

(Henry) Keith MOFFATT

CURRICULUM VITAE

March 2019

Date of birth: 12th April 1935, Edinburgh, Scotland.

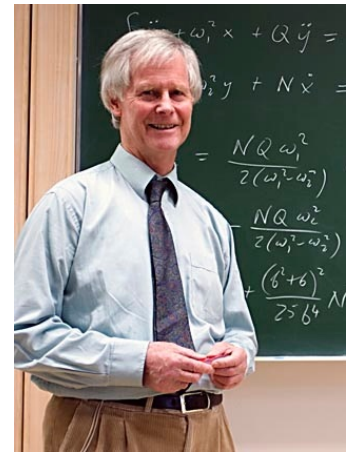
Present Position:

Professor Emeritus of Mathematical Physics, Cambridge University
and

Life Fellow of Trinity College, Cambridge, UK

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Education and Degrees:

1943--53 George Watson's College, Edinburgh

1953 April-July: Exchange student at Lycée Henri IV, Paris

1953--57 Edinburgh University: B.Sc. 1st class Hons. (Math.Sc.) 1957

1957--62 Cambridge University:

B.A. 1959 (1st class Hons. Mathematics ('Wrangler') 1958)

Ph.D. 1962; Dissertation: "*Magnetohydrodynamic Turbulence*"; Sc.D. 1987

1959 Attended École d'Été de Physique Théorique (Les Houches), course on *The Theory of Neutral and Ionised Gases*.

Honorary Doctorates:

1987 Docteur h.c. Inst. Nat. Polytech. Grenoble, France

1990 Doctor h.c. SUNY (State Univ. of New York at Utica, USA)

2001 Hon.D.Sc. Edinburgh University, UK

2006 Doctor h.c. Technical University, Eindhoven, Netherlands

2007 Hon. D.Sc. Glasgow University, UK

Membership of National Academies:

1986 FRS (Fellow of the Royal Society, London)

1988 FRSE (Fellow of the Royal Society of Edinburgh)

1991 Royal Netherlands Academy of Arts and Sciences, Foreign Member

1994 Academia Europæa, Elected Member

1998 Académie des Sciences, Paris, Associé Étranger

2001 Accademia Nazionale dei Lincei, Rome, Socio Stranieri

2008 National Academy of Sciences (USA), Foreign Associate

2010 Academia das Ciências de Lisboa, Académico Correspondente estrangeiro

Prizes and Medals:

1958 Ferguson Scholarship (Awarded by Scottish Universities)
1959 Yeats Prize, 1960 Smith's Prize (Cambridge University)
2001 Panetti-Ferrari International Prize and Gold Medal
2003 Euromech Prize in Fluid Mechanics
2005 Senior Whitehead Prize (London Mathematical Society)
2005 Hughes Medal (Royal Society)
2009 David Crighton Medal (IMA and London Mathematical Society)
2018 American Physical Society, Fluid Dynamics Prize and Otto Laporte Lecture

Other Honours:

1998 Officier des Palmes Académiques (France)
1998 Humphry Davy Lecture (Royal Society)
2001--2003 Chaire Internationale de Recherche Blaise Pascal (École Normale Supérieure, Paris)
2003 Fellow of American Physical Society
2003--2004 Leverhulme Emeritus Professor
2004 Caribbean Award for Fluid Dynamics
2007 Honorary Fellow of the Institute of Mathematics and its Applications (IMA)

Career:

Cambridge University, Dept. of Applied Mathematics and Theoretical Physics (DAMTP):

Lecturer 1964-76; Professor of Mathematical Physics 1980-2002;
Head of DAMTP 1983-91; Emeritus Professor since 2002.

Isaac Newton Institute for Mathematical Sciences:

Director 1996-2001 [Awarded Queen's Anniversary Prize 1999].

Trinity College, Cambridge:

Teaching Fellow 1961-76; Professorial Fellow 1980-2002; Life Fellow since 2002.

Ecole Polytechnique, Paris (Palaiseau), France:

Professeur d'exercice partiel, 1993-99.

Bristol University:

Professor of Applied Mathematics 1977-1980.

