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EDUCATION

<i>Ph.D., Physics</i>	Queen Mary College, London	May 1983
<i>M.Sc., Astrophysics¹</i>	Queen Mary College, London	July 1979
<i>B.A., Mathematics</i>	Jesus College, University of Cambridge	June 1976

PROFESSIONAL EXPERIENCE

<i>Professor</i>	Cardiff University	1996 – present
<i>Director</i>	Welsh e-Science Centre	2001 – 2010
<i>Senior Scientist</i>	Oak Ridge National Laboratory	1995 – 1996
<i>Research Scientist</i>	Oak Ridge National Laboratory	1990 – 1995
<i>Associate Professor</i>	University of South Carolina	1988 – 1990
<i>Staff Scientist</i>	California Institute of Technology	1986 – 1988
<i>Post-Doctoral Research Associate</i>	Queen Mary College, London	1982 – 1986

ADJUNCT/VISITING POSITIONS

<i>Adjunct Professor</i>	Dept. Computer Science, Univ. of Tennessee	2000–2002
<i>Consultant</i>	Jet Propulsion Laboratory	1983–1984

PROFESSIONAL ACTIVITIES

Editorships:

- Co-editor of *Concurrency and Computation: Practice and Experience*
- Principal editor of the journal *Computer Physics Communications*

Editorial Board Membership:

- The International Journal of High Performance Computing Applications
- Journal of Computational Science

Guest Editorships:

- Special theme issue on e-Science: Novel Research, New Science, and Enduring Impact of the *Philosophical Transactions of the Royal Society A*, August 2011.
- Special Issue on Dynamic Computational Workflows: Discovery, Optimization, and Scheduling of *Scientific Programming*, Vol. 15, No. 4, 2007.
- Special Issue on e-Science Applications and Infrastructure of *Concurrency and Computation: Practice and Experience*, Vol. 19, No. 2, February 2007.
- Special issue on Complex Problem-Solving Environments for Grid Computing of *Future Generation Computer Systems*, Vol. 21, No. 6, June 2005.
- Special issue on Grid Computing: Infrastructure and Applications of *The International Journal of High Performance Computing Applications*, Vol. 17, No. 3, August 2003.
- Special issue on Message Passing of *Parallel Computing*, April 1994.

¹ Awarded with Distinction

Conference Chairmanship:

- [UK e-Science All Hands Meeting](#) (AHM 2010), held in Cardiff, UK, 13-16 September 2010
- [First International Conference on Networking and Distributed Computing](#) (ICNDC 2010), held in Hangzhou, P. R. of China, 21-24 October 2010 (general co-chair).
- [Workflow Optimisation in Distributed Environments](#), a workshop held in Edinburgh, UK, 19-20 October 2006.
- [Fifth IEEE International Symposium on Cluster Computing and the Grid](#) (CCGrid2005), held in Cardiff, UK, 9-12 May 2005.
- [Complex Problem-Solving Environments for Grid Computing](#), a workshop at the International Conference on Computational Science (ICCS2003), held in Melbourne Australia, 2-4 June 2003.
- [Agent-Based High Performance Computing](#), a workshop at Autonomous Agents '99, held in Seattle, WA, 1 May 1999.
- 1999 European Research Conference on [Advanced Environments and Tools for High Performance Computing](#), June 1999.
- First [UK Workshop on Java for High Performance Network Computing](#), held in Southampton, 2-3 September 1998.
- 1992 Gordon Research Conference on Software Tools and Libraries for Concurrent Supercomputers.

Conference Program Chairmanship:

- [The 16th IEEE International Symposium on High Performance Distributed Computing](#) (HPDC16), held in Monterey, USA, June 27-29, 2007 (co-chair with Jack Dongarra).
- [UK e-Science Programme All-Hands Meeting 2005](#), held in Nottingham, UK, 20-22 September 2005.
- [UK e-Science Programme All-Hands Meeting 2004](#), held in Nottingham, UK, 1-3 September 2004.
- The [International Conference for High Performance Computing and Communications 2004](#) (SC04) (chair of Applications area)
- [International Parallel and Distributed Processing Symposium](#) 2003 (chair of Applications area)
- [EuroPar 2001](#) (chair of Problem-Solving Environments topic)
- 1994 Scalable High Performance Computing Conference, held in Knoxville, TN, 23-25 May 1994.
- Fifth Distributed Memory Computing Conference, held in Charleston, South Carolina, 9-12 April 1990 (co-chair with Professor Quentin Stout).

Conference Program Committee Membership:

- [Seventh Workshop on Workflows in Support of Large-Scale Science](#) (WORKS 2012), to be held in SaltLake City, USA, 12 November 2102.
- [Fifth IEEE International Conference on Utility and Cloud Computing](#) (UCC 2012), to be held in Chicago, USA, 5-8 November 2012.
- [International Conference on Computational Science](#) (ICCS 2012), held in Omaha, USA, 4-6 June 2012.
- [Fourth IEEE International Conference on Utility and Cloud Computing](#) (UCC 2011), held in Melbourne, Australia, 5-8 December 2011. Member of Tutorials Committee.
- [Seventh IEEE International Conference on e-Science](#) (e-Science 2011), held in Stockholm, Sweden, 5-8 December 2011.
- [International Conference for High Performance Computing, Networking, Storage, and Analysis](#) (SC 2011), to be held in Seattle, USA, 12-18 November 2011.
- [UK e-Science Programme All-Hands Meeting 2011](#) (AHM 2011), held in York, UK, 26-29 September 2011.
- [Second International Workshop on Frontiers of GPU Computing](#) (FGC 2011), held in Dalian, China, 24-26 August 2011.
- [International Conference on Computational Science 2011](#) (ICCS 2011), held in Nanyang Technological University, Singapore, 1- 3 June 2011.
- [Sixth IEEE International Conference on e-Science](#) (e-Science 2010), held in Brisbane, Australia, 7-10 December 2010.

- [International Conference for High Performance Computing, Networking, Storage, and Analysis \(SC 2010\)](#), held in New Orleans, USA, 13-19 November 2010.
- [Eleventh ACM/IEEE International Conference on Grid Computing \(Grid 2010\)](#), held in Brussels, Belgium, 25-29 October 2010.
- [International Conference on Computational Science 2010 \(ICCS 2010\)](#), held in Amsterdam, The Netherlands, 31 May- 2 June 2010.
- [Frontiers of GPU, Multi- and Many-Core Systems Workshop](#), held in conjunction with CCGrid 2010 in Melbourne, Australia, 17-20 May 2010.
- [Tenth IEEE/ACM International Symposium on Cluster Computing and the Grid \(CCGrid2010\)](#), held in Melbourne, Australia, 17-20 May 2010.
- [International Conference on High Performance Computing 2009 \(HiPC2009\)](#), held 16-19 December 2009, in Kochi, India.
- [UK e-Science Programme All-Hands Meeting 2009 \(AHM2009\)](#), held in Oxford, UK, 7-9 December 2009.
- [Fifth IEEE International Conference on e-Science \(e-Science 2009\)](#), held in Oxford, UK, 7-9 December 2009.
- [International Conference for High Performance Computing, Networking, Storage and Analysis 2009 \(SC09\)](#) (member of Program and Posters committees), held 14-20 November 2009, in Portland, Oregon, USA.
- [Fourth Workshop on Workflows in Support of Large-Scale Science \(WORKS09\)](#), held in conjunction with SC09 in Portland, Oregon, 16 November 2009.
- [Eleventh International Symposium on Stabilization, Safety, and Security of Distributed Systems 2009 \(SSS2009\)](#), Autonomic Computational Science track, held 3-6 November 2009, in Lyon, France.
- [Tenth ACM/IEEE International Conference on Grid Computing \(Grid 2009\)](#), held in Banff, Canada, 13-15 October 2009.
- [Cluster 2009](#), held in New Orleans, USA, 31 August-4 September 2009.
- [Eleventh International Workshop on Java and Components for Parallelism, Distribution and Concurrency 2009 \(IWJPC2009\)](#), held in conjunction with the International Parallel and Distributed Processing Symposium, 25-29 May 2009, in Rome, Italy.
- [International Conference on Computational Science 2009 \(ICCS 2009\)](#), held 25-27 May 2009, in Baton Rouge, Louisiana, USA.
- [First International Workshop on Data Grids for eScience 2009 \(DaGreS09\)](#), held in conjunction with the 2009 ACM International Conference on Computing Frontiers, 18-20 May 2009, in Ischia, Italy.
- [Third International Conference on Information Systems, Technology and Management \(ICISTM2009\)](#), held in Delhi, India, 12-13 March 2009.
- [Fourth IEEE International Conference on e-Science \(eScience 2008\)](#), held in Indianapolis, USA, 7-12 December 2008.
- [First International Workshop on High Performance Data Grids \(HPDataGrid2008\)](#), held in Dunedin, New Zealand, 1-4 December 2008.
- [Third Workshop on Workflows in Support of Large-Scale Science \(Works2008\)](#), held in Austin, USA, 17 November 2008.
- [International Conference for High Performance Computing, Networking, Storage and Analysis 2008 \(SC08\)](#) (member of Posters Committee), held in Austin, Texas, 15-20 November 2008.
- [Ninth IEEE/ACM International Conference on Grid Computing \(Grid2008\)](#), held in Tsukuba, Japan, 29 September-1 October 2008.
- [UK e-Science Programme All-Hands Meeting 2008 \(AHM2008\)](#), held in Edinburgh, UK, 8-11 September 2008.
- [11th IEEE International Conference on Computational Science and Engineering \(CSE08\)](#), held in Sao Paulo, Brazil, 16-18 July 2008.
- [International Conference on Computational Science 2008 \(ICCS2008\)](#), held in Krakow, Poland, June 23-25, 2008.
- [International Parallel and Distributed Processing Symposium 2008 \(IPDPS 2008\)](#), held in Miami, USA, 14-18 April 2008.
- [Third IEEE Conference on e-Science and Grid Computing \(eScience 2007\)](#), held in Bangalore, India, 10-13 December 2007.

