

PETER WADHAMS MA PhD ScD (Cantab)

Curriculum vitae

Current position

Professor, Università Politecnica delle Marche, Ancona, Italy.

Emeritus Professor of Ocean Physics, Department of Applied Mathematics and Theoretical Physics (DAMTP), University of Cambridge, Wilberforce Road, Cambridge CB3 0WA.

Education

1966-69 Churchill College, Cambridge. College Scholar. 1969 **BA** in Natural Sciences (Physics). 1972 **MA** (Cantab).

1970-74 Scott Polar Research Institute, University of Cambridge. **PhD** awarded April 1974. Thesis "The effect of a sea ice cover on ocean surface waves".

1994 **ScD** (Cambridge University) awarded for published work.

Appointments

1969 June-Aug Summer student, SACLANT Underwater Laboratory, La Spezia.

1969 Sept - 1970 Oct. Research scientist, Bedford Institute of Oceanography, Dartmouth, Canada. Assistant to Senior Scientist on "Hudson-70" Expedition, an 11-month oceanographic cruise which accomplished the first circumnavigation of the Americas, by way of Antarctica, Chilean fjords, south and north Pacific, Northwest Passage.

1974 Apr -1975 Dec. Postdoctoral fellow of National Research Council of Canada at Institute of Ocean Sciences, Victoria, B.C., Canada, working on sea ice structure and dynamics in the Beaufort Sea and oil spill impacts.

1976 Jan – 2002 Dec. Scott Polar Research Institute, University of Cambridge. Initially Senior Research Associate (Principal Investigator for Office of Naval Research); 1981-7 Assistant Director of Research; 1987-1992 **Director**; 1992-2001 **Reader in Polar Studies**; 2001-2 **Professor of Ocean Physics**.

2003 Jan. Transferred Chair to DAMTP.

1980-1990 Senior Research Fellow, Churchill College, Cambridge

2013-date. Fellow, Clare Hall, Cambridge.

Visiting professorships:-

1980-81. Office of Naval Research **Chair of Arctic Marine Science**, Naval Postgraduate School, Monterey, California.

1987-88. **Cecil and Ida Green Scholar** at Institute of Geophysics and Planetary Physics, **Scripps Institution of Oceanography**, La Jolla (further Green Scholarship awarded for calendar year 2017); and **Walker-Ames Professor**, University of Washington, Seattle.

1995. **Invited Visiting Professor, Arctic Environmental Research Centre**, National Institute of Polar Research, Tokyo, Japan.

1996. **British Council - Monbusho Visiting Professor** at Graduate University of Advanced Studies, Tokyo, Japan, based at National Institute of Polar Research. Revisited 2000 and 2001 under **Royal Society grant** to develop Anglo-Japanese joint programme in Arctic research.

2002. Visiting scholar, Laboratoire d'Océanographie de Villefranche (LOV), France. From 2007 Professeur Associé Recherche, Université Pierre et Marie Curie, Paris, based at LOV.

2003-4 Professorial Fellow, Scottish Association for Marine Science, Dunstaffnage Marine Laboratory, Oban, Scotland.

Honours

1977 **W.S. Bruce Prize**, Royal Society of Edinburgh, "for oceanographic investigations and for studies of pack ice behaviour near Spitsbergen, the North Pole and off East Greenland".

1983 Elected **Fellow of the Arctic Institute of North America** "in recognition of significant contributions to the knowledge of the polar and sub-polar regions".

1987 **The Polar Medal** (H.M. The Queen) with Arctic and Antarctic clasps.

1990 **Italgas Prize** for Research and Innovation in Environmental Sciences, Turin.

2006 Elected **Foreign Member of Finnish Academy of Science and Letters** (Academia Scientiarum Fennica).

2008 Listed as no. 5 among "Britain's top 100 environmentalists" by "Independent on Sunday" (Oct 12 2008).

2008 Recognised by IPCC "for contributing to the work of the Nobel Peace Prize".

2019 **Galileo Prize** for scientific communication, second place, Università di Padova.

Committees

Member of CNR committee "Programma di Ricerche in Artico", Roma, 2018-date.

Member of US National Academy of Sciences Panel on Responding to Oil Spills in Arctic Marine Environments, 2012-13, report published 2014.

Member of Scientific Committee, **European Environment Agency**, Copenhagen, 2004-12.

Review Editor for Chapter 1, 5th Assessment Report (AR5), Intergovernmental Panel on Climate Change, 2012-3.

Member of Committee for electing annual ENI Prizes, Milan and Rome.

Member of Scientific Commission for the Holy Shroud, Diocese of Turin, for determining new experimental programme.

