DAVID JAMES WALLACE

Personal Data Born 7th October 1945, Hawick, Scotland. Married to Elizabeth; one daughter, Sara.
19B, Buckingham Terrace, Edinburgh EH3 4AD
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Previous employment

Oct 2006 – Sep 2014	Master, Churchill College, Cambridge
Oct 2006 – Sep 2011	Director, Isaac Newton Institute for Mathematical Sciences; and NM Rothschild & Sons Professor of Mathematical Sciences, University of Cambridge
Jan 1994 – Dec 2005	Vice-Chancellor, Loughborough University
Apr 2000 – May 2004	Non-executive director, Taylor & Francis Group plc
Oct 2001 - Feb 2004	Non-executive director, UK e-Universities Worldwide Ltd
July 1999 - June 2001	Non-executive director, The Scottish Life Assurance Company
Oct 1979 - Dec 1993	Tait Professor of Mathematical Physics, University of Edinburgh
Oct 1978 - Sep 1979	Reader, Department of Physics, University of Southampton
Oct 1972 - Sep l978	Lecturer, as above
Sep 1970 - July 1972	Harkness Fellow, Department of Physics, Princeton University

Qualifications and Registrations

1995 - Nov 1997	Institute of Directors, Diploma in Company Direction
Oct 1967 - Aug 1970	University of Edinburgh, Ph.D. Thesis on Applications of Current Algebras and Chiral Symmetry Breaking
Oct 1963 - June 1967	University of Edinburgh, B.Sc. with First Class Honours in Mathematical Physics

Distinctions

President, Cambridge Society for the Application of Research 2014-17; Honorary Life Member 2017
Honorary Vice-President for Life, Churchill College Association 2014
Named Lecture in Mathematics “Sir David Wallace”, Loughborough University, 2014
Honorary Fellow, Isaac Newton Institute for Mathematical Sciences 2013
Deputy President & Vice-President, Physical Sciences & Engineering, Royal Society of Edinburgh 2013 -17
Hon ScD, University of East Anglia, 2009
Hon Fellow, Institute of Mathematics and its Applications, 2009
Hon DSc, University of Southampton, 2006
Hon DSc, Loughborough University, 2006
Life Vice-President, Loughborough University Alumni Association, 2006
Visiting Professor, Mathematical Sciences and Physics, Loughborough University, 2006 – 2014
Hon DSc, University of Leicester, 2005
Vice-President, Great Britain Wheelchair Basketball Association, 2005 - 2017
Knighted for services to UK Science, Technology and Engineering, 2004
Hon DSc, University of Edinburgh, 2003
Treasurer and Vice-President, The Royal Society, 2002 – 2007
President, Institute of Physics, 2002 - 2004
Hon DEng, Heriot Watt University, 2002
Companion, Institute of Management, 2001
Awarded Club Colours, Loughborough Students Athletic Union, 2001
Deputy Lieutenant for Leicestershire, 2001 – 2006
Fellow of the Royal Academy of Engineering, 1998
CBE for services to parallel computing, 1996
Star Fundraiser, Loughborough Students Rag, 1995
President, Physics Section, British Association for the Advancement of Science, 1993/4
Fellow of the Institute of Physics, 1991
Fellow of the Royal Society, 1986
Fellow of the Royal Society of Edinburgh, 1982
Maxwell Medal and Prize of the Institute of Physics, 1980
Harkness Fellowship, 1970
Chalmers Research Scholarship, University of Edinburgh, 1967
Prizes, Medals in Astronomy, Mathematics, & Mathematical Physics, University of Edinburgh, 1964 - 1967
Marshall Entrance Bursary, University of Edinburgh, 1963

Recent attainments

- PADI: Open Water Diver, 2012; Advanced OWD, 2016
- ABRSM, E*b* Horn, Practical Exam Grade 5 (distinction), 2020; Performance Exam Grade 6 (distinction), 2021; Performance Exam Grade 7 (merit), 2022.
- The Economist Executive Education, *The New Global Order: How Politics, Business and Technology are Changing* (distinction) 2021

Current Responsibilities and Committees

- Royal Society of Edinburgh, Audit and Risk Committee (2022 -)
- Trustee, The Bill McLaren Foundation (2016 -)

Academic and Scientific Positions and Committees

Within the University of Edinburgh
- Computing Policy Committee (1983 - 1986)
- Head of Department of Physics (1984 - 1987)
- IT Committee (1985 - 1987)
- Dean's Committee, Faculty of Science and Engineering (1986 - 1993)
- Director, Edinburgh Concurrent Supercomputer project (1987 - 1990)
- Director, Edinburgh Parallel Computing Centre (1990 - 1993)
- Nomination Committee, appointment of Principal and Vice- Chancellor (1993)

Within the University of Cambridge
- North-West Cambridge Strategy Committee (2007 - 10)
- Management Committee, Millennium Mathematics Project (2007 - 11)
- Chair, Centre for Scientific Computing (2007 - 2014)
- Cambridge Foundation (2007 - 2014)
- Chair, Steering Committee, then Executive Committee, Centre for Science and Policy (2007 - 2011); member (2011 - 14)
- Information Strategy and Services Syndicate (2008 - 2014)
- West and NW Cambridge Project Board (2010 - 2011)
- Professorial Remuneration (2013, 2015, 2017)
- Chair, Appointments Committee, Earth Sciences and Geography (2007 - 14)
- Chair, Appointments Committee, Computer Science and Technology (2011 - 14)

Churchill College: (2006 – 2014)
- Master, responsible for collegiate leadership of the College
- Trustee, the Sir Winston Churchill Archive Trust
- Trustee, the Margaret Thatcher Archive Trust
- Trustee and Chair, Churchill College Archives Trust
- Chair and non-executive Director, The Møller Centre for Continuing Education Ltd; Queen's Award for Enterprise (International Trade) 2012
- Non-executive Director, Churchill Residences II

University of St Andrews
- Court (2014 - 21)
- Planning and Resources Committee (2014 - 2019)
- Remuneration and HR Committee (2014 - 2018); Remuneration Committee (2018 - 21)
- Sports Centre Redevelopment Project Board (2014 - 18)
- Guardbridge Development governance subgroup (2014 - 15)
- Chair, Selection Committee for the Principal and Vice-Chancellor (2015 - 16)
- Music Centre Project Board, member (2015 - 2019)
- Chair, Audit and Risk Committee (2019 - 21)

Science and Engineering Research Council
- Solid State and Low Temperature Physics Sub-Committee (1982 - 1985)
- Physics Committee (1982 - 1986)
- Science Board Computing Committee (1983 - 1986)
- Panel to examine Science Board computing requirements (1984 - 1985)
- Chair, Computational Science Working Group (1986)
- Chair of Physics Committee and Member of Science Board (1987 - 1990)
- Chair of Science Board and Member of Council (1990 - 1994)

