

# GRAEME FAIRWEATHER

May 29, 2015

## MAILING ADDRESS

Mathematical Reviews, American Mathematical Society, 416 Fourth Street, Ann Arbor,  
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## EDUCATION

1960-1963 B.Sc. (First Class Honours) Applied Mathematics, University of St. Andrews, Scotland.  
1963-1965 Ph.D. Applied Mathematics, University of St. Andrews, Scotland.

## PROFESSIONAL EMPLOYMENT

### Regular Appointments

June 2014-present. Executive Editor Emeritus, Mathematical Reviews, American Mathematical Society, Ann Arbor, Michigan.

2008-June 2014. Executive Editor, Mathematical Reviews, American Mathematical Society, Ann Arbor, Michigan.

2008-present. Professor Emeritus, Department of Mathematical and Computer Sciences, Colorado School of Mines, Golden, Colorado.

1994-2008. Professor and Head, Department of Mathematical and Computer Sciences, Colorado School of Mines, Golden, Colorado.

1990-1994. Associate Director, Center for Computational Sciences, University of Kentucky, Lexington, Kentucky.

1986-1987. Acting Director, Center for Computational Sciences, University of Kentucky, Lexington, Kentucky.

1982-1994. Professor of Mathematics and Engineering Mechanics, University of Kentucky, Lexington, Kentucky.

1971-1981. Associate Professor of Mathematics, University of Kentucky, Lexington, Kentucky.

1969-1971. Assistant Professor of Mathematics, Rice University, Houston, Texas.

1965-1969. Lecturer in Applied Mathematics, University of St. Andrews, St. Andrews, Scotland.

### Visiting Appointments

November–December 2005, Visiting Professor, Department of Mathematics, Chiang Mai University, Chiang Mai, Thailand.

May 2005. Visiting Professor, Departamento de Matemática Aplicada, University of Valladolid, Valladolid, Spain.

March 2004. Visiting Professor, Department of Mathematics and Statistics, University of Cyprus, Nicosia, Cyprus.

November 2001, March 2002. Visiting Scientist, Fields Institute for Research in Mathematical Sciences, Toronto, Canada.

October 1992. Visiting Professor, Nankai Institute of Mathematics, Nankai University, Tianjin, P. R. China, and the Chinese Academy of Sciences, Beijing, P. R. China.

Summer 1989. Visiting Professor, School of Mathematics, The University of New South Wales, Sydney, Australia.

Fall 1988. Fulbright Research Fellow, Departamento de Matemática Aplicada y Computacion, University of Valladolid, Valladolid, Spain.

Spring 1987. Visiting Professor, School for Advanced Studies in Industrial and Applied Mathematics (SASIAM), TecnoPolis Novus Ortus, Valenzano (Bari), Italy.

1980-1981. Visiting Associate Professor of Computer Science, University of Toronto, Toronto, Canada.

1978-1979. Consultant, Amoco Production Company, Tulsa, Oklahoma.

1977-1978. Visiting Professor of Mathematics, University of Tulsa, Tulsa, Oklahoma.

Summer 1976. Visiting Scientist, National Research Institute for Mathematical Sciences, South African Council for Scientific and Industrial Research, Pretoria, South Africa.

Summer 1971. Visiting Senior Research Officer, National Research Institute for Mathematical Sciences, South African Council for Scientific and Industrial Research, Pretoria, South Africa.

1970-1971. Consultant, National Soil Services, Houston, Texas.

Summer 1968. Vacation Associate, United Kingdom Atomic Energy Authority, Culham Research Laboratory, Abingdon, England.

1966-1967. Visiting Lecturer, Department of Mathematics, Rice University, Houston, Texas.

## **THESES DIRECTED**

J. P. Johnson, *Extrapolated Galerkin methods for parabolic equations*, Rice University, Houston, Texas, 1971, Ph.D.

A. V. Saylor, *Extrapolation, deferred correction and defect correction of discrete-time Galerkin methods for linear parabolic problems*, University of Kentucky, 1979, Ph.D.

C. E. Greenwell, *Finite element methods for partial integro-differential equations*, University of Kentucky, 1982, Ph.D.

K. R. Bennett, *Parallel collocation methods for boundary value problems*, University of Kentucky, 1991, Ph.D.

R. I. Fernandes, *Alternating direction implicit finite element methods for solving time dependent problems*, University of Kentucky, 1991, Ph.D.

M. P. Robinson, *Numerical solution of Schrödinger equations using finite element methods*, University of Kentucky, 1991, Ph.D.

D. S. Dillery, *High order orthogonal spline collocation schemes for elliptic and parabolic problems*, University of Kentucky, 1994, Ph.D., (co-adviser with B. Bialecki).

Z.-M. Lou, *Orthogonal spline collocation for biharmonic problems*, University of Kentucky, 1996, Ph.D., (co-adviser with B. Bialecki).

Bingkun Li, *Discrete-time orthogonal spline collocation methods for Schrödinger-type problems*, University of Kentucky, 1998, Ph.D., (co-adviser with B. Bialecki).

Morrakot Khebchareon, *Finite element methods for solving Schrödinger-type problems*, Colorado School of Mines, 2003, Ph.D.

Q. N. Nguyen, *Matrix decomposition algorithms for modified quadratic spline collocation for Helmholtz problems*, Colorado School of Mines, 2005, M.S.

J. Maack, *Quadratic spline collocation for Poisson's and biharmonic equations in the unit square*, Colorado School of Mines, 2009, M.S.

## HONOURS/AWARDS

1963. Miller Prize, University of St. Andrews, Scotland. (Awarded to the best final-year undergraduate in the Faculty of Science.)

1963-1965. Carnegie Scholarship, Carnegie Trust for the Universities of Scotland.

1966-1967. Fulbright Travelling Scholarship.

Fall 1988. Fulbright Senior Fellow, Commission for Educational Exchange Between the United States of America and Spain.

October 2012–September 2016, Distinguished Guest Professor, Department of Mathematics, IIT Bombay, Mumbai, India.

IIT Bombay Research Paper Award for the year 2010:

- A. Pani and G. Fairweather,  $H^1$ -Galerkin mixed finite element methods for parabolic partial integro-differential equations, IMA J. Numer. Anal., 22(2002), 231–252.

The First International Conference on the Method of Fundamental Solutions, Ayia Napa, Cyprus, 11-13 June, 2007. Dedicated to Graeme Fairweather in honor of his 65th birthday.

Advances in Applied Mathematics and Mechanics, Vol 8, No 4. A special issue consisting of invited and contributed papers presented in a Special Session of the 8th International Conference on Scientific Computing and Applications, University of Nevada Las Vegas, April 1–4, 2012, in honor of the 70th birthday of Graeme Fairweather.

## Research Grants

- 1969-1970. National Science Foundation, Grant GP 23400, *Research in Partial Differential Equations, Numerical Analysis and Functional Analysis*. Faculty Associate.
- 1973-1975. National Science Foundation, Grant GP 36561, *Galerkin Methods for the Numerical Solution of Partial Differential Equations*. Principal Investigator.
- 1976-1977. National Science Foundation, Grant MCS 7508331, *Galerkin Methods for the Numerical Solution of Partial Differential Equations*. Principal Investigator. \$7,100.
- 1976-1978. Air Force Office of Scientific Research, Grant 2824, *Thermomechanical Stress Analysis of Advanced Turbine Blade Cooling Configuration*. Research Associate.
- 1980-1981. National Science Foundation, Grant MCS 8002804, *Boundary Methods for Elliptic Boundary Value Problems*. Principal Investigator. \$11,241.
- 1981-1983. National Science Foundation, Grant MCS 8102295, *Boundary Methods for Elliptic Boundary Value Problems*. Principal Investigator. \$62,912.
- 1983-1986. National Science Foundation, Grant MCS 8303287, *Boundary Methods for Elliptic Boundary Value Problems*. Principal Investigator.
1986. National Science Foundation, Grant DMS-8604063, *An Expanded Research Computing System for the Mathematical Sciences*. Co-Principal Investigator. \$30,000.
- 1986-1991. National Science Foundation, *Kentucky EPSCoR - A Program to Build Basic Sciences and Engineering Research in Kentucky, Component Project 5: Collaborative Research in the Computational Sciences*. Co-Principal Investigator, (Principal Investigator 1986-1987, 1990-1991), \$630,518.
1988. National Science Foundation, Grant DMS-8714745, *Mathematical Sciences: NSF-CBMS Regional Conference on Mathematical Foundations of the Boundary Element Method; May 9-13, 1988, Lexington, Kentucky*. Principal Investigator. \$21,100.
- 1989-1992. National Science Foundation, Grant ASC-8811171, *Modeling of Chemical Reactive Flows in a Chemical Vapor Deposition Reactor with Complex Geometry*. Co-Principal Investigator. \$117,690.
- 1991-1994. National Science Foundation, Grant CCR-9103451, *Implementation of Matrix Decomposition for Solving Linear Systems Arising in Orthogonal Spline Collocation for Separable Elliptic Boundary Value Problems*. Co-Principal Investigator. \$90,614.
- 1992-1993. National Science Foundation, Grant DMS-9206014. *Enhancing High Performance Computing at the University of Kentucky*. Co-Principal Investigator. \$93,975.
- 1992-1995. National Science Foundation, Grant EHR-9108764, *Kentucky EPSCoR Advanced Development Program*. Co-Principal Investigator. \$790,603.