Co-ordinator of several EU projects, including ECOPS (European Co-operation on Ocean and Polar Science) 1991-3; ESOP (European Subpolar Ocean Programme) 1993-6; INTERICE 1998-2008 (consortium of European laboratories using ice tank at Hamburg for sea ice physics experiments); CONVECTION (Greenland Sea convection) 2000-4; GreenICE (Greenland Arctic Shelf Ice and Climate Experiment) 2003-7; on steering committee of DAMOCLES (EU FP6, 2006-2010) and ACCESS (Arctic climate, economy and society) 2011-4. Co-coordinator of new EU project ICE-ARC, on impacts of Arctic summer sea ice retreat, 2014-8. Principal Investigator for ONR Arctic Program 1976-1997, 2011-6 (two new programmes on wave interaction with ice, MIZ-DRI and Sea State).

Formerly: President, IAPSO (International Association for the Physical Sciences of the Ocean) Commission on Sea Ice; Co-ordinator, International Programme for Antarctic Buoys (IPAB), World Climate Res. Prog.; member of Scientific Steering Comm., ASPECT (Antarctic Sea-ice properties and climate); UK delegate, Arctic Ocean Sciences Board; member of NERC Peer Review College.

Societies

Fellow of the Royal Geographical Society (**FRGS**); American Geophysical Union; European Geosciences Union; International Glaciological Society; Society for Underwater Technology; Intl. Assoc. Hydrological Sciences; Remote Sensing Soc.; Challenger Society for Marine Science; The Oceanography Society; Society for Scientific Exploration; Arctic Club; Antarctic Club; The Explorers' Club (New York); BIO-Oceans Association (Dartmouth NS); Cambridge Rotary Club.

PhD theses supervised: 22 (Squire, Langhorne, Kristensen, Bratchie, Crocker, O'Farrell, Rottier, Gray, Sheard, Brandon, Low, Tadross, Huddleston, Cottier, Brigham, Jonsdottir, Aksenov, Flocco, Von Eye, Fletcher, Wagner at Cambridge; Marcianesi at UNIVPM)

Editorships (current): Editorial Board, "Cold Regions Science and Technology" (Elsevier); "Underwater Technology" (Society for Underwater Technology). Associate Editor, "Oceanography" (The Oceanography Soc., Washington D.C.). Guest editor, "Polar Science" special issue (vol. 10) on ISAR-4, Rapid Arctic Change meeting Tokyo 2015, and special issue on ISAR-5, Tokyo 2018.

Research experience

Organiser and leader of internationally respected research group since 1976, working on the physical oceanography of the polar seas and the physics of sea ice and icebergs. 54 field projects carried out in Arctic and Antarctic seas, involving work from ships, submarines, AUVs, aircraft and ice camps, including large-scale collaboration among ships, aircraft and ice-based groups. Projects have included major studies of waves in ice and marginal ice zone processes (MIZEX Science plan leader, 1983-7, new ONR-MIZ programme 2011-); 6 RN submarine voyages under Arctic Ocean 1971-2007 (most recently aboard HMS "Tireless" 2007 which included the first use of a multibeam sonar from a submarine to obtain 3D ice imagery); sidescan and multibeam sonar profiling from under-ice AUVs including Autosub off NE Greenland and Gavia and WHOI AUVs (4 campaigns 2004-12); studies of strain and deformation fields in sea ice (FRAM1-3, SIMI projects for ONR; Weddell Sea work for NERC); measurement of mass balance on melting floes in Fram Strait (Sept 2009); modelling work on under-ice tomography (Scripps); convective chimney mapping in Greenland Sea (first multiyear winter and summer tracking; polar eddies (first section); iceberg dynamics and flexure (1980 with "Endurance", then 2012 with BBC shown as "Operation Iceberg", BBC2 Nov 2012).

In recent years I have co-ordinated a sequence of EU research projects (as well as being a partner in many others). Those that I have led are: ECOPS (European Co-operation on Ocean and Polar Science) 1991-3, involving deployment of upward sonar moorings in East Greenland Current; ESOP (European Subarctic Ocean Programme 1993-6 (22 partners), a comprehensive study of the physics, chemistry and biology of the central Greenland Sea gyre and its convective systems; INTERICE, 1998-2003 (consortium of laboratories using ice tank at Hamburg for sea ice physics experiment); CONVECTION, 2000-3 (12 partners), a study of the physics of chimney convection in the Greenland Sea and its relation to ice formation; and GreenICE (Greenland Arctic Shelf Ice and Climate Programme) 2003-6 (6 partners) which involved setting up an ice camp north of Ellesmere Island in 2004 for ice physics and seabed sediment coring studies. Recently I was workpackage leader and steering committee member of the ACCESS project (Arctic climate, economy and society,

28 partners), a successor of DAMOCLES (45 partners), and was co-coordinator of a recently completed EU project in Horizon 2020 called ICE-ARC (Arctic ice changes and their economic impact) as well as a partner in another EU project SPICES at Ancona (on remote sensing of ice), supporting Dr Giuseppe Aulicino, also completed 2019. Partner with Dr Aulicino in new CNR project SWIMMING, starting 2019.