- [Second Workshop Workflows in Support of Large-Scale Science](#) (WORKS07), held in Monterey Bay, USA, June 27-29 2007.
- [International Conference on Computational Science 2007](#) (ICCS 2007), held in Beijing, P. R. of China, 27-30 May 2007.
- [Second IEEE International Conference on e-Science and Grid Computing](#) (eScience2006), held in Amsterdam, The Netherlands, December 4 - 6, 2006.
- [First International Symposium on Grid Computing, High-Performance and Distributed Applications](#) (GADA2006), held 29 Oct-3 Nov 2006 in Montpellier, France
- [Fifth International Conference on Grid and Cooperative Computing](#) (GCC2006), held in Changsha, China, 21-23 October 2006.
- [Seventh IEEE/ACM International Conference on Grid Computing](#) (Grid2006), held in Barcelona, September 28th-29th 2006
- [IEEE International Conference on Cluster Computing](#) (Cluster2006), held in Barcelona, Spain, 25-28 September 2006.
- [8th International Workshop on Java for Parallel and Distributed Computing](#), held in Rhodes, Greece, 25 April 2006.
- [First IEEE International Conference on e-Science and Grid Technologies](#) (eScience2005), held in Melbourne, Australia, 5-8 December 2005.
- [Fourth International Conference on Grid and Cooperative Computing](#) (GCC2005) held in Beijing, China, 30 November – 3 December 2005.
- [Sixth IEEE/ACM International Workshop on Grid Computing](#) (Grid 2005), held in Seattle, USA, 13-14 November 2005.
- [Second International Workshop on Grid Computing and its Application to Data Analysis](#) (GADA'05), held in Agia Napa, Cyprus, 1 November 2005.
- [First International Conference on e-Social Science](#), held in Manchester, UK, 22-24 June 2005.
- [Seventh International Workshop on Java for Parallel and Distributed Computing](#), held 4 April 2005, in Denver, USA.
- [Fifth IEEE/ACM International Workshop on Grid Computing](#) (Grid 2004), held in Pittsburgh, USA, 8 November 2004.
- [First International Workshop on Grid Computing and its Application to Data Analysis](#) (GADA'04), to be held in Larnaca, Cyprus, 25-29 October 2004.
- [Third International Conference on Grid and Cooperative Computing](#), to be held in Wuhan, PR of China, 21-23 October 2004.
- [The 2004 IEEE International Conference on Cluster Computing](#) (Cluster 2004), to be held in San Diego, USA, 20-23 September 2004.
- [EuroPar 2004](#), to be held in Pisa, Italy, 31 August – 3 September 2004 (vice-chair of Applications area).
- [Workshop on Component Models and Systems for Grid Applications](#), to be held in St. Malo, France, 26 June 2004.
- [Sixth International Workshop on Java for Parallel and Distributed Computing](#), held 26 April 2004, in Santa Fe, USA.
- [Fourth IEEE/ACM International Symposium on Cluster Computing and the Grid](#), held 19-22 April 2004, in Chicago, USA.
- [IASTED International Conference on Parallel and Distributed Computing and Networks](#) (PDCN 2004), held 17-19 February 2004, in Innsbruck, Austria.
- [Second European Across Grids Conference](#) (AxGrids04), held 28-30 January 2004, in Nicosia, Cyprus.
- [The 2003 IEEE International Conference on Cluster Computing](#) (Cluster 2003), held 1-4 December 2003, in Hong Kong.
- [Second International Symposium on Parallel and Distributed Computing](#) (ISPDC2003), held 13-14 October 2003, in Ljubljana, Slovenia.
- UK e-Science Programme All Hands Meeting 2003, held 1-3 September 2003, in Nottingham, UK.
- [Advanced Research Workshop on Concurrent Information Processing and Computing](#), held 5-10 July 2003, in Sinaia, Romania.
- [Third International Workshop on Agent-Based Cluster and Grid Computing](#), held in Tokyo, Japan, 12-15 May, 2003.

- Fifth International Workshop on Java for Parallel and Distributed Computing, held in Nice, France, 22-26 April 2003.
- [SC 2002 Conference](#), held in Baltimore, USA, 16-22 November 2002.
- [IEEE International Conference on Cluster Computing](#) (Cluster 2002), held in Chicago, USA, 26-28 September 2002.
- [Fourth International Workshop on Java for Parallel and Distributed Computing](#), held in Fort Lauderdale, USA, 15 April 2002.
- 15th ACM International Conference on Supercomputing, held in Sorrento, Italy, 16–21 June 2001.
- Infrastructure for Scalable Multi-Agent Systems, a workshop at Autonomous Agents 2000, held in Barcelona, Spain, 3–4 June 2000.
- SC 2000 Conference, held in Dallas, TX, November 2000.
- First ACM Conference on Java for High Performance Network Computing, held in San Francisco, 12–14 June 1999.
- The Practical Application of Java Conference 1999, held in London, 21–23 April 1999.
- International Workshop on Java for Parallel and Distributed Computing, held in Puerto Rico, 12–16 April 1999.
- EuroPar'98 Conference.
- 1993 International Conference on Supercomputing.
- Sixth Distributed Memory Computing Conference, held in Portland, OR, March 1991.

Steering Committees:

- Member of the Steering Committee of [17th IEEE International Symposium on High Performance Distributed Computing](#) (HPDC 2008), held in Boston, USA, 23-27 June 2008.
- Member of the Steering Committee of the UK e-Science All-Hands Meeting 2007, held in Nottingham, UK, September 2007.
- Member of the All-Hands Meeting Foundation, 2006 – now.
- Member of the Steering Committee of the [6th International Symposium on Cluster Computing and the Grid](#) (CCGrid'06), held in Singapore, 16-19 May 2006.
- Member of the Steering Committee of the [IEEE International Symposium on High Performance Distributed Computing](#), 2006-now.
- Member of Steering Committee of the Open Middleware Infrastructure Institute, 2004 – 2006.
- Member of EuroPar conference series Advisory Committee.
- Member of the Steering Committee of the International Conference on High Performance Computing 1993–1997.
- Member of the Steering Committee of the Distributed Memory Computing Conference series 1991–1992.
- Member of the Steering Committee for the Perfect Benchmarking Group 1989–1991.

Other:

- Member of Committee of Visitors panel to review U.S. Department of Energy computer science research program, July 2012.
- Member of the Organisation Committee of the [Second European Workshop on Monte Carlo Treatment Planning](#), held in Cardiff, UK, 16-19 October 2009.
- Chair of the External Review Committee of the [International Collaboratory for Emerging Technologies](#) (CoLab), 2007 – now.
- External examiner for MSc in Computer Science, Bristol University, 2007 – now.
- External examiner for the School of Computer Science, University of Reading, 2005 – 2008.
- External examiner for the School of Computer Science, Queen's University Belfast, 2003 – 2007.
- Member of the Organizing Committee of the [First International Conference on Testbeds and Research Infrastructures for the DEvelopment of NeTworks and COMmunities](#) (Tridentcom 2005), held 21-25 February 2005 in Trento, Italy.
- Member of EPSRC Peer Review College 1999-2003, 2005-now.
- Elected member of the board of ACM SIGNUM 1993–1995.
- Executive Director of the MPI Forum, 1993–1994.
- Member of the Organizing Committee of the 1992 Scalable High Performance Computing Conference, held 26–29 April 1992 in Williamsburg, Virginia.

Professional Affiliations:

- Senior Member of the IEEE Computer Society
- Senior Member of the Association of Computing Machinery
- Fellow of the British Computer Society
- Fellow of the Learned Society of Wales

PUBLICATIONS

Theses and Dissertations:

1. D. W. Walker, “*Models of Infrared Emission from Axially Symmetric HII Region/Molecular Cloud Complexes*,” PhD thesis, Department of Physics, Queen Mary College, University of London, May 1983. Supervisor: Dr. J. P. Emerson.
2. D. W. Walker, “*Supernovae: Observation and Theory*,” MSc project dissertation, Department of Mathematics, Queen Mary College, University of London, 1979. Supervisor: Professor I. W. Roxburgh.