International Union of Theoretical and Applied Mechanics (IUTAM):

Participant at Quadrennial Congresses in Stresa 1960, Munich 1964, Stanford 1968, Delft 1976, Toronto 1980, Lyngby 1984, Grenoble 1988, Haifa 1992, Kyoto 1996, Chicago 2000, Warsaw 2004, Adelaide 2008, Beijing 2012, Montreal 2016; member of International Papers Committee 1974-1976, Congress Committee 1976-2004 (Secretary 1984-92), General Assembly since 1980, IUTAM Bureau 1992-2008.

President of IUTAM 2000-04 (Vice-President 2004-08).

International Council for Science (ICSU):

IUTAM representative at General Assemblies of ICSU, Rio de Janeiro 2002, Suzhou China 2005, Maputo Mozambique 2008; and at ICSU 'Unions' meetings, Rome 2007, Paris 2010.

Journal of Fluid Mechanics: Assistant Editor 1963-65, Editor 1966-83

Visiting appointments:

1965 (March-Aug.): Stanford Univ. Calif., Visiting Asst. Prof., Dept. of Aero- and Astronautics.

1965 (Sept.-Dec.): Johns Hopkins Univ. Baltimore Md., Visiting Asst. Prof., Dept. of Mech.

1973 (July-Aug.): Les Houches, École d'Été de Physique Théorique: Lecturer, course on *Fluid Dynamics*,

1973 (Oct.) ICTP Trieste, Italy: Lecturer, Math. and Num. Methods in Fluid Dynamics.

1975-76 Université Pierre et Marie Curie (Paris VI): Prof. Associé at Dépt. de Méc. Théorique.

1978 and 1979 Perugia, Italy; Lecturer, Summer School of Mathematics (CNR).

1982 (March-April): Visitor under USSR--UK exchange agreement to Institutes in Moscow, Leningrad (now St Petersburg), Novosibirsk, Irkutsk and Riga.

1984 (January): Visiting appointment at Univ. of Palermo, Italy (CNR).

1986 (September): Royal Society Exchange Visit to China; lectures in Beijing, Shanghai, Hangzhou and Chengdu.

1986-87: Inst. Nat. Polytec. Grenoble, Visiting appt. (CNRS) (6 months).

1987: IGPP La Jolla, Calif., and INLS, UCSD, Green Scholar (5 months).

1991: Principal Coordinator for program "*Topological Fluid Dynamics*" at Institute for Theoretical Physics (K)ITP, Santa Barbara, California, USA.

1992 (July-Dec.): Principal Organiser for program "*Dynamo Theory*" at Isaac Newton Inst. for Math. Sciences, Cambridge, UK.

1993 (Jan.-April, 90 days): Visiting appointment at RIMS, Kyoto, Japan.

2000 (May): KITP Santa Barbara, Program on *Astrophysical Turbulence*.

2008 (May): KITP Santa Barbara, Program on *Dynamo Theory*.

2012 (July-Dec.): Principal Organiser for program "*Topological Dynamics in the Physical and Biological Sciences*" at Isaac Newton Inst. for Math. Sciences, Cambridge, UK.

National and International Activities:

1972 (July): Chairman, NATO Advanced Study Institute *Magnetohydrodynamic Phenomena in Rotating Fluids*, Cambridge.

1976-1989: Royal Soc. representative on British Nat.Comm. for Theor. and Applied Mechanics.

1989-present: Member of UK Panel for Theoretical and Applied Mechanics.

1988-1991 and 2006-09: Royal Society Sectional Committee 1 (Chairman 1990/91).

1988-1989: Chairman of International Scientific Committee for IUTAM Symposium "*Topological Fluid Mechanics*", Cambridge, Aug. 1989.

1991-99: Scientific Council of Pôle Universitaire et Scientifique, Grenoble.

1998-2001: Conseil Administratif, Institut Henri Poincaré, Paris.

2001 (Sept.): Co-Chair of International Scientific Committee for IUTAM Symposium "*Tubes, Sheets and Singularities in Fluid Mechanics*", Zakopane, Poland.

2002 Isfahan, Iran: 9th Asian Congress of Fluid Dynamics: P.Y.Chou lecture "*Singularities in fluid dynamics and their resolution*"

2003-2016 Trustee and Member of Council, AIMS (African Institute for Mathematical Sciences), Muizenberg, Cape Town, South Africa.

