

Curriculum Vitae

Mark Joseph McGuinness

2010

Nationality: New Zealander.

Born: 23 January 1954 at Hamilton, New Zealand.

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Present Position:

Reader, School of Mathematics, Statistics and Operations Research
Victoria University of Wellington
PO Box 600, Wellington.

I commenced work as a Senior Lecturer in the Mathematics Department at VUW in 1991.

Academic Record:

Ph.d. 1978, Physics Department, Canterbury University, New Zealand.

B.Sc. Hons. (First Class) in Physics, Canterbury University, New Zealand, conferred in 1975.

University Junior and Senior Scholarships, 1971, 1974

IBM New Zealand Scholarship, 1971

UGC Post-Graduate Scholarship, 1975

Charles Cook, Warwick House, Memorial Scholarship, 1975

Thesis Students Supervised:

Sione Paea, MSc with Merit, 2008. *Coal Volatilisation Distribution*

Nigel Holland, MSc, 2008. *The Dynamics of Coupled Oscillators*

Alysha Nickerson, MSc, 2007. *Modelling Solar Heating of Sea Ice*

Young Hong, PhD, 2005. *Cardiac Control Models.*

Natalie Robinson, MSc, 2005. *An oceanographic study of the cavity beneath the McMurdo Ice Shelf, Antarctica.*

Christine Cameron, MSc, 1997. *The Fractal Dimension of New Zealand Fault Lines.*

Irene Pestov, PhD, 1996. *Mathematical Modelling of Two-Phase Geothermal Reservoirs.*

Philip Moir, Dip. Applied Science, 1994. *A Model for Parasitic Infection in Ruminants.*

Previous Positions:

1983-1991 Research Scientist, Mathematical Physics Section, Applied Mathematics Division, DSIR

1981-1983 Instructor in Applied Mathematics at the California Institute of Technology, Pasadena, California, U.S.A.

1978-1981 Post-Doctoral Research Fellow (awarded by the Education Department, Dublin) at the Mathematical Physics Department, University College Dublin, Ireland

Research Interests:

Heat transport in sea ice, and the rate at which sea ice grows in Antarctica, are of interest in my mathematical modelling studies. The relative importance of solar heating of sea ice during the spring warm-up, and the role played by algae, are central to my interests here.

Also of interest is the role played by platelet ice, large pure crystals of ice found encased in land-fast sea ice in many locations around Antarctica, and associated with the nearby ice shelves (floating ends of glaciers where they run into the sea). This work involves nonlinear partial differential equations with source terms, and much of my interest lies in approximate analytic solutions that inform the geophysics.

Publications

Total Publications: **115**

Total number of publications accepted for publication in refereed journals and refereed conference proceedings: **86**
(Consisting of 40 refereed journal articles, 40 refereed conference proceedings and 6 refereed reports)

Total number of other reports: **29**

Refereed Publications with sole authorship: **22**

Refereed Articles in International Journals

1. A.C. Fowler, B. Scheu, W.T. Lee, & **M.J. McGuinness**, *A theoretical model of the explosive fragmentation of vesicular magma*, accepted for publication in the Proceedings of the Royal Society of London, A., Oct 2009. 24 published pages. Published online as doi:10.1098/rspa.2009.0382.
2. **M.J. McGuinness**, M.J.M. Williams, P.J. Langhorne, C. Purdie, & J. Crook, *Frazil Deposition Under Growing Sea Ice*, Journal of Geophysical Research **114**, C07014, doi:10.1029/2007JC004414 (2009).
3. **M.J. McGuinness**, *Modelling Sea Ice Growth*, ANZIAM Journal **50** (2009) 306–319. doi:10.1017/S1446181109000029.
4. P.E. McSharry, **M.J. McGuinness**, & A.C. Fowler, *Confronting a cardiovascular system model with heart rate and blood pressure data*. Computers in Cardiology **32** pp. 587–590, 2005.
5. A.C. Fowler & **M.J. McGuinness**, *A delay recruitment model of the cardiovascular control system*. J. Math. Biol. **51** (5) 508-526, 2005. DOI: 10.1007/s00285-005-0339-1
6. **M.J. McGuinness**, Y. Hong, D. Galletly, & P. Larsen. *Arnold tongues in human cardiorespiratory systems*. Chaos **14** (1) pp. 1–6, March 2004.
7. **M.J. McGuinness**, C.P. Please and D.L.S. McElwain *Approximations to the Distributed Activation Energy Model for the Pyrolysis of Coal*, Combustion and Flame **133** pp. 107–117, April 2003.
8. M.J. Davey, K.A. Landman, **M.J. McGuinness** and H.N. Jin. *Mathematical Modeling of Rice Cooking and Dissolution in Beer Production*, AIChE **48** pp. 1811–1826, 2002.

