

Curriculum Vitae & Publication List: D. A. S. Rees

**Department of Mechanical Engineering
University of Bath
Bath BA2 7AY, U.K.**

Career history:

Imperial College, London (1977–1980) Undergraduate in Mathematics
 British Aerospace, Filton (1980–1982) Structural Dynamics Engineer
 University of Bristol (1982–1985) Postgraduate Student in Mathematics
 University of Bristol (1985–1988) Postdoctoral Research Assistant in Mathematics
 University of Exeter (1988–1990) Lecturer in Applied Mathematics (Fixed term)
 University of Bath (1990–1998) Lecturer in Mechanical Engineering
 University of Bath (1998–) Reader in Fluid Dynamics

Qualifications:

Entrance scholarship to Imperial College, London.
 A.T.C.L. Trinity College of Music, London (1977, external diploma in violin performance)
 A.R.C.S. Imperial College, London (1980)
 B.Sc. Imperial College, London (First class honours in mathematics, 1980)
 Ph.D. University of Bristol (Applied Mathematics, 1985)

Honours:

Membership of the Agder Academy of Sciences and Letters, Norway.
 Special Award for “Outstanding contributions to the field of fluid mechanics and for enhancing the research activities in Bangladesh” by the organizing committee of the International Conference on Applied Mathematics and Mathematical Physics 2004 held in Sylhet, Bangladesh in January 2005.
 Recipient of the Mary Tasker Award for Teaching Excellence 2006.

RESEARCH ACTIVITIES**Summary of publications**

To date I have published 5 review chapters, 102 journal papers, 50 conference papers and 2 book reviews. In addition I have 1 journal paper and 1 review chapter in the press.

Summary of past research topics

My work has focused primarily on the instability of convective flows in porous media. The detailed modelling of geothermal formations or pollutant dispersion in groundwater flows requires accurate simulations of the flows which are induced or modified by buoyancy, and more particularly how such flows are affected by instabilities seeded by disturbances. Often such applications may be idealised as cavity flows or as external boundary layer flows, but imperfections in the form of nonuniform permeability, layering, local hot spots and diurnal variations are frequently present in real systems. Such imperfections play the role of altering overall flow and convection characteristics such as planform selection (of interest to mathematicians) and overall rate of heat transfer (of interest to engineers).

To this end I have developed a large suite of numerical codes which (i) solve both parabolic and elliptic systems, (ii) that can track bifurcations and (iii) obtain eigenvalues of both ordinary and partial differential systems. Many of these codes are written in a style which allows straightforward modifications for new applications. For example, my Keller box code uses numerical differentiation to calculate the Jacobian matrix used in the central Newton-Raphson algorithm, and it may therefore be applied relatively easily to large systems of coupled partial differential equations. My numerical work is often supplemented by asymptotic analyses for both large and small parameters, and, in the case of convection in layers, weakly nonlinear theory. Such mathematical analyses serve to validate the codes and to provide important information for extreme cases which are not easily amenable to numerical study.

I also have interests in the flows of clear fluids, non-Newtonian flows and micropolar fluids. Analytical and numerical methods which I have developed for porous medium flows have also been applied to these more complex models.

Summary of present and future research topics

Current projects include:

Instability of unsteady thermal boundary layers; with Selim (Bath), Bassom (Perth).
Instability of non-Newtonian flows; with Siddheshwar (Bangalore & Bath).
Convection in the presence of anisotropy; with Storesletten (Kristiansand, Norway).
Network modelling of porous media; with Narasimhan (Madras).
Conduction and convection in heterogeneous materials; with Almond and Bowen (Bath).
Thermal imaging detection of cracks; with Almond and Rashid (Bath).
Nonlinear vortex convection in porous boundary layers.
Local thermal nonequilibrium in porous media; with Noghrehabadi (Tehran and Bath).

Planned projects include:

Nonlinear vortex convection in porous boundary layers.
Convection modelling in heterogeneous porous media.

External Professional Activities & Scholarship

Associate Editor of the *Journal of Porous Media*.

Associate Editor of the *International Journal of Numerical Methods in Heat and Fluid Flow*.

I have been employed as an external consultant on two contracts with firms based in Bristol. These companies (Radial Turbine Limited and Advanced Technology Design) required computer codes to model isothermal compressible flow in gas and thrust bearings and gas seals. Two internal reports were issued; these are included in the publication list above under the heading, *Other Output*.

European Coordinator of the 'Transport in Porous Media' email mailing list.

I have refereed over 150 journal papers in the last four years for *Journal of Fluid Mechanics*, *Proceedings of the Royal Society*, *Transport in Porous Media*, *Journal of Porous Media*, *Numerical Heat Transfer*, *International Journal of Heat and Mass Transfer*, *International Journal of Heat and Fluid Flow*, *International Journal of Thermal Sciences*, *International Journal for Numerical Methods in Heat and Fluid Flow*, *Physics of Fluids* and others. In particular I have refereed 7 papers for *IJTS*, 11 for *IJNMHFF*, 14 for *JPM* and 26 for *TiPM*.

Invited presentations at conferences

Invited speaker at the 10th Bangladesh Mathematics Conference (November 1995)

Guest speaker at the Workshop on the Mechanics of Continua (September 1996) at the University of Dhaka, Bangladesh.

Invited speaker at the International Conference on Applied Mathematics (September 2000) at the University of Sylhet, Bangladesh.

Invited speaker at the 2nd International Conference on Basic Sciences and Advanced Technology, (November 2000) at the University of Assiut, Egypt.

Invited lecturer at a Summer School on Porous Medium Flows, (July 2001) Neptun, Romania.

Invited lecturer at the NATO ASI, 'Current Issues on Heat and Mass Transfer in Porous Media', (June 2003) Neptun, Romania.

Invited lecturer at the meeting, Fundamentals of Fluid Flow 2004, BP Institute, Cambridge (Dec 2004).

Invited speaker at The Golden Jubilee Congress of the Indian Society of Theoretical and Applied Mechanics, IIT Kharagpur, India, December 2005.

Invited speaker at the meeting, Continuum Mechanics and Dynamics, University of Durham, March 2006.

Invited speaker at the meeting, Workshop on Environmental Fluid Mechanics as Elements in Agro Meteorological Modelling, to be held at the University of Life Sciences, Ås, Norway, 7-9 June 2006.

Invited speaker at the Bath Institute for Complex Systems Workshop: Computation of Flow and Transport in Heterogeneous Media, to be held in Bath, 19-20 June 2006.

Invited speaker at The 2nd International Conference on Porous Media and their Applications in Science, Engineering and Industry, to be held in Hawaii, USA, June 2007.

Research visits to:

Prof. I.Pop (Cluj, Romania — 6/1992, 6/1993, 11/1993, 6/1994, 7/1997, 7/1998, 6/2000)
Prof. L.Storesletten (Kristiansand, Norway — 4/1996, 11/2001, 10/2004, 9/2005)
Prof. J.L.Lage (SMU Dallas, USA — 6/1996)
Prof. M.A.Hossain (Dhaka, Bangladesh — 11/1995, 7/1996, 7/1998, 11/1999, 7/2000, 1/2002, 1/2003, 2/2004, 2/2005)
Prof. N.Kafousias (Patras, Greece — 6/1997)
Prof. A.Postelnicu (Brasov, Romania — 6/2000).
Prof. A.P.Bassom (UWA, Perth, Australia — 8/2006)
Prof. J.C.Patterson (James Cook University, Townsville, Australia — 8/2006)

Visitors

Prof. L. Storesletten (Agder, Norway) four times, including two four-month sabbaticals,
Prof. Ioan Pop (Cluj, Romania) four times,
Prof John C. Patterson (JCU Townsville, Australia),
Dr. Shigeo Kimura (Shizuoka, Japan),
Prof. Nikos G. Kafousias (Patras, Greece),
Prof. G. Georgantopoulos (Athens, Greece),
Dr. Pat Jordan (Canterbury, New Zealand),
Prof. Md. Anwar Hossain (Dhaka, Bangladesh),
Prof. Peder A. Tyvand (Ås, Norway) twice.
Prof. Pradeep G. Siddheshwar (Bangalore, India); Royal Society Incoming India Fellowship.
Dr. Shalini Gupta (IIT Kanpur, India).