Books:

1. M. Snir, S.W. Otto, S. Huss-Lederman, D. W. Walker and J. J. Dongarra, “*MPI: The Complete Reference. Volume 1, The MPI Core*,” published by MIT Press (2nd edition), 1998.
2. L. S. Blackford, J. Choi, A. Cleary, E. D’Azevedo, J. Demmel, I. Dhillon, J. J. Dongarra, S. Hammarling, G. Henry, A. Petitet, K. Stanley, D. W. Walker, and R. C. Whaley, “*ScaLAPACK Users’ Guide*,” published by the SIAM Press, 1995.
3. M. Snir, S.W. Otto, S. Huss-Lederman, D. W. Walker and J. J. Dongarra, “*MPI: The Complete Reference*,” published by MIT Press, 1995.
4. I. G. Angus, G. C. Fox, J. S. Kim, and D. W. Walker, “*Solving Problems on Concurrent Processors. Volume II: Software for Concurrent Processors*,” published by Prentice-Hall, 1990.
5. G. C. Fox, M. A. Johnson, G. A. Lyzenga, S. W. Otto, J. K. Salmon, and D. W. Walker, “*Solving Problems on Concurrent Processors. Volume I: General Techniques and Regular Problems*,” published by Prentice-Hall, 1988.

Contributions to Books:

1. O. F. Rana, A. Akram, R. Al-Ali, D. W. Walker, G. von Laszewski, K. Amin, “*Quality-of-Service Based Grid Communities*,” in *Extending Web Services Technologies: The Use of Multi-Agent Approaches*, edited by L. Cavedon, Z. Maamar, D. Martin, and B. Benatallah. Published by Springer, 2005. ISBN 0-387-23343-1.
2. O. F. Rana and D. W. Walker, “*Service Design Patterns for Computational Grids*,” in *Patterns and Skeletons for Parallel and Distributed Computing*, edited by Fethi A. Rabhi and Sergei Gorlatch. Published by Springer-Verlag, 2002. ISBN 1-85233-506-9.
3. E. F. D’Azevedo, C. H. Romine, and D. W. Walker, “*Shared-Memory Emulation Enables Billion-Atom Molecular Dynamics Simulation*,” in *Applications on Advanced Architecture Computers*, edited by Greg Astfalk, published by SIAM Press, 1996. ISBN 0-89871-368-4.
4. D. W. Walker and J. J. Dongarra, “*The Design of Linear Algebra Libraries for High Performance Computers*,” in *High Performance Computing*, edited by Gary Sabot, published by Addison-Wesley, 1995.
5. D. W. Walker, “*Full and Banded Matrix Algorithms*,” in *Parallel Computing Works*, edited by G. C. Fox, P. Messina, and R. D. Williams, published by Morgan-Kaufmann, 1994.
6. D. W. Walker, “*Convectively-Dominated Flows and the Flux-Corrected Transport Technique*,” in *Parallel Computing Works*, edited by G. C. Fox, P. Messina, and R. D. Williams, published by Morgan-Kaufmann, 1994.

Conference Proceedings Edited:

1. S. J. Cox and D. W. Walker, *Proceedings of the UK e-Science All Hands Meeting 2005*. ISBN 1-904425-53-4.
2. D. W. Walker and Q. F. Stout, *Proceedings of the Fifth Distributed Memory Computing Conference*, published by IEEE Computer Society, 1990.

Refereed Journal Papers:

1. A. Al-Saidi, D. W. Walker, and O. F. Rana, “*On-demand transmission model for remote visualization using image-based rendering*,” *Concurrency and Computation: Practice and Experience*, Vol. 24, No. 18, pages 2328–2345, December 2012. ISSN 1532-0626.

2. C. Walker, D. Lu, and D. W. Walker, "Automatic Portal Generation Based on Workflow Description", *Parallel Processing Letters*, Vol. 21, No. 2, pages 155-171, 2011.
3. M. Chorley and D. W. Walker, "Performance Analysis of a Hybrid MPI/OpenMP Application on Multi-core Clusters", *Journal of Computational Science*, Vol. 1, No. 3, pages 168-174, 2010.
4. M. Chorley, D. W. Walker, and M. F. Guest, "Hybrid Message-Passing and Shared-Memory Programming in a Molecular Dynamics Application on Multicore Clusters," *International Journal of High Performance Computing Applications*, Vol. 23, No. 3, pages 196-211, August 2009.
5. P. Downes, G. Yaikhom, J. P. Giddy, D. W. Walker, E. Spezi, and D. G. Lewis, "High Performance Computing for Monte Carlo Radiotherapy Calculations," *Philosophical Transactions of the Royal Society A*, Vol. 367, No. 1897, pages 2607-2617, June 2009.
6. I. J. Grimstead, N. J. Avis, and D. W. Walker "RAVE: The Resource Aware Visualization Environment," *Concurrency and Computation: Practice and Experience*, Vol. 21, No. 4, pages 415-448, March 2009. ISSN 1532-0626.
7. M. Lin and D. W. Walker, "GECM: A Portal-Based Grid Application for Computational Electromagnetics," *Future Generation Computer Systems*, Vol. 24, No. 1, pages 66-72, 2008.
8. D. W. Walker, L. Huang, O. F. Rana, and Y. Huang, "Dynamic Service Selection in Workflows Using Performance Data," *Scientific Programming*, Vol. 15, No. 4, pages 235-247, 2007.
9. L. Huang, A. Akram, D. W. Walker, R. J. Allan, O. F. Rana, and Y. Huang, "A workflow portal supporting multi-language interoperation and optimization," *Concurrency and Computation: Practice and Experience*, Vol. 19, No. 12, pages 1583 - 1595, 2007. ISSN 1532-0626.
10. I. J. Grimstead, D. W. Walker, N. J. Avis, F. Kleinermann, and J. McClure, "3D Anatomical Model Acquisition, Processing and Collaborative Visualization within a Grid Enabled Environment," *Computing in Science and Engineering*, Vol. 9, No. 5, pages 32-38, 2007. ISSN 1521-9615
11. R. Al-Ali, O. F. Rana, G. von Laszewski, A. Hafid, K. Amin, and D. W. Walker, "*A Model for Quality-of-Service Provision in Service Oriented Architectures*," *International Journal of Grid and Utility Computing*, 2007 (to appear). ISSN 1741-847X.
12. A. Shaikh-Ali, S. Majithia, O. F. Rana, and D. W. Walker, "*Reputation-Based Semantic Service Discovery*", *Concurrency and Computation: Practice and Experience*, vol. 18, no. 8, pages 817-826, July 2006. ISSN 1532-0626.
13. K. Amin, G. von Laszewski, M. Hategan, R. Al-Ali, O. F. Rana, and D. W. Walker, "*An Abstraction Model for a Grid Execution Framework*," *Journal of Systems Architecture*, vol. 52, no. 2, pages 73-87, February 2006. ISSN 1383-7621.
14. R. Al-Ali, S. Sohail, O. F. Rana, A. Hafid, G. von Laszewski, K. Amin, S. Jha and D. W. Walker, "*Network QoS Provision for Distributed Grid Applications*," *International Journal of Simulation Systems, Science and Technology*, Vol. 5, No. 4, pages 13-28, 2005. ISSN 1473-8031.
15. Y. Yang, O. F. Rana, D. W. Walker, R. Williams, C. Georgousopoulos, M. Caffaro, and G. Aloisio, "*An Agent Infrastructure for On-Demand Processing of Remote Sensing Archives*," *International Journal of Digital Libraries*, Vol. 5, No. 2, pages 120-132, April 2005. ISSN 1432-5012.
16. S. Pallickara, G. Fox, A. Uyar, H. Liu, X. Rao, D. W. Walker, and B. Yildiz "*Performance of a Possible Grid Message Infrastructure*," *Concurrency and Computation: Practice and Experience*, Vol. 17, No. 2-4, pages 193-214, February-April, 2005. ISSN 1532-0626.
17. R. J. Al-Ali, K. Amin, G. von Laszewski, O. F. Rana, D. W. Walker, M. Hategan, and N. Zaluzec, "*Analysis and Provision of QoS for Distributed Grid Applications*," *Journal of Grid Computing*, Vol. 2, No. 2, pages 163-182, June 2004. ISSN 1570-7873.
18. R. J. Al-Ali, A. Hafid, O. F. Rana, and D. W. Walker, "*An Approach for QoS Adaptation in Service-Oriented Grids*," *Concurrency and Computation: Practice and Experience*, Vol. 16, No. 5, pages 401-412, 2004. ISSN 1432-5012.
19. M. Li, P. van Santen, D. W. Walker, O. F. Rana, and M. A. Baker, "*SGrid: a Service-Oriented Model for the Semantic Grid*," *Future Generation Computer Systems*, Vol. 20, No. 1, pages 7-18, 2004. ISSN 0167-739X
20. M. Li, D. W. Walker, O. F. Rana, and Y. Huang, "*Migrating Legacy Codes to Distributed Computing Environments: a CORBA Approach*," *Information and Software Technology*, Vol. 46, No. 7, pages 457-464, 2004.
21. Y. Huang, D. W. Walker, and O. F. Rana, "*Object-Oriented Distributed Computing Based on Remote Class Reference*," *Concurrency and Computation: Practice and Experience*, Vol. 15, No. 1, pages 79-91, January 2003. ISSN 1532-0626.