- 1992-1993. NATO Collaborative Research Grant CRG 920281, *Parallel Method of Lines Algorithms for the Numerical Solution of Partial Differential Equations*. Co-Principal Investigator. BF 107,000.00.
- 1993-1995. National Science Foundation, Grant ASC-9310315, *CISE Postdoctoral Research Associateship in Computational Science and Engineering*. Co-Principal Investigator. \$44,200.
- 1994-1995. National Science Foundation, Grant DMS-9402448, *Workshop on the Method of Lines for Time-Dependent Problems*. Co-Principal Investigator. \$10,000.
- 1994-1995. Institute for Mathematics and Its Applications, University of Minnesota, *Workshop on the Method of Lines for Time-Dependent Problems*. Principal Investigator. \$3,000.
- 1994-1998. Army Research Office Grant DAAH04-94-G-0344, *Alternating Direction Implicit Orthogonal Spline Collocation Methods for Solving Initial/Boundary Value Problems*. Co-Principal Investigator. \$329,061.
- 1994-1998. National Science Foundation, Grant CCR-9403461, *Orthogonal Spline Collocation Methods for Partial Differential Equations*. Co-Principal Investigator. \$180,000.
- 1995-1996. National Science Foundation, Grant DMS-9506603, *Scientific Computing Research Environment in the Mathematical Sciences*. Co-Principal Investigator. \$50,000.
1997. National Science Foundation, Grant DMS-9633686, *Mathematical Sciences: NSF-CBMS Regional Conference on Numerical Analysis of Hamiltonian Differential Equations, June 1997, Golden, Colorado*. Co-Principal Investigator. \$24,089.
- 1998-2002. National Science Foundation, Grant DMS-9805827, *Collocation Methods for Partial Differential Equations*. Co-Principal Investigator. \$170,000.
- 2001-2002. National Science Foundation, Grant DMS-0121301, *Mathematical Sciences: NSF-CBMS Regional Conference on Numerical Methods in Forward and Inverse Electromagnetic Scattering, June 2002, Golden, Colorado*. Co-Principal Investigator. \$27,499.
- 2000-2004. National Science Foundation, Grant DMS-9912293, *REU: Research in the Department of Mathematical and Computer Sciences at the Colorado School of Mines*. Principal Investigator. \$129,798.
2002. National Science Foundation, Grant DMS-0206884, *REU: Research in the Department of Mathematical and Computer Sciences at the Colorado School of Mines*. Supplement. Principal Investigator. \$6,336.
- 2001-2004. Colorado Institute of Technology, *Online Computer Science Program by University of Colorado at Denver and Colorado School of Mines*. Co-Principal Investigator. \$300,000.
- 2002-2004. National Science Foundation, Grant DMS-0215491, *Scientific Computing Research Environments for the Mathematical Sciences*. Principal Investigator. \$25,000.
2004. Colorado Commission on Higher Education, *Colorado Christian University and Colorado School of Mines and Selected Denver-Metro School Districts Partnership to Prepare Highly Qualified Mathematics Teachers for Grades 7-12*. Co-Principal Investigator. \$50,000.

2005. Colorado Commission on Higher Education, *Colorado Christian University and Colorado School of Mines and Selected Denver-Metro School Districts Partnership to Prepare Highly Qualified Mathematics Teachers for Grades 7–12*. Co-Principal Investigator. \$35,000.
2005. Colorado Institute of Technology, *A Cluster of High Performance 64-bit Computers*. Principal Investigator. \$205,961.
- 2005–2009. National Science Foundation, Grant DMS-0453600, *United States-Hong Kong Research Experience for Undergraduates in Numerical Analysis and Scientific Computing*. Principal Investigator. \$301,879.
- 2006–2011. National Science Foundation, Grant DUE-063088, *National Science Foundation Scholarship Program: Retaining Students in Mathematics, Computer Science and Engineering*. Co-Principal Investigator. \$460,000.
2006. Mathematical Association of America Tensor Foundation, *Tech Camp 101*. Co-Principal Investigator. \$5000.
- 2007–2012. National Science Foundation, Grant DGE-0638719, *GK-12 Learning Partnerships: Creating Problem Centered, Interdisciplinary Learning Environments*. Co-Principal Investigator. \$1,780,711.
- 2007–2011. National Science Foundation, Grant CNS-0739233, *BPC-DP: Broadening Female Participation in Computing: Middle School through Undergraduate Study*. Co-Principal Investigator. \$579,557.
- 2008–2013. Bechtel Foundation, *The Bechtel K-5 Educational Excellence Initiative at the Colorado School of Mines*. Co-Principal Investigator. \$2,500,000.

## PUBLICATIONS

### Book and Book Contributions

1. G. Fairweather, *Finite Element Galerkin Methods for Differential Equations*, Lecture Notes in Pure and Applied Mathematics, Volume 34, Marcel Dekker, New York, 1978, 280 pages.
2. D. F. Griffiths, G. A. Watson, J. D. Lambert and G. Fairweather, *A. R. Mitchell: Some Biographical and Mathematical Notes*, in Numerical Analysis A. R. Mitchell 75th Birthday Volume, D. F. Griffiths and G. A. Watson, editors, World Scientific, London, 1996, pp. 1–8.
3. G. Fairweather, *Preface*, Interactive Mathematics Program Year 3, Key Curriculum Press, Berkeley, California, 1999.
4. G. Fairweather and M. Khebchareon, *Numerical methods for Schrödinger-type problems*, in Trends in Industrial and Applied Mathematics, A. H. Siddiqi and M. Kocvara, editors, Kluwer Academic Publishers, Boston, 2002, pp. 219–250.
5. B. Moskal, S. Strong and G. Fairweather, *Assessing core courses in mathematics: effects of multi-section coordination*, in Assessment of Student Learning in College Mathematics: Towards Improved Programs and Courses, B. L. Madison, editor, Association for Institutional Research, Tallahassee, Florida, 2006, pp. 131–143.

### Edited Conference Proceedings

1. P. Keast and G. Fairweather (editors), *Numerical Integration: Recent Developments, Software and Applications*, Proceedings of the NATO Advanced Research Workshop, Dalhousie University, Halifax, Nova Scotia, August 11-15, 1986, D. Reidel Publishing Company, Dordrecht, The Netherlands, 1987, 394 pages.
2. G. Fairweather and I. Gladwell (editors), *Proceedings of the Workshop on the Method of Lines for Time Dependent Problems*, University of Kentucky, 1995, Appl. Numer. Math., 20(1-2), 1996, 244 pages.
3. G. Fairweather, I. Gladwell, B. Leimkuhler and E. S. Van Vleck (editors), *Proceedings of the NSF/CBMS Regional Workshop on Hamiltonian Differential Equations*, Colorado School of Mines, 1997, Appl. Numer. Math., 29, 1999, 165 pages.

### Refereed Journal Articles

1. A. R. Mitchell and G. Fairweather, *Improved forms of the alternating direction methods of Douglas, Peaceman and Rachford for solving parabolic and elliptic equations*, Numer. Math., 6(1964), 285–292.
2. G. Fairweather and A. R. Mitchell, *A generalized alternating direction method of Douglas–Rachford type for solving the biharmonic equation*, Comput. J., 7(1964), 242–245.
3. G. Fairweather and A. R. Mitchell, *A new alternating direction method for parabolic equations in three space variables*, J. Soc. Indust. Appl. Math., 13(1965), 957–965.
4. G. Fairweather and A. R. Mitchell, *A high accuracy alternating direction method for the wave equation*, J. Inst. Math. Appl., 1(1965), 309–316.
5. G. Fairweather and A. R. Mitchell, *Some computational results of an improved ADI method for the Dirichlet problem*, Comput. J., 9(1966), 298–303.
6. G. Fairweather and A. R. Gourlay, *Some stable difference approximations to a fourth order parabolic differential equation*, Math. Comp., 10(1967), 1–11.
7. G. Fairweather, A. R. Gourlay and A. R. Mitchell, *Some high accuracy difference schemes with a splitting operator for equations of parabolic and elliptic type*, Numer. Math., 10(1967), 56–66.
8. G. Fairweather and A. R. Mitchell, *A new computational procedure for A.D.I. methods*, SIAM J. Numer. Anal., 4(1967), 163–170.
9. G. Fairweather, *A note on a generalization of a method of Douglas*, Math. Comp., 23(1969), 407–409.
10. G. Fairweather, *Algorithm 351: Modified Romberg Quadrature*, Comm. ACM, 12(1969), 324–325.
11. G. Fairweather, *On the eigenvalues and eigenvectors of a class of Hessenberg matrices*, SIAM Rev., 13(1971), 220–221.