Overseas PhD students on placement under my supervision

Sharadan Shafie (UTM, Malaysia 2003),
Aminreza Noghrehabadi (Sharif University, Tehran, Iran, 2005/6); recipient of the award, Best Thesis in Thermofluids in Iran (2007), by the Iranian Society of Mechanical Engineers.

Postgraduate Research Students

Samantha Lewis (EPSRC Mathematics)
Robin Strange (EPSRC Mechanical Engineering)
Tanat Wyn Lewis (Departmental Studentship)
Nurzahan Banu (University Studentship)
Manosh Chandra Paul (University Studentship and ORS)
Ibrahim Mohd Jais (Writing up) (UTM, Malaysia)
Kwong-Shing Chan (Yr 3) (EPSRC Mechanical Engineering)
Asma Selim (Yr 2) (Departmental Studentship and University Overseas Award)
Greg Tourte (Yr 2) (Part-time, self-funded)

Examination of theses

I have been an internal examiner for 5 Ph.D. theses and an M.Phil thesis.

External examinerships:

1996: Two MPhil theses (report & viva voce) Dept. of Mathematics, Dhaka University, Bangladesh.
1997: PhD thesis (report) from the University of Perth, Australia.
1997: PhD thesis (viva voce) Dept. of Applied Mathematics, University of Leeds.
1999: PhD thesis (report) from the University of Durban-Westville, South Africa.
2001: PhD thesis (report & viva voce) from the RCMPS, Chittagong University, Bangladesh.
2001: PhD thesis (viva voce) Dept. of Applied Mathematics, University of Leeds.
2003: PhD thesis (viva voce) School of Mathematical Sciences, City University, London.
2005: PhD thesis (report) Department of Mechanical Engineering, IIT Madras, India.
2005: PhD thesis (report) Department of Mechanical Engineering, IIT Kanpur, India.
2005: PhD thesis (report) Department of Mechanical Engineering, IIT Kharagpur, India.

Book chapters:

1. D.A.S.Rees (1998) “Thermal boundary layer instabilities in porous media: a critical review” *Transport Phenomena in Porous Media* eds. D.B.Ingham & I.Pop. (Pergamon) 233–259.
2. D.A.S.Rees (2000) “The stability of Darcy–Bénard convection” *Handbook of Porous Media* ed. K.Vafai. (Marcel Dekker) 521–558.
3. D.A.S.Rees (2002) “Recent advances in porous medium thermal boundary layer instabilities” *Transport Phenomena in Porous Media II* eds. D.B.Ingham & I.Pop. (Pergamon) 54–81.
4. E.Magyari, D.A.S.Rees & B.Keller (2005) “A review of the effects of viscous dissipation on convective flows in porous media” *Handbook of Porous Media II* ed. K.Vafai. (Marcel Dekker) Chapter 4.
5. D.A.S.Rees & I.Pop (2005) “Local thermal nonequilibrium in porous medium convection” *Transport Phenomena in Porous Media III* eds. D.B.Ingham & I.Pop. (Pergamon) 147–173.
6. D.A.S.Rees, A.Selim & J.P.Ennis-King (2007) “The instability of unsteady boundary layers in porous media” *Emerging Topics in Heat and Mass Transfer in Porous Media* ed. P.Vadasz. (Springer) To appear

Refereed Journal Publications:

1. D.S.Riley & D.A.S.Rees (1985) “Non-Darcy natural convection from arbitrarily inclined heated surfaces in saturated porous media” *Quarterly Journal of Mechanics and Applied Mathematics* **38**, 277–295.
2. D.A.S.Rees & D.S.Riley (1985) “Free convection above a near horizontal semi-infinite heated surface embedded in a saturated porous medium” *International Journal of Heat and Mass Transfer* **28**, 183–190.
3. D.A.S.Rees & D.S.Riley (1986) “Convection in a porous layer with spatially periodic boundary conditions: resonant wavelength excitation” *Journal of Fluid Mechanics* **166**, 503–530.
4. D.A.S.Rees (1988) “The stability of Prandtl-Darcy convection in a vertical porous slot” *International Journal of Heat and Mass Transfer* **31**, 1529–1534.
5. D.A.S.Rees & D.S.Riley (1989) “The effects of boundary imperfections on convection in a saturated porous layer: non-resonant wavelength excitation” *Proceedings of the Royal Society A* **421**, 303–339.
6. D.A.S.Rees & D.S.Riley (1989) “The effects of boundary imperfections on convection in a saturated porous layer: near-resonant wavelength excitation” *Journal of Fluid Mechanics* **199**, 133–154.
7. D.A.S.Rees & D.S.Riley (1990) “The three-dimensional stability of finite-amplitude convection in a layered porous medium heated from below” *Journal of Fluid Mechanics* **211**, 437–461.
8. D.A.S.Rees (1990) “The effect of long-wavelength thermal modulations on the onset of convection in an infinite porous layer heated from below” *Quarterly Journal of Mechanics and Applied Mathematics* **43**, 189–214.
9. D.A.S.Rees & A.P.Bassom (1991) “Some exact solutions for free convective flows over heated semi-infinite surfaces in porous media” *International Journal of Heat and Mass Transfer* **34**, 1564–1567.
10. D.A.S.Rees & A.P.Bassom (1993) “The nonlinear nonparallel wave instability of free convection induced by a horizontal heated surface in fluid-saturated porous media” *Journal of Fluid Mechanics* **253**, 267–296.
11. D.A.S.Rees (1993) “A numerical investigation of the nonlinear wave stability of vertical thermal boundary layer flow in a porous medium” *Journal of Applied Mathematics and Physics (Z.A.M.P.)* **44**, 306–313.
12. D.A.S.Rees & A.P.Bassom (1994) “The linear wave instability of boundary layer flow induced by a horizontal heated surface in porous media” *International Communications in Heat and Mass Transfer* **21**, 143–150.
13. D.A.S.Rees & I.Pop (1994) “A note on free convection along a vertical wavy surface in a porous medium” *Trans. A.S.M.E. Journal of Heat Transfer* **116**, 505–508.