22. M. Li, D. W. Walker, O. F. Rana, Y. Huang, P. T. Williams, and R. C. Ward, "Engineering High Performance Legacy Codes as CORBA Components for Problem-Solving Environments," *Journal of Parallel and Distributed Computing*, Vol. 63, No. 11, pages 1152-1163, 2003. ISSN 0743-7315.
23. G. C. Fox, S. Pallickara, M. Pierce, and D. W. Walker, "Towards Dependable Grid and Web Services," *Ubiquity*, Vol. 4, no, 25, August 2003.
<http://ubiquity.acm.org/article.cfm?id=941405>.
24. R. J. Al-Ali, O. F. Rana, D. W. Walker, S. Jha, and S. Sohail, "G-QOSM: Grid Service Discovery Using QoS Properties," *Computing and Informatics*, Vol. 21, No. 4, pages 363-382, 2002. ISSN 1335-9150.
25. Y. Yang, O. F. Rana, D. W. Walker, C. Georgousopoulos, G. Aloisio, and R. Williams, "Agent-Based Data Management in Digital Libraries," *Parallel Computing*, Vol. 28, No. 5, pages 773-792, May 2002. ISSN 0167-8191.
26. M. Li, O. F. Rana, and D. W. Walker, "Wrapping MPI-Based Legacy Codes as Java/CORBA Components," *Future Generation Computer Systems*, Vol. 18, No. 2, pages 213-223, October 2001.
27. J. J. Dongarra and D. W. Walker, "The Quest for Petascale Computing," *IEEE Computing in Science and Engineering*, Vol. 3, No. 3, pages 32-39, May/June 2001. ISSN 1521-9615.
28. D. W. Walker, M. Li, O. F. Rana, M. S. Shields, and Y. Huang, "The Software Architecture of a Distributed Problem-Solving Environment," *Concurrency: Practice and Experience*, Vol. 12, No. 15, pages 1455-1480, December 2000.
29. M. S. Shields, O. F. Rana, D. W. Walker, M. Li, and D. Golby, "A Java/CORBA-Based Visual Program Composition Environment for PSEs," *Concurrency: Practice and Experience*, Vol. 12, pages 687-704, 2000.
30. R. Hempel and D. W. Walker, "The Emergence of the MPI Message Passing Standard for Parallel Computing," *Computer Standards and Interfaces*, Vol. 21, No. 1, pages 51-62, 1999.
31. J. J. Dongarra, S. Hammarling and D. W. Walker, "Key Concepts for Parallel Out-Of-Core LU Factorization," *Parallel Computing*, Vol. 23, pages 49-70, 1997.
32. B. Straughan and D. W. Walker, "Multi-Component Diffusion and Penetrative Convection," *Fluid Dynamics Research*, Vol. 19, pages 77-89, 1997.
33. D. W. Walker, "Free Market Computing and the Global Economic Infrastructure," *IEEE Parallel and Distributed Technology*, Vol. 4, No. 3, pages 60-62, Fall 1996. ISSN 1063-6552.
34. D. W. Walker and S. W. Otto, "Redistribution of Block-Cyclic Data Distributions Using MPI," *Concurrency: Practice and Experience*, Vol. 8, No. 9, pages 707-728, November 1996.
35. B. Straughan and D. W. Walker, "Two Very Accurate and Efficient Methods for Computing Eigenvalues and Eigenfunctions in Porous Convection Problems," *J. Computational Phys.*, Vol. 127, pages 128-141, 1996.
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71. P. M. Campbell, E. A. Carmona and D. W. Walker, "*Hierarchical Domain Decomposition With Unitary Load Balancing For Electromagnetic Particle-In-Cell Codes*," in *Proceedings of the Fifth Distributed Memory Computing Conference*, Charleston, South Carolina, April, 9-12, 1990. Published by IEEE Computer Society Press, 1990.
72. D. W. Walker, "*The Implementation of a Three-Dimensional PIC Code on a Hypercube Concurrent Processor*," in *Proceedings of the Fourth Conference on Hypercubes, Concurrent Computers, and Applications*, edited by J. L. Gustafson, held March 7-9, 1989, in Monterey, CA.
73. C. F. Baillie and D. W. Walker, "*Lattice QCD as a Large-Scale Scientific Computation*," in *Proceedings of the International Conference on Vector and Parallel Computing*, held in Tromso, Norway, June, 1988.
74. G. C. Fox and D. W. Walker, "*Concurrent Computers in Science*," in *proceedings of the 1988 Conference on Computers in Physics Instruction*, held August 1-5, 1988 at North Carolina State University, Raleigh, North Carolina.
75. G. C. Fox and D. W. Walker, "*A Portable Programming Environment for Multiprocessors*," in *Proceedings of the 12th IMACS World Congress on Scientific Computing*, held July 18-22, 1988, in Paris, France.
76. D. W. Walker, "*Portable Programming within a Message Passing Model: the FFT as an Example*," in *Proceedings of the Third Conference on Hypercube Concurrent Computers and Applications*, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, NY, 1988.
77. M. Breaden, G. C. Fox, A. Ho, A. Knutson, S. Kuwamoto, and D. W. Walker, "*The MAC-CUBE, a Macintosh-Based Hypercube*," in *Proceedings of the Third Conference on Hypercube Concurrent Computers and Applications*, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, NY, 1988.
78. M. Breaden, D. Chang, S. Chen, G. C. Fox, A. Ho, S. Snyder, and D. W. Walker, "*The PC-CUBE, an IBM PC-Based Hypercube*," in *Proceedings of the Third Conference on Hypercube*

- Concurrent Computers and Applications, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, NY, 1988.
79. D. W. Walker, “*Performance of a QCD Code on the NCUBE*,” in Proceedings of the Third Conference on Hypercube Concurrent Computers and Applications, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, N.Y., 1988.
 80. G. C. Fox, W. Furmanski and D. W. Walker, “*Optimal Matrix Algorithms on Homogeneous Hypercubes*,” in Proceedings of the Third Conference on Hypercube Concurrent Processors and Applications, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, NY, 1988.
 81. D. W. Walker, T. Aldcroft, A. Cisneros, G. C. Fox and W. Furmanski, “*LU Decomposition of Banded Matrices and the Solution of Linear Systems on Hypercubes*,” in Proceedings of the Third Conference on Hypercube Concurrent Processors and Applications, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, NY, 1988.
 82. C. F. Baillie, P. Messina and D. W. Walker, “*Performance Evaluation of Scientific Programs on Advanced Architecture Computers*,” in Proceedings of the Third Conference on Hypercube Concurrent Computers and Applications, held in Pasadena, California, January 19-20, 1988, edited by G. C. Fox, published by ACM Press, New York, N.Y., 1988.
 83. D. W. Walker and G. R. Montry, “*Implementation and Performance of a Two-Dimensional, Flux-Corrected Transport Code on the nCUBE*,” in Proceedings of the Third Conference on Hypercube Concurrent Computers and Applications, edited by G. C. Fox, held January 19-20, 1988, in Pasadena, CA. Published by ACM Press, 1988.
 84. D. W. Walker, G. C. Fox, A. Ho, and G. R. Montry, “*A Comparison of the Performance of the Hypercube and Elxsi 6400*,” in Hypercube Multiprocessors 1987, the Proceedings of the Second Conference on Hypercube Multiprocessors held at Knoxville, Tennessee, September 1986, pages 210-219. Published by SIAM, Philadelphia, 1987.
 85. D. W. Walker, “*Models of Externally Heated Clouds*,” in Sub-Millimetre Wave Astronomy, edited by J. E. Beckman and J. P. Phillips. Published by Cambridge University Press, 1982.