12. G. Fairweather *A survey of discrete Galerkin methods for parabolic equations in one space variable*, Math. Colloq. Univ. Cape Town, 7(1971–1972), 43–77.
13. G. Fairweather, *Galerkin methods for vibration problems in two space variables*, SIAM J. Numer. Anal., 9(1972), 702–714.
14. T. Dupont, G. Fairweather and J. P. Johnson, *Three-level Galerkin methods for parabolic equations*, SIAM. J. Numer. Anal., 11(1974), 392–410.
15. J. E. Dendy and G. Fairweather, *Alternating direction Galerkin methods for parabolic and hyperbolic problems on rectangular polygons*, SIAM J. Numer. Anal., 12(1975), 144–163.
16. G. Fairweather and J. P. Johnson, *On the extrapolation of Galerkin methods for parabolic problems*, Numer. Math., 23(1975), 269–287.
17. G. Fairweather, *A note on the efficient implementation of certain Padé methods for linear parabolic problems*, BIT, 18(1978), 106–109.
18. G. Fairweather and P. Keast, *An investigation of Romberg quadrature*, ACM Trans. Math. Software, 4(1978), 316–322.
19. G. Fairweather, F. J. Rizzo, D. J. Shippy and Y. S. Wu, *On the numerical solution of two-dimensional potential problems by an improved boundary integral equation method*, J. Comput. Phys., 31(1979), 96–112.
20. G. Fairweather, *On the approximate solution of a diffusion problem by Galerkin methods*, J. Inst. Math. Appl., 24(1979), 121–137.
21. G. Fairweather and I. M. Navon, *A linear ADI method for the shallow water equations*, J. Comput. Phys., 36(1980), 1–18.
22. M. Davis, G. Fairweather and J. Yamanis, *Annular bed reactor – methanation of carbon dioxide*, Can. J. Chem. Eng., 59(1981), 497–500.
23. M. Davis and G. Fairweather, *On the use of spline collocation for boundary value problems arising in chemical engineering*, Comput. Methods Appl. Mech. Engrg., 18(1981), 179–189.
24. M. Davis, G. Fairweather and J. Yamanis, *Analysis of SO<sub>2</sub> oxidation in non-isothermal catalyst pellets using the dusty-gas model*, Chem. Eng. Sci., 37(1982), 447–452.
25. P. Keast, G. Fairweather and J. C. Diaz, *A computational study of finite element methods for second order two-point boundary value problems*, Math. Comp., 40(1983), 499–518.
26. K. S. Denison, C. E. Hamrin, Jr., and G. Fairweather, *Solution of boundary value problems using software packages: DD04AD and COLSYS*, Chem. Eng. Commun., 22(1983), 1–9.
27. P. H. Muir, G. Fairweather and M. Vedha-Nayagam, *The effect of Prandtl number on heat transfer from a rotating disk with blowing at the wall*, Int. Comm. Heat Mass Transfer, 10(1983), 287–297.



28. J. C. Diaz, G. Fairweather and P. Keast *Fortran packages for solving certain almost block diagonal systems by modified alternate row and column elimination*, ACM Trans. Math. Software, 9(1983), 358–375.
29. J. C. Diaz, G. Fairweather and P. Keast, *Algorithm 603 COLROW and ARCECO: Packages for solving certain almost block diagonal linear systems by modified alternate row and column elimination*, ACM Trans. Math. Software, 9(1983), 376–380.
30. G. Fairweather and A. V. Saylor, *On the application of extrapolation, deferred correction and defect correction to discrete-time Galerkin methods for parabolic problems*, IMA J. Numer. Anal., 3(1983), 173–192.
31. G. Fairweather, M. E. Davis and J. Yamanis, *The non-iterative solution of nonlinear parabolic and mixed-type problems arising in reactor design*, Chem. Eng. Commun., 23(1983), 89–99.
32. G. Fairweather, P. Keast and J. C. Diaz, *On the  $H^{-1}$ -Galerkin method for second-order linear two-point boundary value problems*, SIAM J. Numer. Anal., 21(1984), 314–326.
33. G. Fairweather, *A note on the condition of a matrix*, Int. Comm. Heat Mass Transfer, 11(1984), 191–195.
34. R. L. Johnston and G. Fairweather, *The method of fundamental solutions for problems in fluid flow*, Appl. Math. Modeling, 8(1984), 265–270.
35. W. L. Seward, G. Fairweather and R. L. Johnston, *A survey of higher order methods for the numerical integration of semidiscrete parabolic problems*, IMA J. Numer. Anal., 4(1984), 375–425.
36. C. P. Kelkar, C. E. Hamrin, Jr., and G. Fairweather, *Letter to the Editor*, A.I.Ch.E.J., 31(1985), 351–352.
37. D. Bhattacharyya, M. Jevtitch, J. T. Schrodt and G. Fairweather, *Prediction of membrane separation characteristics by pore distribution measurements and surface force-pore flow model*, Chem. Eng. Commun., 42(1986), 111–128.
38. C. E. Greenwell-Yanik and G. Fairweather, *Analyses of spline collocation methods for parabolic and hyperbolic problems in two space variables*, SIAM J. Numer. Anal., 23(1986), 282–296.
39. G. Fairweather and A. V. Saylor, *On the asymptotic expansion of the discretization error of certain discrete-time Galerkin methods for parabolic problems*, Numer. Funct. Anal. Optim., 8(1985–86), 447–471.
40. A. Akyurtlu, J. F. Akyurtlu, C. E. Hamrin, Jr., and G. Fairweather, *Reformulation and the numerical solution of the equations for a catalytic, porous wall, gas-liquid reactor*, Computers Chem. Eng., 10(1986), 361–365.
41. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for the numerical solution of the biharmonic equation*, J. Comput. Phys., 69(1987), 434–459.

42. G. Fairweather and M. Vedha-Nayagam, *An assessment of numerical software for solving two-point boundary value problems arising in heat transfer*, Numerical Heat Transfer, 11(1987), 281–293.
43. M. Vedha-Nayagam, P. Jain and G. Fairweather, *The effect of surface mass transfer on buoyancy-induced flow in a variable-porosity medium adjacent to a horizontal heated plate*, Int. Comm. Heat Mass Transfer, 14(1987), 495–506.
44. P. S. Kasibhatla, L. K. Peters and G. Fairweather, *Numerical simulation of transport from an infinite line source: error analysis*, Atmos. Environ., 22(1988), 75–82.
45. A. Karageorghis and G. Fairweather, *The Almansi method of fundamental solutions for solving biharmonic problems*, Internat. J. Numer. Methods Engrg., 26(1988), 1665–1682.
46. E. G. Yanik and G. Fairweather, *Finite element methods for parabolic and hyperbolic partial integro-differential equations*, Nonlinear Anal., 12(1988), 785–809.
47. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for the solution of non-linear plane potential problems*, IMA J. Numer. Anal., 9(1989), 231–242.
48. G. Fairweather and D. Meade, *A survey of spline collocation methods for the numerical solution of differential equations*, Mathematics for Large Scale Computing, J. C. Diaz, ed., Lecture Notes in Pure and Applied Mathematics, Volume 120, Marcel Dekker, New York, 1989, pp. 297–341.
49. A. Karageorghis and G. Fairweather, *The simple layer potential method of fundamental solutions for certain biharmonic problems*, Internat. J. Numer. Methods Fluids, 9(1989), 1221–1234.
50. D. J. Shippy, P. S. Kondapalli and G. Fairweather, *Analysis of acoustic scattering in fluids and solids by the method of fundamental solutions*, Mathl. Comput. Modelling, 14(1990), 74–79.
51. W. L. Seward, P. Kasibhatla and G. Fairweather, *On the numerical solution of a model air pollution problem with nonsmooth initial data*, Comm. Appl. Numer. Methods, 6(1990), 145–156.
52. G. Fairweather, J. M. Sanz-Serna and I. Christie, *A stabilized Galerkin method for a third order evolutionary problem*, Math. Comp., 55(1990), 497–507.
53. G. Fairweather and R. D. Saylor, *The reformulation and numerical solution of certain non-classical initial-boundary value problems*, SIAM J. Sci. Statist. Comput., 12(1991), 127–144.
54. R. I. Fernandes and G. Fairweather, *An alternating direction Galerkin method for a class of second order hyperbolic equations in two space variables*, SIAM J. Numer. Anal., 18(1991), 1265–1281.
55. G. Fairweather and J. C. Lopez-Marcos, *A box method for a nonlinear equation of population dynamics*, IMA J. Numer. Anal., 11(1991), 525–538.