14. D.A.S.Rees & I.Pop (1995) "Free convection induced by a vertical wavy surface with uniform heat flux in a porous medium" *Trans. A.S.M.E. Journal of Heat Transfer* **117**, 547–550.
15. A.P.Bassom & D.A.S.Rees (1995) "The linear vortex instability of flow induced by a horizontal heated surface in a porous medium" *Quarterly Journal of Mechanics and Applied Mathematics* **48**, 1–19.
16. D.A.S.Rees & I.Pop (1994) "Boundary layer flow and heat transfer on a continuous moving wavy surface" *Acta Mechanica* **112**, 149–158.
17. D.A.S.Rees & I.Pop (1994) "Free convection induced by a horizontal wavy surface in a porous medium" *Fluid Dynamics Research* **14**, 151–166.
18. D.A.S.Rees & L.Storesletten (1995) "The effect of anisotropic permeability on free convective boundary layers in porous media" *Transport in Porous Media* **19**, 79–92.
19. S.Lewis, A.P.Bassom & D.A.S.Rees (1995) "The stability of vertical thermal boundary layer flow in a porous medium" *European Journal of Mechanics B: Fluids* **14**, 395–408.
20. D.A.S.Rees & I.Pop (1995) "Non-Darcy natural convection from a vertical wavy surface in a porous medium" *Transport in Porous Media* **20**, 223–234.
21. D.A.S.Rees & A.P.Bassom (1996) "The Blasius boundary layer flow of a micropolar fluid" *International Journal of Engineering Science* **34**, 113–124.
22. D.A.S.Rees (1996) "The effect of inertia on free convection from a horizontal surface embedded in a porous medium" *International Journal of Heat and Mass Transfer* **39**, 3425–3430.
23. A.P.Bassom & D.A.S.Rees (1996) "Free convection from a heated vertical cylinder embedded in a fluid-saturated porous medium" *Acta Mechanica* **116**, 139–151.
24. D.A.S.Rees & J.L.Lage (1997) "The effect of thermal stratification on natural convection in a vertical porous insulation layer" *International Journal of Heat and Mass Transfer* **40**, 111–121.
25. D.A.S.Rees (1997) "The effect of inertia on the onset of mixed convection in a porous layer heated from below" *International Communications in Heat and Mass Transfer* **24**, 277–283.
26. M.A.Hossain, K.C.A.Alam & D.A.S.Rees (1997) "Magnetohydrodynamic forced and free convection boundary layer flow along a vertical porous plate" *Journal of Applied Mechanics and Engineering* **2**, 33–51.
27. D.A.S.Rees & I.Pop (1997) "The effect of longitudinal surface waves on free convection from heated surfaces in porous media" *International Communications in Heat and Mass Transfer* **24**, 419–425.
28. L.Storesletten & D.A.S.Rees (1997) "An analytic study of free convective boundary layer flow in porous media: the effect of anisotropic diffusivity" *Transport in Porous Media* **27**, 289–304.
29. D.A.S.Rees (1996) "The effect of inertia on the stability of convection in a porous layer heated from below" *Journal of Theoretical and Applied Fluid Mechanics* **1**, 154–171.
30. S.Lewis, D.A.S.Rees & A.P.Bassom (1997) "High wavenumber convection in tall porous containers heated from below" *Quarterly Journal of Mechanics and Applied Mathematics* **50**, 545–563.
31. D.A.S.Rees (1997) "Three-dimensional free convection boundary layers in porous media induced by a heated surface with spanwise temperature variations" *Trans. A.S.M.E. Journal of Heat Transfer* **119**, 792–798.
32. I.Pop, D.A.S.Rees & L.Storesletten (1998) "Free convection in a shallow annular cavity filled with a porous medium" *Journal of Porous Media* **1**, 227–241.
33. M.A.Hossain & D.A.S.Rees (1998) "Non-Darcy free convection along a horizontal heated surface" *Transport in Porous Media* **29**, 309–321.
34. M.A.Hossain, S.K.Das & D.A.S.Rees (1998) "Heat transfer response of free convection flow from a vertical heated plate to an oscillating surface heat flux" *Acta Mechanica* **126**, 101–113.
35. N.G.Kafoussias, D.A.S.Rees & J.E.Daskalakis (1998) "Numerical study of the combined free and forced convective boundary layer flow past a vertical isothermal flat plate with a temperature-dependent viscosity" *Acta Mechanica* **127**, 39–50.

36. M.A.Hossain, D.A.S.Rees & I.Pop (1998) "Free convection–radiation interaction from an isothermal plate inclined at a small angle to the horizontal" *Acta Mechanica* **127**, 66–73.
37. L.Storesletten & D.A.S.Rees (1998) "The influence of higher–order effects on the linear instability of thermal boundary layer flow in porous media" *International Journal of Heat and Mass Transfer* **41**, 1833–1843.
38. I.Pop, R.S.R.Gorla, H.S.Takhar & D.A.S.Rees (1998) "Convective wall plume in micropolar fluids" *Z.A.M.M* **78**, 431–438.
39. M.A.Hossain, M.A.Alim & D.A.S.Rees (1998) "Effect of thermal radiation on natural convection over cylinders of elliptic cross–section" *Acta Mechanica* **129**, 177–186.
40. M.A.Hossain & D.A.S.Rees (1998) "Radiation–conduction interaction on mixed convection flow along a slender cylinder" *A.I.A.A. Journal of Thermodynamics and Heat Transfer* **12**, 611–614.
41. M.A.Hossain, M.A.Alim & D.A.S.Rees (1998) "The effect of radiation on free convection from a porous vertical plate" *International Journal of Heat and Mass Transfer* **42**, 181–191.
42. D.A.S.Rees & I.Pop (1998) "Free convection boundary–layer flow of a micropolar fluid from a vertical flat surface" *Institute of Mathematics and its Applications, Journal of Applied Mathematics* **61**, 179–197.
43. D.A.S.Rees (1999) "The effect of steady transverse surface temperature variations on vertical free convection" *International Journal of Heat and Mass Transfer* **42**, 2455–2464.
44. D.A.S.Rees (1999) "Free convective boundary layer flow from a heated surface in a layered porous medium" *Journal of Porous Media* **2**, 39–58.
45. D.A.S.Rees & K.Vafai (1999) "Darcy–Brinkman free convection from a heated horizontal surface" *Numerical Heat Transfer Part A – Applications* **35**, 191–204.
46. D.A.S.Rees & I.Pop (1999) "Free convective stagnation-point flow in a porous medium using a thermal nonequilibrium model" *Int. Comm. Heat Mass Transfer* **26**, 945–954.
47. M.A.Hossain & D.A.S.Rees (1999) "Combined heat and mass transfer in natural convection flow from a vertical wavy surface" *Acta Mechanica* **136**, 133–141.
48. D.A.S.Rees & M.A.Hossain (1999) "The combined effect of inertia and a spanwise pressure gradient on free convection from a vertical surface in porous media" *Numerical Heat Transfer Part A – Applications* **36**, 725–736.
49. D.A.S.Rees & I. Pop (2000) "Vertical free convective boundary–layer flow in a porous medium using a thermal nonequilibrium model" *Journal of Porous Media* **3**, 31–44.
50. M.A.Hossain, I.Pop & D.A.S.Rees (2000) "The effect of time-periodic surface temperature oscillations on free convection from a vertical surface in a porous medium" *Transport in Porous Media* **39**, 119–130.
51. D.A.S.Rees & I.Pop (2000) "Vertical free convection in a porous medium with variable permeability effects" *Int. J. Heat Mass Transfer* **43**, 2565–2571.
52. D.A.S.Rees & I.Pop (2000) "The effect of g-jitter on vertical free convection boundary-layer flow in porous media" *Int. Comm. Heat Mass Transfer* **27**, 415–424.
53. M.A.Hossain, M.S.Munir, & D.A.S.Rees (2000) "Flow of viscous incompressible fluid with temperature dependent viscosity and thermal conductivity past a permeable wedge with uniform surface heat flux" *International Journal of Thermal Sciences* **39**, 635–644.
54. N.Banu and D.A.S.Rees (2000) "The effect of inertia on vertical free convection boundary layer flow from a heated surface in porous media with suction" *Int. Comm. Heat Mass Transfer* **27**, 775–783.
55. D.A.S. Rees and I. Pop (2001) "Effect of g-jitter on free convection near a stagnation point in a porous medium" *Int. J. Heat Mass Transfer* **44**, 877–883.
56. D.A.S.Rees & A.P.Bassom (2000) "Onset of Darcy–Bénard convection in an inclined porous layer heated from below" *Acta Mechanica* **144**, 103–118.
57. A.P.Bassom, D.A.S.Rees & L.Storesletten (2001) "Convective plumes in porous media: the effect of asymmetrically placed boundaries" *Int. Comm. Heat Mass Transfer* **28**, 31–38.

