

JOHN SHERWOOD

J.D. Sherwood

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Research career

2011– Visitor, DAMTP, University of Cambridge

2009–2011 Research Associate, DAMTP, University of Cambridge
Modelling electrospray printing of molten glass

1986–2009 Schlumberger Cambridge Research
Research Scientist (1986–90), Senior Research Scientist (1990–1999)
Principal Research Scientist (1999–2003), Scientific Advisor (2003–2009)
Visiting scholar in the Division of Applied Mechanics, Harvard (Fall 1991)
Mathematical modelling to guide & interpret experiments for oilfield services research

Major achievements: Initiated research on guarded downhole sampling probes (4 patents)

Introduced chemical effects into poroelastic models of swelling shales

Initiated rheometry of paste-like filtercakes

PI for EU Marie-Curie fellowship on streaming potentials generated by multiphase flow

Theoretical modelling of gas-liquid flow (3 patents)

Other activities: chair of library committee, mentoring of younger scientists,

Organised 2 Schlumberger-wide conferences on fluid mechanics

1983–86 Engineer at Etudes et fabrication Dowell Schlumberger, St. Etienne, France
Initiated modelling of acidizing, diversion and fluid placement in porous media

1979–82 Unilever Research, Port Sunlight Laboratory
Scientist in Liquids/Soft Solids section (rheology, liquids solids processing)
Introduced non-Newtonian flow computations to model soap flow through processing machinery

Education

1979 PhD Thesis: The primary electroviscous effect

1976–79 Research in the Department of Applied Maths and Theoretical Physics,
Cambridge, supervised by Dr. E.J. Hinch

1976 Part III of Mathematical tripos (with distinction)

1975 BA (1st class honours)

1972 Entrance Scholarship to read mathematics at Trinity College, Cambridge

GRANTS, and SUPERVISION OF POSTDOC

P.I. for E.U. 6th Framework Programme (FP6-Mobility) contract IEF-041766 2007–2008, (EOTIP),
€ 160861 ≈ £144,000.
E. Lac, E.U. Marie Curie fellowship.

TEACHING EXPERIENCE

Industrial Supervision of students

A. Higgins, University of Cambridge Cavendish Laboratory 1989–1992.
J. Soubiran, Université Paris 6, 1998–1999.

Summer School

Lecturer at CISM (Udine), Chemo-mechanical Couplings in Porous Media — Geomechanics and Biomechanics, June 23–27 2003 (see item 9 in list of published conference proceedings.)

Undergraduate supervisions

1976–1979 Part 1A and Part 1B Mathematics
2009–2010 Part 1A and Part II Mathematics

PROFESSIONAL ACTIVITIES

Examiner for 19 theses, listed in Appendix A

Referee for *J. Fluid Mech.*, *Phys. Fluids*, *Proc. Roy. Soc A*, *Chem. Engng Sci.*, *AIChEJ*, *J. Colloid Interface Sci.*, *Langmuir*, *J. Non-Newtonian Fluid Mech.*, *J. Rheology*, *J de Physique III*, *Cement & Concrete Res.*, *J. Petrol. Sci. Eng.*, *Tribology International*, *I & E.C. Res.*, *Chem. Eng. J.*, *ZAMP*, *Q.J.M.A.M.*, *Eur. J. Mechanics B: Fluid Mech.*, *Transport in Porous Media*

Referee for grants from EPSRC; member of the Peer Review College 2003–5.

Referee for: Israel Science Foundation, French Agence Nationale de Recherche, GA CR Czech Science Foundation.

Associate Editor of European Physical Journal — Applied Physics, 2003–2004

Editorial Board of Journal of Non-Newtonian Fluid Mechanics, 2004–

Elected **Fellow** of the Institute of Physics, 2004.

Isaac Newton Institute: Schlumberger Correspondent 2008–2009.

INVITED CONFERENCE TALKS

Royal Society/Unilever Indo-UK Forum. “Solid-Solid Interactions,” 12–16 September 1994.

Society of Chemical Industry, Evening meeting lecture: “Chemomechanics: stresses and strain in swelling shale,” London, 18 October 1994.

“La Thixotropie,” 29th Annual meeting of the Groupe Français de Rhéologie, Orléans 7–9 November 1994 (keynote lecture).

Newton Institute Symposium, “J.R.A. Pearson, Celebration of a complex fluid career.” Cambridge, U.K. 14 March 1996.

