

Professor David Philip Marshall



Personal details

Date of birth: 13th July 1968
Present appointment: *Professor of Physical Oceanography,
Head of Atmospheric, Oceanic and Planetary Physics*
Address: Atmospheric, Oceanic and Planetary Physics
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United Kingdom
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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 honours), 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

Aug 2016 - Dec 2018: *Adjunct Professor, IMAS, University of Tasmania*
Aug 2013 - present: *Head of 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

Jul 2020: Co-organiser, *Physics of the Ocean Summer School, Badhonnef*
Sep 2018: 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: *Editor, Ocean Modelling*
 Nov 2017 - present: *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: *Francoqui Prize Jury, Francoqui 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 - present: *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 - present: *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 25 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-Nueve, Oxford, Southampton)*

Various dates:

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

University of Oxford

Dec 2017 - Jun 2018: Chair, NERC Demand Management Decision Panel
Oct 2016 - present: Governing Body representative, *St Hugh's Alumni Association*
Oct 2016 - present: *Physics Development Board*
Jun 2016: Keynote speaker, *Physics Alumni Garden Party*, Oxford
Apr 2016: Keynote speaker, *Alumni Weekend in North America*, Washington D.C.
Nov 2015 - present: AOPP Annual Alumni Event at the Royal Society
Oct 2013 - Jul 2014: Finals Examiner, Department of Physics
Jul 2013 - present: Head, *Atmospheric, Oceanic and Planetary Physics*
Jul 2013 - present: *Physics Management Committee*
Sep 2012 - Feb 2013: *Halley Chair Appointment Committee*
Oct 2012 - Jan 2013: *Geochemistry Chair Appointment Committee*
Sep 2009 - Jul 2012: AOPP Seminar organiser
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 5 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: *Laboratory Review Working Group*, Department of Meteorology
Feb 2000 - Apr 2000: *Joint Infrastructure Fund Working Group*, Department of Meteorology
Jan 2000 - Sep 2002: *Faculty of Science Postgraduate Committee*
Nov 1999 - Jun 2000: *New Meteorology Degrees Implementation Group*
Sep 1999 - Sep 2002: *Higher Degree Tutor* (to about 50 research students)
Jun 1999 - Sep 2002: Chair, *Higher Degree Board*, Department of Meteorology
Jun 1999 - Sep 2002: *Higher Degree Forum*, Department of Meteorology
Jul 1998 - Jun 1999: *Seminar Coordinator*, Department of Meteorology
Apr 1998 - Mar 2007: *Fluids Laboratory Manager*, Department of Meteorology
Apr 1998 - Sep 2000: *Laboratory Committee*, Department of Meteorology
Oct 1997 - Jun 1999: *House Committee*, Department of Meteorology
Dec 1994 - Jun 1998: Chair, *Staff-Student Committee*, Department of Meteorology

Dec 1994 - Jun 1998: *Student Feedback Coordinator*, Department of Meteorology
 Dec 1994 - Jun 1998: *Faculty of Science Joint Committee*
 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/MPhil students

Research contracts

Community programme

Jan 2007 - Dec 2014: *RAPID-WATCH* £16M
 Bryden, Marshall, Sutton, Wood, Marotzke, Srokosz

Funded projects

Oct 2017 - Sep 2020: *GEOMETRIC* £461 687
 NERC (PI)

Sep 2014 - Sep 2017: *Implementation and optimisation of geostrophic parameterisations in ocean circulation models* £286 937
 NERC (CoI; led by University of Edinburgh)

Oct 2013 - Aug 2019: *UK-OSNAP* £402 652
 NERC (Oxford PI; led by NOC)

Nov 2013 - Mar 2014: *Southern Ocean Modelling* £40 000
 Met Office (PI)

Oct 2011 - Mar 2016: *TEA-COSI* £335 847
 NERC (CoI; led by NOC)

Apr 2011 - Sep 2015: *OSMOSIS* £99 933
 NERC (Oxford PI; led by University of Reading)

May 2011 - Apr 2012: *Numerical modelling of ocean circulation using a vorticity-potential method* £50 204
 NERC (PI)