58. D.A.S.Rees & A.Postelnicu (2001) "The onset of convection in an inclined anisotropic porous layer" *Int. J. Heat Mass Transfer* **44**, 4127-4138.
59. M.A.Hossain, S. Hussain & D.A.S.Rees (2001) "Effect of fluctuating surface temperature and surface concentration on surface heat flux and surface mass flux from a vertical flat plate" *Z. Angew. Math. Mach. (ZAMM)* **81**, 699-709.
60. D.A.S.Rees (2001) "Vortex instability from a near-vertical heated surface in a porous medium. I Linear theory" *Proc. Roy. Soc. A.* **457**, 1721-1734.
61. D.A.S. Rees and I. Pop (2001) "g-jitter induced free convection near a stagnation point" *Heat and Mass Transfer* **37**, 3030-3033.
62. A.Postelnicu and D.A.S.Rees (2001) "The onset of convection in an anisotropic porous layer inclined at a small angle from the horizontal" *Int. Comm. Heat Mass Transfer* **28**, 641-650.
63. N.Banu and D.A.S.Rees (2001) "The effect of a travelling thermal wave on weakly nonlinear convection in a porous layer heated from below" *J. Porous Media* **4**, 225-239.
64. D.A.S.Rees & M.A.Hossain (2001) "The effect of inertia on free convective plumes in porous media" *Int. Comm. Heat Mass Transfer* **28**, 1137-1142.
65. M.A.Hossain, S.Kabir & D.A.S.Rees (2002) "Natural convection of fluid with variable viscosity from a heated vertical wavy surface" *Z. Angew. Math. Phys. (ZAMP)* **53**, 48-57.
66. I.Pop & D.A.S.Rees (2002) "Effects of g-jitter on free convection near a stagnation point" *Z.A.M.M.* **81**, S951-S952, Suppl. 4.
67. D.A.S.Rees (2002) "The onset of Darcy-Brinkman convection in a porous layer: an asymptotic analysis" *Int. J. Heat Mass Transfer* **45**, 2213-2220.
68. N.Banu and D.A.S.Rees (2002) "The onset of Darcy-Bénard convection using a thermal nonequilibrium model" *Int. J. Heat Mass Transfer* **45**, 2221-2228.
69. D.A.S.Rees & L.Storesletten (2002) "The linear instability of a thermal boundary layer with suction in an anisotropic porous medium" *Fluid Dynamics Research* **30**, 155-168.
70. D.A.S.Rees (2002) "Vortex instability from a near-vertical heated surface in a porous medium. II Non-linear evolution" *Proc. Roy. Soc. A.* **458**, 1575-1592.
71. D.A.S.Rees & L.Storesletten (2002) "Convective plume paths from a line source" *Quarterly Journal of Mechanics and Applied Mathematics* **55**, 443-455.
72. D.A.S.Rees, L.Storesletten & A.P.Bassom (2002) "Convective plume paths in anisotropic porous media" *Transport in Porous Media* **49**, 9-25.
73. D.A.S.Rees & I.Pop (2002) "Comments on "Natural convection from a vertical plate in a saturated porous medium: nonequilibrium theory" by A.A. Mohamad" *Journal of Porous Media* **5**, 225-227.
74. D.A.S.Rees & I.Pop (2003) "The effect of large-amplitude g-jitter on vertical free convection boundary-layer flow in porous media" *International Journal of Heat and Mass Transfer* **46**, 1097-1102.
75. D.A.S.Rees (2003) "Vertical free convective boundary-layer flow in a porous medium using a thermal nonequilibrium model: elliptical effects" *J. Appl. Math. Phys. (ZAMP)* **54**, 437-448.
76. A.Postelnicu & D.A.S.Rees (2003) "The onset of Darcy-Bénard convection in a porous layer using a thermal nonequilibrium model. Part 1: Stress-free boundaries" *International Journal of Energy Research* **27**, 961-973.
77. D.A.S.Rees, E.Magyari & B.Keller (2003) "The development of the asymptotic viscous dissipation profile in a vertical free convective boundary layer flow in a porous medium" *Transport in Porous Media* **53**, 347-355.
78. D.A.S.Rees, A.P.Bassom & I.Pop (2003) "Forced convection past a heated cylinder in a porous medium using a thermal nonequilibrium model: boundary layer theory" *European Journal of Mechanics B: Fluids* **22**, 473-486.

79. A.Selim, M.A.Hossain & D.A.S.Rees (2003) "The effect of surface mass transfer on mixed convection flow past a heated vertical flat permeable plate with thermophoresis" *International Journal of Thermal Sciences* **42**, 973-982.
80. M.A.Hossain & D.A.S.Rees (2003) "Natural convection flow of a viscous incompressible fluid in a rectangular porous cavity heated from below with cold sidewalls" *Heat and Mass Transfer* **39**, 657-663.
81. W.S.Wong, D.A.S.Rees & I.Pop (2004) "Forced convection past a heated cylinder in a porous medium using a thermal nonequilibrium model: finite Péclet number effects" *International Journal of Thermal Sciences* **43**, 213-220.
82. D.A.S.Rees & P.A.Tyvand (2004) "The Helmholtz equation for convection in two-dimensional porous cavities with conducting boundaries" *Journal of Engineering Mathematics* **49**, 181-193.
83. I.Pop, D.A.S.Rees & C.Egbers (2004) "Mixed convection flow in a narrow vertical duct filled with a porous medium" *International Journal of Thermal Sciences* **43**, 489-498.
84. D.A.S.Rees & P.A.Tyvand (2004) "Oscillatory convection in a two-dimensional porous box with asymmetric lateral boundary conditions" *Phys. Fluids* **16**, 3706-3714.
85. D.M.Leppinen, I.Pop, D.A.S.Rees & L.Storesletten (2004) "A note on free convection in a shallow annular cavity filled with a porous medium" *Journal of Porous Media* **7(4)**, 1-14.
86. M.C.Paul, D.A.S.Rees & M.Wilson (2005) "The influence of higher order effects on the linear wave instability of vertical free convective boundary layer flow" *International Journal of Heat and Mass Transfer* **48**, 809-817.
87. M.A.Hossain & D.A.S.Rees (2005) "Natural convection flow of water near its density maximum in a rectangular enclosure having isothermal walls with heat generation" *Heat and Mass Transfer* **41**, 367-374.
88. M.C.Paul, D.A.S.Rees & M.Wilson (2005) "The influence of higher order effects on the vortex instability of vertical free convective boundary layer flow in a wedge-shaped domain" *International Journal of Heat and Mass Transfer* **48**, 1417-1424.
89. M.A.Hossain, M.Z.Hafiz & D.A.S.Rees (2005) "Buoyancy and thermocapillary driven convection flow of an electrically conducting fluid in an enclosure with heat generation" *International Journal of Thermal Sciences* **44**, 676-684.
90. D.A.S.Rees, E.Magyari & B.Keller (2005) "Vortex instability of the asymptotic dissipation profile in porous media" *Transport in Porous Media* **61**, 1-14.
91. D.A.S.Rees, L.Storesletten & A.Postelnicu (2006) "The onset of convection in an inclined anisotropic porous layer with oblique principle axes" *Transport in Porous Media* **62**, 139-156.
92. D.P. Almond, C.R. Bowen & D.A.S. Rees (2006) "Composite dielectrics and conductors: simulation, characterisation and design" *J. Phys. D, Applied Physics* **39**, 1295-1304.
93. W.P. Breugem & D.A.S. Rees (2006) "A derivation of the volume-averaged Boussinesq equations for flow in porous media with viscous dissipation" *Transport in Porous Media* **63**, 1-12.
94. E.Magyari & D.A.S.Rees (2006) "Effect of viscous dissipation on the Darcy free convection boundary layer flow over a vertical plate with exponential temperature distribution in a porous medium" *Fluid Dynamics Research* **38(6)**, 405-429.
95. D.A.S.Rees, A.Postelnicu & L.Storesletten (2006) "The onset of Darcy-Forchheimer convection in inclined porous layers heated from below" *Transport in Porous Media* **64**, 15-23.
96. P.Bhave, A.Narasimhan & D.A.S.Rees (2006) "Natural convection heat transfer enhancement using adiabatic block: optimal block size and Prandtl number effect" *International Journal of Heat and Mass Transfer* **49**, 3807-3818.
97. A.Selim & D.A.S.Rees (2007) "The instability of a developing thermal front in a porous medium. I Linear theory" *Journal of Porous Media* **10**, 1-15.
98. A.Selim & D.A.S.Rees (2007) "The instability of a developing thermal front in a porous medium. II Nonlinear evolution" *Journal of Porous Media* **10**, 17-33.