Engineering and Physical Sciences Research Council
- Member of Council (1994 - 1998)
- Chair, Technical Opportunities Panel (1994 - 1998)
- Council appointment panel (2002 – 2005, 2007 - 2008)
- Chair, Review of Portfolio Partnerships Scheme (2007)
- Chair, Selection Panel, Complexity Science in the Real World (2009)
- Visiting Panel for Review of EPSRC Strategic Advisory Routes (2013)

DTI and Office of Science and Technology

- LINK Board (1995 - 1999)
- LINK/TCS Board (1999 - 2001)
- Chair, e-Science Steering Committee (2001 - 2006)
- Chair, TCS Quinquennial Review (2001)

Department for Education and Skills
- Deputy Chair, Better Regulation Review Group (2003 - 4)

Commission of the European Communities
- Expert to the CODEST Committee on the Stimulation Action BRAIN (1987)
- Vice-Chair, Scientific Applications Working Group, and member, High Performance Computing and Networking Advisory Committee (1991 - 1992)
- Physics Panel, Human Capital and Mobility Programme (1992 - 1993)
- Large Scale Facility Panel, Training and Mobility of Researchers Programme (1995)
- European Science and Technology Assembly (1997 - 1998)

Department of Culture Media and Sport
- Advisory Panel on Listed Events (1998)

Higher Education Funding Councils
- UGC Review of Physics (1987 - 1988)
- Technical Options Group on Advanced Research Computing, and Chair of the Novel Architectures Sub-group, for the Computer Board of the UFC (1988 - 1990)
- Scottish Higher Education Funding Council (1993 – 1997)
- Review of Postgraduate Education (1995 - 1996)
- Research Assessment Panel for Physics (1992, 1996)
- Chair, Value for Money Steering Group (1997 - 2003)
- East Midlands Widening Access Panel (1998 - 2000)
- Director, UK e-Universities Worldwide Ltd (2001 - 2004)
- Sino-UK e-Learning Programme, Steering Group (2001 - 2004)
- Indo-UK Collaborative Programme in Science and Technology, Steering Group (2002 - 2003)
- Performance Indicators Steering Group (2004 - 2005)

Universities UK
- Chair, CVCP and SCOP Task Force on Sport (1995 - 1997)
- Information Systems Strategy Group (1996 - 2003)
- Regional Committee (1999 - 2000)
- Research Policy Steering Committee (2004 - 2005)

Royal Society
- Sectional Committee 2 (1986 - 1989)
- Mullard Award Committee (1990 - 1995)
- Research Grants Board A (1991 - 1994)
- Chaired input to House of Commons Select Committee on Science and Technology enquiry 'Are we Realising our Potential?' (2000)
- Member of Council (2001 - 2007)
- Treasurer and Vice-President (2002 - 2007)
- Chair, Royal Society/ Wolfson Laboratory Refurbishment Committee (2007 - 2011)
- Carlton House Terrace Development Ltd (The Royal Society) (2002 - 2007)
- Chair, Royal Society (Australia) PTY.LTD. (ACN 126 112 678) (2007)
- Trustee and Chair, Royal Society Pension Scheme (2002 - 2007)
- Chair, Working Group to review the role of Treasurer (2013)
- Newton International Fellowships panel, member (2012 -); chair, Physical Sciences (2014 - 16)
- Panel Co-Chair, Japan Society for the Promotion of Science (JSPS) Fellowships (2014 - 16).
- National Academies, Leverhulme APEX Awards Committee (2017 - 22)

Royal Society of Edinburgh
- Vice-President, Physical Sciences and Engineering, and member of Council (2013 - 17)
- Deputy President (2014 - 17)
- Fellowship Committee (2013 - 17)
- Prizes Committee (2013 - 17)
- Royal Medals Committee (2013 - 17)
- Audit and Risk Committee (2013 - 17)

- Investment Committee (2014 - 17)
- Strategic Funding Review Group (2014)
- Chair, response to BIS consultation on Science and Innovation Strategy (2014)
- Pensions Working Group (2014 – 16, 2017 - 21)
- CEO Nomination Panel (2016 - 17)
- Chair, response to Select Committee consultation on Balance and Effectiveness of Research and Innovation Spending (2018)
- Audit and Risk Commiittee (2022 -)

IEEE
- Chair, past chair, James Clerk Maxwell Award, joint with RSE (2015 - 17)
- Medals Council (2015 - 16)

Royal Academy of Engineering
- Working Group on Measuring Excellence of Research in Engineering (1999)
- Standing Committee for Education and Training (2000 - 2002)
- Chair, Appointment panel for Chair in Emerging Technology (2008)

Institute of Physics
- Computational Physics Group (1986 -1988)
- Member of Council (1997 – 2000; 2001 - 2005)
- Chair, *Profile for Physics* Working Group (1998 - 2000)
- President (2002 - 2004)
- Chair, Awards Review Working Group (2005)
- Institute of Physics, Remuneration Committee (2006 - 2011)
- Campaign Board (2012 - 2014)

Editorial Boards
- Journal of Physics A (1979 - 1982)
- Journal of Statistical Physics (1985 - 1988)
- International Journal of Neural systems (1989 - 1994)
- International Journal of High Speed Computing (1989 - 1994)
- Concurrency: Practice and Experience (1990 - 1999)
- Network (1990 - 1994)
- Computing Systems in Engineering (1990 - 1995)

Brathay Hall and Brathay Exploration Group
- Participant, Brathay Hall Outward Bound Programme (1963)
- Participant, Brathay Exploration Group, Iceland (1964)
- Instructor, Brathay Hall Outward Bound Programme (1965)
- Assistant Leader, Brathay Exploration Group, Poland (1965)
- Leader, Brathay Exploration Group, Lake District (1966)
- Assistant Leader, Brathay Exploration Group, Norway (1967)
- Leader, Brathay Exploration Group, Foula (1973)

Other
- Panel of Experts in Mathematical Physics, Board of Advisers for Promotions, University of London (1980 - 1990)
- Scientific Programme Chair, STATPHYS 15 Conference (1983)
- Co-director, 26th Scottish Universities Summer School in Physics, a NATO Advanced Study Insititute (1983)
- Scientific Programme Organiser, UK Theoretical High Energy Physics Institute (1981 - 1984)
- External Examiner for Honours BSc in Physics, University of Birmingham (1986 - 1987)
- Associate Director, National Electronics Research Initiative on Pattern Recognition (RIPR), Defence Research Agency, Electronics Division, Malvern (1986 - 1990)
- Scientific Steering Committee, Isaac Newton Institute for Mathematical Sciences, Cambridge (1990 - 1993)
- Science Award Panel, Saltire Society (1991 – 1992)
- Chair, advisory group on parallel computing, CERN (1993)
- Board of Governors, Loughborough Endowed Schools (1994 - 2006)
- Board of Governors, Loughborough College of Art and Design (1994 - 1998)
- Director and (from 1995) Vice-Chair, Sports Aid Foundation (East Midlands) Ltd (1994 - 2000)
- Member of Court, University of Nottingham (1996 - 2002)

