

Patrick H. Worley

Senior Research Staff
Computational Earth Sciences Group
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Research Interests

Parallel algorithm design, implementation, and optimization for scientific computing, especially for applications in earth system modeling, fusion energy sciences, and astrophysics; Performance evaluation of parallel applications and computer systems.

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Education

Ph.D.	Computer Science	Stanford University	1988
M.S.	Computer Science	Stanford University	1983
B.S.	Computer Science	Indiana University	1980
B.S.	Mathematics	Indiana University	1980

Employment History

1987- Computer Science and Mathematics Division, Oak Ridge National Laboratory
1980-1987, Computer Science Department, Stanford University
1982-1983, Stanford Linear Accelerator Center
1982-1982, Lawrence Livermore National Laboratory
1980-1980, Indiana University Cyclotron Facility
1979-1979, National Astronomy and Ionosphere Center

Current Research Projects

Performance Engineering and Analysis Center End Station

- Principal Investigator
- URL: <http://www.nccs.gov/leadership/projects/fy07.html>

Performance Engineering for the Next Generation Community Climate System Model

- Principal Investigator
- URL: <http://www.scidac.gov/climate/earth.html>

Performance Engineering Research Institute

- Institutional Lead
- Application Engagement Lead
- URL: <http://www.peri-scidac.org>

Framework Application for Core-Edge Transport Simulations

- Institutional Lead
- URL: <http://www.scidac.gov/fusion/fullscale.html>

Center for Plasma Edge Simulation

- Performance Engineering Lead
- URL: http://www.scidac.gov/FES/FES_CPES.html

A Scalable and Extensible Earth System Model for Climate Change Science

- Performance Engineer
- URL: <http://www.scidac.gov/climate/earth.html>

Current Professional Responsibilities

- Appointed Positions: Co-chair of the Software Engineering Working Group
for the Community Climate System Model (2002-)
- Organizing Committees: Petascale Architectural Requirements for the Geosciences Workshops
(April 2006, June 2006, Feb. 2007, ...)
Fusion Simulation Project Workshop (May 2007)
SciDAC 2007 (June 2007)
- Program Committees: 8th International LCI Conference on Cluster Computing (May 2007)
Supercomputing 2007 (November 2007)
- Editorial Boards: Parallel Computing (2006-)

Professional Societies

- 1981- Society for Industrial and Applied Mathematics
1977- Association for Computing Machinery

Other Recent Professional Activities

Elected Positions:	Secretary for the SIAM Activity Group on Supercomputing (SIAG/SC), 2000-2002
Appointed Positions:	ACM SIGMETRICS Electronic Bulletin Board moderator (1996-2004)
Editorial Boards:	Electronic Journal of Performance Evaluation and Modelling for Computer Systems (1997-2001)
Review Panels:	NSF Partnership for Advanced Computational Infrastructure program (2001, 2002, 2003) NSF Knowledge and Distributed Intelligence Initiative (1998)
Conference Organizer:	Sixth Workshop on Numerical Solutions of Fluid Flow in Spherical Geometry (Co-Chair) 1997 Gordon Research Conference on High Performance Computing and Information Infrastructure (Co-Chair)
Program Committees:	SIAM Conference on Parallel Processing for Scientific Computing (2004, 2006)
Tutorial Committees:	ACM/IEEE Conference on High Performance Networking and Computing (2003, 2004)
Minisymposia Organizer:	SIAM Annual Meeting (2005) SIAM Conference on Parallel Processing for Scientific Computing (2006)
Proposal Reviewer:	Department of Energy (MICS, OBER, SBIR) National Science Foundation
Journal Reviewer:	Computing Concurrency: Practice and Experience Electronic Journal of Performance Evaluation and Modelling IEEE Computing in Science and Engineering IEEE Transactions on Computers IEEE Transactions on Parallel and Distributed Systems International Journal on High Performance Computing Applications Journal on Parallel and Distributed Computing Journal of Statistical Computation and Simulation Monthly Weather Review Parallel Computing SIAM Journal on Matrix Analysis SIAM Journal on Scientific Computing Software: Practice and Experience
Conference Reviewer:	ACM/IEEE Conference on High Performance Networking and Computing Euro-Par High Performance Computer Architecture International LCI Conference on Cluster Computing International Conference on Parallel Processing International Symposium on High Performance Computing Systems and Applications
Other Activities:	Steering Committee for Numerical Benchmarks for the Climate/Ocean-Weather Modeling Community (COWbench) Organizing Committee for Parallel Kernels and Benchmarks Suite Co-presenter of tutorial on Performance Evaluation at SC'98 Co-presenter of tutorial on Performance Evaluation at SC'97 First Opponent in Ph.D Defense at NTNU, Trondheim, Norway (1997) Performance Evaluation Zone Bulletin Board moderator