99. A.Nouri-Borujerdi, A.R.Noghrehabadi & D.A.S.Rees (2007) "The effect of local thermal non-equilibrium on impulsive conduction in porous media" *International Journal of Heat and Mass Transfer* **50**, 3244-3249.
100. A.Nouri-Borujerdi, A.R.Noghrehabadi & D.A.S.Rees (2007) "The Linear Stability of a Developing Thermal Front in a Porous Medium: The Effect of Local Thermal Nonequilibrium" *International Journal of Heat and Mass Transfer* **50**, 3090-3099.
101. A.Nouri-Borujerdi, A.R.Noghrehabadi & D.A.S.Rees (2007) "The effect of local thermal non-equilibrium on conduction in porous channels with a uniform heat source" *Transport in Porous Media* **69**, 281-288.
102. A.Nouri-Borujerdi, A.R.Noghrehabadi & D.A.S.Rees (2007) "The Onset of Convection in a Horizontal Porous Layer with Uniform Heat Generation Using a Thermal Non-Equilibrium Model" *Transport in Porous Media* **69**, 343-357.

Journal papers to appear:

103. A.Nouri-Borujerdi, A.R.Noghrehabadi & D.A.S.Rees "Influence of Darcy number on the onset of convection in a porous layer with a uniform heat source" *To appear in International Journal of Thermal Sciences*.

Papers under review:

104. D. Leppinen & D.A.S. Rees "Natural convection in shallow porous cavities near the density maximum: the conduction and intermediate regimes" *Submitted to Journal of Fluid Mechanics*.
105. N.F. Abd Kadir, D.A.S. Rees & I. Pop "Conjugate forced convection flow past a circular cylinder with internal heat generation which is embedded in a porous medium" *Submitted to International Journal of Numerical Methods in Heat and Fluid Flow*.
106. M.C.Paul, D.A.S.Rees & M.Wilson "Receptivity of free convective flow from a heated vertical surface. I. Linear waves" *Submitted to Proceedings of the Royal Society*.
107. M.C.Paul, D.A.S.Rees & M.Wilson "Receptivity of free convective flow from a heated vertical surface. II. Nonlinear waves" *Submitted to Proceedings of the Royal Society*.
108. M.C.Paul & D.A.S.Rees "Direct Numerical Simulation of the linear stability of a free convective boundary layer flow using a thermal disturbance with slowly increasing frequency" *Submitted to International Journal of Thermal Sciences*.
109. D.A.S.Rees, A.P.Bassom & P.G.Siddheshwar "Local thermal non-equilibrium effects arising from the injection of a hot fluid into a porous medium" *Submitted to Journal of Fluid Mechanics*.
110. D.A.S.Rees, D.A.Nield & A.V.Kuznetsov "Vertical free convective boundary-layer flow in a bidisperse porous medium" *Submitted to Trans.A.S.M.E. Journal of Heat Transfer*.

Conference Proceedings:

111. D.A.S.Rees & D.S.Riley (1987) "The evolution of instabilities in an infinite porous layer heated from below: the effect of near-resonant thermal forcing" *A.S.M.E. H.T.D-94, A.M.D.-89*, 59-66, in "Bifurcation Phenomena in Thermal Processes and Convection", Proceedings of the A.S.M.E. Winter Annual Meeting, Boston.
112. D.A.S.Rees (1994) "Numerical simulation of thermal boundary layer instabilities in porous media" *Proc. I.U.T.A.M. Symposium on "Nonlinear instabilities of nonparallel flows"*, Clarkson University, New York, 1993, pp242-247.
113. D.A.S.Rees (1996) "The effect of layering on free convection from a vertical heated surface in a porous medium" *Proc. Int. Conf. on Porous Media and their Applications in Science, Engineering and Industry (June 1996)* Kona, Hawaii, pp403-431.
114. R.Strange & D.A.S.Rees (1996) "The effect of fluid inertia on the onset of unsteady convection in a saturated porous layer heated from below" *Proc. Int. Conf. on Porous Media and their Applications in Science, Engineering and Industry (June 1996)* Kona, Hawaii, pp71-84.

115. S.Lewis, D.A.S.Rees & A.P.Bassom (1996) "High wavenumber convection in tall porous containers heated from below" *Proc. Int. Conf. on Porous Media and their Applications in Science, Engineering and Industry (June 1996)* Kona, Hawaii, pp3-18.
116. M.A.Hossain, N.Banu, D.A.S.Rees & A.Nakayama (1996) "Unsteady forced convection boundary layer flow through saturated porous media" *Proc. Int. Conf. on Porous Media and their Applications in Science, Engineering and Industry (June 1996)* Kona, Hawaii, pp85-101.
117. X.Gan, I.Mirzaee, J.M.Owen, D.A.S.Rees & M.Wilson (1996) "Flow in a rotating cavity with a peripheral inlet and outlet of cooling air" *A.S.M.E. Gas Turbine Conference, Birmingham (June 1996) Paper 96-GT-309*
118. C.S.Kirk, H.Shirvani, D.A.S.Rees & A.R.Mileham (1996) "Mathematical prediction of the weld thermal cycle and HAZ microstructure" *Proceedings of the 2nd International Conference on Coasts, Ports and Marine Structures* Dec 1996, Tehran, Iran, pp159-173.
119. D.A.S.Rees, S.Lewis & A.P.Bassom (1997) "Instability of thermal boundary layer flows" *Proceedings of the 10th Bangladesh Mathematics Conference* November 1995, Dhaka, Bangladesh, pp1-27.
120. M.A.Hossain, A.C.Mandal & D.A.S.Rees (1997) "Magnetohydrodynamic natural convection over isothermal permeable horizontal plates" *Proceedings of the 10th Bangladesh Mathematics Conference* November 1995, Dhaka, Bangladesh, pp41-53.
121. K.C.A. Alam, M.A.Hossain & D.A.S.Rees (1997) "Magnetohydrodynamic free convection boundary layer flow along a vertical porous plate with variable surface temperature" *Proceedings of the 10th Bangladesh Mathematics Conference* November 1995, Dhaka, Bangladesh, pp63-75.
122. M.Wilson, P.D.Arnold, T.W.Lewis, I.Mirzaee, D.A.S.Rees & J.M.Owen (1997) "Instability of flow and heat transfer in a rotating cavity with a stationary outer casing" *Eurotherm 55* (Heat transfer in Single Phase Flow) September 1997, Santorini, Greece.
123. T.W.Lewis & D.A.S.Rees (1998) "Numerical simulation of buoyancy induced flows in sealed rotating cavities" *Heat and Mass Transfer Australia Proc. 6th Australasian conference on heat transfer* (Dec 1996 Sydney, Australia) pp73-80.
124. N.Banu, D.A.S.Rees & I.Pop (1998) "Steady and unsteady convection in rectangular porous cavities with internal heat generation" *Proceedings of the 11th International Heat Transfer Conference (August 1998 Kyongju, Korea)* Vol. 4 pp375-380.
125. D.A.S.Rees & A.P.Bassom (1998) "The onset of convection in a sloping porous layer" *Proceedings of the 11th International Heat Transfer Conference (August 1998 Kyongju, Korea)* Vol. 4 pp497-502
126. T.W.Lewis, M.Wilson & D.A.S.Rees (1998) "Unsteady laminar flow and heat transfer in a rotating cavity with a stationary outer surface" *Proceedings of the 11th International Heat Transfer Conference (August 1998 Kyongju, Korea)* Vol. 6 pp553-557
127. N.G.Kafoussias, G.A.Georgantopoulos & D.A.S.Rees (1998) "Numerical investigation of two dimensional laminar and turbulent boundary layer compressible flow with pressure gradient and heat and mass transfer" *Proceedings of the 5th National Congress on Mechanics, Ioannina, Greece, 27-30 August 1998)* Vol. 2 pp981-989
128. D.A.S.Rees & I.Pop (1999) "Vertical free convection boundary-layer flow in a porous medium using a thermal nonequilibrium model" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp1-12
129. D.A.S.Rees (1999) "Vertical free convection boundary-layer flow in a porous medium using a thermal nonequilibrium model: elliptic effects" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp13-22
130. T.W. Lewis, D.A.S. Rees & M. Wilson (1999) "Unsteady axisymmetric flow in a rotating cavity with a stationary outer casing" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp23-30
131. N. Banu & D.A.S. Rees (1999) "The effect of a travelling thermal wave on weakly nonlinear convection in a porous layer heated from below" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp31-45