56. P. Pai, T. H. Tsang and G. Fairweather, *On the use of the software package SPRINT in the study of atmospheric turbulence in a convective boundary layer*, *Environmental Software*, 6(1991), 120–130.
57. B. Bialecki, G. Fairweather and K. R. Bennett, *Fast direct solvers for piecewise Hermite bicubic orthogonal spline collocation equations*, *SIAM J. Numer. Anal.*, 29(1992), 156–173.
58. P. S. Kondapalli, D. J. Shippy and G. Fairweather, *Analysis of acoustic scattering in fluids and solids by the method of fundamental solutions*, *J. Acoust. Soc. Amer.*, 91(1992), 1844–1854.
59. P. S. Kondapalli, D. J. Shippy and G. Fairweather, *The method of fundamental solutions for transmission and scattering of elastic waves*, *Comput. Methods Appl. Mech. Engrg.*, 96(1992), 255–269.
60. Y. Yan and G. Fairweather, *Orthogonal spline collocation methods for some partial integro-differential equations*, *SIAM J. Numer. Anal.*, 29(1992), 755–768.
61. F. Majaess, P. Keast, G. Fairweather and K. R. Bennett, *The solution of almost block diagonal linear systems arising in spline collocation at Gaussian points with monomial basis functions*, *ACM Trans. Math. Software*, 18(1992), 193–204.
62. F. Majaess, P. Keast, G. Fairweather and K. R. Bennett, *Algorithm 704: ABDPACK and ABBPACK – Fortran programs for the solution of almost block diagonal linear systems arising in spline collocation at Gaussian points with monomial basis functions*, *ACM Trans. Math. Software*, 18(1992), 205–210.
63. K. R. Bennett and G. Fairweather, *A parallel boundary-value ODE code for shared-memory machines*, *Internat. J. High Speed Computing*, 4(1992), 71–86.
64. M. P. Robinson, G. Fairweather and B. M. Herbst, *On the numerical solution of the cubic Schrödinger equation in one space variable*, *J. Comput. Phys.*, 103(1993), 277–284.
65. R. I. Fernandes and G. Fairweather, *Analysis of alternating direction collocation methods for parabolic and hyperbolic problems in two space variables*, *Numer. Methods Partial Differential Equations*, 9(1993), 191–211.
66. B. Bialecki and G. Fairweather, *Matrix decomposition algorithms for separable elliptic boundary value problems in two space dimensions*, *J. Comput. Appl. Math.*, 46(1993), 369–386.
67. I. H. Sloan, Dat Tran and G. Fairweather, *A fourth-order cubic spline method for linear second-order two-point boundary value problems*, *IMA J. Numer. Anal.*, 13(1993), 591–607.
68. M. P. Robinson and G. Fairweather, *Orthogonal cubic spline collocation solution of underwater acoustic wave propagation problems*, *J. Comput. Acoust.*, 1(1993), 355–370.
69. G. Fairweather and J. C. Lopez-Marcos, *An explicit extrapolated box scheme for the Gurtin-MacCamy equation*, *Comput. Math. Appl.*, 27(1994), 41–53.
70. B. Bialecki, G. Fairweather and K. A. Remington *Fourier methods for piecewise Hermite bicubic orthogonal spline collocation*, *East-West J. Numer. Math.*, 2(1994), 1–20.

71. G. Fairweather, *Spline collocation methods for a class of hyperbolic partial integro-differential equations*, SIAM J. Numer. Anal., 31(1994), 444–460.
72. M. P. Robinson and G. Fairweather, *Orthogonal spline collocation methods for Schrödinger-type equations in one space variable*, Numer. Math., 68(1994), 355–376.
73. L. K. Peters, C. M. Berkowitz, G. R. Carmichael, R. C. Easter, S. T. Ghan, G. Fairweather, J. M. Hales, L. R. Leung, W. R. Pennell, F. A. Potra, R. D. Saylor and T. T. Tsang *The current state and future direction of Eulerian models in simulating the tropospheric chemistry and transport of trace species: a review*, Atmospheric Environment, 28(1995), 189–222.
74. B. Bialecki and G. Fairweather, *Matrix decomposition algorithms in orthogonal spline collocation for separable elliptic boundary value problems*, SIAM J. Sci. Comput., 16(1995), 330–347.
75. M. Vedha-Nayagam and G. Fairweather, *Diffusion flame over a continuous moving fuel plate in a parallel flow of oxidizer under microgravity*, AIAA J. Thermophysics and Heat Transfer, 10(1996), 97–101.
76. J. C. Morrison, C. Baunach, L. Larson, B. Bialecki and G. Fairweather, *Spline collocation calculation for the hydrogen molecular ion*, J. Physics B: At. Mol. Opt. Phys., 29(1996), 2375–2391.
77. G. Fairweather and J. C. Lopez-Marcos, *Galerkin methods for a semilinear parabolic problem with nonlocal boundary conditions*, Adv. Comput. Math., 6(1996), 243–262.
78. B. Li, G. Fairweather and B. Bialecki, *Discrete-time orthogonal spline collocation methods for Schrödinger equations in two space variables*, SIAM J. Numer. Anal., 35(1998), 453–477.
79. Z. Lou, B. Bialecki and G. Fairweather, *Orthogonal spline collocation methods for biharmonic problems*, Numer. Math., 80(1998), 267–303.
80. G. Fairweather and A. Karageorghis, *The method of fundamental solutions for elliptic boundary value problems*, Adv. Comput. Math., 9(1998), 69–95.
81. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric acoustic scattering and radiation problems*, J. Acoust. Soc. Am., 104(1998), 3212–3218.
82. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric potential problems*, Internat. J. Numer. Methods Engrg., 44(1999), 1653–1669.
83. B. Li, G. Fairweather and B. Bialecki, *A Crank-Nicolson orthogonal spline collocation method for vibration problems*, Appl. Numer. Math., 33(2000), 299–306.
84. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric elasticity problems*, Computational Mechanics, 25(2000) 524–532.
85. P. Amodio, J. R. Cash, G. Roussos, R. W. Wright, G. Fairweather, I. Gladwell, G. L. Kraut and M. Paprzycki, *Almost block diagonal linear systems: sequential and parallel solution techniques, and applications*, Numer. Linear Algebra Appl., 7(2000), 275–317.

86. J. C. Morrison, T. Wolf, B. Bialecki, G. Fairweather and L. Larson *Numerical solutions of the orbital equations for diatomic molecules*, *Molecular Physics*, 98(2000), 1175–1184.
87. B. Bialecki and G. Fairweather, *Orthogonal spline collocation methods for partial differential equations*, *J. Comput. Appl. Math.*, 128(2001), 55–82.
88. A. Pani and G. Fairweather,  *$H^1$ -Galerkin mixed finite element methods for parabolic partial integro-differential equations*, *IMA J. Numer. Anal.*, 22(2002), 231–252.
89. B. Li, G. Fairweather and B. Bialecki, *Discrete-time orthogonal spline collocation methods for vibration problems*, *SIAM J. Numer. Anal.*, 39(2002), 2045–2065.
90. B. Bialecki, G. Fairweather and A. Karageorghis, *Matrix decomposition algorithms for modified spline collocation for Helmholtz problems*, *SIAM J. Sci. Comput.*, 24(2003), 1733–1753.
91. A. Pani and G. Fairweather, *An  $H^1$ -Galerkin mixed finite element method for an evolution equation with a positive type memory term*, *SIAM J. Numer. Anal.*, 40(2003), 1475–1490.
92. G. Fairweather, A. Karageorghis and P. A. Martin, *The method of fundamental solutions for scattering and radiation problems*, *Eng. Anal. Bound. Elem.*, 27(2003), 759–769.
93. G. Fairweather and I. Gladwell, *Algorithms for almost block diagonal linear systems*, *SIAM Rev.*, 46(2004), 49–58.
94. G. Fairweather, A. Karageorghis and Y.-S. Smyrlis, *A matrix decomposition MFS algorithm for axisymmetric biharmonic problems*, *Adv. Comput. Math.*, 23(2005), 55–71.
95. B. Bialecki, G. Fairweather and A. Karageorghis, *Optimal superconvergent one step cubic spline collocation methods*, *SIAM J. Sci. Comput.*, 27(2005), 575–598.
96. G. Fairweather, Q. Lin, Y. Lin, J. Wang and S. Zhang, *Asymptotic expansions and Richardson extrapolation of approximate solutions for second order elliptic problems on rectangular domains by mixed finite element methods*, *SIAM J. Numer. Anal.*, 44(2006), 1122–1149.
97. R. Tankelevich, G. Fairweather, A. Karageorghis and Y.-S. Smyrlis, *Potential field based geometric modeling using the MFS*, *Internat. J. Numer. Methods Engrg.*, 68(2006), 1257–1280.
98. M. Ewing, B. Moskal and G. Fairweather, *Mathematical problem solving: a comparative analysis between the U.S. and Korea*, *The International Journal of Learning*, 14(8) (2007), 267–274.
99. G. Fairweather, H. Ma and W. Sun, *Orthogonal spline collocation methods for the stream function-vorticity formulation of the Navier-Stokes equations*, *Numer. Methods Partial Differential Equations*, 24(2008), 449–464.
100. A. K. Pani, G. Fairweather and R. I. Fernandes, *Alternating direction implicit orthogonal spline collocation methods for an evolution equation with a positive kernel*, *SIAM J. Numer. Anal.*, 46(2008), 344–364.