- Chair, Loughborough University Development Trust (1996 - 2005)
- Award Panel, Bank of Scotland Tercentenary Award for Innovation in Teaching and Learning (1997 - 1998)
- Board of Governors, Repton School (1998 - 2002)
- Founding Chair, East Midlands Universities Association (1998 - 2000)
- Board of Governors, Loughborough College (1999 - 2002)
- Director, The Scottish Life Assurance Company (1999 - 2001) ; Registered with IMRO and Personal Investment Authority (PIA).
- Director, SportsAid East Midlands Ltd (2000 - 2002)
- Director, Taylor & Francis Group plc (2000 - 2004); Chair, Remuneration Committee (2001 - 2004)
- Board Member, Royal Commission for the Exhibition of 1851 (2001 - 2011)
- Chair, Industrial & Engineering Advisory Committee, Royal Commission for the Exhibition of 1851, (2001 - 2009)
- Founding Chair, Continuing Professional Development Board for Physical Education (2001)
- Board Member, Ford College (2001 - 2005)
- Chair, Loughborough College Enterprises Ltd (2001 - 2002)
- Director, Loughborough College Properties Ltd (2001 - 2002)
- Leadership Team, Leicestershire Cares (2001 - 2002)
- Scottish Science Advisory Committee (2002 - 2004)
- Academic Policy Committee, Repton School (2002 - 2006)
- British Council: British-Italian Partnership Programme (2002 - 2005)
- Director, Youth Sport Trust (2002 - 2007)
- British Universities Sports Association: review of eligibility (2004)
- Visiting Professor, Mathematical Sciences and Physics, Loughborough University (2006 – 2014)
- Honorary Member, Old Reptonian Society (2006)
- Selection Committee, European Postdoctoral Institute (2006 - 2011)
- Chair, Council for the Mathematical Sciences (2006 - 2010)
- Selection Committee, European Postdoctoral Institute (2006 - 2011)
- Trustee, Winston Churchill Foundation of the United States (2006 - 2014); Trustee Emeritus (2018 -)
- Governor and Trustee, John Lyon's Foundation (Harrow School, the John Lyon School and John Lyon's Charity; known formerly as Harrow School Foundation) (2007 - 16)
- Trustee, Thriplow Charitable Trust (2007 - 2014)
- Trustee, The Winston Churchill Foundation of the United States in the UK (2008 - 14);
- DCSF/ DIUS High Level Steering Group for STEM (2008 - 2010)
- Leibniz Gemeinschaft Evaluation of Mathematisches Forschungsinstitut Oberwolfach (2009)
- Trustee, The Royal Institution of Great Britain (2011 - 12)
- Physical and Mathematical Sciences Panel, Research Leadership Awards, Leverhulme Trust (2012)
- President and Provost Appointing Committee, Imperial College (2012 - 14)
- President, Cambridge Society for the Application of Research (2014 - 17)
- National Readers' Panel, Queen's Anniversary Prizes (2015 - 22)
- Trustee, The Bill McLaren Foundation (2016 -)
- Advisory Committee, Data for Policy Conference (2016 - 20)
- Panel Member, The Leverhulme Trust, Doctoral Scholarships scheme (2017)
- Chair, International Centre for Mathematical Sciences (2017 - 22)
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Research Summary (1967-93)

Publications. (Co)author of more than 100 research papers, on high energy physics, phase transitions and critical phenomena, neural network models and high performance computing.

PhD students. More than 40 students have successfully completed their PhD studies under my supervision.

Research Seminars and Lectures (to 1993). Frequent visitor and lecturer at workshops, conferences and summer schools in the UK and abroad; typically 20 or more invited lectures and presentations per year, to academics, industrialists, school children and the general public.

Research funding. In research awards to 1991, principal investigator in 27 grants from SERC (value £1.8M), 6 grants and contracts from Govt Depts (value £1.3M) and 15 others mainly from industry and EC, to a value of £0.85M. In 1993, total EPCC income was around £2.5M per annum, with around £1M of audited industrial collaboration in addition.

Commentary on Research:

PhD work in Theoretical High Energy Physics, under the supervision of Prof P.W. Higgs, University of Edinburgh. Studied applications of quantum field theory and group theory, 1967-70.

Harkness Fellowship at Princeton University, 1970-72. Continued work in high energy physics, focusing on gauge theories and dual models. Extended work into applications of field theory and the renormalisation group in phase transitions, in collaboration with E. Brezin and K.G. Wilson, with first applications to calculations of equations of state at critical points.

Theory Group, Physics Department, University of Southampton, 1972-79. Continued work in high energy theory, while building up a research group in the theory of phase transitions (including first order phase transitions), and critical phenomena (including percolation).

Sabbatical in the USA, 7 months, 1979. Visitor to Virginia Polytechnic Institute and State University, Harvard University and MIT. Initiated work on field theory of surface fluctuations to describe critical phenomena of systems with discrete symmetries (for example, liquid vapour transitions).

Head, Theory and Computation Group, Physics Department, University of Edinburgh, 1979-94. The group had 6 permanent staff, and latterly 6 postdoctoral research assistants and 19 postgraduate students.

- Led revitalisation of **high energy theory group**, building up external funding and support, primarily in lattice gauge theories of elementary particles. With G.S. Pawley in Condensed Matter, the Group was a world pioneer of the successful exploitation of massively parallel computers. This activity was instrumental in the development of the parallel computing activities at Edinburgh, and was a vital component of the “UKQCD” collaboration, which obtained Research Council support for a series of high performance computers for “Grand Challenge” research.
- Continued work in **theory of phase transitions and critical phenomena**. Particular work included estimates of high order behaviour in perturbation theory using instanton techniques, and the development of droplet models of phase transitions.
- In collaboration with A.D. Bruce and others, started work in 1984 in **artificial neural network models**, using the techniques of statistical physics. Particular interests included algorithms for learning, theory of capacity and learning, and applications. The Edinburgh group, with D.J. Willshaw in Cognitive Science, was identified as one of 16 "Key West European Neural Network Research Groups" in a report prepared by Science Applications International Corporation for the United States Government in 1991.
- **Director, Edinburgh Parallel Computing Centre**. EPCC was established during 1990, as a multi-disciplinary centre for service, training, research and applications on parallel high performance computing systems. It built on more than a decade of practical experience. By 1994, the facilities of the Centre represented one of the most significant concentrations of high performance computing resource in any European University, and provide a networked service to several hundred users mainly in the UK. From 1987, the activities in parallel computing grew at 50% per year, to a professional staff of around 50, with a further 11 supported in other departments. More than 30 industrial organisations in the UK, Europe, the USA and Japan were involved in contracts and collaborations. In 1992, the Centre was selected as a Large Scale Facility under the Human Capital and Mobility Programme of the CEC. Two commercial companies spun-out from the activities of the Centre: Scapa Technologies, in computer

stress testing; and Quadstone, which provides Customer Relationship Management software for very large databases.
- **Covid**-19 modelling of Case Fatality Rates, R-number and Growth Rate, in collaboration with G.J. Ackland and J.A.Ackland.