132. M.A.Hossain, S.Kabir & D.A.S.Rees (1999) "Natural convection flow from a vertical wavy surface with variable viscosity" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp55-62
133. M.A.Hossain, S.Hussain & D.A.S.Rees (1999) "Influence of fluctuating surface temperature and concentration to natural convection flow from a vertical flat plate" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp97-109
134. M.A.Hossain & D.A.S.Rees (1999) "Double diffusion effects on natural convection flow from a vertical wavy surface" *Proceedings of the Workshop on Applied Mathematics, Sylhet, Bangladesh, 1-3 September 1998* pp47-54
135. C.Akhter, M.A.Hossain & D.A.S.Rees (2000) "Convection from a vertical plate embedded in a stratified medium with uniform heat sources" *Proceedings of the International Conference on Applied Mathematics and Mathematical Physics, 11-15 September 2000, Sylhet, Bangladesh.* pp91-99
136. D.A.S.Rees & A.Postelnicu (2000) "The onset of convection in an inclined anisotropic porous layer" *Proceedings of the International Conference on Applied Mathematics and Mathematical Physics, 11-15 September 2000, Sylhet, Bangladesh.* pp101-114
137. D.A.S.Rees (2000) "Linear and nonlinear vortex instabilities in free convective boundary layers in porous media" *Proceedings of the International Conference on Applied Mathematics and Mathematical Physics, 11-15 September 2000, Sylhet, Bangladesh.* pp115-130
138. M.C.Paul, D.A.S.Rees & M.Wilson (2000) "Instability of vertical free convection boundary layers" *Proceedings of the International Conference on Applied Mathematics and Mathematical Physics, 11-15 September 2000, Sylhet, Bangladesh.* pp137-143
139. A.Postelnicu & D.A.S.Rees (2001) "The onset of Darcy-Bénard convection using a thermal nonequilibrium model" *Proceedings of the Romanian-Japanese Conference on Numerical Simulation in Engineering, "Dunarea de Jos" University of Galați, Romania, 18-19 September 2001.*
140. M.C.Paul, D.A.S.Rees & M.Wilson (2001) "Thermal boundary layer response to time-periodic disturbances" *Proceedings of the 2nd International Conference on Computational Methods in Heat and Mass Transfer, Rio de Janeiro, Brazil, 22-26 October, 2001.*
141. Y.J.Kim & D.A.S.Rees (2000) "Convection flow of polar fluids through a porous medium past a vertical plate in the presence of a magnetic field" *Proceedings of the XIIIth International Congress on Rheology, 20-25 August 2000, Cambridge, England.*
142. A.Postelnicu, I.Pop & D.A.S.Rees (2000) "Free convective boundary-layer flow about a vertical cylinder embedded in a porous medium using a thermal nonequilibrium model" *Proceedings of the 2nd International Conference on Applied Mathematics for Industrial Flows, 12-14 October 2000, Il Ciocco, Tuscany, Italy.*
143. M.A.Hossain & D.A.S.Rees (2002) "Natural convection flow of a viscous incompressible fluid in a rectangular porous medium heated from below" *Proceedings of the BSME-ASME Int. Conf. on Thermal Engineering, 31 Dec 2001-2 Jan 2002, Dhaka, Bangladesh.* pp207-218.
144. N.Banu & D.A.S.Rees (2003) "Free convection boundary layer flow induced by a vertical surface in a horizontally layered porous medium" *NATO ASI proceedings, Neptun, Romania, June 9-20 2003*, pp11-18.
145. D.M.Leppinen & D.A.S.Rees (2003) "Convection in shallow rectangular cavities near the density maximum" *NATO ASI proceedings, Neptun, Romania, June 9-20 2003*, pp255-264.
146. D.A.S.Rees & P.A.Tyvand (2003) "Degeneracy and the time-dependent onset of convection in porous cavities with conducting boundaries" *NATO ASI proceedings, Neptun, Romania, June 9-20 2003*, pp459-467.
147. D.A.S.Rees, E.Magyari & B.Keller (2003) "Hexagonal cell formation in Darcy-Bénard convection with viscous dissipation and inertia" *NATO ASI proceedings, Neptun, Romania, June 9-20 2003*, pp468-477.
148. D.A.S.Rees (2003) "Nonlinear vortex development in free convective boundary layers in porous media" *NATO ASI proceedings, Neptun, Romania, June 9-20 2003*, pp449-458.
149. A.A. Mohamad & D.A.S.Rees (2004) "Conjugate free convection in a porous medium attached to a wall held at constant temperature" *Proceedings of the 2nd International Conference on the Applications of Porous Media, 24-27 May 2004, Évora, Portugal*, pp93-98.

150. L.Storesletten & D.A.S.Rees (2004) "Onset of convection in an inclined porous layer with internal heat generation" *Proceedings of the 2nd International Conference on the Applications of Porous Media, 24-27 May 2004, Évora, Portugal*, pp139-146.
151. D.A.S.Rees (2004) "Convection in a sidewall-heated porous cavity in the presence of viscous dissipation" *Proceedings of the 2nd International Conference on the Applications of Porous Media, 24-27 May 2004, Évora, Portugal*, pp231-236.
152. A.Selim & D.A.S.Rees (2005) "Cellular instabilities of a developing thermal front in a porous medium" *Proceedings of the International Conference on Applied Mathematics and Mathematical Physics, 4-7 January 2005, S.U.S.T., Sylhet, Bangladesh*.
153. L.Storesletten, D.A.S.Rees & I.Pop (2005) "Natural convection in inclined porous cavities filled with a porous medium" *Proceedings of the 4th ICCHMT, May 17-20, 2005, Paris-Cachan. Paper ICCHMT05-253*.
154. D.A.S.Rees & A.Selim (2005) "The instability of growing thermal boundary layers" *Proceedings of the Golden Jubilee Congress of the Indian Society of Theoretical and Applied Mechanics, December 13-17, 2005, I.I.T. Kharagpur, India*.
155. D.A.S.Rees, D.P.Almond, C.R.Bowen (2005) "The Conductivity of a Randomly Constituted Solid with Two Components using a Network Model of Heat Conduction" *Proceedings of the Golden Jubilee Congress of the Indian Society of Theoretical and Applied Mechanics, December 13-17, 2005, I.I.T. Kharagpur, India*.
156. L.Storesletten & D.A.S.Rees (2006) "The onset of convection in a two-layered porous medium with anisotropic permeability" *Proceedings of the 3rd International Conference on Applications of Porous Media, May 29 - June 3, 2006, Marrakech, Morocco*.
157. S.Gupta, B.V.R.Kumar & D.A.S.Rees (2006) "The onset and development of convection in a semi-infinite porous region heated from below and with uniform suction" *Proceedings of the 3rd International Conference on Applications of Porous Media, May 29 - June 3, 2006, Marrakech, Morocco*.
158. K.Ando, D.A.S.Rees & A.P.Bassom (2006) "Onset of convection in an unsteady thermal boundary layer" *Proceedings of the 13th International Heat Transfer Conference, August 12-18, Sydney, Australia*.
159. A.Selim & D.A.S.Rees (2006) "Secondary instabilities of a developing thermal front in a porous medium" *Proceedings of the 13th International Heat Transfer Conference, August 12-18, Sydney, Australia*.
160. A.Rashed, D.P.Almond, D.A.S.Rees, S.Burrows and S.Dixon (2006) "Crack detection by laser spot imaging thermography" *Review of Progress in Quantitative Non Destructive Evaluation, Portland, Oregon*.