101. B. Moskal, C. Skokan, L. Kosbar and G. Fairweather, *The synergy of middle school outreach*, Academic Exchange Quarterly, 12(2) (2008), 49–54.
102. B. Bialecki, G. Fairweather, A. Karageorghis and Q. N. Nguyen, *Optimal superconvergent one step quadratic spline collocation methods*, BIT, 48(2008), 449–472.
103. B. Bialecki, G. Fairweather, D. B. Knudson, D. A. Lipman, Q. N. Nguyen, W. Sun and G. M. Weinberg, *Matrix decomposition algorithms for the finite element Galerkin method with piecewise Hermite cubics*, Numer. Alg., 52(2009), 1–23.
104. R. Tankelevich, G. Fairweather and A. Karageorghis, *Three-dimensional image reconstruction using the PF/MFS technique*, Eng. Anal. Bound. Elem., 33(2009), 1403–1410.
105. K. Dui, G. Fairweather, Q. N. Nguyen and W. Sun, *Matrix decomposition algorithms for the  $C^0$ -quadratic finite element method*, BIT, 49(2009), 509–526.
106. A. K. Pani, G. Fairweather and R. I. Fernandes, *ADI orthogonal spline collocation methods for parabolic partial integro-differential equations*, IMA J. Numer. Anal., 30(2010), 248–276.
107. B. M. Moskal and G. Fairweather, *Research experience for U.S. undergraduates: a collaboration between Hong Kong and U.S. mathematicians*, Mathematical Culture, 1(2010), 68–84, (in English and Chinese).
108. B. Bialecki, G. Fairweather and A. Karageorghis *Matrix decomposition algorithms for elliptic boundary value problems: a survey*, Numer. Alg., 56(2011), 253–295.
109. G. Fairweather, A. Karageorghis and J. Maack *Compact optimal quadratic spline collocation methods for the Helmholtz equation*, J. Comput. Phys., 230(2011), 2880–2895.
110. R. I. Fernandes and G. Fairweather, *An ADI extrapolated Crank-Nicolson orthogonal spline collocation method for nonlinear reaction-diffusion systems*, J. Comput. Phys. 231(2012), 6248–6267.
111. B. Bialecki, G. Fairweather and J. C. López-Marcos, *The Crank-Nicolson Hermite cubic orthogonal spline collocation method for the heat equation with nonlocal boundary conditions*, Adv. Appl. Math. Mech., 5(2013), 442–460.
112. K. Dui, G. Fairweather and W. Sun, *Matrix decomposition algorithms for arbitrary order  $C^0$  tensor product finite element systems*, J. Comput. Appl. Math., 275 (2015), 162–182.
113. B. Bialecki, G. Fairweather and J. C. López-Marcos, *The extrapolated Crank-Nicolson orthogonal spline collocation method for a quasilinear parabolic problem with nonlocal boundary conditions*, J. Sci. Comput., 62 (2015), 265–283
114. G. Fairweather, H. Zhang, X. Yang and D. Xu, *A backward Euler orthogonal spline collocation method for the time fractional Fokker-Planck equation*, Numer. Methods Partial Differential Equations, DOI: 10.1002/num.21958.
115. G. Fairweather, X. Yang, D. Xu and H. Zhang, *An ADI Crank-Nicolson orthogonal spline collocation method for the two-dimensional fractional diffusion-wave equation*, J. Sci. Comput., DOI: 10.1007/s10915-015-0003-x.

116. M. Khebchareon, A. K. Pani and G. Fairweather, *Alternating direction implicit Galerkin methods for an evolution equation with a positive-type memory term*, J. Sci. Comput., DOI: 10.1007/s10915-015-0004-9.
117. R. I. Fernandes, B. Bialecki and G. Fairweather, *An ADI extrapolated Crank-Nicolson orthogonal spline collocation method for nonlinear reaction-diffusion systems on evolving domains*, J. Comput. Phys., revised.
118. M. Khebchareon, A. K. Pani and G. Fairweather, *Convergence analysis of the Crank-Nicolson orthogonal spline collocation method for linear parabolic problems in two space variables*, submitted.

### ArXiv articles

1. R. I. Fernandes and G. Fairweather, *An ADI extrapolated Crank-Nicolson orthogonal spline collocation method for nonlinear reaction-diffusion systems - a computational study*. Available from: <arXiv:1202.1005>.
2. G. Fairweather, X. Yang, D. Xu and H. Zhang, *An ADI Crank-Nicolson Orthogonal Spline Collocation Method for the Two-Dimensional Fractional Diffusion-Wave Equation*. Available from: <arXiv:1405.3264>.

### Invited Publications

1. B. Moskal and G. Fairweather, *Assessment at the department level: why should mathematics departments assess?*, *Mathematicians and Education Reform Newsletter*, 17(2004) pp. 1, 4–5, 10–11.
2. B. Moskal and G. Fairweather, *Enhancing U.S. undergraduate students' appreciation of research in the mathematical sciences through international collaboration*, *Hong Kong Mathematical Society Newsletter*, 1(2009), pp. 6–10.

### Non-Refereed Articles

1. B. Moskal, S. Strong and G. Fairweather, *First Annual Front Range Undergraduate Mathematics Conferences: lessons learned*, *Rocky Mountain Section of the Mathematical Association of America: Newsletter*, pp. 6–7, Spring 2005.
2. B. Moskal and G. Fairweather, *An international research experience for undergraduates in computational mathematics: a collaboration among Hong Kong universities and the Colorado School of Mines*, *Rocky Mountain Section of the Mathematical Association of America: Newsletter*, pp. 15–16, Fall 2006.

### Papers in Refereed Conference Proceedings

1. G. Fairweather and R. L. Johnston, *The method of fundamental solutions for problems in potential theory*, *Treatment of Integral Equations by Numerical Methods*, C. T. H. Baker and G. F. Miller, editors, Academic Press, London, 1982, pp. 349-359.
2. G. Fairweather and M. Vedha-Nayagam, *On the use of numerical software for solving two-point boundary value problems arising in heat transfer*, *AICHE/ASME 23rd National Heat Transfer Conference*, Denver, Colorado, August 1985.
3. F. Majaess, P. Keast and G. Fairweather, *Packages for solving almost block diagonal linear systems arising in spline collocation at Gaussian points with monomial basis functions*, *Scientific Software Systems*, J. C. Mason and M. G. Cox, editors, Chapman and Hall, London, 1990, pp. 47-58.
4. M. P. Robinson and G. Fairweather, *An orthogonal spline collocation method for the numerical solution of underwater acoustic wave propagation problems*, *Computational Acoustics - Volume 2*, D. Lee, A. R. Robinson and R. Vichnevetsky, editors, Elsevier Science Publishers, Amsterdam, 1993, pp. 339-353.



5. B. Bialecki, X.-C. Cai, M. Dryja and G. Fairweather, *An additive Schwarz algorithm for piecewise Hermite bicubic orthogonal spline collocation*, Domain Decomposition Methods in Science and Engineering (Como, 1992), Contemp. Math., 157, American Mathematical Society, Providence, RI, 1994, pp. 237-244.
6. B. Moskal, G. Fairweather and S. Dallman, *Impacting pre-college education: A partnership between an engineering university and a school of education*, Proceedings of the ASEE Global Colloquium on Engineering Education, Rio de Janeiro, Brazil, October 2006, (6 pages).
7. G. Fairweather and B. M. Moskal, *Research Experience for Undergraduates in Numerical Analysis and Scientific Computing: An International Program*, Proceedings of the Conference on Promoting Undergraduate Research in Mathematics, American Mathematical Society, Providence, Rhode Island, 2007, pp. 207-212.
8. G. Fairweather, A. Karageoghis, Y.-S. Smyrlis and R. Tankelevich, *The application of the method of fundamental solutions in geometric modeling*, Third Asian-Pacific Congress on Computational Mechanics (APCOM'07), Kyoto, Japan, December 2007.
9. B. Bialecki, G. Fairweather, A. Karageorghis and Q. N. Nguyen, *Optimal superconvergent one step quadratic spline collocation methods for Helmholtz equations*, Recent Advances in Computational Science, P. Jorgensen, X. Shen, C-W. Shu and N. Yan, editors, World Scientific, Singapore, 2008, pp. 156-174.
10. R. I. Fernandes, B. Bialecki and G. Fairweather, *Alternating direction implicit orthogonal spline collocation methods for evolution equations*, in Mathematical Modelling and Applications to Industrial Problems (MMIP-2011), M. J. Jacob and S. Panda, editors, Macmillan Publishers India Limited, 2012, pp. 3-11.