9. **M.J. McGuinness**, K. Landman, J. Trodahl, and A. Pantoja, *Solar radiative heating in first-year sea ice*, *Annals of Glaciology*, **33** pp. 261–266, 2001.
10. K.A. Landman & **M.J. McGuinness**, *Modelling the Cooking of a Single Cereal Grain*, Chapter 5 in the book *Modeling: Case Studies from Industry*, editors A.Cumberbatch and A.Fitt, Cambridge University Press, 2001, pp. 97–114.
11. H.J. Trodahl, S.O.F. Wilkinson, **M.J. McGuinness**, & T.G. Haskell. *Thermal conductivity of sea ice: Dependence on temperature and depth*, *Geophys. Res. Lett.* **28**, pp.1279–1282, 1 April 2001.
12. K.A. Landman & **M.J. McGuinness**, *Mean Action Time for Diffusive Processes*, *Journal of Applied Mathematics and Decision Sciences*, **4**(2) (2000) pp.125–141.
13. H.J. Trodahl, **M.J. McGuinness**, P.J. Langhorne, K. Collins, A.E. Pantoja, I.J. Smith and T.G. Haskell. *Heat Transport in McMurdo Sound First Year Fast Ice*, *J. Geophys. Res.* **105** (2000) pp. 11,347–11,358.
14. **M.J. McGuinness**, C.P. Please, N. Fowkes, P. McGowan, L. Ryder and D. Forte. *Modelling the Wetting and Cooking of a Single Cereal Grain*, *The IMA Journal of Mathematics Applied in Business and Industry*, **11** (2000) pp. 49–70. Also Research Report 98-28, School of Mathematical and Computing Sciences, Victoria University of Wellington.
15. **M.J. McGuinness**, E. Donskoi and D.L.S. McElwain. *Asymptotic Approximations to the Distributed Activation Energy Model*, *Applied Mathematics Letters* **12** (1999) pp.27–34.
16. **M.J. McGuinness**, K. Collins, H.J. Trodahl and T.G. Haskell. *Nonlinear Thermal Transport and Brine Convection in First Year Sea Ice*, *Annals of Glaciology*, **27** (1998) pp.471–476.
17. **M.J. McGuinness**, *Steady Solution Selection and Existence in Geothermal Heat Pipes. II: The Conductive Case*, *International Journal of Heat and Mass Transfer*, **40** No.2 (1997) pp.311–321. Also Research Report 96-181, Department of Mathematics, Victoria University of Wellington.
18. **M.J. McGuinness**, *Steady Solution Selection and Existence in Geothermal Heat Pipes. I: The Convective Case*, *International Journal of Heat and Mass Transfer*, **39** No.2 (1996) pp.259–274. Also Research Report 94-139, Department of Mathematics, Victoria University of Wellington.
19. **M.J. McGuinness**, S. White, R. Young, H. Ishizaki, K. Ikeuchi, Y. Yoshida. *A Model of the Kakkonda Geothermal Reservoir*, *Geothermics* **24** No. 1 1995, pp.1–48.