Having written the first textbook on sea ice (*Ice in the Ocean*, 2000, Taylor and Francis), I have become deeply concerned with the problem of global feedbacks from Arctic sea ice retreat, leading to acceleration of global warming rates, sea level rise, offshore methane emissions and thermohaline circulation changes. This has led to the book *A Farewell to Ice* (2016, Allen Lane; 2018 in Italian translation *Addio ai ghiacci*, Bollati Boringhieri, also 8 other languages) and is a strong factor in my teaching and in planned future research.

Teaching

- Cambridge University** Part III Mathematics (MMaths): taught 4th year course on polar oceans and climate change, annually 2008-15. Part II (3rd year) Geography: lecture course on sea ice, icebergs and polar oceanography, 1982-2003. Textbook based on course, “Ice in the Ocean”, published 2000. Seminars to MPhil in Polar Studies, SPRI, 1976-date.
- Université Pierre et Marie Curie**, Paris. Cours de thèse (examined course for graduate students) on polar oceanography, 2005-9.
- Università Politecnica delle Marche, Ancona.** Master’s course on polar oceans and climate change 2013 – date. 48 lectures per year, delivered over 6 week period.
- Politecnico di Torino.** Similar Master’s course to be delivered Oct-Dec 2019.
- Frequent invited lectures at summer schools, conferences etc. Examples: Orkney International Science Festival, 1995-2019; Wadati Conferences on Climate Change in the Polar Regions, 1994-2001; Okhotsk Sea and Sea Ice Symposia, Mombetsu, 1997-2001; International Conferences on the Oceanography of the Ross Sea, Antarctica, 1997-2001; ACSYS Sea Ice Thickness Workshops, 1997-2003; Gordon Research Conference on Sea Ice Biology, 1999; World Economic Forum, New York, 2002; MIT Global Change Fora, 2009-2011; NERC Spring Schools; Ice Technology (Ice Tech), 2008-2010; ISAR-1 (Tokyo, International Symposium on Arctic Research) 2008 – ISAR5, 2018
- Contributor to Open University Foundation Course in Oceanography.
- Examiner for 11 PhD theses in UK, France, Finland, Norway, Sweden

Named lectures (some examples)

W.S. Bruce Lecture, Royal Society of Edinburgh, 1980

Walker-Ames Lecture, University of Washington, 1988

Italgas Prize Lecture, University of Turin, 1990

Finnish Academy Acceptance Lecture, 2007

Royal Institution Friday Night Discourse, March 7 2008, on “The Polar Oceans and Climate Change”.

FEEM Lecture 2016 (Fondazione Eni Enrico Mattei, Milan) on climate change.

Sonar probing of ice thickness and ice-related climate feedbacks. Walter Munk Centennial Symposium, Aug 30 2017, Scripps Institution of Oceanography, La Jolla.

Reinventar el horizonte; ciencia y arte ante el cambio climático, Madrid, April 18 2018.

Climate Change: a Challenge to our Present Society.

Global Change and Environmental Pollution and Restoration, Università degli Studi di Palermo, 25 June 2018, “Global Change and Environmental Effects”
The Crisis of the Earth and the Future of Humanity. Keynote Address, PEACE Bar Festival, Kyung Hee University, Seoul, Sep 19 2018; speaking again at 2019 Festival.
Science and the Future: Contraddizioni e Sfide, Politecnico di Torino, Nov 2 2018 “Present and Prospective Role of the Oceans and Ice Cover in the World Climate”.
Climate Change, Health of the Planet and Future of Humanity. Pontifical Academy of Sciences - CNR, Nov 15 2018, Vatican City. “Feedbacks in Climate Change and the Need for Carbon Drawdown”.
Climate Impacts Arising from Arctic Sea Ice Retreat. 9th Symposium on Polar Science, Tokyo, Dec 6 2018
Talks on polar climate change at Universities of Trento and L’Aquila, 2018.
Talks at Book Festivals of Milan, Mantova, Torino 2018-19 and (in USA) Miami, Seattle, Baton Rouge, Austin.

Publications. 5 books authored, 7 books edited or coedited, 320 other publications.

Public interactions

Briefings to All Party Parliamentary Committee on Climate Change 2007-13, following earlier briefings to Prime Minister (Rt. Hon. Margaret Thatcher) 1990,
Briefings to Environmental Audit Committee, House of Commons.
Frequent interviews on climate change, leading to more than 30 YouTube entries, including TED talk.
Role in film “Ice on Fire” (Leonardo DiCaprio, producer, HBO), released 2019.
Subject of BBC film “Operation Iceberg”, 2012.