Oct 2010 - Sep 2013: *New framework for parameterising ocean eddies: energetics, conservation and flow stability* £329 273
 NERC (PI; with Imperial College)

Apr 2010 - Dec 2015: *UK GEOTRACES* £1 018 896
 NERC (CoI; led by Earth Sciences)

Feb 2009 - Jan 2012: *Role of ocean eddies in glacial cycles* £364 436
 NERC

Oct 2008 - Mar 2012: *21st Century Ocean Institute* £300 000
 James Martin 21st Century School

Oct 2008 - Dec 2011: *Adjoint sensitivity of sea level and inter-basin transports to forcing and circulation anomalies* £411 347
 NERC (PI, with Helen Johnson)

Apr 2008 - Sep 2010: *Carbon Cycle Modelling, Assimilation and Prediction* £207 774
 NERC (Oxford PI; subcontracted from CEH)

Jul 2007 - Mar 2010: *DESIRE* £259 718
 NERC (Oxford PI; led by BAS)

Aug 2005 - Sep 2010: *Next-generation unstructured mesh ocean circulation modelling* £385 029
 NERC (Reading/Oxford PI; led by Imperial College)

Apr 2005 - Sep 2008: *Attribution of Climate Change Signals in the Atlantic* £175 987
 NERC (PI; with Proudman Laboratory)

Oct 2004 - Sep 2007: *Separation of Oceanic Boundary Layers* £132 270
 NERC (PI; with Imperial College)

May 2003 - Apr 2009: *Monitoring array along the western margin of the North Atlantic* £629 375
 NERC (CoI; led by Proudman Laboratory)

Jan 2002 - Dec 2004: *Participation in MESO* £30 752
 NERC (PI)

Jun 2001 - May 2004: *North Atlantic ocean-atmosphere interaction* £145 533
 NERC (PI; with Brian Hoskins)

Apr 2000 - Mar 2003: *Parameterisation of geostrophic ocean turbulence* £121 241
 NERC (PI)

Oct 1998 - Sep 2000: *Transport of water masses in eastern North Atlantic* £25 355
 NERC (PI)

Jul 1997 - Dec 1998: *Processes in boundary current separation* £51 176
 Met Office (PI)

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 2016	- present:	Twm Jonathan (with Helen Johnson, Mike Bell)
Oct 2016	- present:	Ke Zhao
Oct 2014	- present:	Laura Cimoli (<i>Clarendon Scholar</i> ; with Helen Johnson)

Degree awarded

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

Research staff

Oct 2017	- :	Julian Mak
Apr 2016	- :	Yavor Kostov
Oct 2010	- Jun 2013:	James Maddison
Mar 2009	- Sep 2011:	Laure Zanna (<i>James Martin Fellow</i>)
Mar 2009	- Nov 2010:	Stuart Daines
Feb 2009	- Apr 2010:	Adam Candy (<i>James Martin Fellow</i>)
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
Apr 2005	- Mar 2007:	Helen Johnson (<i>Royal Society University Research Fellow</i>)
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

Summer students, visiting students

Dan Shipley, Talia Tamarin, Catherine Jones, Russell Hay, Helen Pillar, Ronan Paugam, Marlos Goes, Adam Candy, Caroline Bain, Gabriella Villani

Refereed publications

ResearcherID B-6767-2009; ORCID 0000-0002-5199-6579; h-index 26; total citations 2031 (Web of Science)

Submitted

92. 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, 2018: A sea change in our view of overturning – first results from the Overturning in the Subpolar North Atlantic Program. *Science*, submitted (invited).
91. Stanley, G. J., T. E. Dowling, M. E. Bradley, D. P. Marshall, 2018: Ertel potential vorticity versus Bernoulli potential on approximately neutral surfaces in the Antarctic Circumpolar Current. *J. Phys. Oceanogr.*, submitted.
90. Doddridge, E. W., and D. P. Marshall, 2018: Implications of eddy cancellation on nutrient distribution within subtropical gyres. *J. Geophys. Res.*, revised.
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.*, revised.