20. **M.J. McGuinness**, K. Pruess, M. O'Sullivan and M. Blakeley. *Geothermal Heat Pipe Stability: Solution Selection by Upstreaming and Boundary Conditions*, *Transport in Porous Media* **11** (1993), pp.71–100.
21. **M.J. McGuinness**, *Chaos - A Walk Through The Garden*, *New Zealand Science Review* **49** (3) 1992, pp.75–78.
22. *Vertical Two-phase Flow in Porous Media*, *Transport In Porous Media*, **8** 1992, pp.99–131. Co-authors W. Kissling, G. Weir, S. White and R. Young.
23. *Analysis of One-Dimensional Horizontal Two-phase Flow in Geothermal Reservoirs*, *Transport In Porous Media* **7** 1991, pp.223–253. Co-authors W. Kissling, A. McNabb, G. Weir, S. White and R. Young.
24. *The Heat Source of the Ruapehu Crater Lake; Deductions from the Energy and Mass Balances*, *J. Vulc. and Geophys. Res.*, **46** 1991, pp.1–20. Co-authors A. Hurst, H. Bibby and B. Scott.
25. *Pressure Transmission in a Bounded Randomly Fractured Reservoir of Single-Phase Fluid*, *Transport in Porous Media* **1** (1986), 371–397.
26. *A Computation of the Limit Capacity of the Lorenz Attractor*, *Physica* **16D** (1985), 265–275.
27. *On the Nature of the Torus in the Complex Lorenz Equations*, *SIAM J. Applied Math.* **44** number 4 (1984), 681–700. Co-author Dr. A. Fowler.
28. *The Fractal Dimension of the Lorenz Attractor*, *Physics Letters* **99A** (1983), 5–9.
29. *Hysteresis in the Lorenz Equations*, *Physics Letters* **92A** (1982), 103–105. Co-author Dr. A. Fowler.
30. *Hysteresis, Period Doubling and Intermittency at High Prandtl Number in the Lorenz Equations*, *Studies in Applied Math.* **69** (1982), 99–126. Co-author Dr. A. Fowler.
31. *A Description of the Lorenz Attractor at High Prandtl Number*, *Physica* **5D** (1982), 149–181. Co-author Dr. A. Fowler.
32. *The Real and Complex Lorenz Equations in Rotating Fluids and Lasers*, *Physica* **5D** (1982), 108–121. Co-author Dr. J. D. Gibbon.
33. *The Complex Lorenz Equations*, *Physica* **4D** (1982), 139–162. Co-authors are Dr. A. Fowler and Dr. J. D. Gibbon.
34. *Amplitude Equations at the Critical Points of Unstable Dispersive Physical Systems*, *Proc. Roy. Soc. Lond.* **A377** (1981), 185–218. Co-author Dr. J. D. Gibbon.

35. *Derivation of the Lorenz Equations for Some Unstable Dispersive Physical Systems*, Physics Letters **77A** (June 1980), 285–289. Co-author Dr. J. D. Gibbon.
36. *Nonlinear Focussing and the Kelvin-Helmholtz Instability*, Physics Letters **77A** (May 1980), 118–122. Co-author Dr. J. D. Gibbon.
37. *Infinities of Polynomial Conserved Densities for a Class of Nonlinear Evolution Equations*, Journal of Mathematical Physics **21** (1980), 2743–2748.
38. *Noether's Theorem and Infinities of Conserved Densities*, in the proceedings of the meeting on Nonlinear Evolution Equations and Dynamical Systems in the series Lecture Notes in Physics **120** (1980), 363–368.
39. *Infinities of Polynomial Conserved Densities for Nonlinear Evolution Equations*, Journal of Mathematical Physics **21** (1980), 2737–2742.
40. *The Conserved Densities of the Korteweg–de Vries Equation*, Journal of Mathematical Physics **19** (1978), 2285–2288.

Refereed Conference Proceedings

The Mathematics-In-Industry Study Group and the European Study Groups with Industry are one week workshops on actual mathematical modelling problems, with further work done by the moderators to produce a paper that is then refereed before publication in the proceedings. The quality of these MISGs and ESGIs is outstanding on an international scale, and they routinely attract top academics from around the world.