Technical Reports:

1. G. C. Fox and D. W. Walker, “*e-Science Gap Analysis*,” commissioned by the DTI, June 2003.
2. D. W. Walker, M. Li, O. F. Rana, M. S. Shields, and Y. Huang, “*The Software Architecture of a Distributed Problem-Solving Environment*,” Technical Report TM/ORNL-1999/321, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge TN 37831, USA. February 2000.
3. D. W. Walker and L. Liang, “*Modeling Flow in Fractured Media*,” Technical Report TM/ORNL-2000/37, Computer Science and Mathematics Division, Oak Ridge National Laboratory, Oak Ridge TN 37831, USA. February 2000.
4. V. R. Deshpande, W. B. Sawyer and D. W. Walker, “*An MPI Implementation of the BLACS*,” Technical Report TR-96-11, Swiss Center for Scientific Computing, May 1996.
5. J. Choi, J. J. Dongarra, S. Ostrouchov, A. Petitet, D. W. Walker and R. C. Whaley, “*A Proposal for a Set of Parallel Basic Linear Algebra Subprograms*,” Technical Report CS-95-292, Department of Computer Science, University of Tennessee, Knoxville, May 1995.
6. D. W. Walker and S. W. Otto, “*Redistribution of Block-Cyclic Data Distributions Using MPI*,” Technical Report ORNL/TM-12999, Oak Ridge National Laboratory, June 1995.
7. J. Choi, J. J. Dongarra and D. W. Walker, “*The Design of a Parallel, Dense Linear Algebra Software Library: Reduction to Hessenberg, Tridiagonal, and Bidiagonal Form*,” Technical Report ORNL/TM-12472, Oak Ridge National Laboratory, July 1994.
8. J. Choi, J. J. Dongarra, S. Ostrouchov, A. Petitet, D. W. Walker and R. C. Whaley, “*The Design and Implementation of the ScaLAPACK LU, QR, and Cholesky Factorization Routines*,” Technical Report ORNL/TM-12470, Oak Ridge National Laboratory, September 1994.
9. J. Choi, J. J. Dongarra and D. W. Walker, “*PB-BLAS: A Set of Parallel Block Basic Linear Algebra Subprograms*,” Technical Report ORNL/TM-12468, Oak Ridge National Laboratory, March 1994.
10. J. Choi, J. J. Dongarra and D. W. Walker, “*Parallel Matrix Transpose Algorithms on Distributed Memory Concurrent Computers*,” Technical Report ORNL/TM-12309, Oak Ridge National Laboratory, October 1993.

11. J. Choi, J. J. Dongarra and D. W. Walker, “*PUMMA: Parallel Universal Matrix Multiplication Algorithms on Distributed Memory Concurrent Computers*,” Technical Report ORNL/TM-12252, Oak Ridge National Laboratory, April 1993.
12. J. J. Dongarra, R. Hempel, A. J. G. Hey and D. W. Walker, “*A Proposal for a User-Level Message Passing Interface in a Distributed Memory Environment*,” Technical Report ORNL/TM-12231, Oak Ridge National Laboratory, February 1993.
13. D. W. Walker, “*Standards for Message Passing in a Distributed Memory Environment*,” Technical Report ORNL/TM-12147, Oak Ridge National Laboratory, August 1992.
14. J. J. Dongarra, R. A. van de Geijn and D. W. Walker, “*A Look at Scalable Dense Linear Algebra Libraries*,” Technical Report ORNL/TM-12126, Oak Ridge National Laboratory, July 1992.
15. D. W. Walker, “*The Hierarchical Spatial Decomposition of Three-Dimensional Particle-In-Cell Plasma Simulations on MIMD Distributed Memory Multiprocessors*,” Technical Report ORNL/TM-12071, Oak Ridge National Laboratory, July 1992.
16. D. W. Walker, “*A Fortran 90 Code for Magnetohydrodynamics. Part I: Banded Convolution*,” Technical Report ORNL/TM-12032, Oak Ridge National Laboratory, January 1992.
17. D. W. Walker, P. H. Worley and J. B. Drake, “*Parallelizing the Spectral Transform Method - Part II*,” Technical Report ORNL/TM-11855, Oak Ridge National Laboratory, July 1991.
18. M. Chen, E. DeBenedictis, G. C. Fox, J. Li, and D. W. Walker, “*Hypercubes are General-Purpose Multiprocessors with High Speedup*,” Technical Report C³P-499, Caltech Concurrent Computation Program, California Institute of Technology, Pasadena, CA, March 1988.
19. C. F. Baillie, E. W. Felten and D. W. Walker, “*Benchmarking the Connection Machine*,” Technical Report C³P-443, Concurrent Computation Program, California Institute of Technology, July 1987.
20. P. D. Noerdlinger and D. W. Walker, “*Discrete Fourier Transforms on the Mark II Hypercube*,” Technical Report C³P-337, Caltech Concurrent Computation Program, California Institute of Technology, Pasadena, CA, July 1986.

Articles for a General Audience:

1. D. W. Walker, “*Parallel Computing*,” in *Encyclopedia of Physical Science and Technology*, Third Edition, Volume 11, pages 579-591, published by Academic Press, 2002.
2. J. J. Dongarra, G. E. Fagg, R. Hempel, and D. W. Walker, “*Message Passing Software Systems*,” in *Wiley Encyclopedia of Electronics and Electrical Engineering*, edited by J. Webster, published by John Wiley and Sons, 1999.
3. D. W. Walker, “*Advanced Environments and Tools for High Performance Computing*,” report on the 1999 European Research Conference on Problem-Solving Environments. Available only online at <http://www.cs.cf.ac.uk/User/David.W.Walker/PSES/euresco99.html>, June 1999.
4. J. J. Dongarra, N. Nachtigal, E. Ng, B. Peyton, W. Shelton, and D. W. Walker, “*Software Components to Facilitate Application Development*,” *Oak Ridge National Laboratory Review*, Vol. 30, Nos. 3 & 4, 1997.
5. J. J. Dongarra and D. W. Walker, “*MPI: A Standard Message Passing Interface*,” *SIAM News*, Vol. 29, No. 1, Jan/Feb, 1996.
6. E. F. D’Azevedo, C. H. Romine, and D. W. Walker, “*Shared Memory Emulation Is The Key To Billion-Atom Molecular Dynamics Simulation*,” *SIAM News*, Vol. 28, No. 5, May/June, 1995.
7. G. Helou and D. W. Walker, “*Infrared astronomical satellite (IRAS) catalogs and atlases. Volume 7: The small scale structure catalog*,” *Infrared astronomical satellite (IRAS) catalogs and atlases. Volume 7*, pages 1-265, 1988.
8. D. W. Walker, “*Secrets of the Sky: the IRAS Data at Queen Mary College*,” *ICL Technical Journal*, Vol. 4, 1985.

INVITED TALKS, SEMINARS, AND TUTORIALS

Invited Talks:

1. “*The Landscape of High Performance Computing*,” presented as an invited keynote talk at the Parallel Programming Symposium, School of Computer Science, University of Nottingham, 29 October 2008.
2. “*Performance Results for Nested Parallelism on Multicore Architectures*,” presented at Clusters and Computational Grids for Scientific Computing, an invitation-only workshop held at Flat Rock, North Carolina, USA, 14-17 September 2008.
3. “*Workflows: Representation and Semantics*,” presented at the Second Distributed Programming Abstractions Workshop, held in Edinburgh, UK, 31 October – 2 November 2007.

4. "Portal Interfaces for Grid-Based Scientific Computing," presented at Clusters and Computational Grids for Scientific Computing, an invitation-only workshop held at Flat Rock, North Carolina, USA, 10-13 September 2006.
5. "Lessons Learned from the GECOM Project," presented at the IFIP working conference on Grid-based Problem Solving Environments, an invitation-only conference held at Prescott, Arizona, USA, 17-21 July 2006.
6. "The Grid: an Infrastructure for e-Business and e-Science," presented in the Vice-Chancellor's lecture series at Cardiff University, 4 February 2004.
7. "Problem-Solving Environments for Grid Computing," presented at the National University for Defense Technology, Changsha, PR of China, 19 September 2003.
8. "The Grid: Infrastructure and Opportunities," presented at the National Assembly for Wales, 15 January 2003.
9. "Problem-Solving Environments for Grid Computing," presented at the 2003 European Research Conference on Advanced Environments and Tools for High Performance Computing, Albufeira, Portugal, 14-19 June 2003.
10. "Algorithms and Applications for Petascale Computing," presented at the US/UK N+N meeting Beyond Teraflops Towards Petaflops, held in London, 2 October 2002.
11. "The Grid: Opportunities in Healthcare and Medical Informatics," presented at the National Assembly for Wales, 30 July 2002.
12. "The Grid and e-Science," presented at the Spectral Theory Workshop at Gregynog, 16 May 2002.
13. "The Grid, Virtual Organizations, and Problem-Solving Environments," presented at the 2001 IEEE Conference on Cluster Computing (Cluster 2001), held in Newport Beach, California, 11 October 2001.
14. "Problem-Solving Environments: a Review of Progress," presented at the 2001 European Research Conference on Advanced Environments and Tools for High Performance Computing, Castelvechio Pascoli, Italy, 16-21 June 2001.
15. "High Performance Computing: Past Highlights and Future Trends," presented at Algorithmy 2000, held in Podbanske, Slovakia, 10-15 September 2000.
16. "Collaborative High Performance Computing in the 21st. Century," presented at Computational Science in the 21st. Century, IFIP WG2.6 Workshop, University of Patras, Greece, May 21, 1998.
17. "Problem-Solving Environments in Science and Industry," PINEAPL Workshop on the Use of Parallel Numerical Libraries, held in Toulouse, France, February 9-10, 1998.
18. "Software Standards for High Performance Computing," HPCI'98 Conference, held in Manchester, England, January 12-14, 1998.
19. "Features and Design of the MPI Specification," Intel Supercomputer Users Group meeting, held in Albuquerque, NM, June 21-23, 1995.
20. "Issues in the Design of Scalable Software Libraries for Distributed Memory Concurrent Computers," Workshop on Environments and Tools for Parallel Scientific Computing, held in Walland, TN, May 26-27, 1994.
21. "Message Passing Interface: The New Parallel Programming Standard?" SHARE81 Summer 1993 Meeting, held in Washington, D.C., August 18, 1993.
22. "MPI: A Standard Message Passing Interface for Distributed Memory Concurrent Computers," Advanced Workshop on Programming Tools for Parallel Machines, Otranto, Italy, June 22-25, 1993.
23. "Parallelizing the Spectral Transform Method," Fifth Workshop on Use of Parallel Processors in Meteorology, held at the European Center for Medium-Range Weather Forecasts, Reading, England, November 23-27, 1992.
24. "A Draft Standard for Message Passing in Distributed Memory Environments," Second RAPS Workshop on Standards and Benchmarking in Parallel Computing, held at the European Center for Medium-Range Weather Forecasts, Reading, England, November 25, 1992.
25. "The Design of Scalable Software Libraries for Distributed Memory Concurrent Computers," CNRS-NSF Workshop on Environments and Tools for Parallel Scientific Computing, held in Saint Hilaire du Touvet, France, September 7-8, 1992.
26. "Standards for Message Passing on Distributed Memory Computers: the US View," RAPS Consultative Forum Workshop on Parallel Programming Models and Interfaces, held at GMD, Bonn, Germany, May 4-6, 1992.