Recent Lectures and articles

- *Merit, Meritocracy and Michael Young*, discussion meeting of the Royal Society of Edinburgh Dining Club, 1 October 2018, https://lettersfromscotland.org/.
- *Denis Rooke* in *Memorial Tributes* **21** 357-362, National Academies Press 2017
- *High Performance Computing.* The Sir Nevill Mott Lecture, Loughborough University, 11 March 2015. www.lboro.ac.uk/departments/physics/news/seminar-programme/sirnevillmottlectureseries/
- *A career in science and education:* Drummond Community High School, Edinburgh, 27 Nov. 2014
- *Leadership and University:* Harrow Family Fifth Form Conference, 19 June 2014
- *High Performance Computing and Innovation*
  - China Executive Leadership Programme, University of Cambridge, 18 July 2013
  - Information Engineering Conference, Engineering Department, University of Cambridge, 28 June 2013
  - Symposium organised by National University of Defence Technology, Wutai Shan, 11 April 2013
- *Five Millennia of Mathematics*
  - Cambridge in America reunion, San Francisco, 5 November 2011.
  - Churchill College Alumni Association weekend, 24 September 2011.
  - Culford School, 23 September 2011.
  - SIAM student chapter conference, Heriot Watt University, 31 March 2010.
- *Churchill, his College and Denmark:* Danish UK Chamber of Commerce, 14 May 2010.
- *Globalisation of Culture and Language:* Round table discussion, Festival of Thinkers, Abu Dhabi, 3 November 2009.
- *College and University Leadership.* Presentation and discussion for Chinese University Presidents and senior staff at Churchill College: 11 December 2013; 26 October 2011; 20 October 2010; 27 November 2009; 3 December 2008,
- *Globalisation: a personal view*. Presentation and round table discussion, French Physical Society Annual Conference, Ecole Polytechnique, 9 July 2009.
- *Activities and opportunities at the Isaac Newton Institute for Mathematical Sciences*, 2006 – 2011, at Birmingham; Manchester; Nottingham; Loughborough; Durham; Warwick; Brunel; Edinburgh/ Heriot-Watt; Strathclyde; Glasgow; Bristol; Swansea; Sheffield; Leeds; Liverpool; Proudman Oceanographic Laboratory; RAL; Open University; Newcastle; Bath; Reading; Exeter/ Met Office; Plymouth; Leicester; Kent; Sussex; Southampton; Portsmouth; Surrey; HoDoMS; BMC; ICMS; Annual Particle Theory Meeting Durham; IMS, Singapore; Polytechnic University, HK; Tsinghua; CAS Academy of Mathematics and System Science; Kavli Institute Peking University; Reading; BAMC Nottingham; UCL; European Bioinformatics Institute, Hinxton; RAL.
- *Virtue from necessity,* Times Higher Education Supplement, 5 March 2004; on the importance of diversity of funding streams, and on the HEFCE funding model for teaching.
- *Universities in the marketplace: where's Loughborough?* Paper analysing issues of commercialisation, February 2004, stimulated by *Universities in the marketplace,* by Derek Bok, Princeton University Press, 2003.
- *When concentration surpasses excellence*, Research Fortnight, 15 October 2003; an analysis of the HEFCE funding model for research.
- *A model approach to society*, summary of Institute of Physics Presidential Address, Physics World, May 2003; exploring three metaphors which provide some insight into issues in Science in Society.
- *The UK e-Science Programme*, lectures at University of Malaya, Shanghai Jiatong University, Tongji University, Xian Jiatong University, Northwestern Polytechnical University, Beijing Institute of Technology, Beijing University of Aeronautics and Astronautics, National Science Foundation of China, Peking University, Fudan University, Chinese Physical Society (annual meeting, Shanghai), August-September, 2001.
- *Sport and Recreation in HE and FE*, invited lecture, British Universities and Colleges PE Association, BUCPEA 2000 conference, Newcastle, April 2000.
- *Development in the University Sector and the Contribution of Sport*, invited lecture, Sport England Conference, Birmingham, February 2000.
- *Economic Added Value of Science and Engineering Degrees*, in the workshop *Physics and Foresight: Science in Our Lives*, Institute of Physics Congress, Salford, April 1999.
- *The University Perspective*, invited lecture, British Universities Sports Association (BUSA) Conference, Loughborough University, March 1999.

- *Towards a Probably Approximately Correct Theory of Knowledge?* seminar, Department of Social Science, Loughborough University, February 1999.
- *Information and Communication Technologies: Senior Management Competencies,* invited lecture at the JISC workshop on the Dearing recommendations, October 1998.

Short talks

- *Governance in Successful Enterprises,* ERA Foundation Annual Lunch,London, 7 May 2015; Royal Society of Edinburgh, 6 October 2015.
- *Leadership,* Scottish Crucible Launch Dinner, Royal Society of Edinburgh, 23 April 2015.
- *Luck and Leadership,* University of St Andrews Annual Award Dinner, 20 April 2015.

RESEARCH GRANTS AND CONTRACTS

SERC, BRG51113	Symmetry breaking and the Wilson theory of critical phenomena; 1.10.73 – 30.9.76	£10,781
SERC, GRA 07508	Renormalisation group methods on lattices; 1.10.76 – 30.9.79	£13,350
SERC, NG 08955	The structure and phenomenology of gauge field theories of the fundamental interactions (RA to study quark confinement and higher symmetries of the fundamental interactions); 1.10.80–30.9.82	£19,900
SERC, GRA81768	Applications of extended solutions of field theories in statistical physics (RA to study non-trivial solutions of the classical field equations and fluctuations about them); 1.10.79 – 30.9.82	£25,815
SERC, NG 10071	Aspects of lattice gauge theories (visiting fellowship for Prof. J.L. Cardy, University of California at Santa Barbara); 1.5.81 – 11.6.81	£910
SERC, NG 12105	Lattice gauge theory calculations with fermions (visiting fellowship for Dr. E. Marinari, University of Rome); 15.4.82 – 14.5.82	£762
SERC, NG 12099	Lattice gauge theory calculations with fermions (visiting fellowship for Dr. F. Rapuano, University of Rome); 15.4.82 – 14.5.82	£762
SERC, GRB 96322	:Statistical physics of random surfaces (RA position to study problems involving random surfaces, using principally field theory methods); 1.10.82 – 30.9.85	£35,540
SERC, NG 11337	Field and lattice gauge theories of elementary particle interactions; .10.82 – 30.9.84	£22,747
SERC, GRC 09258	Monte Carlo methods for critical phenomena (visiting fellowship for Dr. R.H. Swendsen, IBM, Zurich); 1.6.82 – 30.5.83	£1,020
SERC, GRC 01474	Surface fluctuations in field theory and the lattice Ising model (visiting fellowship for Prof. R.K.P.Zia, VPISU, Virginia); 15.9.82 – 14.9.83	£1,060
SERC, NG 11849	with R.A. Cowley, G.S. Pawley, G. Burns: Gauge theory and condensed matter calculations on an Edinburgh DAP; 1.5.82 – 30.4.85	£180,000
SERC, GRC 66817	with G.S. Pawley: Disk filestore for Physics calculations on the Edinburgh DAP; 1.8.83 – 31.7.85	£8,280
SERC, NG 13959	with K.C. Bowler: Lattice gauge theory calculations using the Edinburgh DAP; 1.10.83–30.9.84	£9,160
SERC, NG 12617	with K.C. Bowler: Lattice gauge theory calculations using the Edinburgh DAP); 1.10.82 – 30.9.83	£7,350
NATO	with A.J.G. Hey (Southampton U.), J. Mandula (Washington U.) and J. Weyers (U. of Louvain). Quantum chromodynamics on a lattice; 1.7.83-30.6.86	£3,000
NATO, ASI 45/83	with P.W, Higgs: Statistical and Particle Physics: Common problems and techniques (NATO Advanced Study Institute Award, to help support a Scottish Summer School in Physics); 12.11.82 – 29.2.84	£21,770
SERC, NG 14840	with K.C. Bowler and P.W. Higgs:Gauge theories of elementary particles (two RA positions); 1.10-84 – 30.9.86	£53,089
SERC, NG 14703	with K.C. Bowler: European lattice gauge theory collaboration (Travel and subsistence grant); 1.12.83 – 31.12.84	£1,536
SERC, SO/106/83	Particle and statistical physics – common problems and techniques (for 10 UK students to participate in Scottish Universities Summer School in Physics); 25.4.83 – 24.10.83	£2,700