The Geothermal Workshop Proceedings are small papers, typically six to eight typeset pages long, a popular and fast publication method in geothermal modelling. They are refereed, and are an important avenue for dissemination of information in the international geothermal modelling community. There is no duplication of my results published in journals.

1. A.B. Thompson, G. Richardson, P. Dellar, **M. McGuinness**, C. Budd, *Arc Phenomena in low-voltage current limiting circuit breakers*, to appear in the proceedings of the Sixty-Eighth European Study Group with Industry, held at the University of Southampton, UK, March 30–April 3, 2009. 17 pages.
2. B. Anderssen, N. Fowkes, R. Hickson, & **M. McGuinness**, *Analysis of Coil Slumping*, in the proceedings of the 2009 Mathematics and Statistics in Industry Study Group, Institute of Mathematics and Statistics, Eds.

- T. Marchant, M. Edwards. & G. Mercer, University of Wollongong, Australia, published Jan 2010, pp. 90–108. ISBN: 978-1-74128-181-1
3. K. Borg, V. Cregan, A. Fowler, **M. McGuinness**, S. O'Brien, L. Schwartz, & V. Zubkov, *Partial Wetting Phenomenon in Superhydrophobic Microchannels*, in the Proceedings of the Seventieth European Study Group with Industry, held at the University of Limerick, Ireland, June 28–July 3, 2009, pp.3–28.
 4. **M. McGuinness**, *Preface of the Symposium on Mathematical Modelling of Extremes*, Numerical Analysis and Applied Mathematics, editors T.E. Simos, G. Psihoyios, and Ch. Tsitouras, peer-reviewed proceedings of the International Conference on Numerical Analysis and Applied Mathematics, Rethymno, Crete, 18-22 September 2009, AIP Conference Proceedings (New York), p. 1141.
 5. **M. McGuinness**, A.C. Fowler, B. Scheu, & W.T. Lee, *Exploding Rocks*, Numerical Analysis and Applied Mathematics, editors T.E. Simos, G. Psihoyios, and Ch. Tsitouras, peer-reviewed proceedings of the International Conference on Numerical Analysis and Applied Mathematics, Rethymno, Crete, 18-22 September 2009, AIP Conference Proceedings (New York), pp. 1142–1445.
 6. A. Korobeinikov, A. Kovacec, **M. McGuinness**, M. Pascoal and A. Pereira, *Optimizing a complex hydroelectric cascade in the electricity market*, to appear in the proceedings of The 69th European Study Group with Industry 2009, held at the Departamento de Matemática da Universidade de Coimbra, Portugal, 20–24 April, 2009.
 7. **McGuinness**, M., Sweatman, W., Baowan, D., Barry, S. *Annealing Steel Coils*, in the proceedings of the Mathematics-in-Industry Study Group 2008, Institute of Mathematics and Statistics, University of Wollongong, Australia, published Dec 2008, pp. 61–80.
 8. Fraser, W.B., Macaskill, C., **McGuinness**, M, and Thornton, A. *Strip track-off and buckling between transport rollers* , in the proceedings of the Mathematics-in-Industry Study Group 2007, Institute of Mathematics and Statistics, University of Wollongong, Australia, published January 2008, pp. 13–31.
 9. Whiten, B, **McGuinness**, M, and Hoseinei, S. *Sustainable Water Management in the Water Industry*, in the proceedings of the Mathematics-in-Industry Study Group 2006, Centre for Mathematics in Industry, Massey University, Albany, New Zealand, Editor Graeme Wake, January 2007, pp. 193–214.
 10. **McGuinness**, M.J. & Jenkins, D. *Modelling the Physics of High-Speed Weighing*, in the proceedings of the 2005 Mathematics-in-Industry Study Group, Centre for Mathematics in Industry, Massey University, Albany,

New Zealand, Editor Graeme Wake, December 2005, pp. 129–158. ISBN 0 473-10423-7.