Journal Publications

1. S. R. Alam, R. F. Barrett, M. R. Fahey, J. A. Kuehn, O. E. Messer, R. T. Mills, P. C. Roth, J. S. Vetter and P. H. Worley, "An Evaluation of the ORNL XT3," *International Journal of High Performance Computing Applications* (to appear).
2. P. W. Jones, P. H. Worley, Y. Yoshida, J. B. White III, and J. Levesque, "Practical performance portability in the Parallel Ocean Program (POP)," *Concurrency: Practice and Experience*, Vol. 17(10), pp. 1317-1327 (August 2005).
3. P. H. Worley and J. B. Drake, "Performance Portability in the Physical Parameterizations of the Community Atmospheric Model", *International Journal for High Performance Computer Applications*, Vol. 19(3), pp. 187-202 (August 2005).
4. T. H. Dunigan, Jr., J. S. Vetter, J. B. White III, and P. H. Worley, "Performance Evaluation of the Cray X1 Distributed Shared-Memory Architecture", *IEEE Micro*, Vol. 25(1), pp. 30-40 (January/February 2005).
5. P. H. Worley, A. C. Robinson, D. R. Mackay, and E. J. Barragy, "A Study of Application Sensitivity to Variation in Message Passing Latency and Bandwidth", *Concurrency: Practice and Experience*, Vol. 10(5), pp. 387-406 (April 1998).
6. P. H. Worley, A. C. Robinson, D. R. Mackay, and E. J. Barragy, "A Study of Application Sensitivity to Variation in Message Passing Latency and Bandwidth", *Concurrency: Practice and Experience*, Vol. 10(5), pp. 387-406 (April 1998).
7. J. Brehm, P. H. Worley, and M. Madhukar, "Performance Modeling for SPMD Message-Passing Programs", *Concurrency: Practice and Experience*, Vol. 10(5), pp. 333-357 (April 1998).
8. I. T. Foster and P. H. Worley, "Parallel algorithms for the spectral transform method", *SIAM Journal on Scientific Computing*, Vol. 18(3), pp. 806-837 (May 1997).
9. I. T. Foster, B. Toonen, and P. H. Worley, "Performance of parallel computers for spectral atmospheric models", *Journal of Atmospheric and Oceanic Technology*, Vol. 13(5), pp. 1031-1045 (October 1996).
10. J. B. Drake, I. T. Foster, J. G. Michalakes, B. Toonen, and P. H. Worley, "Design and Performance of a Scalable Parallel Community Climate Model", *Parallel Computing*, Vol. 21(10), pp. 1571-1592 (October 1995).
11. G. Horton, S. Vandewalle, and P. H. Worley, "An algorithm with polylog parallel complexity for solving parabolic partial differential equations", *SIAM Journal on Scientific Computing*, Vol. 16(3), pp. 531-541 (May 1995).
12. J. B. Drake, G. A. Geist, H. R. Hicks, K. L. Kliewer, G. M. Stocks, L. E. Toran, and P. H. Worley, "The Center for Computational Sciences at Oak Ridge National Laboratory", *International Journal of Supercomputer Applications*, Vol. 7, No. 1, pp. 3-14, (1993)
13. D. W. Walker, P. H. Worley and J. B. Drake, "Parallelization of the Spectral Transform Method. Part II", *Concurrency: Practice and Experience*, Vol 4(7), p.509-531 (Oct. 1992).
14. P. H. Worley and J. B. Drake, "Parallelization of the Spectral Transform Method", *Concurrency: Practice and Experience*, Vol 4(4), p.269-291 (June 1992).
15. P. H. Worley, "The effect of multiprocessor radius on scaling", *Parallel Computing*, Vol. 18(1), pp. 361-376 (April 1992).
16. P. H. Worley, "Limits on parallelism in the numerical solution of linear PDEs", *SIAM Journal on Scientific and Statistical Computing*, Vol. 18(1), pp. 1-35 (January 1991).