Published

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*, doi:10.1175/JCLI-D-18-0241.1.
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 re-entrant 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. Amer. Met. 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.
78. Lauderdale, J. M., D. R. Munday, D. P. Marshall, and R. G. Williams, 2017: The impact of Southern Ocean residual upwelling on atmospheric CO₂. *Climate Dynam.*, 48, 1611-1631.
77. Bachman, S. D., D. P. Marshall, J. R. Maddison, and J. Mak, 2017: Evaluation of a scalar eddy transport coefficient based on geometric constraints. *Ocean Modell.*, 109, 44–54 .
76. Marshall, D. P., D. R. Munday, L. Novak, and M. H. P. Ambaum, 2017: Eddy saturation and frictional control of the Antarctic Circumpolar Current. *Geophys. Res. Lett.*, 44, 286–292.
75. Mak, J., J. R. Maddison, and D. P. Marshall, 2016: A new gauge-invariant method for diagnosing eddy diffusivities. *Ocean Modell.*, 104, 252-268.
74. Doddridge, E. W., D. P. Marshall, and A. McC. Hogg, 2016: Eddy cancellation of the Ekman cell in subtropical gyres. *J. Phys. Oceanogr.*, 46, 2995-3010.
73. Marshall, D. P., 2016: A theoretical model of long Rossby waves in the Southern Ocean and their interaction with bottom topography. *Fluids*, 1, 17.
72. Klocker, A., D. P. Marshall, S. R. Keating, and P. L. Read, 2016: A regime diagram for ocean geostrophic turbulence. *Q. J. Roy. Met. Soc.*, 69, 2411-2417.
71. Tamarin, T., J. R. Maddison, J. R., H. Eyal, and D. P. Marshall, 2016: A geometric interpretation of eddy Reynolds stresses in barotropic ocean jets. *J. Phys. Oceanogr.*, 46, 2285-2307.
70. Pillar, H. R., P. Heimbach, H. L. Johnson, and D. P. Marshall, 2016: Dynamical attribution of recent variability in Atlantic overturning. *J. Climate*, 29, 3339-3352.

