Union General Assembly*, Nice
Jun 2003: Invited speaker, *International Union of Geodesy and Geophysics General Assembly*, Saporro
Jul 2002: Invited speaker, *4th Annual Meeting of the CLIVAR Atlantic Implementation Panel*, Bermuda
Mar 2001: Invited speaker, *European Geophysical Society General Assembly*, Nice
Jan 2001: Invited speaker, *'Aha Huliko'a Workshop: From Stirring to Mixing in a Stratified Ocean*, Honolulu
Aug 1999: Invited speaker, *World Ocean Circulation Experiment Atlantic Workshop*, Kiel
Apr 1999: Invited speaker, *Royal Society Discussion Meeting, Ocean Bottom Pressure Variability*, London
Sep 1998: Invited speaker, *Programme Océan Multidisciplinaire Méso Echelle workshop*, Paris
May 1998: Invited speaker, EUROCLIVAR conference, *North Atlantic Climate Variability*, Florence
Sep 1995: Invited speaker, *Workshop on Topography Effects in Ocean Circulation*, Toulon

International seminars

Erwin Schrödinger International Institute, University of Vienna; California Institute of Technology; Courant Institute, New York University; Geophysical Fluid Dynamics Laboratory, Princeton; Harvard University; IFREMER, Brest; Jet Propulsion Laboratory, Pasadena; KMNI, Utrecht; Lamont-Doherty Earth Observatory, Columbia University; Massachusetts Institute of Technology; Nanjing University; Nanjing University of Information, Science and Technology; Ocean University, Qingdao; Pabna University of Science and Technology, Bangladesh; Peking University; University of California, Los Angeles; University of Georgetown, Guyana; University of Hamburg; Utrecht University; University of Stockholm; Federal University of Santa Catarina, Florianapolis, Brazil; Woods Hole Oceanographic Institution