27. "The Role of Supercomputers in Industrial and Academic Research," presented at the Southeastern Section meeting of the Society of Industrial and Applied Mathematics, March 1990.
28. "Concurrent Supercomputers in Science," (with G. C. Fox) presented at the Conference on Computers in Physics Instruction, August 3, 1988.

Tutorial Presentations:

1. "Problem-Solving Environments," tutorial presentation at the 2001 International Conference on Computational Science, held in San Francisco, 27 May 2001.
2. "Message Passing Using MPI: from Fundamentals to Applications," tutorial presentation at the NSF Trainers Workshop in Parallel Computing, North Carolina Supercomputing Center, April 10, 1995.
3. "MPI: From Fundamentals to Applications," tutorial presentation at center for Research on Parallel Computation, Rice University, March 21, 1995.
4. "Message Passing Using MPI: from Fundamentals to Applications," tutorial presentation at the Seventh SIAM Conference on Parallel Computing, San Francisco, CA, February 14, 1995.
5. "Message Passing Using MPI: from Fundamentals to Applications," tutorial presentation at the Third IEEE International Symposium on High Performance Distributed Computing, San Francisco, CA, August 2, 1994.
6. "MPI: A Standard Message Passing Interface for Distributed Memory Concurrent Computers," ICASE/LaRC Short Course on Parallel Computation, held in Hampton, VA, July 26-30, 1993.
7. "Communication Methods, Routines, and Examples," tutorial presentation at Supercomputing '89, November 13, 1989.
8. "Massively Parallel Computers: Programming Paradigms, Algorithms, and Applications," tutorial presentation at the Fifth Annual Computer Science Symposium, University of South Carolina, Columbia, April 7, 1989.
9. "Introduction to Parallel Computing," a series of 12 tutorial seminars presented at the University of South Carolina in Fall 1988. These tutorials are available in book and videotape forms.
10. "Solving Problems on Concurrent Processors," tutorial presentation at the Second International Conference on Supercomputing, May 4, 1987.
11. "How To Write C Programs in CrOS III and CUBIX," tutorial presentation given at the JPL/Caltech Hypercube Course, March 17, 1987.
12. "The One-Dimensional Wave Equation on the Hypercube," tutorial presentation given at the JPL/Caltech Hypercube Course, March 17, 1987.

Research Seminars:

1. "Application Performance of a Hybrid MPI/OpenMP Application on Multicore Clusters", presented at the School of Systems Engineering, Reading University, 6 May 2010.
2. "Performance Results for Nested Parallelism on Multicore Architectures," presented at the Centre for Advanced Computing and Emerging Technologies, Reading University, 3 December 2008.
3. "Problem-Solving Environments for Grid Computing," presented at School of Computing and Mathematical Sciences, Greenwich University, 1 May 2003.
4. "PSEs and The Grid: More Than Just a Pretty (Inter)Face," presented at Department of Computer Science, University of Manchester, 13 March 2002.
5. "PSEs and The Grid: More Than Just a Pretty (Inter)Face," presented at Department of Computer Science, University of Wales, Swansea, 26 February 2002.
6. "Applied Mathematics and Grid Computing," presented at Durham University, 23 November 2001.
7. "The Grid and Intelligent Problem-Solving Environments," presented at Michigan Technological University, 3 September 2001.
8. "Advanced Interfaces for High Performance Computing," presented at Lawrence Berkeley Laboratory, Berkeley, California, May 6, 1998.
9. "Software Libraries for Message Passing Computers," presented at the Department of Computer Science, University of Wales, Swansea, November 26, 1996.
10. "Software Libraries for Message Passing Computers," presented at the Department of Electronics and Computer Science, University of Southampton, February 21, 1996.
11. "Using the Advanced Features of MPI," presented at the Department of Computer Science, Rice University, August 1, 1994.

12. "Paradigms and Strategies for Scientific Computing on Distributed Memory Concurrent Computers," presented at the Department of Electronic and Computer Science, Southampton University, November 27, 1992.
13. "Techniques for Dynamically Load Balancing Parallel Particle-In-Cell Simulations," presented at the Department of Computer Science, University of Tennessee, Knoxville, January 30, 1992.
14. "Hierarchical Domain Decomposition with Unitary Load Balance for Particle-In-Cell Codes," presented at Oak Ridge National Laboratory, May 8, 1990.
15. "Particle Simulation Methods on MIMD Distributed Memory Concurrent Computers," presented at the Center for Machine Intelligence, University of South Carolina, Columbia, February 8, 1990.
16. "The Implementation of the SOS Code for Parallel Processing," presented at the Air Force Weapons Laboratory, Albuquerque, August 1989.
17. "The Flux-Corrected Transport Algorithm on the NCUBE," presented at the Department of Mathematics, University of South Carolina, Fall 1988.
18. "The Flux-Corrected Transport Algorithm on the NCUBE," presented at the Northrop Research and Technology Center, Spring 1988.
19. "Cros IV and Beyond," presented at the California Institute of Technology, October 7, 1987.

Movies and Videotapes:

1. B. Straughan and D. W. Walker, "Spectra Arising from Stability Problems in Hydrodynamics," June 1995.
2. J. Goldsmith and D. W. Walker, "The Kelvin-Helmholtz Instability on the N-Cube," 1987.

DETAILS OF PROFESSIONAL EXPERIENCE

Professor of High Performance Computing, Cardiff University, December 1995 to present.

Since December 1995 I have been Professor of High Performance Computing in the Department of Computer Science at the Cardiff University. I am head of the Distributed Collaborative Computing group and Director of the Welsh e-Science Centre (WeSC). My main research interests are collaborative problem-solving environments and portals to support computational science, and software infrastructure for Grid computing. The overall aim of this research is to provide transparent access to distributed and heterogeneous computer sources, and falls under the general heading of "Grid-based computing". The key underlying software technologies include Web services for distributed computing, Java for platform independence, immersive visualisation, and XML and related technologies. I also have along-standing and continuing research interest in parallel algorithms and applications

Since coming to Cardiff University I have focused on developing the computational resources available and was successful in 1998 in securing funding for a 30-processor Sun E6500 computer which formed the basis of the Cardiff Centre for Computational Science and Engineering (CCCSE). I have also been instrumental in establishing the Cardiff Distributed Visualisation Facility (CDVF) based around a 64-processor SGI system and a 150-processor cluster system, connected by a 1Gbps link, driving various semi-immersive displays. Since September 2001 I have been Director of the Welsh e-Science Centre, and CCCSE and CDVF have now been absorbed administratively within this organization.

Senior Researcher, Oak Ridge National Laboratory, Tennessee, Oct. 1999–Jan. 2001

During this period I was on leave from Cardiff University and headed the Collaborative Technologies Group in the Computer Science and Mathematics Division at ORNL. My main research interests at ORNL were collaborative problem-solving environments, interfaces for the remote operation of scientific instruments, and environments for immersive visualization.

Researcher and Senior Researcher, Oak Ridge National Laboratory, Tennessee, Sept. 1990–Dec. 1995

From May 1994 I was leader of the Applied Mathematics Group in the Mathematical Sciences Section at ORNL. I supervised a group of 8 research scientists while continuing to pursue my own research. As group leader my responsibilities included the development of research programs, writing research proposals to secure funding, and assessing the work performance of my supervisees. In 1995 I was promoted to Senior Researcher.