17. P. H. Worley, "The effect of time constraints on scaled speedup", *SIAM Journal on Scientific and Statistical Computing*, Vol. 11(5), pp. 838-858 (September 1990).

Conference Papers

1. C.S. Chang, S. Ku, M. Adams, E. D'Azevedo, Y. Chen, J. Cummings, S. Ethier, L. Greengard, T.S. Hahm, F. Hinton, D. Keyes, S. Klasky, W.W. Lee, Z. Lin, Y. Nishimura, S. Parker, R. Samtaney, d. Stotler, H. Weitzner, P. Worley, D. Zorin, and CPES Team, "Integrated particle simulation of neoclassical and turbulence physics in the tokamak pedestal/edge region using XGC", in Proceedings of the 21st IAEA Fusion Energy Conference, Chengdu, People's Republic of China, Oct. 16-21, 2006.
2. P. Worley, A. Mirin, J. Drake, and W. Sawyer, "Performance Engineering in the Community Atmosphere Model", *Journal of Physics: Conference Series*, Vol. 46, pp. 356-362 (2006). (Proceedings of the 2006 SciDAC Conference, Denver, CO, June 25-29, 2006.)
3. S. R. Alam, R. F. Barrett, M. R. Fahey, O. E. Messer, R. T. Mills, P. C. Roth, J. S. Vetter, and P. H. Worley, "Evaluation of the Cray XT3 at ORNL: a Status Report", in Proceedings of the 48th Cray User Group Conference, Lugano, Switzerland, May 8-11, 2006.
4. P. H. Worley, "Performance of the Community Atmosphere Model on the Cray X1E and XT3", in Proceedings of the 48th Cray User Group Conference, Lugano, Switzerland, May 8-11, 2006.
5. K. Raghavachar, G. Mahinthakumar, P. Worley, E. Zechman, R. Ranjithan, "Parallel Performance Modeling using a Genetic Programming Based Error Correction Procedure", in Proceedings of the High Performance Computing Symposium (HPC 2006), Huntsville, AL, April 2-6, 2006.
6. P. H. Worley, "Benchmarking using the Community Atmospheric Model", in Proceedings of the 2006 SPEC Benchmark Workshop, Austin, TX, January 23, 2006.
7. L. Oliker, J. Carter, M. Wehner, A. Canning, S. Ethier, A. Mirin, G. Bala, D. Parks, P. Worley, S. Kitawaki, and Y. Tsuda, "Leading Computational Methods on Scalar and Vector HEC Platforms", in Proceedings of the ACM/IEEE International Conference for High Performance Computing, Networking and Storage (SC05), Seattle, WA, November 12-18, 2005.
8. P. Worley, J. Candy, L. Carrington, K. Huck, T. Kaiser, G. Mahinthakumar, A. Maloney, S. Moore, D. Reed, P. Roth, H. Shan, S. Shende, A. Snavely, S. Sreepathi, F. Wolf, and Y. Zhang, "Performance Analysis of GYRO: A Tool Evaluation", *Journal of Physics: Conference Series*, Vol. 16, pp. 551-555 (2005). (Proceedings of the 2005 SciDAC Conference, San Francisco, CA, June 26-30, 2005.)
9. T. H. Dunigan, Jr., J. S. Vetter, and P. H. Worley, "Performance Evaluation of the SGI Altix 3700", in Proceedings of the 2005 International Conference on Parallel Processing, Oslo, Norway, June 14-17, 2005.
10. G. R. Carr, M. J. Cordery, J. B. Drake, M. W. Ham, F. M. Hoffman, and P. H. Worley, "Porting and Performance of the Community Climate System Model (CCSM3) on the Cray X1", in Proceedings of the 47th Cray User Group Conference, Albuquerque, NM, May 16-19, 2005.
11. M. R. Fahey, S. Alam, T. H. Dunigan, Jr., J. S. Vetter, and P. H. Worley, "Early Evaluation of the Cray XD1", in Proceedings of the 47th Cray User Group Conference, Albuquerque, NM, May 16-19, 2005.
12. J. S. Vetter, S. R. Alam, T. H. Dunigan, Jr., M. R. Fahey, P. C. Roth, and P. H. Worley, "Early Evaluation of the Cray XT3 at ORNL", in Proceedings of the 47th Cray User Group Conference, Albuquerque, NM, May 16-19, 2005.