11. **McGuinness, M.J.** & Taylor, S. *Strip Temperature in a Metal Coating Line Annealing Furnace*, in the proceedings of the 2004 Mathematics-in-Industry Study Group, Massey University, Albany, New Zealand, 26 – 30 January 2004, pp. 23–45.
12. **McGuinness, M.J.** & Benjamin, B., *Submarine Lead-Acid Battery Performance*, in the proceedings of the 2003 Mathematics-in-Industry Study Group, University of South Australia, Adelaide, Australia, 3 – 7 February 2003, pp. 23–48. Published in May 2008.
13. **McGuinness, M.J.** & McKibbin, R., *Terrain-Induced Slugging*, in the proceedings of the 2002 Mathematics-in-Industry Study Group, University of South Australia, Adelaide, Australia, 11 – 15 February 2002, pp.125–139.
14. Roberts, A.J. & **McGuinness, M.J.** *Modelling the flow in tall tapered feeders*, in the proceedings of the 2001 Mathematics-in-Industry Study Group, University of South Australia, Adelaide, Australia, 29 January – 2 February 2001, pp.60–77. Also Research Report 01-19, School of Mathematical and Computing Sciences, Victoria University of Wellington.
15. Roberts, A.J. & **McGuinness, M.J.** *Dip Coating Process for Hot Metal Castings*, in the proceedings of the 1999 Mathematics-In-Industry Study Group, held at Queensland University of Technology, Brisbane, Australia, 1–5 February 1999, pp.20–48. Published July 2000. Also Research Report 00-04, School of Mathematical and Computing Sciences, Victoria University of Wellington.
16. **McGuinness, M.J.**, P. Howlett & H. Jin, *Process Optimisation of Rice Gelatinisation for Beer Production*, in the proceedings of the 1998 Mathematics-In-Industry Study Group, held at Queensland University of Technology, Brisbane, Australia, 2–6 February 1998, pp.98–132. Also Research Report 98-22, School of Mathematical and Computing Sciences, Victoria University of Wellington.
17. **McGuinness, M.J.**, *Ngawha Geothermal Field - a Review*, presented at the 19th New Zealand Geothermal Workshop, Auckland University, November 1996, and to appear in the proceedings of the 20th New Zealand Geothermal Workshop to be held in November 1998. Also Research Report 97-235, School of Mathematical and Computing Sciences, Victoria University of Wellington.
18. **McGuinness, M.J.**, S.P. White & W.M. Kissling *Models of the Kawerau Geothermal Reservoir*, in the proceedings of the Geothermal Resources Council meeting, San Francisco, October 1997, pp.1–8.

19. **McGuinness**, M.J., *Upstreaming mimics capillarity in geothermal heat pipes*, Research Report 97-211, Department of Mathematics, Victoria University of Wellington, 7 pages. Also in the proceedings of the 21st Workshop on Geothermal Reservoir Engineering, Stanford University, California, January 27–29, 1997.
20. **McGuinness**, M.J., *Gravity-driven geothermal heat pipes*, in the Proceedings of the 5th International Heat Pipe Symposium, Royal Melbourne Institute of Technology, Nov 1996, published as *Heat Pipe Technology; Theory. Applications and Prospects*, Eds. Andrews, Akbarzadeh and Sauciuc, Pergamon Press, 1997, pp.240–247. Also Research Report 96-194, Department of Mathematics, Victoria University of Wellington, 6 pages.
21. **McGuinness**, M.J., I.Sauciuc, A.Akbarzadeh, & P.Johnston *Heat Pipe Research in Australia and New Zealand*, in the Proceedings of the 5th International Heat Pipe Symposium, Royal Melbourne Institute of Technology, Nov 1996, published as *Heat Pipe Technology; Theory. Applications and Prospects*, Eds. Andrews, Akbarzadeh and Sauciuc, Pergamon Press, 1997, pp.93–103.
22. **McGuinness**, M.J. & I.Pestov *Non-balanced counterflow; the effect of net mass flux*, in the proceedings of the 18th New Zealand Geothermal Workshop, Auckland University, November 1996, pp.281–284. Also Research Report 96-195, Department of Mathematics, Victoria University of Wellington.
23. **McGuinness**, M.J., *Heat pipes and through-flows in geothermal reservoirs*, in the proceedings of the 18th New Zealand Geothermal Workshop, Auckland University, November 1996, pp.285–290. Also Research Report 96-192, Department of Mathematics, Victoria University of Wellington.
24. **McGuinness**, M.J. & P. McGowan *Modelling the Cooking Process of a Single Cereal Grain*, in the Proceedings of the 1996 Mathematics-in-Industry Study Group, held at the University of Melbourne, Australia, 29 January – 2 February, 1996, pp.114–140. Also Research Report 96-183, Department of Mathematics, Victoria University of Wellington.
25. **McGuinness**, M.J. & R. Young *1D Geothermal Models — The Good, The Bad and the Unlikely* in the proceedings of the 16th New Zealand Geothermal Workshop, Auckland University, November 1994, pp.21–28.
26. **McGuinness**, M.J. *Geothermal Heat Pipes — Just How Long Can They Be?* in the proceedings of the 15th New Zealand Geothermal Workshop, Auckland University, November 1993, pp.259–266.