Clay behaviour: Chemo-mechanical coupling, Maratea, Italy, 28–30 June 2001.

Microfluidics: electrokinetic and interfacial phenomena. University of Minnesota, 7–11 December 2009. (Invited lecture; IMA Complex fluids and complex flows thematic year.)

APPENDIX A: Thesis Committees

L. Elasmî, Etude de la sustentation d'un corps par un fluide traversant une plaque poreuse. Université Pierre et Marie Curie, Paris 6, 1990 (rapporteur).

A. Meunier, Simulations numériques de suspensions de sphères dans un fluide visqueux. Laboratoire Physique de la matière condensée, Université de Nice, 1990 (rapporteur).

J. Tanzosh, Integral equation formulations of the linearized Navier-Stokes equation: applications to particle motions in rotating viscous flows. Division of Applied Sciences, Harvard, 1994.

E.D. Kelly, Applications of boundary integral methods to viscous flows. Department of Applied Mathematics and Theoretical Physics, University of Cambridge, 1995.

A. Wierenga, Colloidal dispersions of inorganic rods and platelets. Van 't Hoff laboratory, Utrecht, 1997.

A. Benkenida, Développement et validation d'une méthode de simulation d'écoulements diphasiques sans reconstruction d'interfaces. Application à la dynamique des bulles de Taylor. Institut Mécanique des Fluides de Toulouse, 1999 (rapporteur).

H. Auradou, Quelques processus physiques au voisinage d'une surface auto-affine. Groupe Matière condensée et matériaux, Université de Rennes 1, 1999 (rapporteur).

S. Marino, Phénomènes de transports couplés induits par des circulations de fluides dans des milieux poreux et fracturés. Institut de Physique du Globe de Paris, Thèse de doctorat de l'Université de Paris VII, 2002 (rapporteur).

K. Heister, Coupled transport in clayey materials with emphasis on induced electrokinetic phenomena. Department of Earth Sciences — Geochemistry, Utrecht 2005.

M. Paszkuta, Phénomènes de transport couplés dans les argiles du Callovo-Oxfordien. Institut de Physique du Globe de Paris, 2005 (rapporteur).

N. Dubash, Behaviour of a conducting drop in viscous fluid subject to an electric field. Department of Mathematics, Imperial College, University of London, 2006.

A. Gupta, Couplages multi-phénomènes dans les argilites. Institut de Physique du Globe de Paris, 2007 (rapporteur).

P. Rousseau-Gueutin, Les processus couplés dans les argilites du Callovo-Oxfordien. Université Pierre et Marie Curie, Paris 6, 2008 (rapporteur).

N. Brosse, Trajectoire et sillage d'un corps en chute libre en interaction avec un autre corps ou en présence d'un confinement. Institut National Polytechnique de Toulouse, 2010.

G.C. Agbangla, Blocage de microcanaux par des particules micrométriques en écoulement : simulations numériques et expériences à l'échelle locale. Université Toulouse 3 Paul Sabatier, 2011 (rapporteur).

D. Morel, (MSc degree) Movement of foam in a pipe under the influence of gravity. Department of Applied Mathematics and Theoretical Physics, University of Cambridge, 1988.

M. Hoffman, (M.Phil degree) A lattice gas model with a continuous velocity distribution and a long-range potential. Cavendish Laboratory, University of Cambridge, 1998.

Ph. Coussot, (habilitation) Propriétés mécaniques des dispersions et suspensions — Applications en hydraulique torrentielle. Université Paris 6, 1997 (rapporteur).

P. Bacchin, (habilitation) Génie des interactions physico-chimiques : Applications à la transformation de la matière molle. Université Paul Sabatier, Toulouse III, 2006 (rapporteur).

APPENDIX B: Other Conference Talks

Euromech 104, “Mechanics of colloidal dispersions,” Louvain, Belgium, 4–7 September 1978.

Euromech 191, “The physics of dispersions of small particles,” Cambridge U.K., 1–4 April 1985.

CCP5: “Industrial applications of molecular dynamics simulations,” Birbeck College London, January 1988.

Institute of Physics and Faraday division of the Royal Society of Chemistry, Neutron Scattering group. “Flowing and stretched systems,” Imperial College London, 20–21 April 1988.

Royal Society of Chemistry, Faraday Division, Colloid and Interface Science group. “Inorganic Particulates.” Chester, U.K. 19–20 September 1989.