Conference Proceedings to appear:

161. D.A.S.Rees (2007) "Microscopic modelling of the two-energy model for conduction in heterogeneous media" Submitted to *Proceedings of the 2nd International Conference on Porous Media and its Applications in Science and Engineering, June 17-21 2007, Kauai, Hawaii, USA*.
162. D.A.S.Rees, A.P.Bassom & P.G.Siddheshwar (2007) "The injection of a hot fluid into a cold porous medium: the effects of local thermal nonequilibrium" Submitted to *Proceedings of the 2nd International Conference on Porous Media and its Applications in Science and Engineering, June 17-21 2007, Kauai, Hawaii, USA*.

Reviews:

163. D.A.S.Rees (1992) "Review of 'Matrix Computation (Second Edition)' by Alan Jennings & J.J. McKewen" *Proc.I.Mech.E. J.Sys.Cont.Eng.* **206**, 272.
164. D.A.S.Rees (1993) "Review of 'Interactive Dynamics of Convection and Solidification' (Proceedings of the NATO Advanced Study Institute, Chamonix, France, 1992)" *Geophysical and Astrophysical Fluid Dynamics* **72**, 277-278.

Other output (non-refereed or non-research):

165. D.A.S.Rees (1986) “Numerical calculation of pressure distributions in journal gas bearings and thrust gas bearings” Radial Turbine Limited (internal report).
166. D.J.Allen, D.A.S.Rees, R.F.Sargent & E.K.Armstrong (1989) “Analysis of clearance seals for gas turbine applications” Advanced Technology Design Ltd. (internal report).
167. D.A.S.Rees (1994) “Integration by parts: a quick, easy and accurate method” *Theta* **8** No. 1, 44–47.
168. D.A.S.Rees (1994) “Direct Numerical Simulation of vertical thermal boundary layer instabilities: non-linear wave evolution” *University of Bath, School of Mechanical Engineering Report 012/1994*
169. D.A.S.Rees (1997) “Free convective boundary layer flow from a heated surface in a layered porous medium” *General Seminar in Mathematics, University of Patras, Patras, Greece*, **22–23** 225–254 (1996–1997)
170. M.A.Hossain & D.A.S.Rees (2002) “Buoyancy and thermocapillary driven convection flow of electrically conducting fluid in an enclosure with heat generation” *Int. Centre for Theoretical Physics*, preprint

Unpublished presentations and lectures since 1998

- “Onset of convection in a sloping porous layer heated from below”
— Department of Mathematics, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh (August 1998)
- “The numerical solution of ordinary and partial differential equations using the Keller box method”
“Vertical free convective boundary-layer flow in a porous medium using a thermal nonequilibrium model”
“Vertical free convective boundary-layer flow in a porous medium using a thermal nonequilibrium model: elliptical effects”
“Double diffusion effects on free convection from a vertical wavy surface”
— Workshop on Applied Mathematics, University of Sylhet, Bangladesh (September 1998)
- “Vortex instability from a near-vertical heated surface in a porous medium”
“The effect of inertia and suction on convection from a vertical surface in a porous medium”
— Romanian Conference on Fluid Dynamics, Cluj, Romania (September 1998)
- “Vortex instabilities from near vertical heated surfaces in porous media”
— 12th Bangladesh Mathematics Conference, R.C.M.P.S., University of Chittagong, Bangladesh.
- “Primary and secondary vortex instability mechanisms in free convective porous medium flows”
— Department of Thermo and Fluid Mechanics, University of Brasov, Romania (June 2000)
- “Primary and secondary vortex instability mechanisms in free convective porous medium flows”
— British Applied Mathematics Conference, University of Reading (April 2001)
- “Vortex evolution and secondary instabilities in porous medium thermal boundary layer flows”
— Centre for Nonlinear Mechanics, University of Bath (16/10/2001)
- “Nonlinear vortex evolution and secondary instabilities in porous medium thermal boundary layers”
— Department of Mathematics, Birmingham University (23/11/2001)
- “Degenerate convection in porous media heated from below”
— Department of Mathematics, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh (14/2/2004)
- “The equations governing convective flows in porous media”
— Department of Mathematics, Dhaka University, Dhaka, Bangladesh (15/2/2004)
- “Degenerate convection in porous media heated from below”
— Research Centre for the Mathematical and Physical Sciences, Chittagong University, Chittagong, Bangladesh (16/2/2004)
- “Degenerate convection in porous media heated from below”
— Department of Mathematics, BRAC University, Dhaka, Bangladesh (18/2/2004)
- “Linear and nonlinear vortex instabilities in thermal boundary layers in porous media”

— D.A.M.T.P., University of Cambridge (1/6/2004)

“Degenerate convection in porous media heated from below”
— Department of Mathematics, IIT Kharagpur, India (11/12/2005)

“Linear and nonlinear wave instabilities of vertical free convection boundary layer flow”
— Department of Mathematics, IIT Kharagpur, India (12/12/2005)

“The instability of growing thermal boundary layers in porous media”
— Workshop on Continuum Mechanics and Diffusion, University of Durham (3/3/2006)

“Microscopic modelling of the two-temperature model for conduction in periodic and heterogeneous media”
— Complex Systems Workshop on the Computation of Flow and Transport in Heterogeneous Media, University of Bath, (20/6/2006)

“Microscopic modelling of the two-temperature model for conduction in periodic and heterogeneous media”
— Department of Mathematics & the School of Environmental Systems Engineering, University of Western Australia, Perth, Australia (11/8/2006)

“Microscopic modelling of the two-temperature model for conduction in periodic and heterogeneous media”
“Linear and nonlinear instabilities of a vertical free convection boundary layer”
— Department of Civil and Environmental Engineering, James Cook University, Townsville, Australia (21/8/2006)

“The injection of a hot fluid into a cold porous medium: the effects of local thermal nonequilibrium”
— British Applied Mathematics Colloquium, University of Bristol (19/4/2007)

TEACHING

Courses taught

Heat Transfer (M.Sc. — Bristol University)
Fluid Mechanics (Yr 3 — Exeter University)
Mathematical Methods (Yr 2 — Exeter University)
Numerical Methods (Yr 1 — Exeter University)
Heat Transfer (Yr 4)
Computational Fluid Dynamics (Yr 3)
Modelling Techniques I [i.e. Fourier methods] (Yr 2)
*Modelling Techniques II (Yr 2)
Thermofluids II (Yr 1)
Mathematics for Electrical Engineering I (Yr 1)
Mathematics for Electrical Engineering II (Yr 1)
*Mathematics II (Combined Mechanical and Electrical Engineering, Yr 1)

(Those marked with an asterisk are current duties)

Textbook

I am presently in the process of preparing a textbook on Perturbation Methods for mathematics and engineering students. It will be published in Bangladesh for the use of Bangladeshi students. Western textbooks are prohibitively expensive in the subcontinent, and therefore this book will be priced at an affordable level.