13. P. H. Worley, S. Alam, T. H. Dunigan, Jr., M. R. Fahey, and J. S. Vetter, "Comparative Analysis of Interprocess Communication on the X1, XD1, and XT3", in Proceedings of the 47th Cray User Group Conference, Albuquerque, NM, May 16-19, 2005.
14. G. R. Carr, I. L. Carpenter, M. J. Cordery, J. B. Drake, M. W. Ham, F. M. Hoffman, and P. H. Worley, "Porting and Performance of the Community Climate System Model (CCSM3) on the Cray X1", in Proceedings of the 11th Workshop on High Performance Computing in Meteorology, Reading, UK, October 25-29-19, 2004, eds. W. Zwiefelhofer and G. Mozdzyński, World Scientific, Fall, 2005.
15. P. K. Agarwal, R. A. Alexander, E. Apra, S. Balay, A. S. Bland, J. Colgan, E. F. D'Azevedo, J. J. Dongarra, T. H. Dunigan, Jr., M. R. Fahey, R. A. Fahey, A. Geist, M. Gordon, R. J. Harrison, D. Kaushik, M. Krishnakumar, P. Luszczek, A. Mezzacappa, J. A. Nichols, J. Nieplocha, L. Oliker, T. Packwood, M. S. Pindzola, T. C. Shulthess, J. S. Vetter, J. B. White III, T. L. Windus, P. H. Worley, T. Zacharia, "ORNL Cray X1 Evaluation Status Report", in Proceedings of the 46th Cray User Group Conference, Knoxville, TN, May 17-21, 2004.
16. F. M. Hoffman, M. Vertenstein, H. Kitabata, J. B. White III, P. H. Worley, J. B. Drake, M. Cordery, "Adventures in Vectorizing the Community Land Model", in Proceedings of the 46th Cray User Group Conference, Knoxville, TN, May 17-21, 2004.
17. J. B. Drake, P. H. Worley, I. Carpenter, M. Cordery, "Experience with the Full CCSM", in Proceedings of the 46th Cray User Group Conference, Knoxville, TN, May 17-21, 2004.
18. P. H. Worley and J. Levesque, "The Performance Evolution of the Parallel Ocean Program on the Cray X1", in Proceedings of the 46th Cray User Group Conference, Knoxville, TN, May 17-21, 2004.
19. G. Mahinthakumar, M. Sayeed, J. Blondin, P. Worley, W. Hix, and A. Mezzacappa, "Performance Evaluation and Modeling of a Parallel Astrophysics Application", in Proceedings of the High Performance Computing Symposium 2004, p. 27-33, Ed: Joerg Meyer, The Society for Modeling and Simulation International, ISBN 1-56555-278-4, Arlington, VA.
20. T. H. Dunigan, Jr., M. R. Fahey, J. B. White III, and P. H. Worley, "Early Evaluation of the Cray X1", in Proceedings of the ACM/IEEE Conference on High Performance Networking and Computing (SC03), Phoenix, AZ, November 15-21, 2003. (331411 bytes)
21. P. H. Worley and T. H. Dunigan, "Early Evaluation of the Cray X1 at Oak Ridge National Laboratory", in Proceedings of the 45th Cray User Group Conference, Columbus, OH, May 12-16, 2003.
22. J. S. Vetter and P. H. Worley, "Asserting Performance Expectations", in Proceedings of the ACM/IEEE Conference on High Performance Networking and Computing (SC02), Baltimore, MD, November 16-22, 2002.
23. P. H. Worley, "Scaling the Unscalable: A Case Study on the AlphaServer SC", in Proceedings of the ACM/IEEE Conference on High Performance Networking and Computing (SC02), Baltimore, MD, November 16-22, 2002.
24. P. H. Worley, T. H. Dunigan, Jr., M. R. Fahey, J. B. White III and A. S. Bland, "Early Evaluation of the IBM p690", in Proceedings of the ACM/IEEE Conference on High Performance Networking and Computing (SC02), Baltimore, MD, November 16-22, 2002.
25. P. H. Worley, "Performance Evaluation of the IBM SP and the Compaq AlphaServer SC", in Proceedings of the ACM/SIGARCH International Conference on Supercomputing (ICS'00), Santa Fe, NM, May 8-11, 2000.