#### **Papers in Non-Refereed Conference Proceedings**

1. G. Fairweather and J. P. Johnson, *Richardson extrapolation for parabolic Galerkin methods*, The Mathematical Foundations of the Finite Element Method with Applications to Partial Differential Equations, A. K. Aziz, editor, Academic Press, New York, 1972, pp. 767-768.
2. G. Fairweather, F. J. Rizzo and D. J. Shippy, *Computation of double integrals in the boundary integral equation method*, Advances in Computer Methods for Partial Differential Equations - III, R. S. Stepleman and R. Vichnevetsky, editors, IMACS, 1979, pp. 331-334.
3. R. L. Johnston, G. Fairweather and P. S. Han, *The method of fundamental solutions, an adaptive boundary element method, for problems in potential flow and solid mechanics*, Proc. Fifth ASCE Specialty Conf. Eng. Mech. Div., Laramie, Wyoming, 1984, pp. 500-504.
4. R. L. Johnston, G. Fairweather and A. Karageorghis, *An adaptive indirect boundary element method with applications*, Boundary Elements VIII: Proceedings of the 8th International Conference, Tokyo, Japan, September 1986, Vol. II, edited by M. Tanaka and C. Brebbia, Springer-Verlag, New York, 1987, pp. 587-598.
5. G. Fairweather, *On solving almost block diagonal linear systems arising in two-point boundary value problems*, Actas IX CEDYA, Proceedings of the Ninth Congress on Differential Equations and Applications, Valladolid, Spain, September 1986, pp. 1-22.

6. G. Fairweather, *Packages for solving certain almost block diagonal linear systems*, Proceedings of the Thirteenth South African Symposium on Numerical Mathematics, Umhlanga Rocks, South Africa, July 1987, pp. 107-111.
7. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for plane bi-harmonic problems*, Proceedings of the Thirteenth South African Symposium on Numerical Mathematics, Umhlanga Rocks, South Africa, July 1987, pp. 113-121.
8. G. Fairweather and E. G. Yanik, *Finite element methods for nonlinear parabolic and hyperbolic partial integro-differential equations*, in "Differential Equations and Applications Volume I", Proceedings of the International Conference on Theory and Applications of Differential Equations, Columbus, Ohio, 1988, A. R. Aftabzadeh, editor, Ohio University Press, Athens, Ohio, 1989, pp. 270-276.
9. M. Vedha-Nayagam, B. Agarwal and G. Fairweather, *Diffusion flame over a continuous moving fuel plate in a parallel flow of oxidizer under microgravity*, 1989 Fall Technical Meeting, The Eastern Section of The Combustion Institute, Albany, New York, October 1989, pp. 68-1-68-4.
10. G. Fairweather, *Galerkin and collocation methods for partial integro-differential equations*, Integral Equations and Inverse Problems, V. Petkov and R. Lazarov, editors, Proceedings of the Bulgarian Academy of Sciences International Conference on Integral Equations and Inverse Problems, Varna, Bulgaria, September 1989, Pitman Research Notes in Mathematics Series 235, Longman Scientific & Technical, Harlow, Essex, England, 1991, pp. 76-85.
11. D. J. Shippy, P. S. Kondapalli and G. Fairweather *Some boundary methods for analysis of elastic-wave propagation*, Advances in Boundary Element Techniques, J. H. Kane, G. Maier, N. Tosaka and S. N. Atluri, editors, Proceedings of the 1991 International Conference on Computing in Engineering Science, Melbourne, Australia, August 1991, Springer-Verlag, Berlin, 1993, pp. 391-406.
12. G. Fairweather, K. R. Bennett and B. Bialecki, *Parallel matrix decomposition algorithms for separable elliptic boundary value problems*, Computational Techniques and Applications: CTAC-91, Proceedings of the 1991 International Conference on Computational Techniques and Applications, Adelaide, South Australia, July 1991, B. J. Noye, B. R. Benjamin and L. H. Colgan, editors, Computational Mathematics Group, Australian Mathematical Society, 1992, pp. 63-74.
13. G. Fairweather and J. C. Lopez-Marcos, *Finite element methods for a nonlocal semilinear parabolic problem arising in thermoelasticity*, 14th IMACS World Congress on Computational and Applied Mathematics, Atlanta, Georgia, 1994, Vol. 3, pp. 1241-1245.
14. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for elliptic boundary value problems*, Fundamental Solutions in Boundary Elements, F. G. Benitez, editor, University of Sevilla, Spain, 1997, pp. 13-26.
15. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric problems*, Boundary Element Technology XIII, C. S. Chen, C. A. Brebbia and D. W. Pepper, editors, WIT Press, Southampton, 1999, pp. 387-396.

16. M. Khebchareon and G. Fairweather, *An ADI Crank-Nicolson finite element Galerkin method for Schrödinger systems*, Collected Papers, International Workshop and Conference on Analysis and Applications, May 2000, Chiang Mai University, Thailand, pp. 59–65.
17. A. Karageorghis, G. Fairweather and P. A. Martin, *Recent advances in the method of fundamental solutions*, Advances in Meshfree and X-FEM Methods, G. R. Liu, editor, World Scientific, Singapore, 2002, pp. 17–22.

### Technical Reports

1. G. Fairweather, *Galerkin methods for differential equations*, Report WISK 96, Council for Scientific and Industrial Research, Pretoria, South Africa, March 1972.
2. G. Fairweather, *Galerkin methods for differential equations - second edition*, Report WISK 111, Council for Scientific and Industrial Research, Pretoria, South Africa, January 1973.
3. J. E. Dendy and G. Fairweather, *Alternating direction Galerkin methods for parabolic and hyperbolic problems on rectangular polygons*, Report LA-5534-MS, Los Alamos Scientific Laboratory, Los Alamos, New Mexico, February 1974.
4. G. Fairweather and P. Keast, *A comparison of non-adaptive Romberg quadrature routines*, Technical Report 96, Department of Computer Science, University of Toronto, July 1976.
5. G. Fairweather, *A note on the efficient implementation of certain Padé methods for linear parabolic problems*, Report WISK 252, Council for Scientific and Industrial Research, Pretoria, South Africa, March 1977.
6. G. Fairweather, *Notes on Galerkin, collocation and collocation-Galerkin methods for linear two-point boundary value problems*, Report WISK 247, Council for Scientific and Industrial Research, Pretoria, South Africa, July 1977.
7. G. Fairweather and I. M. Navon, *A linear alternating direction implicit (ADI) method for solving the shallow water equations*, Report WISK 269, Council for Scientific and Industrial Research, Pretoria, South Africa, August 1977.
8. J. C. Diaz, G. Fairweather and P. Keast, *FORTTRAN packages for solving certain almost block diagonal linear systems by modified alternate row and column elimination*, Technical Report 148/81, Department of Computer Science, University of Toronto, January 1981.
9. P. Keast, G. Fairweather and J. C. Diaz, *A comparative study of finite element methods for the solution of second order linear two-point boundary value problems*, Technical Report 150/81, Department of Computer Science, University of Toronto, March 1981.
10. G. Fairweather and P. Keast, *ROWCOL - a package for solving almost block diagonal linear systems arising in  $H^{-1}$ -Galerkin and collocation- $H^{-1}$ -Galerkin methods*, Technical Report 158/82, Department of Computer Science, University of Toronto, July 1982.
11. P. Keast and G. Fairweather, *NATO Advanced Research Workshop, Numerical Integration: Recent Developments, Software and Applications*, Dalhousie University, August 11-15, 1986, Abstracts of Invited and Contributed Papers, Technical Report 1986CS-3, Computing Science Division, Dalhousie University, Halifax, Nova Scotia.

12. A. Karageorghis and G. Fairweather, *The Almansi method of fundamental solutions for solving biharmonic problems*, Research Report ABERNA 10, Department of Mathematics, The University College of Wales, Aberystwyth, Wales, March 1987.
13. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for the solution of non-linear plane potential problems*, Research Report ABERNA 15, Department of Mathematics, The University College of Wales, Aberystwyth, Wales, September 1987.
14. A. Karageorghis and G. Fairweather, *The simple layer potential method of fundamental solutions for certain biharmonic problems*, Research Report ABERNA 23, Department of Mathematics, The University College of Wales, Aberystwyth, Wales, July 1988.
15. G. Fairweather, *NSF-CBMS Regional Conference, Mathematical Foundations of the Boundary Element Method, May 9-13, 1988, Abstracts of Principal Lectures, Invited and Contributed Papers*, Technical Report CCS-88-1, Center for Computational Sciences, University of Kentucky, June 1988.
16. W. L. Seward, P. Kasibhatla and G. Fairweather, *On the numerical solution of a model air pollution problem with nonsmooth initial data*, Technical Report CCS-89-2, Center for Computational Sciences, University of Kentucky, September 1989.
17. G. Fairweather and R. D. Saylor, *The reformulation and numerical solution of certain non-classical initial-boundary value problems*, Technical Report CCS-89-3, Center for Computational Sciences, University of Kentucky, October 1989.
18. M. P. Robinson and G. Fairweather, *On the use of the NAG code D02NNF in the numerical solution of the cubic Schrödinger equation in one space variable*, Technical Report CCS-89-4, Center for Computational Sciences, University of Kentucky, December 1989.
19. F. Majaess, P. Keast, G. Fairweather and K. R. Bennett, *Fortran packages for the solution of almost block diagonal linear systems arising in spline collocation at Gaussian points with monomial basis functions*, Technical Report CCS-90-3, Center for Computational Sciences, University of Kentucky, June 1990.
20. B. Bialecki and G. Fairweather, *Matrix decomposition algorithms for separable elliptic boundary value problems in two space dimensions*, Technical Report CCS-90-4, Center for Computational Sciences, University of Kentucky, June 1990.
21. P. S. Kondapalli, D. J. Shippy and G. Fairweather *The method of fundamental solutions for scattering and transmission of waves in fluids and solids*, Technical Report CCS-90-5, Center for Computational Sciences, University of Kentucky, October 1990.
22. K. R. Bennett and G. Fairweather, *PCOLNEW: A parallel boundary-value ODE code for shared-memory machines*, Technical Report CCS-90-8, Center for Computational Sciences, University of Kentucky, November 1990.
23. G. Fairweather, *Spline collocation methods for a class of hyperbolic partial integro-differential differential equations*, Technical Report CCS-92-1, Center for Computational Sciences, University of Kentucky, August 1992.