External courses presented

“Perturbation methods for ordinary and partial differential equations”
— 16 hours, Department of Mathematics, University of Dhaka, Bangladesh (November 1999)

“The use of solvability conditions in ODEs and PDEs”
— 2 hours, Department of Mathematics, University of Cluj, Cluj, Romania (June 2000)

“Stability analysis of Darcy-Bénard convection”
— 4 hours, Summer School on Porous Medium Flows, Neptun, Constanța, Romania (25-29 June 2001)

Teaching Philosophy

As I was employed within my present department to teach the 2nd year Mathematics course (now called Modelling Techniques), my role is very much geared towards ensuring that engineers can acquire as good a mathematical intuition as they have a physical intuition. Part of this aim is to enable students to be able to master all those technicalities and processes which many mathematicians and physicists find come naturally. I see the lecture as being only one facet of this learning process. In my Year 1 course, which is delivered to the Electrical Engineering students, I also provide my own set of printed notes to accompany the lectures, the second facet. In general, the printed notes deliver the rigorous aspect of mathematical manipulations, together with detailed reasonings, while in the lectures themselves I use pictures and diagrams to illustrate the rigour or the derivations. In this way I hope to be able to appeal to both holistic and sequential learners. I also regard tutorial support, the third facet, as being essential to the learning process, for it is at these times that I am able to use my expertise not only to determine what has caused a particular mental block over a topic, but also to devise ways to get the student around that block. The fourth facet is coursework, and I regard this as being both formative and summative. Coursework scripts are marked up not only in order to show why mistakes have been made, but also to indicate alternative ways of tackling certain problems.

ADMINISTRATION

Administrative duties undertaken

Lectures and Tutorials Working Party (part of the Quality in Engineering Education initiative)
Examination Rationalisation Working Group
Sexual and Racial Harassment Advisory Network
Organisation of the School of Mechanical Engineering research seminar programme
Board of Studies (Mechanical Engineering)
Board of Studies (Mathematics)
Member of Mathematics Working Party

- Information Services Committee
- Final year research projects coordinator
- Engineering Courses Committee
- Calculator Approval Officer
- * Library Representative
- Advisory Committee on Disability
- * Departmental Research Committee
- * Portfolio Assessor for new lecturers.
- * Faculty Representative on the University Information Committee.

(Those marked with an asterisk are current duties)

EXTRACURRICULAR ACTIVITIES

I was a member of the orchestra accompanying the Bath University Student Opera's production of Purcell's Dido and Aeneas in 1996 and Purcell's King Arthur in 1997.

I am a regular participant in the department's Christmas show. I have contributed various violin and piano pieces such as Caprice Basque by Sarasate, some gypsy pieces, the Russian Dance from Swan Lake, and a Nocturne by Chopin, and some comedy songs such as the Lobachevsky Plagiarism song by Tom Lehrer.

I have also contributed violin performances to the cultural events of four mathematics conferences in the subcontinent, three in Bangladesh and one in India.

RESEARCH GRANTS HELD

J. M. Owen & D. A. S. Rees
 MoD (RAE, Pyestock)
 "Computation of flow and heat transfer between contra-rotating turbine discs"
 £105075
 Research Officer: Dr. J.-X. Chen
 April 1991 — March 1994.

D. A. S. Rees
 SERC
 "A study of the effects of surface roughness on heat transfer from heated surfaces in porous media"
 £352
 Travel grant to visit Prof. I. Pop, Romania.
 April 1992 – March 1993.

D. A. S. Rees
 Fellowship of Engineering
 £300
 Travel grant to attend the IUTAM Symposium "Nonlinear Instabilities of Nonparallel Flows", Clarkson University, New York.
 June 1993

J. M. Owen & D. A. S. Rees
 SERC/MOD
 "Heat transfer in a rotating cavity with peripheral flow of cooling air"
 £117296
 Research Officer: Dr. M. Wilson
 Research Student: I. Mirzaee.
 October 1993 — September 1996

D. A. S. Rees
 Commission of the European Communities Mobility Scheme
 "Convection in porous media"
 7900ECU
 Travelling Fellowship to visit Prof. I. Pop, Cluj, Romania.
 June 1993 — May 1994

D. A. S. Rees
SERC (Mathematics)
“Theoretical study of thermal boundary layer instabilities”
Postgraduate studentship (Mathematics Committee Pool Award)
Research student: Samantha Lewis
October 1993 — September 1996

D. A. S. Rees
EPSRC (Engineering)
“Direct Numerical Simulation of free convection”
Postgraduate studentship (Departmental Quota Award)
Research student: Rob Strange
October 1994 — September 1997

J. M. Owen & D. A. S. Rees
EPSRC/European Gas Turbines
“Heat transfer in a rotor–stator system with pre-swirled cooling air”
£239000
Research Officers: Dr. J.-X. Chen, R. Pilbrow
Research Student: H. Karabay
October 1994 — September 1997

D. A. S. Rees British Council
“Stability of free convection in layers and boundary layers”
£300
International travel grant to present invited talk at the 10th Bangladesh Mathematics Conference.
August 1995.

D. A. S. Rees
University Bursary
“The computation of buoyancy-induced flows in rotating cavities”
Postgraduate studentship
Research student: Tanat Lewis
October 1995 — September 1998

G. W. Hunt, C. J. Budd & D. A. S. Rees
EPSRC Applied Nonlinear Mathematics Programme
“Modelling of localised folding using 4th order nonlinear parabolic equations”
£104766
Postdoctoral Research Assistant
January 1997 — December 1999

D. A. S. Rees & M. Wilson
University Bursary
Postgraduate studentship
Research student: Miss Nurzahan Banu
November 1996 — October 1999

M. Wilson & D. A. S. Rees
20 hours of CPU time on the Rutherford Cray (subproject cr3065)
“Direct numerical simulation of buoyancy-induced flows in rotating cavities”
August 1996 — August 1997

D. A. S. Rees
Royal Society
£715
Travel Grant to attend and present papers at conferences and Universities in Korea and Bangladesh
(August/September 1998).

D. A. S. Rees
University Bursary & O.R.S. award
Research Student: Manosh Chandra Paul
October 1999 — September 2002

D. A. S. Rees Royal Society
£300
Travel grant to visit Prof. I. Pop, Cluj, Romania and Prof. A. Postelnicu, Brasov, Romania.
July 2000.

D. A. S. Rees
E.P.S.R.C. studentship
Research Student: Kwong Shing Chan
October 2002 — September 2005

D. A. S. Rees
Departmental Studentship and University Overseas Bursary
Research Student: Asma Selim
October 2003 — September 2006

D. A. S. Rees
Royal Society India Fellowship
Research Visitor: Prof Pradeep G Siddheshwar
March 2006 — February 2007

D. A. S. Rees
Royal Academy of Engineering
£ 900
Travel Grant to attend the 13th International Heat Transfer Conference in Sydney, and to make research visits to the University of Western Australia, Perth and James Cook University, Townsville.
August 2006

REFEREES

All of the following academics are prepared to provide references upon request. Of these, Profs Pop, Storesletten and Bassom have been collaborators.

Prof D B Ingham,
Department of Mathematics,
University of Leeds,
Leeds LS2 9JT.
Phone: 0113 343 5113
email: amt6dbi@maths.leeds.ac.uk

Prof P G Daniels,
Department of Mathematics,
City University,
Northampton Square,
London EC1V 0HB.
Phone: 0171 4778450
email: P.G.Daniels@city.ac.uk

Prof I Pop,
Faculty of Mathematics,
University Babeş Bolyai,
Cluj CP253
R3400 Romania
email: popi@math.ubbcluj.ro

Prof L Storesletten,
Department of Mathematics,
Agder University College,
Serviceboks 422,
4604 Kristiansand,
Norway.
email: Leiv.Storesletten@hia.no

Prof P Vadasz,
Department of Mechanical Engineering,
Northern Arizona University,
P.O. Box 15600,
Flagstaff AZ 86011-5600,
U.S.A.
email: Peter.Vadasz@nau.edu

Prof D A Nield,
Department of Engineering Science,
University of Auckland,
Private Bag 92019,
Auckland,
New Zealand.
email: d.nield@auckland.ac.nz

Prof A P Bassom,
School of Mathematics and Statistics,
The University of Western Australia,
35 Stirling Highway,
Crawley,
Western Australia 6009,
Australia.
email: bassom@maths.uwa.edu.au