69. Buckingham, C., A. Naveira Garabato, A. F. Thompson, L. Brannigan, A. Lazar, D. P. Marshall, A. J. G. Nurser, G. Damerell, K. J. Heywood, and S. E. Belcher, 2016: Seasonality of submesoscale flows in the ocean surface boundary layer. *Geophys. Res. Lett.*, **43**, 2118–2126.
68. Marshall, D. P., D. R., Munday, L. C. Allison, R. J. Hay, and H. L. Johnson, 2016: Gill's model of the Antarctic Circumpolar Current, revisited: The role of latitudinal variations in wind stress. *Ocean Modell.*, **97**, 37–51.
67. Maddison, J. R., D. P. Marshall, and J. Shipton, 2015: On the dynamical influence of eddy potential vorticity fluxes. *Ocean Modell.*, **92**, 169–182.
66. Brannigan, L., D. P. Marshall, A. Naveira Garabato, and A. J. G. Nurser, 2015: The seasonal cycle of submesoscale flows. *Ocean Modell.*, **92**, 69–84.
65. Munday, D. R., H. L. Johnson, and D. P. Marshall, 2015: The role of ocean gateways in the dynamics and sensitivity to wind stress of the early Antarctic Circumpolar Current. *Paleoceanography*, **30**, 284–302.
64. Howard, E., A. McC. Hogg, S. Waterman, and D. P. Marshall, 2015: The injection of zonal momentum by buoyancy forcing in a Southern Ocean model. *J. Phys. Oceanogr.*, **45**, 259–271.
63. Marshall, D. P., and L. Zanna, 2014: A conceptual model of ocean heat uptake under climate change. *J. Climate*, **27**, 8444–8465.
62. Carton, J., S. A. Cunningham, E. E. Frajka-Williams, Y.-O. Kwon, D. P. Marshall, and R. Msadek, 2014: The Atlantic overturning circulation: more evidence of variability and links to climate. *Bull. Amer. Met. Soc.*, **95**, ES163–ES166.
61. Munday, D. R., H. L. Johnson, and D. P. Marshall, 2014: Impacts and effects of mesoscale eddies on ocean carbon storage and atmospheric pCO₂. *Global Biogeochem. Cycles*, **28**, 877–896.
60. Zhai, X., H. L. Johnson, and D. P. Marshall, 2014: A simple model of the response of the Atlantic to the North Atlantic Oscillation. *J. Climate*, **27**, 4052–4069.
59. Klocker, A., and D. P. Marshall, 2014: Advection of eddies by depth-mean flow. *Geophys. Res. Lett.*, **41**, 3517–3521.
58. Marshall, D. P., and H. L. Johnson, 2013: Propagation of meridional circulation anomalies along western and eastern boundaries. *J. Phys. Oceanogr.*, **43**, 2699–2717.
57. Drijfhout, S. S., D. P. Marshall, and H. Dijkstra, 2013: Conceptual models of the wind-driven and thermohaline circulation. *Ocean Circulation and Climate, A 21st Century Perspective*, International Geophysics, **103**, Academic Press, Elsevier, 257–282, doi: 10.1016/B978-0-12-391851-2.00011-8.
56. Marshall, D. P., B. Vogel, and X. Zhai, 2013: Rossby rip currents. *Geophys. Res. Lett.*, **40**, 4333–4337.
55. Maddison, J., and D. P. Marshall, 2013: The Eliassen-Palm flux tensor. *J. Fluid Mech.*, **729**, 69–102.
54. Munday, D. R., H. L. Johnson, and D. P. Marshall, 2013: Eddy saturation of equilibrated circumpolar currents. *J. Phys. Oceanogr.*, **43**, 507–532.
53. Zhai, X., and D. P. Marshall, 2013: Vertical eddy energy fluxes in the North Atlantic subtropical and subpolar gyres. *J. Phys. Oceanogr.*, **43**, 95–103.
52. Zhai, X., H. L. Johnson, D. P. Marshall, and C. Wunsch, 2012: On the wind power input to the ocean general circulation. *J. Phys. Oceanogr.*, **42**, 1357–1365.
51. Marshall, D. P., J. R. Maddison and P. S. Berloff, 2012: A framework for parameterizing eddy potential vorticity fluxes. *J. Phys. Oceanogr.*, **42**, 539–557.
50. Marshall, D. P., 2011: Rossby wormholes. *J. Mar. Res.*, **69**, 309–330.
49. Allison, L. C., H. L. Johnson, and D. P. Marshall, 2011: Spin-up and adjustment of the Antarctic Circumpolar Current and global pycnocline. *J. Mar. Res.*, **69**, 167–189.
48. Meredith, M., P. L. Woodworth, T. K. Chereskin, D. P. Marshall, L. C. Allison, G. R. Bigg, K. Donahue, K. J. Heywood, C. W. Hughes, A. Hibbert, A. McC. Hogg, H. L. Johnson, L. Jullion, B. A. King, H. Leach, Y.-D. Lenn, M. A. Morales Maqueda, D. R. Munday, A. C. Naveira Garabato, C. Provost, J.-B. Sallée, and J. Sprintall, 2011: Sustained monitoring of the Southern Ocean at Drake Passage: past achievements and future priorities. *Rev. Geophys.*, **49**, RG4005, doi:10.1029/2010RG000348.
47. Zhai, X., H. L. Johnson, and D. P. Marshall, 2011: A model of heat content and sea level change in the Atlantic in response to thermohaline forcing. *J. Climate*, **24**, 5619–5632.
46. Maddison, J. R., D. P. Marshall, C. C. Pain, and M. D. Piggott, 2011: Accurate representation of geostrophic and hydrostatic balance in unstructured mesh finite element ocean modelling. *Ocean Modell.*, **39**, 248–261.
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11. Stephens, J. C., and D. P. Marshall, 1999: Dynamics of the Mediterranean Salinity Tongue. *J. Phys. Oceanogr.*, 29, 1425-1441.
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9. Adcroft, A., and D. P. Marshall, 1998: How slippery are piecewise-constant coastlines in numerical ocean models? *Tellus*, 50A, 95-108.
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7. Marshall, D. P., 1997: Subduction of water masses in an eddying ocean. *J. Mar. Res.*, 55, 201-222.
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2. Marshall, D. P., 1993: Resonance of Fofonoff's mode in a rotated basin. *J. Phys. Oceanogr.*, 23, 970-978.
1. Marshall, D. P., and J. C. Marshall, 1992: Zonal penetration scale of midlatitude oceanic jets. *J. Phys. Oceanogr.*, 22, 1018-1032.