My research at ORNL was a mixture of applied mathematics and computer science, and focuses on the use of high performance computers for computational mathematics and science in the following main areas:

- Standards for message passing on high performance computers. I am one of the instigators of the MPI Forum, a group of researchers from universities, government laboratories, and computer vendors in Europe and the United States, that has developed the specification of a standard message passing interface (MPI) for high performance computers.
- The development of a software library for performing dense linear algebra computations in message passing environments, particularly on distributed memory concurrent computers. I am the project manager at ORNL for this work. The first phase of this work is now complete, and has led to the release of the ScaLAPACK software. ScaLAPACK (“scalable LAPACK”) is a message passing version of the the widely-used LAPACK software library. The project involves collaboration with Jack Dongarra of Oak Ridge National Laboratory and the University of Tennessee, Danny Sorensen of Rice University, Michael Heath of University of Illinois, James Demmel of the University of California, Berkeley, and Tony Chan of the University of California, Los Angeles.
- The numerical solution of eigenvalue problems arising from partial differential equations in fluid dynamics. This work, in collaboration with Professor Brian Straughan of Glasgow University, has been applied to penetrative convection and multi-component diffusion problems. We have also investigated the Orr-Sommerfeld problem, and its generalization to two immiscible fluids. The stability criteria are derived using a Chebyshev tau method, and the eigenvalue problem is then solved with the QZ algorithm.
- Particle-in-cell (PIC) codes for plasma simulations. I have published several papers on the design and performance of PIC codes parallel computers, and collaborated with Ian Foster of Argonne National Laboratory on a Fortran M version of a particle-in-cell (PIC) code.
- Benchmarking high performance computers. I have been leader of a benchmarking project at ORNL. In addition I was part of the ParkBench effort, and served as chair of the compact applications subcommittee.
- Parallel molecular dynamics. I have worked on two projects aimed at developing parallel implementations of molecular dynamics simulations using Intel's NX message passing routines, PVM, and MPI.
- Computational fluid dynamics on high performance computers. In 1991-2 I worked on the parallel implementation of a spectral code to solve the shallow water equations. This was implemented on the Intel Paragon supercomputer at ORNL. This work led to my involvement in the parallelization of the Community Climate Model 2 (CCM2), a global climate model. In 1987 I developed a parallel code for studying convectively-dominated flows using the flux-corrected transport technique.

Associate Professor, University of South Carolina, Columbia, Aug. 1988–Aug. 1991

From September 1, 1990 until August 31, 1991 I was on leave of absence from my faculty position in the Department of Mathematics at the University of South Carolina. During this time I worked as a Research Scientist at Oak Ridge National Laboratory. I was awarded tenure at the Associate Professor level at the University of South Carolina, effective August 15, 1991, but decided to remain at ORNL.

As an Associate Professor in the Department of Mathematics at the University of South Carolina I taught undergraduate and graduate courses in Numerical Linear Algebra, Numerical Analysis, and Nonlinear Optimization. In addition, I gave a course of 12 seminars entitled “An Introduction to Parallel Computing”, and I presented a tutorial “Massively Parallel Computers: Programming Paradigms, Algorithms, and Applications” at the University of South Carolina Fifth Annual Computer Science Symposium, April 1989. I also directed M.Sc. theses, and gave reading courses for graduate students.

I was Program Chairman for the Fifth Distributed Memory Computing Conference (DMCC5), which was held April 9-12, 1990, in Charleston, South Carolina. DMCC5 was a large international conference, and I was responsible for attracting federal funding, inviting speakers, advertising, organizing the conference program, and overseeing the peer review process through which the papers presented at the conference were selected.

Member of the Professional Staff, Concurrent Computation Project, California Institute of Technology, Pasadena, March 1986 – Aug. 1988

While working as a member of the professional staff in Caltech's Concurrent Computation Project the major part of my work involved the use of concurrent processors in the following areas:

- Parallel algorithms for linear algebra computations. I developed and implemented a parallel code for the LU factorization of banded matrices. I worked on efficient parallel matrix multiplication algorithms and parallel algorithms for reducing dense matrices to Householder form. I also parallelized a multifrontal code for the solution of partial differential equations by the finite element technique.
- The Caltech Performance Evaluation Project. This project evaluated the performance of a number of advanced architecture computers using real scientific and engineering programs, mostly developed by researchers at Caltech and JPL. I also worked with the Perfect benchmarking group in evaluating large-scale scientific applications on a wide range of advanced architecture computers.
- Parallel CFD. I worked with researchers for Sandia National Laboratory on the parallelization of a two-dimensional, flux-corrected transport code for studying convectively-dominated fluids. This code was run on the NCUBE hypercube.
- I co-authored the two-volume book "Solving Problems on Concurrent Processors" published by Prentice Hall. I was also responsible for the production of a software package related to these books. This software package consists of a hypercube simulator, together with a set of concurrent programs for solving a broad range of problems.

Second Post-Doctoral Position, School of Mathematical Sciences, Queen Mary College, University of London, Jan. 1985–Feb. 1986

Upon being appointed to a second post-doctoral position at Queen Mary College I worked on the scientific analysis of data from the Infrared Astronomical Satellite (IRAS). An efficient means of analyzing the huge amount of data gathered by IRAS was needed. This was done by using ICL's "Contents Addressable Filestore" (CAFS) facility. CAFS differs from conventional database systems since it selects data by means of hardware through an intelligent disk controller, rather than by software. I was one of the pioneering users of CAFS, and it was extremely useful in the analysis of the IRAS data.

My scientific work on the IRAS data is documented in my publications. The three main topics I worked on were:

- The dipole anisotropy in the distribution of infrared galaxies.
- The measurement of the red-shifts of IRAS galaxies. This involved observations with the Isaac Newton Telescope on La Palma in the Canary Islands.
- Modeling the zodiacal background radiation.

First Post-Doctoral Position, School of Mathematical Sciences, Queen Mary College, University of London, Jan. 1982–Dec. 1984

In my first post-doctoral position I was involved in the analysis of data from the Infrared Astronomical Satellite (IRAS) project. My work was based at the Rutherford-Appleton Laboratory near Oxford, where I was principally involved in developing software to measure detector noise and baselines, and to evaluate the performance of the IRAS point source detection algorithm. The IRAS project involved close collaboration between UK, the Netherlands and USA, and I spent 3 months at NASA's Jet Propulsion Laboratory where I assessed the performance of the IRAS detectors, and checked that the data reduction system performed correctly. Upon returning to the UK I worked on the fine-tuning of the UK data processing system, and on the scientific analysis of the IRAS data.

In January 1984 I returned to JPL for a further 10 months. I was made responsible for the production of the IRAS Small Scale Structure Catalog, which is one of the main final products of the IRAS mission. I designed a data processing system to reliably extract infrared sources in a certain size range from the raw data, and supervised the writing of the necessary software. In recognition of my work on the IRAS project I received two Group Achievement Awards from NASA in October 1984.

Ph.D. Thesis Work, Department of Physics, Queen Mary College, University of London, Sept. 1979–Jan. 1982

My Ph.D. work involved the solution of the coupled differential equations of radiative transfer and ionization equilibrium, in order to model the infrared continuum emission from clouds of molecules and dust heated by nearby stars.

POST-DOCTORAL RESEARCH ASSISTANTS SUPERVISED

Jaeyoung Choi	Parallel libraries for linear algebra	1994–1995
Philip Locascio	Parallel molecular dynamics	1991–1994
Maozhen Li	Software component technologies for distributed computing	1999–2001
Yanyan Yang	Mobile agents for accessing remote digital libraries	1999–2001
Yan Huang	Infrastructure for supporting Grid services	2002–2003
Ian Grimstead	Resource-Aware Visualisation Environment	2003–2008
Maria Lin	Grid-Enabled Computational Electromagnetics	2003–2005
Lican Huang	Workflow Optimisation for e-Science Applications	2004–2006
Peter Burnap	Messaging and Notification in Grid Organisations	2004–2006
Daniela Tsaneva	OMII-RAVE	2007–2008
Gagarine Yaikhom	Radiotherapy treatment planning on the Grid (RTGrid)	2007–2009
Gareth Roberts	Lattice Boltzmann Methods for Modelling Fluids	2007–2010
Gagarine Yaikhom	Cloud and GPU computing for radiotherapy	2010–2012

COMPLETED M.Sc. THESIS SUPERVISIONS

Xiaohua Hu	The Implementation of a Flux-Corrected Transport Code on the Stardent Titan II Computer	August 1990
Mahmoud Breigheith	Rapid Elliptic Solvers and the FACR Algorithm	May 1991

COMPLETED Ph.D. THESIS SUPERVISIONS

Yan Huang	The Role of Jini in a Service-Oriented Architecture for Grid Computing	April 2003
Matthew Shields	Visual Programming Environments for Multi-Disciplinary Distributed Applications	November 2004
Shrija Rajbhandari	Provenance Support for Service-Based Infrastructure	December 2007
Dashan Lu	Automatic Portal Generation Based on XML Workflow Description	January 2010
Asma Al-Saidi	On-Demand Transmission Model Using Image-Based Rendering for Remote Visualization	July 2011