SERC, NG 15908	with K.C. Bowler, A.D. Bruce, R.D. Kenway, G.S. Pawley, A. McKendrick: Scientific computation on the Edinburgh DAPs (maintenance of 2 DAPs); 1.7.85 – 30.9.87	£88,585
Department of Trade & Industry, IT/16/56/604	Acquisition of Meiko Computing Surface (for demonstrationand scientific purposes); 20.3.86 – 28.2.87 (The Computer Board made an award of £78,000 to Edinburgh Regional Computing Centre for the associated MicroVAX host system.)	£111,000
MoD, 2087/27 (through RSRE)	Learning, storage, recall and discrimination in neural network models (Computing Officer and costs); 1.7.86–30.6.88	£72,882
SERC, NG 17094	with K.C. Bowler and R.D. Kenway: Non-perturbative studies of gauge theories (2 RA positions); 1.10.86 – 30.9.89	£66,821
ICL Limited	Software development on the Distributed Array Processor (Computing Officer to support applications work); 1.10.86 – 31.3.87	£6,000
Meiko Limited	Software Development on the Computing Surface (Computing Officer to support graphics and applications work); 1.4.87 – 30.9.8	£6,000
Department of Trade & Industry, IT/8/56/41	Edinburgh Concurrent Supercomputer (Contribution for Phase 1A of hardware installation); 2.3.87 – 31.3.90 (The Computer Board made an award of £400,000 to the Edinburgh Regional Computing Centre under the same initiative.)	£575,000
SERC, GR/E 09863A	F. Murray, P.B. Denyer (Electrical Engineering) and D.J. Wallace (Administered by E.E.): Experimental studies of neural computation using VLSI technology; 1.2.87 – 31.1.89	£12,940
EC, SC1*-0250-C(JR):	Statistical mechanics and its application to complex problems in Engineering and Biology Twinning managed by D. Sherrington, Oxford; 1.6.89 – 30.11.92	£10,000
Meiko Limited	Computing Officer Support (to place Mr. G.V. Wilson at Edinburgh in support of the Edinburgh Concurrent Supercomputer project); 1.10.87 – 31.12.89	£38,100
SERC, GRE 21810	Edinburgh Concurrent Supercomputer (Contribution from Science and Nuclear Physics Boards for hardware, maintenance and 1 person for 3 years); 1.10.87 – 30.9.90	£399,945
Hewlett Packard	Partnership contribution to the Edinburgh Concurrent Supercomputer project. (Also contributed disks to a value of $100K); 1.10.87 – 30.9.89	£30,000
Royal Dutch Shell Group (The Netherlands)	Partnership for 2 years in Edinburgh Concurrent Supercomputer Project; 1.5.88 – 30.4.90	£100,000
Department of Trade & Industry	Contribution to ECS hardware installation (Phase 2); 1.2.89 – 31.3.91	£569,000
National Physical Laboratory	Monte Carlo Numerical Simulation (Contract to mount EG4 package on the Computing Surface); 29.1.88 – 31.5.88	£4,500
British Telecom	Consultancy for software development on the Computing Surface for image compression; 20.6.88 – 12.8.88	£2,800
Scottish Development Agency	Grant towards Annual Seminar (1988)for the Edinburgh Concurrent Supercomputer Project; 1.7.88 – 1.1.89	£2,500
SERC, GRE 89933	Support to prepare Esprit proposal 20.4.88 – 19.1.89	£1,575
SERC, GRF 41815	with K.C. Bowler, P.W. Higgs and R.D. Kenway: Towards solutions of quantum field theories: 1.10.89 - 30.0.93	£167,648

EC SC1*-0286-C (JR)	with D.J. Willshaw and R.G.M. Morris Twinning agreement led by E.T. Rolls, Oxford on Parallel Processing in Neural Networks. 1.12.89–30.11.92 Physics Department resource	£30,000
SERC, B18534	with R.N. Ibbett: Foundation support to EPCC, for Novel Architecture Computing Research, 1.1.90 – 31.3.94	£505,000
SERC GR/F /5869	with P. Thanisch: Parallel Processing with Intelligent Knowledge Bases, 1.6.90 – 31.5.93	£94,289
British Gas	Image restoration by neural network models: 1.7.90 – 31.8.90	£2,000
Shell Expro	through EPCC contract: Oil well facies determination by neural network models: 1.7.90 – 30.9.90	£10,000
Hitachi Research Laboratories, Dublin	Affiliation to EPCC for neural network consultancy; 1.8.90 – 31.7.92	£15,000
SERC, GR/F 79719	with A.D. Bruce : Dynamics and Statistical Mechanics of Neural Network Models: 1.1.91 – 31.12.93	£87,308
	EPCC also received recurrent support from the Computer Board to a total per annum, of £184,000	
EPSRC, BBSRC, NERC, STFC, RCUK, Leverhulme Trust, Garfield Weston Foundation, MS Research Cambridge, Thriplow Trust, Schlumberger, individual philanthropy	New grants and donations to the Isaac Newton Institute for Mathematical Sciences, Cambridge, in the period 2006 – 2011.	>£11 million