27. **McGuinness**, M.J. *Solution Selection in Geothermal Heat Pipes*, in the proceedings of the 14th New Zealand Geothermal Workshop (presented at the 13th New Zealand Geothermal Workshop), Auckland University, November 1992, pp.321–326.
28. **McGuinness**, M.J. & S.P. White *Modelling the Kawerau Geothermal System*, in the proceedings of the 13th New Zealand Geothermal Workshop, Auckland University, November 1991, pp.149–154.
29. **McGuinness**, M.J. *Heat Pipe Stability in Geothermal Reservoirs*, in the proceedings of the 1990 International Symposium on Geothermal Energy, Hawaii, August 1990, Geothermal Resources Council, Part I, pp.1301–1308.
30. **McGuinness**, M.J., W. Kissling, G. Weir, S. White, R. Young, A. McNabb, & J. Burnell *Two-Phase Flow Studies*, in the proceedings of the Eleventh New Zealand Geothermal Workshop, Auckland University (November 1989) 241–246.
31. **McGuinness**, M.J. *Heat Pipe Stability and Upstream Differencing*, in the proceedings of the Tenth New Zealand Geothermal Workshop, Auckland University (November 1988) 117–121.
32. **McGuinness**, M.J. & M. Louie *Tracer Modelling*, in the proceedings of the Tenth New Zealand Geothermal Workshop, Auckland University (November 1988) 113–115.
33. **McGuinness**, M.J. & K. Pruess *Unstable Heat Pipes*, in the proceedings of the Ninth New Zealand Geothermal Workshop, Auckland University (November 1987) 147–151.
34. **McGuinness**, M.J. & J. G. Burnell *Interference Tests at Kawerau, New Zealand*, in the proceedings of the Twelfth Workshop on Geothermal Reservoir Engineering, Stanford University (January 1987).
35. **McGuinness**, M.J. & K. Louie *Interference Tests at Ohaaki — A Search for a Linear Boundary*, in the proceedings of the Eighth New Zealand Geothermal Workshop, Auckland University (November 1986), 23–28.
36. **McGuinness**, M.J. *Interference Testing of the Rhyolites Overlying the Ohaaki Geothermal Reservoir*, in the proceedings of the 1985 International Symposium on Geothermal Energy, Hawaii (August 1985), Geothermal Resources Council Transactions **9** Part 2, 541–545.
37. **McGuinness**, M.J. *Pressure Tests in a Bounded Highly Permeable Naturally Fractured Geothermal Reservoir: a New Theory and a Case Study*, in the proceedings of the 1985 International Symposium on Geothermal Energy, Hawaii (August 1985), Geothermal Resources Council Transactions **9** Part 2, 547–552.