2007: Organised exhibit "*Dynamics of Spin*" at Royal Society Exhibition, July 2007 (and subsequently exhibited again at Techfest, Mumbai, India, January 2008).

2008 October Copenhagen, Denmark: IUTAM Symposium "*150 years of Vortex Dynamics*"; invited lecture "*The Persistence of Spin*".

2001-2008: Member of Sc. Adv. Board, Inst. for Mathematical Sciences, NUS, Singapore.

2002-2010: Member of Scientific Council, CISM, Udine, Italy.

2005 Université de Tous les Savoires, Paris: Lecture *La Mécanique des Fluides*
http://www.canal-u.tv/video/universite_de_tous_les_savoires/la_mecanique_des_fluides.1435

2008-2011: Science Foundation Ireland, member of IC&ET Panel (Information, Communication and Emergent Technologies).

2009: Chairman and Director, ICSU-sponsored Spring School "*Fluid Dynamics and Geophysics of Environmental Hazards*", 19 April-2 May, Inst. for Math. Sci., Singapore.

2010--2014 Board Member and Treasurer, AIMS-NEI (which has now established six AIMS Institutes in South Africa, Senegal, Ghana, Cameroon, Tanzania and Rwanda), see <http://www.nexteinstein.org>

2011 (July) Pisa, Scuola Normale: ESF-EMS-CRM meeting "Knots and Links": invited lecture "*Relaxation to topologically complex equilibria*".

2011 (Sept.) Warsaw: ETC (European Turbulence Conference) followed by 'History of Turbulence' meeting. Lecture: "*G.K.Batchelor and the Post-war Renaissance of Turbulence*".
http://www.youtube.com/watch?v=0_1mlWNdfLs&list=PL0jAiXLfdUJBAoYmevhgcao62CBX9fIIF&index=13

2011 (Sept.) Turbulence Colloquium Marseille (marking 50th Anniv. of 1961 Marseille Turbulence meeting): Lecture: "*Homogeneous Turbulence: an Introductory Review*".

2009--2012 Ecole Polytechnique, Paris (Palaiseau), Membre du Conseil d'Enseignement et de Recherche.

2012 (Aug.) Beijing, ICTAM 23; General Assembly meetings and Lectures:(1) "*Toy models, illustrating complex mechanical phenomena*"; (2) "*Twisted Plateau borders and the collapse of a Möbius strip soap-film*".

2013 (March) Fukuoka University (Japan) IUTAM Symposium "*Vortex dynamics: Formation, Structure and Function*". Invited Public Lecture: "*Fundamental physical principles illustrated by simple mechanical toys*"

2013 (April) University of Chicago: Seminar "*Topological jumps in fluid mechanics*"

2013 (Sept.) JSPS/UK meeting "*Topological vorticity dynamics in the physical sciences*", Cambridge, UK.

2013 (Nov.) Moscow: Millionshchikov Centenary Meeting: Invited Lecture "The role of helicity in turbulent flow"

2013 (Nov.) Moscow: Skoltech Colloquium "Soap film dynamics and topological jumps under continuous deformation" (<https://www.youtube.com/watch?v=SM3m4n1j-EU>; see also <<http://postnauka.ru/video/19457>>)

2013 (Dec.) Paris: meeting of AERES committee for evaluation of the laboratory FAST (Université Paris XI)

2014 (Feb.) Cape Coast, Ghana: Lectures at AIMS-Ghana <<http://www.aims.edu.gh/the-campus>> “*Toy models illustrating complex mechanical phenomena*”.

2014 (Feb.) Yaounde, Cameroon: Launch of AIMS-Cameroon <<http://www.aims-cameroon.org>>; lecture at AIMS-Cameroon, Limbe “*Toy models illustrating complex mechanical phenomena*”.

2014 (May) IJLRA, Jussieu, Paris: Colloque francophone “*sur les défis et aspects fondamentaux de la turbulence*”. Invited lecture “*Reconnection of skewed vortices*”.

2014 (May) Stony Brook, Long Island, NY: Invited participant at Simons Center Workshop “*Geometrical Aspects of Hydrodynamics*”.