PUBLICATIONS

1. Electromagnetic effects in $K \to 2\pi$ decays, Nucl. Phys. **B12** (1969) 245-56
2. η-π mixing, $\eta \to 3\pi$ and Chiral Lagrangians, Nucl. Phys. **B20** (1970) 23-44 (with H. Osborn)
3. Tadpole electromagnetic effects, σ-commutator terms and η P.C.A.C., Nucl.Phys. **B27** (1971) 221-36.
4. Chiral symmetry breaking and the dual pion model, Phys. Rev. **D6** (1972) 723-5 with J.H. Schwartz).
5. Feynman graph expansion for the equation of state near the critical point (Ising-like case), Phys. Rev. Letters **29** (1972) 591-4 (with E. Brézin and K.G. Wilson).
6. Feynman graph expansion for the equation of state near the critical point, Phys. Rev. **B7** (1973) 232-9 (with E. Brézin and K.G. Wilson).
7. Critical behaviour of a classical Heisenberg ferromagnet with many degrees of freedom, Phys. Rev. **B7** (1973) 1967-74 (with E. Brézin).
8. Critical behaviour of anisotropic cubic systems, J. Phys. C6 (1973)1390-404 Corrigenda **C7** (l974) 4551.
9. A modified ε-expansion for a Hamiltonian with cubic point-group symmetry.J. Phys. **A6** (1973) 1667-78 (with I.J. Ketley).
10. The ε-expansion and parametric models for the Ising equation of state in the critical region, Phys. Letters **46A** (1973) 261-2 (with R.K.P. Zia).
11. Parametric models and the Ising equation of state at order ε^3, J.Phys.**C7** (1974) 3480-90 (with R.K.P. Zia).
12. Gradient flow and the renormalization group, Phys. Letters **48A** (1974) 325-6 (with R.K.P. Zia).
13. Harmonic perturbations of generalised Heisenberg spin systems, J. Phys.**C8** (1975) 839-43 (with R.K.P. Zia).
14. Gradient properties of the renormalisation group equations in multicomponent systems,Annals of Physics (New York) **92** (1975) 142-63 (with R.K.P. Zia).
15. On the uniqueness of φ^4 interactions in two and three component spin systems, J. Phys. **A8** (1975) 1089-96 (with R.K.P. Zia).
16. Critical behaviour of the continuous n-component Potts model, J. Phys. **A8** (1975) 1495-507 (with R.K.P. Zia).
17. The ε-expansion in the U(n) Thirring model, Lett. al Nuovo Cim. **14** (1975) 493-9 (with P.H. Weisz).
18. Singularities induced by Goldstone modes, Phys. Rev. **B12** (1975) 5340-2 (with R.K.P. Zia).
19. Symmetries as a consequence of renormalisation constraints, Nucl. Phys. **B108** (1976) 293-309 (with R.K.P. Zia).
20. The ε-expansion for exponents and the equation of state in isotropic systems, in *Vol. 6 of Phase Transitions and Critical Phenomena,* Eds. C. Domb and M.S. Green, (Academic Press 1976) pp. 293-356.
21. The Renormalization Group : invited article for the *Institute of Physics Bulletin*, October 1976, pp. 447-50.
22. Crossover behaviour and effective critical exponents in isotropic and anisotropic Heisenberg systems, J. Phys. **A9** (1976) 1117-32 (with A.D. Bruce).
23. Essential singularities at first-order phase transitions, Phys. Rev. Letters **37** (1976) 639-42 (with W. Klein and R.K.P. Zia).
24. Models for strong interactions in 6-ε dimensions, Phys. Letters **B65** (1976) 171-3 (with A.J. McKane and R.K.P. Zia).
25. Universality in the percolation problem - anomalous dimensions of φ^4 operators, Phys. Rev. **B15** (1977) 4657-66 (with D.J. Amit and R.K.P. Zia).
26. Spin anisotropy and crossover in the Potts model, Phys. Rev. **B17** (1978) 2384-7 (with A.P. Young).
27. Some applications of instantons in statistical mechanics, in *Solitons and Condensed Matter Physics*, Eds. A.R. Bishop and T. Schneider, (Springer-Verlag, 1978) pp. 104-15.
28. High order behaviour in φ^3 field theories and the percolation problem, Phys. Rev. **B17** (1978) 2956-64 (with A. Houghton and J.S. Reeve). Reprinted in *Large-Order Behaviour of Perturbation Theory*, eds. J.C. le Guillou and J. Zinn-Justin, North Holland (1990) 332-340

29. The renormalisation group approach to scaling in physics, Rep. Prog. Phys.**41** (1978) 1-85 (with R.K.P. Zia). Reprinted in *Critical Phenomena II,* Eds. S. Hikami and Y. Iwasaki (Physical Society of Japan, 1982) pp. 94-178
30. Instanton calculations using dimensional regularisation, J. Phys. **A11** (1978) 2285-304 (with A.J. McKane).
31. Metastable lifetimes, level crossings and vertical cuts in quantum mechanics J. Phys. **A11** (1978) 1933-41 (with L.S. Schulman and M. Stone).
32. Comments on the Field Theoretic formulation of the Yang-Lee edge singularity, J. Phys. **A12** (1979) L47-51 (with J.E. Kirkham).
33. Strong interaction models in 6-ε-dimensions, in *Hadron Structures and Lepton Hadron Interactions,* Eds. M. Levy et al, (Plenum 1979) pp.687-96.
34. Euclidean group as a dynamical symmetry of surface fluctuations: the planar interface and critical behaviour, Phys. Rev. Letters **43** (1979) 808-12 (with R.K.P. Zia).
35. Phase transitions in n = 4 type - II antiferromagnets, J. Phys. **C13** (1979) L851-7 (with D. Mukamel).
36. Membrane models and generalized Z_2 gauge theories, Phys. Letters **93B** (1980) 433-6 (with M.J. Lowe).
37. Goldstone modes in vacuum decay and first order phase transitions, J. Phys.**A13** (1980) 1755-68 (with N.J. Gunther and D.A. Nicole).
38. Instantons and the Ising model below T_c, J. Phys. **A13** (1980) L381-5 (with M.J. Lowe).
39. Phase diagrams of U(1) lattice Higgs models, Phys.Letters **104B** (1981) 481 (with K.C. Bowler, G.S. Pawley, B.J. Pendleton and G.W. Thomas).
40. Critical behaviour in interfaces, in *Proceedings of the Cargese Summer Institute on Phase Transitions* (1980) Eds. J.C. le Guillou and J. Zinn-Justin, (Plenum, 1981) pp. 423-57.
41. Field theories of surfaces, in *Gauge Theories and Experiments at High Energies*, Eds. K.C. Bowler and D.G. Sutherland, (SUSSP Publications, University of Edinburgh, 1981) pp. 459-517.
42. The Ising model in a random field: supersymmetric surface fluctuations and their implications in three dimensions, J. Phys. **A14** (1981) L527-31 with H.S. Kogon).
43. Droplet theory of low-dimensional Ising models, Phys. Rev. Letters **47** (1981) 1743-6; **E48** (1982) 446 (with A.D. Bruce).
44. Solitons and instantons, in *Proceedings of the Gwatt workshop on Non-Linear Phenomena* (1982).
45. Perturbative approach to surface fluctuations, in *Proceedings of Ecole d'Éte de Physique Théorique,* Les Houches, 1982, Eds. J.B. Zuber and R. Stora, (North Holland, 1984) pp. 173-216.
46. Quarks, computers and the strong force, New Scientist (Dec. 1983) pp.668-72.
47. Critical exponent ν for generalized surface fluctuations, Phys. Rev. **B27** (1983) 569-71 (with M.J. Lowe).
48. Droplet theory in low dimensions: Ising systems in zero field, J. Phys. **A16** (1983) 1721-69 (with A.D. Bruce).
49. Pion Propagator in quenched lattice QCD, Nucl. Phys. **B220** [FS8] (1983) 137-48 (with K.C. Bowler, G.S. Pawley, E. Marinari and F. Rapuano).
50. Mass differences and finite-size systematics in quenched QCD, in Proceedings of the International EPS Conference on High Energy Physics, Brighton 1983, Rutherford Appleton Lab (1984) 15-16 (with K.C. Bowler and G.S. Pawley).
51. Numerical simulation on the ICL Distributed Array Processor, in *Proceedings of Les Houches workshop,* 1983, Eds. C. Itzykson, Y. Pomeau and N. Sourlas, Phys. Reports **103** (1984) 190-201.
52. ditto , extended version, in Proceedings of 7th Johns Hopkins Workshop, 1983, Eds.G. Domokos and S. Kovesi-Domokos (World Scientific, 1984) pp. 273-92.
53. Contributor in *Proceedings of Fermilab Industrial Affiliates Roundtable on Supercomputer Developments in the Universities,* Fermilab (May 1983) pp. 27-35.
54. Non-perturbative renormalisation in field theory, in *Proceedings of VIII Sitges Conference,* June 1984, on Applications of Field Theory to Statistical Mechanics, Ed. L. Garrido (Springer-Verlag, 1985) pp 151-69.
55. Computer simulations of quark and gluon interactions, Nature **312** (1984) 404-5.