38. **McGuinness**, M.J. *Recent Interference Tests at Ngawha and Ohaaki*, proceedings of the 6th New Zealand Geothermal Workshop, Auckland University (1984), 169–174.
39. J.D. Gibbon, A.C. Fowler & M.J. **McGuinness**, *Real and Complex Lorenz Equations and their Relevance to Physical Systems*, in the proceedings of the Order in Chaos conference, CNLS, Los Alamos National Laboratory, May 1982 (Springer Lecture Notes in Mathematics).
40. J.D. Gibbon & M.J. **McGuinness**, *A Derivation of the Lorenz Equations in Unstable Dispersive Physical Systems*, proceedings of the meeting on Nonlinear Evolution Equations held in Trinity College Dublin, May 1980, published by the Royal Irish Academy.

Refereed Reports

1. *Maths Makes Crispier Cereals*, in New Zealand Science Monthly, **10** Issue 5, June 1999, p.4.
2. *An Estimate of the Potential of the Kawerau Geothermal Reservoir*, Chapter 17 in DSIR Geothermal Report Number 10, compiled for the Oil and Gas Division, Ministry of Energy (August 1986).
3. *Interference Tests*, in The Ngawha Geothermal Field — Recent and Updated Investigations, Geothermal Report **8**, D.S.I.R. (1985), 188–216.
4. *A Model of Rotorua Geothermal Field and Springs*, in *The Rotorua Geothermal Field*, a Technical Report of the Geothermal Monitoring Programme 1982–1985, Oil and Gas Division, Ministry of Energy, New Zealand, Chapter **9**, 471–493. Co-authors were M. A. Grant, S. B. Dalziel, Y. Razali, and M. J. O’Sullivan.
5. *Some Recent Developments in Reservoir Modelling in New Zealand*, presented to the International Symposium on Geothermal Energy, 1988, Exploration and Development of Geothermal Resources, held at Kumamoto and Beppu, Japan, November 10–14.
6. *Ohaaki Rhyolite Interference Tests*, A.M.D. Report **119** (March 1984), 7 pages and 27 figures.

DSIR Consulting Reports

1. *Thermal Modelling of the Kakkonda Geothermal Reservoir, Part I. Conceptual and Mathematical Modelling*, DSIR Physical Sciences Report DSIRPS-C-20, prepared for JMC Geothermal Research and

- Development Co., Ltd., Jan 1991. 45 typeset pages, plus 160 pages of figures and appendices. Co-author S.P. White.
2. *Kawerau Modelling Scenarios — Production from KA36*, Technical Report Number 153 prepared for the Gas and Geothermal Trading Group, Ministry of Energy, February 1989. Co-author S.P. White.
 3. *Ngawha Reservoir Engineering Heat-Sweep Modelling*, Technical Report Number 155, prepared for the Gas and Geothermal Trading Group, Ministry of Energy, May 1989. Co-author R.M. Young.
 4. *Ohaaki ReInjection Review — Transient Testing of Injection Wells*, a report prepared for the Electricity Corporation of New Zealand Ltd. (September 1988). Co-author W. Kissling.
 5. *Kakkonda Interference Tests*, a report prepared for JMCD, Morioka, Japan (June 1988). Co-authors M. Grant, W. Kissling.
 6. *Kawerau Modelling Scenarios — Final Report*, report KA-1988-M&W-1 prepared for the Gas and Geothermal Trading Group, Ministry of Energy, May 1988. Co-author S.P. White.
 7. *Assessment of Development Impacts and Reservoir Response of Tauhara Geothermal Field*, a report prepared by DSIR for the Waikato Valley Authority (February 1988). Co-authors R. Allis, R. Glover, L. Klyen, T. Lumb, M. Mongillo, I. Nairn, P. Otway, B. Scott and I. Donaldson.
 8. *Kawerau Modelling Final Report*, report KA-1987-M&W-3 prepared for the Gas and Geothermal Trading Group, Ministry of Energy, Wellington (November 1987). Co-author S.P. White.
 9. *Kawerau Modelling — A Progress Report*, report KA-1987-M&W-2 prepared for the Gas and Geothermal Trading Group, Ministry of Energy, Wellington (November 1987). Co-author S.P. White.
 10. *Mokai 2-D Modelling — A Final Report*, prepared for the Electricity Corporation of New Zealand Ltd. (April 1987). Co-author J.D. Leaver.
 11. *Progress Report on Modelling of the Kawerau Geothermal Field*, DIT Report Number 35, prepared for the Gas and Geothermal Trading Group, Ministry of Energy, Wellington (March 1987).
 12. *A Numerical Model of the Kawerau Geothermal Reservoir, Preliminary Results*, DIT Report Number 33, prepared for the Oil and Gas Division, Ministry of Energy, Wellington (November 1986). Co-author S.P. White.
 13. *Kawerau Interference Tests (August–October 1985)*, a report for Oil and Gas Division, Ministry of Energy (November 1986). Co-author J.G. Burnell.