24. M. P. Robinson and G. Fairweather, *Orthogonal spline collocation methods for Schrödinger - type equations in one space variable*, Technical Report CCS-92-2, Center for Computational Sciences, University of Kentucky, December 1992.
25. T. F. Chan, G. Fairweather and J. P. Shao, *First-order system least squares methods for convection-diffusion equations on unstructured meshes*, UCLA Computational and Applied Mathematics Report 94-31, October 1994.
26. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for elliptic boundary value problems*, Technical Report TR/12/1997, Department of Mathematics and Statistics, University of Cyprus.
27. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric potential problems*, Technical Report TR/1/1998, Department of Mathematics and Statistics, University of Cyprus.
28. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric acoustic scattering and radiation problems*, Technical Report TR/2/1998, Department of Mathematics and Statistics, University of Cyprus.
29. A. Karageorghis and G. Fairweather, *The method of fundamental solutions for axisymmetric elasticity problems*, Technical Report TR/3/1999, Department of Mathematics and Statistics, University of Cyprus.
30. B. Li, G. Fairweather and B. Bialecki, *Discrete-time orthogonal spline collocation methods for vibration problems*, Technical Report 00-05, Department of Mathematical and Computer Sciences, Colorado School of Mines, 2000.
31. G. Fairweather, A. Karageorghis and B. Bialecki, *Matrix decomposition algorithms for modified cubic spline collocation for separable elliptic boundary value problems. I. Poisson and Helmholtz problems*, Technical Report TR/01/2000, Department of Mathematics and Statistics, University of Cyprus, revised 2001.
32. G. Fairweather, A. Karageorghis and P. A. Martin, *The method of fundamental solutions for scattering and radiation problems*, Technical Report TR/04/2002, Department of Mathematics and Statistics, University of Cyprus, 2002.
33. B. Bialecki, G. Fairweather and A. Karageorghis, *Optimal superconvergent one step nodal cubic spline collocation methods*, Technical Report TR/04/2004, Department of Mathematics and Statistics, University of Cyprus.
34. R. Tankelevich, G. Fairweather, A. Karageorghis and Y.-S. Smyrlis, *Potential field based geometric modeling using the method of fundamental solutions*, Technical Report TR/14/2005, Department of Mathematics and Statistics, University of Cyprus.
35. B. Bialecki, G. Fairweather, A. Karageorghis and Q. N. Nguyen, *On the formulation and implementation of optimal superconvergent one step quadratic spline collocation methods for elliptic problems*, Technical Report TR/18/2007, Department of Mathematics and Statistics, University of Cyprus.

36. G. Fairweather, A. Karageorghis and J. Maack, *Compact optimal quadratic spline collocation methods for Poisson and Helmholtz problems: formulation and numerical verification*, Technical Report TR/03/2010, Department of Mathematics and Statistics, University of Cyprus.

## BOOK REVIEWS

1. R. T. Gregory and D. L. Karney, *A Collection of Matrices for Testing Computational Algorithms*, Wiley-Interscience, 1969, (Math. Rev., 40(1970), 6752).
2. W. F. Ames, *Numerical Methods for Partial Differential Equations*, Barnes and Noble, 1969, (Math. Rev., 41(1971), 7828).
3. D. Greenspan, *Introduction to Numerical Analysis*, Markham Publishing Company, 1971, (Math. Rev., 42(1971), 7028).
4. W. F. Ames, *Numerical Methods for Partial Differential Equations, Second Edition*, Academic Press, 1977, (Math. Rev., 58(1979), 24826).
5. T. Meis and U. Marcowitz, *Numerical Solution of Partial Differential Equations*, Springer-Verlag, New York, 1981, (Math. Comp., 40(1983), 718-720).
6. L. Lapidus and G. F. Pinder, *Numerical Solution of Partial Differential Equations in Science and Engineering*, Wiley, New York, 1982, (American Scientist, 72(1984), 524-525).
7. D. B. Ingham and M. A. Kelmanson, *Boundary Integral Equation Analysis of Singular, Potential and Biharmonic Problems*, Lecture Notes in Engineering 7, Springer-Verlag, New York, 1984, (Math. Comp., 47(1986), 751-752).
8. C. A. Brebbia, *Topics in Boundary Element Research, Volume 1: Basic Principles and Applications*, Springer-Verlag, New York, 1984, (Math. Comp., 48(1987), 835-838).

## INVITED CONFERENCE LECTURES

*SIAM Fall Meeting*, Cincinnati, Ohio, October 1981.

*LMS Symposium on the Numerical Solution of Integral Equations*, Durham, England, July 1982, (with R. L. Johnston).

*Society of Engineering Science, 19th Annual Meeting*, Rolla, Missouri, October 1982, (with R. L. Johnston).

*Fifth ASCE-EMD Specialty Conference*, Laramie, Wyoming, August 1984, (with R. L. Johnston and P. S. Han).

*Canadian Applied Mathematics Society Annual Meeting*, Halifax, Nova Scotia, Canada, May 1985.

*1986 ASCE Spring Convention*, Seattle, Washington, April 1986, (with R. L. Johnston).

*Joint Meetings of the Iowa Sections of MAA, SIAM, ASA*, Iowa City, Iowa, April 1986.

*9th CEDYA, Spanish Conference on Differential Equations and Their Numerical Solution*, Valladolid, Spain, September 1986.

*Thirteenth South African Symposium on Numerical Mathematics*, Umhlanga Rocks, South Africa, July 1987.

*Canadian Applied Mathematics Society Annual Meeting*, Winnipeg, Manitoba, Canada, June 1989.

*Australian Mathematical Society, 33rd Annual Meeting*, Macquarie University, Sydney, Australia, July 1989.

*Canadian Mathematical Society Winter Meeting*, Montreal, Canada, December 1989.

*Stefan Banach Mathematical Center - XXXVII Semester, Numerical Analysis and Mathematical Modeling*, Warsaw, Poland, May 1991.

*CTAC 91, International Conference on Computational Techniques and Applications*, Adelaide, Australia, July 1991.

*Special Session on Numerical Solution for Integro-Differential Equations*, Joint Mathematics Meetings, San Francisco, January 1995.

*ICPAM '95, International Conference on Pure and Applied Mathematics*, Bahrain, November 1995.

*MAFELAP 1996, Ninth Conference on the Mathematics of Finite Element Methods and Applications*, Brunel University, England, June 1996.

*Regional Seminar on Computational Methods and Simulation in Engineering - CMSE'97*, Bandung, Indonesia, September, 1997.

*Workshop on Scientific Computing and Applications*, City University, Hong Kong, December 1998.

*BETECH'99, Thirteenth International Conference on Boundary Element Technology*, Las Vegas, Nevada, June 1999.

*ICIAM'99, 4th International Congress on Industrial and Applied Mathematics*, Edinburgh, Scotland, July 1999.

*5th National Congress on Computational Mechanics*, University of Colorado, Boulder, August 1999.

*International Workshop and Conference in Analysis and Applications*, Chiang Mai University, Chiang Mai, Thailand, May 2000. Presented short course and plenary address.

*Second International Workshop on Scientific Computing and Applications*, Kananaskis, Alberta, Canada, May 2000.

*Second Southern Conference on Computing*, University of Southern Mississippi, October 2000.

*First International Conference on Industrial and Applied Mathematics in Indian Sub-continent and Vth Annual Conference of ISIAM*, Amritsar, India, January 2001.

*Special Session on Finite Element Analysis and Applications*, American Mathematical Society, Spring Western Section Meeting, Las Vegas, Nevada, April 2001.

*CTAC-2001, International Conference on Computational Techniques and Applications*, Brisbane, Australia, July 2001.

*Workshop on Scientific Computing*, Chinese University of Hong Kong, December 2001.

*International Conference on Abstract and Applied Analysis*, Hanoi, Vietnam, August 2002.

*Atlantic Provinces Council on the Sciences, APICS Mathematics/Statistics/Computer Science Conference*, Mount Allison University, Sackville, New Brunswick, October 2002.

*Mathematics of Computation and Approximation, Conference in Honour of the 65th Birthday of Professor Ian Sloan*, University of New South Wales, Sydney, Australia, July 2003.