British Applied Mathematics Colloquium (& 33rd BTMC) Oxford 9–12 April 1991.

API Division of Fluid Dynamics, 44th Annual meeting, Phoenix Arizona, 24–26 November 1991.

Particules: Transport, Ségrégation, Mélange. Carry le Rouet, France. 3–5 June 1992.

Euromech 290, Mechanics of Swelling, Rhodos, Greece, August 23–27 1993.

British Society of Rheology & Dutch Society of Rheology. Theoretical and General Rheology. Cambridge U.K., 22–24 September 1993.

DTI Colloid Technology Programme Review, Cambridge U.K., 22–23 March 1994.

GDR Physique des Milieux Hétérogènes complexes, “Suspensions Concentrées.” Paris, 25 March 1994.

Royal Society of Chemistry, Faraday Division, Colloid and Interface Science Group. “Theoretical modelling and simulation in colloid and interface Science,” Bristol, U.K., 18–20 April 1994

OECD Nuclear Energy Agency, Workshop on determination of hydraulic and hydrochemical characteristics of argillaceous rocks, Nottingham U.K., 7–9 June 1994.

GDR Physique des Milieux Hétérogènes complexes, “Suspensions”. Orsay, France. 23 March 1995.

Royal Society of Chemistry, Faraday Division, Colloid and Interface Science Group. “Concentrated Dispersions,” Bristol, 29–31 March 1995.

Society of Chemical Industry, Colloid and Surface Chemistry group. “Transport in porous Media”, London, 30 March 1995.

GDR Rhéophysique des suspensions et colloïdes. La Bresse, France 21–27 January 1996.

Newton Institute Euroconference, “Constitutive Relations and their applications,” Cambridge, U.K. 15–19 April 1996.

GDR Physique des Milieux Hétérogènes complexes, “Cooperative phenomena in complex media,” Cambridge, U.K. 4–6 September 1996.

Society of Rheology, 68th Annual meeting. Galveston, Texas, 16–20 February 1997.

EFMC-3, 3rd Euromech Fluid Mechanics Conference, Göttingen, Germany, 15–18 September 1997.

Euromech 376, Waves in two-phase flows, Istanbul, Turkey, 27–30 April 1998.

ICMF'98, 3rd International Conference on Multiphase Flow. Lyon, France 8–12 June 1998.
ELKIN 2000 International Symposium on Electrokinetic Phenomena, Dresden, Germany, 2–6 October 2000.
Vieillissement et matière désordonnée, Carry le Rouet, France. 5–7 June 2001.
IUTAM symposium on the mechanics of physicochemical and electromechanical interactions in porous media, Kerkrade, The Netherlands, 18–23 May 2003.
Fluid Flow Fundamentals 2003, BP Institute, University of Cambridge, 16–18 December 2003.
Visco-plastic fluids: from theory to application. Banff International Research Station, 22–27 October 2005.

APPENDIX C: Other seminars

Department of Applied Mathematics, Liverpool, (1980).
Statistical laboratory DPMMS, Cambridge (27 September 1985).
IMFT, Toulouse (14 October 1986; 10 March 1999; 21 March 2000; 6 September 2001).
Department of Applied Mathematics, Cambridge, (20 May 1987, 31 January 1995, 2 February 1999, 10 October 2005, 27 November 2009).
Division of Applied Sciences, Harvard (16 October 1991).
The Levich Institute, CUNY, NY (6 December 1991).
Department of Chemical Engineering, Princeton (10 December 1991).
Dept. Aerospace and Mechanical Engineering, Boston University (13 December 1991).
Department of Chemical Engineering, Imperial College London, (18 January 1994, 29 January 2002).
Department of Mathematics, Imperial College London, (20 October 2010).
Department of Applied Mathematics, Aberystwyth (5 May 1994).
Van 't Hoff laboratory, Utrecht (22 February 1996).
Department of Applied Mathematics, Birmingham (11 March 1998).
Department of Chemical Engineering, Cornell (19 & 20 October 1998).
Department of Mechanical Engineering, King's College London (13 June 2001).
BP Institute, University of Cambridge (21 June 2002).
Dept. Earth Sciences — Geochemistry, Utrecht (30 May 2005). Minisymposium “Fluxes and driving forces in clay”, organised by the Dutch Geochemische Kring.
Dept. Mathematics, University of Leeds (11 February 2010).
LadHyX, Ecole Polytechnique (24 March 2011).