14. *The Effect of Exploitation at Mokai on Shallow Groundwater*, a report prepared for NZED (October 1986).
15. *Mokai Modelling*, a report prepared for NZED (October 1986).
16. *A Revised Estimate of the Potential of the Kawerau Geothermal Reservoir*, report KA-1986-MJM-2 prepared for the Oil and Gas Division, Ministry of Energy (August 1986).
17. *Interference Between KA17 and KA27*, Report KA-1985-MJM-1 prepared for the Ministry of Energy, Wellington, 1985.

Confidential Consulting Reports

1. M.J. McGuinness, *Wellbore Simulator FITWEL22 Report — Extending Fitwel17 Capabilities*, a technical report on a wellbore simulator designed for Mighty River Power (January, 2009), 28 pages.
2. M.J. McGuinness, *Wellbore Simulator FITWEL Manual — Automated Fitting of Wellbore Parameters*, a technical report on a wellbore simulator designed for Mighty River Power (March, 2008), 24 pages.
3. M.J. McGuinness, *Wellbore Simulator QPWELL Manual — Finding a Given Total Flowrate and Wellhead Pressure* a technical report on a wellbore simulator designed for Mighty River Power (May, 2007), 11 pages.
4. M.J. McGuinness, *Wellbore Simulator OUTCRV report — Incorporating Pseudopressure at Feedpoints*, a technical report on wellbore simulation prepared for Mighty River Power (March, 2007), 8 pages.
5. M.J. McGuinness, *Sleeving RK5 — Wellbore simulations II*, a technical report on wellbore simulation prepared for Mighty River Power (March, 2007), 11 pages.
6. M.J. McGuinness, *Sleeving RK5 — Wellbore simulations*, a technical report on wellbore simulation prepared for Mighty River Power (March, 2007), 12 pages.
7. M.J. McGuinness, *KA41 Calciting Wellbore Simulations*, a technical report on wellbore calciting prepared for Mighty River Power (November, 2006), 6 pages.
8. M.J. McGuinness, *Wellbore Simulator OUTCRV*, a technical report on wellbore simulation prepared for Mighty River Power (October, 2006), 12 pages.
9. M.J. McGuinness, *KA41 Simulation Report*, a technical report on wellbore simulation prepared for Mighty River Power (October, 2006), 18 pages.

Other Papers, including Conference Proceedings and DSIR Reports

1. *Modelling the growth of Antarctic sea ice*, in the Proceedings of the 2007 Annual Meeting of the Korean Society for Industrial and Applied Mathematics, KSIAM, Seoul, Korea, Vol. 3 (2), pp. 211–214, Nov 2007.
2. *A platelet puzzle in Antarctica*, in the Proceedings of the Korean Society for Industrial and Applied Mathematics, KSIAM, Seoul, Korea, 6 pages, Nov 2006.
3. *Mathematical modelling of rice gelatinisation in beer production*, Ferment, June/July 2000, pp. 45-47. Co-authors Davey, M.J., Landman, K.A., and Jin, H.N.