56. Monte Carlo renormalisation group calculations of critical behaviour in the simple-cubic Ising model, Phys. Rev. **B29** (1984) 4030-40 (with G.S. Pawley, R.H. Swendsen and K.G. Wilson).

57. Hadron mass calculations with Susskind and Wilson fermions in the fundamental-adjoint plane, Nucl. Phys. **B240** [FS12] (1984) 213-36 (with K.C. Bowler, D.L. Chalmers, A. Kenway, R.D. Kenway and G.S. Pawley).

58. A partitioned conjugate gradient algorithm for lattice Green functions, Phys. Lett **145B** (1984) 88-92 (with K.C. Bowler. R.D. Kenway and G.S. Pawley).

59. Monte Carlo renormalisation group studies of SU(3) lattice gauge theory,contributed to *XXII International Conference on High Energy Physics* (Leipzig, July 1984), TH3952-CERN, (with K.C. Bowler, R.D. Kenway, G.S. Pawley, A. Hasenfratz, P. Hasenfratz, Heller, F. Karsch and I.Montvay).

60. Non-perturbative renormalisation using dimensional regularisation: applications to the ε-expansion J. Phys. **A17** (1984) 1861-76 (with A.J. McKane and O.F. de Alcantara Bonfim).

61. Concurrency and parallelism in MC and MD simulations in physics, Computer Phys.Comm. **37** (1985) 251-60 (with G.S. Pawley, K.C. Bowler and R.D.Kenway).

62. Computing the strong force, in Building The Universe, Ed. C. Sutton (Blackwell, 1985) pp 164 - 75 (reprinted from "Quarks, computers and the strong force").

63. Spin glass models of neural networks: size dependence of memory properties,in *Proc, Conf. Adv. in Lattice Gauge Theories*, Eds. D.W. Duke and J.F. Owens (World Scientific, 1985), pp 326 - 46.

64. Effects of anisotropic surface tension on first order transition singularities, Phys. Rev. **B31** (1985) 1624-26 (with R.K.P. Zia).

65. Monte Carlo renormalisation group studies of SU(3) lattice gauge theory, Nucl. Phys. **B527** [FS14] (1985) 155-72 (with K.C. Bowler et al).

66. A critique of quenched hadron mass calculations, Phys. Lett **162B** (1985) 354-6 (with K.C. Bowler et al).

67. The β-function and potential at β = 6.0 and 6.3 in SU(3) gauge theory, Phys. Lett. **163B** (1985) 367-70 (with K.C. Bowler et al).

68. Memory and learning in a class of neural network models, in *Proc. Conf. on Lattice Gauge Theory - a Challenge in Large Scale Computing*, Eds. B. Bunk, K.H. Mutter and K. Schilling (Plenum, 1986), pp 313 - 330.

69. Learning and memory properties in fully connected networks, in *Neural Networks for Computing, AIP Conf. Series* 151 (1986), 65-70 (with A.D. Bruce, A. Canning, B. Forrest and E. Gardner).

70. The SU(3) β-function at large β, Phys. Lett. B, **179B** (1986) 375-78 (with K.C. Bowler et al).

71. Applications of parallel computing in condensed matter physics**, *Physica Scripta,*** T**19** (1987) 32-38 (with K.C. Bowler, A.D. Bruce, R.D. Kenway, G.S. Pawley).

72. Exploiting highly concurrent computers for physics, *Physics Today*, **40**, (Oct. 1987) 40-48 (with K.C. Bowler, A.D. Bruce, R.D. Kenway and G.S. Pawley).

73. Dynamics and statistical mechanics of the Hopfield model, J. Phys. A, **20** (1987) 2909-2034 (with A.D. Bruce and E. Gardner)

74. Implementing neural network models on parallel computers *The Computer Journal,* **30** (1987) 413-419 (with B.M. Forrest, D. Roweth, N. Stroud and G.V. Wilson).

75. Developments in Parallel Computing, *SERC Annual Report for 1987-1988,* (1988) 64-67.

76. Training with noise: application to word and text storage, in *Neural Computers: From Computational Neuroscience to Computer Design* , ed. R. Eckmiller, Springer-Verlag (1987) 251-260, (with E. Gardner and N. Stroud).

77. Following nature's example, *Electronics and Power,* IEE Review, (1988) 117-119 (with P.M. Grant and D.G. Bounds).

78. The Edinburgh Concurrent Supercomputer: project and applications, *in The Design and Application of Parallel Digital Processors,* IEE, London and New York (1988) 172-179,(with K.C. Bowler and R.D. Kenway).

79. The Edinburgh Concurrent Supercomputer: project and applications, in *Proceedings of the Third International Conference on Supercomputing*, Boston 1988, eds. L.P. Kartashev, S.I.Kartashev, (1988) 200-209 (with K.C.Bowler and R.D. Kenway).

80. Neural network models: a physicist's primer, *Proc. of the 32nd Scottish Universities Summer School in Physics*, St. Andrews, eds. R.D. Kenway and G.S. Pawley, SUSSP Publications, Edinburgh, (1988) 168-210.