EXTERNAL EXAMINATION OF PhD THESES

Gordon Peter Stewart	Optimization Strategies for Large-Scale Distributed Computing and Data Management in the Presence of Security and Other Requirements	University of Glasgow	5 December 2012
Simon Hammond	Performance Modelling and Simulation of High Performance Computing Systems	University of Warwick	17 May 2011
Heba Kurdi	Personal Mobile Grids with a Honeybee Inspired Resource Scheduler	Brunel University	14 May 2010
Alejandra Gonzalez-Beltran	Efficient Access to Distributed Information Using Structured Peer-to-Peer Systems	Queens University Belfast	28 November 2007
Amuragam Paventhan	Grid Approaches to Data-Driven Scientific and Engineering Workflows	University of Southampton	15 May 2007
Ganesan Subramaniam		National University of Singapore	26 March 2007
Henan Zhao	Towards Realistic Scheduling for Heterogeneous Systems	University of Manchester	5 December 2006

Muhammad Aamir Shafi	Nested Parallelism for Multi-core Systems using Java	Portsmouth University	7 November 2006
Maria Angeles Moraga	Models for the Evaluation of Portal Quality	University of Castille-La Mancha, Spain	21 September 2006
Hong Ong	Java Embedded Microkernel (JEM)	Portsmouth University	18 February 2004
Francis Bunnin	Automatic Generation of Software Components for Financial Modelling	Imperial College, London	13 March 2001
Mark Papiani	An Architecture for Management of Large, Distributed, Scientific Data	Southampton University	30 June 2000
Heath James	Scheduling in Metacomputing Systems	University of Adelaide	August 1999
Simon Cox	Development and Applications of High Performance Computing	Southampton University	27 Feb. 1998
John Tracey	Stability Analysis of Multi-Component Convection-Diffusion Problems	Glasgow University	24 July 1997
Antoine Petitet	Algorithmic Redistribution Methods for Block Cyclic Data Distributions	University of Tennessee, Knoxville	December 1996

COMMITTEE ASSIGNMENTS WITHIN UNIVERSITY OF SOUTH CAROLINA

Dean's Advisory Council, 1988-90

Search Committee for Chair of Computer Science Department, 1989-90

Applied Mathematics Committee, 1989-90

Colloquium Committee, 1989-90

College Computer Advisory Committee, 1990-90

COMMITTEE ASSIGNMENTS WITHIN CARDIFF UNIVERSITY

ARCCA Oversight Group, 2008-present

Ad Hoc Committee on High-End Computing, 2004-2007.

e-Research Strategy Group, 2003-2005.

Review Committee of Network Enhancement Project, 2002-2004.

School Board, 1996-present

School Research Committee, 1996-present.

University e-Research Strategy Group, 2002-2004

University Web Policy Board, 1997-99

Chair of departmental Electronic Information Committee, 1997-99.

TEACHING ASSIGNMENTS AT CARDIFF UNIVERSITY

Most recently taught	Title	Code	Students
Autumn 2013	High Performance Computing	CM3103	18
Spring 2013	Distributed Computing Technologies	CM0356	70
Autumn 2012	Adaptive Organisations	CM0385	30
Autumn 2012	Parallel Processing	CM0323	25
Spring 2010	Parallel and Grid Computing	CMT803	7
Spring 2010	Scientific Computing	CM0368	18

Spring 2006	The Grid and Related Computing Technologies	CMP915	8
Spring 2005	Operating Systems, Architecture, and Assembly Language	CM0144	110
Spring 2004	Data Structures and Algorithms	CMT502	45
Spring 2002	Emerging Distributed Computing Technologies	CMP913	1
Autumn 1999	Algorithms and Data Structures II	CM0212	80
Spring 1999	Algorithms IV	CM0314	25
Autumn 1998	Algorithms II	CM0201	80
Spring 1998	Parallel Processing I	CM0224	70

TEACHING ASSIGNMENTS AT UNIVERSITY OF SOUTH CAROLINA

Most recently taught	Title	Code	Students
Spring 1991	Thesis preparation	Math 799	1
Spring 1991	Reading course	Math 798	1
Spring 1990	Numerical Analysis I	Math 726	19
Autumn 1989	Numerical Analysis II	Math 727	6
Spring 1989	Numerical Analysis	Math 526	7
Spring 1989	Numerical Optimization	Math 524	10
Autumn 1988	Numerical Linear Algebra	Math 526	21

RESEARCH GRANTS AWARDED IN THE U.K.

Agency	Title	Period	Amount , £
EPSRC	Inverse Problems for Magnetic Induction Tomography	09/13-08/16	430,833
OMII-UK	Monte-Carlo Treatment Planning*	02/09 – 05/09	48,800
EPSRC	All Hands Meeting Network (AHM-Net)	05/08 – 04/11	318,272
OMII-UK	OMII-RAVE*	07/07 – 12/08	106,577
OMII-UK	OMII-WHIP	03/07 – 02/08	177,888
EPSRC	The Development of Monte Carlo Techniques for Verification of Conformal Radiotherapy using the UK e-Science Grid*	10/05 – 01/09	399,110
EPSRC	Performance Engineering for High-End Computing Applications*	10/05 – 09/09	128,609
OMII	Messaging and Notification in Grid-oriented Organisations*	05/05 – 01/06	40,000
EPSRC	Performance Evaluation of the NaradaBrokering Messaging System*	09/04 – 02/05	76,841
EPSRC	Workflow Optimisation for e-Science Applications*	05/04 – 04/07	396,623
EPSRC	Extension to Core Funding for the Welsh e-Science Centre*	05/04 – 12/06	200,000
EPSRC	PASOA: Provenance-Aware Service-Oriented Architecture	02/04 – 01/07	221,492
DTI	DIPSO: Wide Area Distributed Problem Solving	07/03 – 06/05	96,403

DTI	GECEM: Grid-Enabled Computational Electromagnetics*	10/03 – 09/05	102,500
DTI	RAVE: a Resource-Aware Visualisation Environment*	04/03 – 03/06	186,534
PPARC	GridOneD	11/01 – 10/04	352,607
EU Framework 5	A Grid Application Toolkit and Testbed (GRIDLAB)	01/02 – 12/04	289,433
EPSRC	Regional Grid Center at Cardiff University*	10/01 – 09/04	587,201
WDA	Cardiff Regional Grid Centre	09/01 – 03/05	302,000
JREI	Enhancing the Infrastructure for Computational Science and Engineering at the University of Wales, Cardiff*	06/99 – 07/02	144,748
EPSRC	Problem-Solving Environments for Large-Scale Simulations*	02/98 – 01/01	178,461
JTAP/JISC	The Role of Java in High Performance Computing*	09/97 – 08/98	5,000
University of Wales, Cardiff	Development of a High Performance Computing Centre*	09/97 – 08/98	125,000

* Principal Investigator

RESEARCH GRANTS AWARDED IN THE USA

Agency	Title	Period	Amount, \$
Lab Director's R&D Fund, ORNL	A Scalable Virtual Environment for Scientific Computing*	09/00 – 08/02	315,000
Seed Money Fund, ORNL	A Collaborative Problem-Solving Environment for Weld Process Modelling*	06/00 – 05/01	95,000
ARPA/ARO	A Scalable Parallel Library for Numerical Linear Algebra, II	01/95 – 06/97	482,875
Army Research Lab	Benchmarking	09/94 – 12/94	265,000
ARPA/ARO	A Scalable Parallel Library for Numerical Linear Algebra, I	08/91 – 08/94	620,000
AFWL	The Hierarchical Decomposition of 3-D Particle Plasma Simulation Codes on Hypercube Multiprocessors*	10/90 – 06/91	24,000
AFWL	The Performance of 3-D Particle Plasma Simulation Codes on Concurrent Multiprocessors*	06/90 – 09/90	24,647
NSF	Student Participation in DMCC5*	04/90 – 04/91	18,500
AFWL/SCEEE	Implementation of the SOS Code for PIC Plasma Simulations on Hypercube Multiprocessors*	06/89 – 09/89	29,941
USC/CRPS	Large-Scale Applications on Concurrent Supercomputers*	01/89 – 12/89	2,400

* Principal Investigator

MANUSCRIPTS REVIEWED FOR JOURNALS

Concurrency and Computation: Practice and Experience

Computer Physics Communications

International Journal of High Performance Applications

IEEE Parallel and Distributed Technology

IEEE Transactions on Parallel and Distributed Systems

Parallel Processing Letters

ACM Computing Surveys

Journal of Parallel and Distributed Computing

Parallel Computing

Concurrency: Practice and Experience

IBM Journal of Research and Development

SIAM Journal of Statistical and Scientific Computing

International Journal of Modern Physics C

Journal of Computational Physics

PROPOSALS REVIEWED

Research Promotion Foundation, Cyprus, 2009-2013.

EPSRC, 1997 – present.

ESRC, 2004

PPARC, 2003

Austrian Science Fund, 2007

Danish Agency for Science, Technology and Innovation, 2007

Science Foundation Ireland, 2001

Leverhulme Trust, 1998, 2001

US Department of Energy, 1996

NASA HPCC/Earth and Space Sciences Applications Program, 1992 –1994.

Idaho Board of Education, 1993