*Annual Conference of the Mathematical Society of Thailand*, Chiang Mai University, Chiang Mai, Thailand, May 2004.

*International Workshop on Computational Science and Its Education*, Capital Normal University, Beijing, China, August 2005.

*Fifth International Conference on Scientific Computing and Applications*, Banff, Canada, May 2006.

*The 2nd International Conference on Structured Matrices*, Hong Kong Baptist University, Hong Kong, June 2006.

*2006 Korea–USA Forum for Attracting Gifted/Talented Students into Science and Engineering*, Seoul, Korea, June 2006.

*ASEE Global Colloquium on Engineering Education, Engineering Education in the Americas and Beyond*, Rio de Janeiro, Brazil, October 2006.

*Canadian Applied and Industrial Mathematics Society Annual Meeting*, Banff, Canada, May 2007.

Plenary speaker, *MFS 2007: Workshop on the Method of Fundamental Solutions*, Ayia Napa, Cyprus, June 2007.

*International Conference on Spectral and High Order Methods (ICOSAHOM07)*, Beijing, China, June 2007.

*Third Asian-Pacific Congress on Computational Mechanics (APCOM'07)*, Kyoto, Japan, December 2007, (with R. Tankelevich).

*International Conference on Applied Mathematics: Modeling, Analysis and Computation*, City University of Hong Kong, June 2008.

*SIAM National Meeting*, San Diego, CA, July 2008, (with B. Moskal).

*International Conference on Engineering and Computational Mathematics (ECM2009)*, The Hong Kong Polytechnic University, May 2009, (with J. Maack).

Plenary speaker, *Third International Conference on Science and Mathematics Education in Developing Countries*, Phnom Pehn, Cambodia, March 2010, (with J. Dinh and B. Moskal).

*Nonstandard Discretizations for Fluid Flows*, Banff International Research Station (BIRS), Banff, Canada, November 2010, (with A. Karageorghis).

Plenary speaker, *Fourth International Conference on Science and Mathematics Education in Developing Countries*, Phnom Pehn, Cambodia, February 2011.

Plenary speaker, *International Conference on Mathematical Modelling and Applications to Industrial Problems*, Calicut, India, March 2011, (with R. I. Fernandes and B. Bialecki).



*Special Session on Recent Advances in Finite Element Methods*, American Mathematical Society, Spring Western Section Meeting, University of Nevada, Las Vegas, April 30-May 1, 2011, (with R. I. Fernandes).

Plenary speaker, *Fifth International Conference on Science and Mathematics Education in Developing Countries*, Phnom Pehn, Cambodia, March 2012.

Plenary speaker, *The Eighth International Conference on Scientific Computing and Applications*, University of Nevada, Las Vegas, April 1–4, 2012.

*2nd Workshop on Computational Mathematics*, Department of Applied Mathematics, The Hong Kong Polytechnic University, Hong Kong, May 25–26, 2012, (with R. I. Fernandes).

*International Conference on Applied Mathematics 2012: Modeling, Analysis & Computation*, City University of Hong Kong, Hong Kong, May 28 – June 1, 2012, (with A. Karageorghis).

*Lloyd G. Roeling Mathematics Conference*, University of Louisiana Lafayette, November 2–4, 2012, (with K. Du and W. Sun).

*MAA Texas Section Annual Meeting*, Texas Tech University, April 12–13, 2013.

Plenary speaker, *Sixth International Conference on Science and Mathematics Education in Developing Countries*, Mandalay, Myanmar, November 1–2, 2013.

*The Second International Conference on Engineering and Computational Mathematics (ECM2013)*, The Hong Kong Polytechnic University, 16–18 December 2013.

Plenary speaker, *Seventh International Conference on Science and Mathematics Education in Developing Countries*, Mandalay, Myanmar, November 7–9, 2014.

*Recent Advances in Computational Mathematics & Applications*, Tsinghua Sanya International Mathematics Forum (TSIMF), Sanya, China, December 8–12, 2014

## **PROFESSIONAL ACTIVITIES**

Chartered Mathematician, United Kingdom.

Chartered Scientist, United Kingdom.

## **Membership of Professional Societies**

Fellow of the Institute of Mathematics and its Applications

American Mathematical Society (Life Member)

American Society for Engineering Education

Canadian Applied and Industrial Mathematics Society (Life Member)

European Mathematical Society

Mathematical Association of America

Society for Industrial and Applied Mathematics (Life Member)

South African Mathematical Society

## **Conference Organization**

Member, Organizing Committee, The Southeast Asian Conference of Mathematical Education and Mathematics, Hong Kong, August 2016.

Member and Past Co-Chair, International Program Committee, *8th International Conference on Science and Mathematics Education in Developing Countries*, Yangon University, Yangon, Myanmar, November 7-9, 2015.

Member, Scientific Committee, The Joint International Conference on Trefftz Method VII and Method of Fundamental Solutions III, Hangzhou, China, October 11-13, 2015.

Co-Chair, International Program Committee, *7th International Conference on Science and Mathematics Education in Developing Countries*, University of Mandalay, Mandalay, Myanmar, November 7-9, 2014.

Member, Scientific Committee, *The Ninth International Conference on Scientific Computing and Applications*, Xi'an, China, June 12-16, 2014.

Co-Chair, International Program Committee, *6th International Conference on Science and Mathematics Education in Developing Countries*, University of Mandalay, Mandalay, Myanmar, November 1-3, 2013.

Special Session organizer, *International Conference on Applied Mathematics 2012: Modeling, Analysis & Computation*, City University of Hong Kong, Hong Kong, May 28-June 1, 2012.

Member, Scientific Committee, *The Eighth International Conference on Scientific Computing and Applications*, University of Nevada, Las Vegas, April 1-4, 2012.

Chair, International Program Committee, *5th International Conference on Science and Mathematics Education in Developing Countries*, Phnom Penh, Cambodia, March 1-3, 2012.

Member, International Program Committee, *4th International Conference on Science and Mathematics Education in Developing Countries*, Phnom Penh, Cambodia, February 23-25, 2011.

Member, International Program Committee, *3rd International Conference on Science and Mathematics Education in Developing Countries*, Phnom Penh, Cambodia, March 2-5, 2010.

Minisymposium organizer, ICIAM 2003, *5th International Conference on Industrial and Applied Mathematics*, Sydney, Australia, 7-11 July, 2003.

Member, Technical Committee, *WOPLA '03: Workshop on Parallel Linear Algebra*, June 2-4, 2003, Melbourne, Australia.

Member, Scientific Committee, *Third International Workshop on Scientific Computing and Applications*, City University, Hong Kong, January 6-9, 2003.

Member, Scientific Committee, *International Conference on Abstract and Applied Analysis 2002*, August 13-17, 2002, Hanoi, Vietnam.

Co-Director, *NSF-CBMS Regional Conference on Numerical Methods in Forward and Inverse Electromagnetic Scattering*, Colorado School of Mines, Golden, Colorado, June 3-7, 2002. Principal lecturer: Peter B. Monk

Minisymposium organizer, *ICIAM'99, 4th International Congress on Industrial and Applied Mathematics*, Edinburgh, Scotland, July 1999.

Member, International Scientific Advisory Committee, *Thirteenth International Conference on Boundary Element Technology BETECH '99*, University of Nevada, Las Vegas, June 8-10, 1999.

Member, Organizing Committee, *Fourth SIAM/INRIA International Conference on Mathematical and Numerical Aspects of Wave Propagation*, Colorado School of Mines, Golden, Colorado, June 1-5, 1998.

Co-Director, *NSF-CBMS Regional Conference on Numerical Analysis of Hamiltonian Differential Equations*, Colorado School of Mines, Golden, Colorado, June 2-6, 1997. Principal lecturer: J. M. Sanz-Serna.

Director, *Workshop on the Method of Lines for Time-Dependent Problems*, University of Kentucky, Lexington, Kentucky, May 31-June 3, 1995.

Director, *Mini-Conference on Domain Decomposition Methods*, University of Kentucky, Lexington, Kentucky, November 15-16, 1991.

Director, *NSF-CBMS Regional Conference on Mathematical Foundations of the Boundary Element Method*, University of Kentucky, Lexington, Kentucky, May 9-13, 1988. Principal lecturer: Wolfgang L. Wendland.

Co-Director, *NATO Advanced Research Workshop: Numerical Integration, Recent Developments, Software and Applications*, Dalhousie University, Halifax, Nova Scotia, August 11-15, 1986.

Member of Conference Committee and Session Organizer, *Fourth IMACS International Symposium on Computer Methods for Partial Differential Equations*, Lehigh University, Bethlehem, Pennsylvania, July 1981.

### **Other Professional Activities**

Member of the Numerical Analysis Study Group, MAA Committee on the Undergraduate Programs in Mathematics (CUPM), 2015 Curriculum Guide.

Member of external review committee for Department of Mathematics:

Iowa State University, March 1988.

Southern Methodist University, January 2005

University of Nevada, Las Vegas, April 2005

Southern Mississippi University, November 2006

University of Texas at Arlington, April 2007