81. Neural network models, in *Proc. Vector and Parallel Processors in Computational Science III, Parallel Computing* (1988) **8**, 71-83 (with B.M. Forrest, D. Roweth, N. Stroud and G.V. Wilson).

82. Scientific Computation on SIMD and MIMD Machines, *Phil. Trans. Royal Soc. London A* **326** (1988) 481-498.

83. Parallel computing, in *Optical Computing,* eds B.S. Wherrett and F.A.P. Tooley, Edinburgh University Press (1989) 281-317.

84. The Edinburgh Concurrent Supercomputer: project and applications, *Proc. of CONPAR '88*, eds C.R. Jesshope, K.D. Reinartz, Cambridge University Press (1989) 635-642 (with K.C. Bowler and R.D. Kenway).

85. Training with noise and the storage of correlated patterns in a neural network model, *J.Phys A* 22 (1989) 2019-2030 (with E.J. Gardner and N. Stroud).

86. Large scale applications of transputers in HEP: the Edinburgh Concurrent Supercomputer, *Comp. Phys. Commun*, **57,** (1989) 101-107 (with S.P. Booth, K.C. Bowler, D.J. Candlin, R.D. Kenway, B.J. Pendleton, A.M. Thornton, J. Blair-Fish and D. Roweth).

87. Critical point phenomena: universal physics at large length scales, in *The New Physics*, ed. P. Davies, Cambridge University Press (1989) 239-267 (with A.D. Bruce)

88. Supercomputing with transputers, in *Applications of Transputers*, eds. L. Freeman, C. Phillips, IOS Press, (1990) 72-81.

89. Neural network applications in the Edinburgh Concurrent Supercomputer Project , in *Neuro Computing: Algorithms, Architectures and Applications,* eds F. Fogelman Soulies, J. Herault, Springer-Verlag NATO ASI series **68** 181-193 (1990) (with M.G. Norman, N.J. Radcliffe, G.D. Richards, F.J. Smieja, J.F. Collins, S.J. Hayward, B.M. Forrest).

90. Supercomputing with transputers, *Supercomputer* **36** (1990) 120-132.

91. Large scale applications of transputers: achievement and perspective in *Computing Methods in Applied Sciences and Engineering,* eds R. Glowinski, A. Lichnewsky, SIAM, (1990) 436-446.

92. Theory, application and technology transfer in the Edinburgh Parallel Computing Centre, Internal Report (with M.G. Norman).

93. Supercomputing with transputers, *Computing Systems in Engineering,* **1** (1990) 131-141.

94. Algorithms and architectures for Grand Challenges in physics, in *Proc.Conf. on Very Large Scale Computing in the 21st Century,* SIAM (1991) 1-22.

95. Competition between Hopfield and symmetry-transform interactions in a neural net, *J.Phys. A 24,* (1991) 4445 - 4457 (with M.R. Evans and C.Zhan).

96. Storage capacity and learning in Ising-spin neural networks, *Physics of Neural Networks*, eds E. Domany, K,. Schulten, J.L. van Hemmen, Springer-Verlag, (1991) 121-147 (with B.M. Forrest).

97. The use of the CAPE environment in the simulation of rock fracturing, *Concurrency: Practice and Experience* (1991) 687-698 (with M.G. Norman, J.R. Henderson and I.G. Main).

98. Enlarging the attractor basins of neural networks with noisy external fields, *J. Phys. A* **24** (1991) 5639-5650.(with H.W. Yau)

99. Massively parallel computing: status and prospects, in *Proceedings International Conference on Industrial and Applied Mathematics,* Washington DC, SIAM (1992). Edited version also in Proc. *JFIT Technical Conference*, University of Sussex 24–25 March 1992.

100. Physics leads the way at Edinburgh HPC facilities, *Computers in Physics*, Vol. 6, No.4. (1992) 334-338 (with K.C. Bowler, L.K. Chantler, D.C. Heggie, R.D. Kenway, D.J. Tildesley, A.S. Trew).

101. Massively parallel computing: status, industrial impacts and prospects, *Proc. 12th Workshop on Vector and Parallel Computing,* SPEEDUP Vol. 6 (1992) 53-56.

102. Basins of attraction of neural network models with external fields. *Physica* A 185 (1992) 471-480 (with H.W. Yau).

103. High performance computing and networking in Europe – a perspective, *Proc. of Town Meeting on Supercomputing*, VII.1 to VII.5, Science and Engineering Research Council publication (1992).

104. High performance computing for numerical applications, in *Proc. ACME Conference on Computational Mechanics* (1993), (with K.A. Hawick).

105. Stochastic image restoration: clean images and their likelihood, in *Proc. Sixth Int. Conf. on Indust. and Eng. Appl. of AI and Expert Systems* (1993) (with E. Perez-Minana and R.B. Fisher).
106. HPCN in Europe: a personal perspective, "in *Proc. Conf. HPCN93*, Amsterdam, May 1993."
107. The Identification of Lithofacies Types in Geological Imagery using Neural Networks, in *Proceedings of EURO CAIPEP Conference,* Aberdeen September 1993 (with D.A. Harris and J.J.M. Lewis).
108. Learning and generalisation in a linear perceptron stochastically trained with noisy data. *J Phys A: Math Gen* 26 (1993) 5767–5779) (with A P Dunmur).
109. HPCN in Europe: A personal perspective, in *Future Generation Computer Systems* 10 Elsevier Science BV (1994) pp 153-158.
110. SHEFC and the Funding of the Science Base, in *The Science Base: underpinning the future in Scotland*, Royal Society of Edinburgh publication 1994.
111. High Performance Computing and Networking: Large Facility Aspects, invited paper 5th EPS International Conference, University of Lausanne, Dorigny, Switzerland, 12-14 September 1994. World Scientific Publishing (1995) pp 101-109.
112. Personal Reflections on Kenneth Wilson at Princeton and Edinburgh, J Stat Phys 157 (2014), pp 639-643 (with K C Bowler, R D Kenway and G S Pawley). Also published in Ken Wilson Memorial Volume: Renormalization, Lattice Gauge Theory, the Operator Product Expansion and Quantum Fields, eds Belal E Baaquie, Kerson Huang, Michael E Peskin & K K Phua, World Scientific Publishing (2015).
113. Abrupt increase in the UK coronavirus death-case ratio in December 2020, https://www.medrxiv.org/content/10.1101/2021.01.21.21250264v1 (with Graeme J Ackland) (2021)
114. Evolution of case fatality rates in the second wave of coronavirus in England: effects of false positives, a Variant of Concern and vaccination, https://www.medrxiv.org/content/10.1101/2021.04.14.21255385v1 (with James A Ackland, and Graeme J Ackland) (2021)
115. Graeme J. Ackland, James A. Ackland, Mario Antonioletti, and David J. Wallace. Fitting the reproduction number from uk coronavirus case data and why it is close to 1. Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 380(2233):20210301, 2022.