2014 (Nov.) Fields Institute, Toronto. Conference “The Legacy of Vladimir Arnold”; Invited lecture: “*Relaxation under topological constraints — and the breaking of these constraints*”.

2014 (Nov.) Perimeter Institute, Waterloo, Ont. Invited Lecture: “*Soap film dynamics: topological jumps with a twist*”

2014 (Dec.) Hong Kong, City University; International Conference on Applied Mathematics 2014; Invited Lecture: “*Soap film dynamics and topological jumps under continuous deformation*”.

2015 (March): 86th GAMM Conference, Lecce, Italy: Ludvig Prandtl Memorial Lecture: “*Discontinuities and topological jumps in slowly evolving vortical flows*”.

2015 (May): ICMS, Edinburgh; Invited Lecture: “*Topological jumps; some soap-film surprises.*”

2015 (July): Aix-en-Provence, France, 8th Festival de Théorie “*Pathways to Relaxation*”; Rosenbluth Lecture “*Relaxation under topological constraints*”

2015 (Nov.): Boston, USA, 68th APS/DVD meeting: Invited Lecture: “*Soap Film Dynamics and Topological jumps under continuous deformation*”.

2016 (April): Venice, IUTAM Symposium: Helicity, structures and singularity in fluid and plasma dynamics. Lecture “*Magnetic Relaxation and the Taylor Conjecture*”. <<http://www.matapp.unimib.it/~ricca/IUTAM2016Venice/>>

2016 (September): Belchatów, Poland, Fluid Dynamics Conference; Invited lecture “*Magnetic relaxation and structure/singularity formation in highly conducting fluids*”

2016 (October): Toulouse, France. Meeting on History of Fluid Mechanics. Invited Lecture: “*Early years of the Journal of Fluid Mechanics: Style and International Impact*”.

2017 (June): Freiburg, Germany; Summer School on Modern Knot Theory; Invited lecture course on (1) *Helicity and its role in dynamo theory*; (2) *Relaxation under topological constraints*; (3) *Minimum energy states of knots and links*; and (4) *Topological jumps of minimum area soap-films*.

2017 (September) MREP2017 meeting <<http://www.damtp.cam.ac.uk/user/rt449/mrep2017/mrep.html>>: Opening lecture “*Some non-mirror-symmetric reflections on dynamo theory*”

2017 (2 October) Whittaker Colloquium, Edinburgh.

2017 (12 December). Bajer Memorial meeting, Newton Institute

2018 (28 March) Lecture “*Finite-time singularity . . .*”, Non-Linéaire meeting, Paris

2018 (10 April) Lecture at Carlo Barenghi meeting, Newcastle.

2018 (11 September). Seminar SEAS Harvard.

2018 (November) Otto Laporte Lecture at APS DFD meeting, Atlanta.

2019 (8 April) Lecture at SQU-Cambridge Symposium, Oman

2019 (25 April) Contributed lecture “*Chiral transfer of Angular Momentum*”, BAMC, Bath

2019 (19 November) Interviewed by Alan Macfarlane.<<https://www.sms.cam.ac.uk/media/3113251>>

Research Students mentored (Cambridge except as otherwise stated):

L. Todd (PhD 1964), J.C.J. Nihoul (PhD 1965), R.T. Waechter (1966), J. Toomre (PhD 1967), S. Richardson (1967), G.O. Roberts (PhD 1969), A.M. Soward (PhD 1969), A.D. Sneyd (PhD 1969), R.F. Dillon (PhD 1974), M.R.E. Proctor (PhD 1975), T. Hynes (PhD 1978), A. Hooper (PhD Bristol 1980), H. Kamkar (PhD Bristol 1980), E.M. Lungu (PhD Bristol 1980), C. Hancock (PhD Bristol 1980), C.J. Chapman (PhD Bristol 1980), S. Nightingale (MSc 1985), P. Watterson (PhD 1985), K. Bajer (PhD 1989), A.D. Gilbert (PhD 1988), T. Felici (PhD 1991), R. Ricca (PhD 1993), D. Linardatos (PhD 1993), A. Chui (PhD 1994), P. Carlotti (PhD 2001), P.J. Dellar (PhD 2002), V. Mac (MSc 1997), C.P. Hills (PhD 1999), M. Branicki (PhD 2005).