Other publications

21. Marshall, D. P., 2013: Book review: "Buoyancy-driven flows" by Eric Chassignet, Claudia Cenedese and Jacques Verron (Eds.). *Theor. Comput. Fluid Dyn.*, 27, 733-734.
20. Candy, A. S., G. M. Henderson, and D. P. Marshall, 2009: Ocean sequestration of atmospheric CO₂ through alkalinity addition: a 1D modelling study of particle addition and dissolution. *Oxford Martin School Internal Report*, 29pp..
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18. Marshall, D. P., and H. L. Johnson, 2004: Adjustment of the thermohaline circulation to localized forcing anomalies. *Proc., Oceanography, Lakes and Rivers, Centro Internacional de Matemática, Lisbon*.
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.
16. Visbeck, M., D. Marshall, and the CLIVAR-Atlantic Implementation Panel, 2002: CLIVAR in the Atlantic sector. *CLIVAR Exchanges*, 7, 4-5.
15. Johnson, H. L., and D. P. Marshall, 2002: Thermohaline circulation changes: a new quantitative theory. *Bull. Amer. Met. Soc.*, 83, 347-348.
14. Marshall, D. P., S. T. Adcock, and C. E. Tansley, 2001: Geostrophic eddies, abyssal recirculations and inertial jets. *Proc., 2001 'Aha Huliko`a Hawaiian Winter Workshop, P. Muller and D. Henderson, Eds., University of Hawaii*, 9-15.
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.
9. Tansley, C., and D. P. Marshall, 1997: Interactions between the Gulf Stream, the Deep Western Boundary Current and topography. *11th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society*, 204-205.
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.
7. Roberts, M., and D. P. Marshall, 1997: Do we require adiabatic mixing schemes in eddy-resolving ocean models? *10th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society*, 46-47.

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5. Marshall, D., 1996: Topographic steering of large-scale ocean currents. *Topography effects in ocean circulation*, Toulon, France. M. Crepon, Ed..
4. Marshall, D., 1995: Subduction of tracers in the Southern Ocean. *Sigma*, **15**, 8-9.
3. Marshall, D., 1993: Subduction in a time-dependent thermocline model. *9th Conference on Waves and Stability, American Meteorology Society*, 122-123.
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

May 2018 :	<i>C5 Atmospheric Physics</i> Lectures on observing and modelling weather and climate
Jan 2015 - May 2018:	<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> Undergraduate lectures
Jan 1995 - Mar 1997:	<i>MTB21 Oceanography</i> Postgraduate lectures

Other teaching

Mar 2018:	Co-organiser and lecturer, <i>Oceans in Weather and Climate School</i> , Exeter
Sep 2017:	Guest lecturer, <i>NCAS Climate Summer School</i> , Cambridge
Jul 2017:	Co-organiser and lecturer, <i>Physics of the Ocean Summer School</i> , Badhonnef
Jun 2016:	Invited Lecturer, <i>European Earth System and Climate Modelling School</i> , Helsinki
Sep 2015:	Guest lecturer, <i>NCAS Climate Summer School</i> , Cambridge
Jul 2014:	Invited lecturer, <i>Physics of the Ocean Summer School</i> , Badhonnef
Feb 2013:	Invited Lecturer, <i>Waves and Instabilities in Geophysical and Astrophysical Flows Winter School</i> , Les Houches
Jun 2012:	Invited Lecturer, <i>European Earth System and Climate Modelling School</i> , Kos
Sep 2011:	Guest lecturer, <i>NCAS Climate Summer School</i> , Cambridge
Sep 2009:	Guest lecturer, <i>NCAS Climate Summer School</i> , Cambridge
Sep 2007:	Principal lecturer, <i>Netherlands CCR Summer School</i> , Les Diablerets
Sep 2007:	Guest lecturer, <i>UJCC-NCAS Climate Modelling Summer</i>

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, 21 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:

- *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!!*
- *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

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; Peking University; University of California, Los Angeles; University of Georgetown, Guyana; University of Hamburg; Utrecht University; University of Stockholm; Woods Hole Oceanographic Institution