26. J. B. Drake, S. Hammond, R. James, and P. H. Worley, "Performance Tuning and Evaluation of a Parallel Community Climate Model", in Proceedings of the ACM/IEEE Conference on High Performance Networking and Computing (SC99), Portland, OR, November 13-19, 1999.
27. P. H. Worley, "Impact of Communication Protocol on Performance", in Proceedings of the Second International Workshop on Software Engineering and Code Design in Parallel Meteorological and Oceanographic Applications, (June 15 - 18, 1998), NASA Conference Publication 1998-206860, pp. 277-288.
28. J. Brehm and P. H. Worley, "Performance Prediction for Complex Parallel Applications", in Proceedings of the 11th International Parallel Processing Symposium, (April 1st - 5th, 1997), IEEE Computer Society Press, pp. 187-192.
29. P. H. Worley, "MPI performance evaluation and characterization using a compact application benchmark code", in Proceedings of the Second MPI Developers Conference and Users' Meeting (July 1-2, 1996), pp. 170-177.
30. J. B. Drake, I. T. Foster, J. G. Michalakes, and P. H. Worley, "Parallel algorithms for semi-Lagrangian transport in global atmospheric circulation models", in Proceedings of the Seventh SIAM Conference on Parallel Processing for Scientific Computing (Feb. 15-17, 1995), pp. 119-124.
31. P. H. Worley, I. T. Foster, and B. Toonen, "Algorithm comparison and benchmarking using a parallel spectral transform shallow water model", in Proceedings of the Sixth Workshop on Parallel Processing in Meteorology (Nov. 21-25, 1994), pp. 277-289.
32. J. B. Drake, I. T. Foster, J. J. Hack, J. Michalakes, B. D. Semeraro, B. Toonen, D. L. Williamson, P. H. Worley, "PCCM2: A GCM Adapted for Scalable Parallel Computers", in Proceedings of the 5'th Global Climate Symposium of the AMS, Nashville, TN, Jan. 1994
33. I. T. Foster and P. H. Worley, "Parallelizing the Spectral Transform Method: A Comparison of Alternative Parallel Algorithms", in Proceedings of the Sixth SIAM Conference on Parallel Processing for Scientific Computing (March 22-24, 1993), pp. 100-107.
34. J. B. Drake, R. E. Flanery, I. T. Foster, J. J. Hack, J. G. Michalakes, R. L. Stevens, D. W. Walker, D. L. Williamson, and P. H. Worley, "The message-passing version of the parallel community climate model", in Proceedings of the Fifth ECMWF Workshop on Use of Parallel Processors in Meteorology (November 23-27, 1992), pp. 500-513.
35. B. M. Carlson, T. D. Wagner, L. W. Dowdy, and P. H. Worley, "Speedup properties of phases in the execution profile of distributed parallel programs", in Proceedings of the Sixth International Conference on Modeling Techniques and Tools for Computer Performance Evaluation (September 16-18, 1992), pp. 83-96.
36. P. H. Worley, "Phase modeling of a parallel scientific code", in Proceedings of the Scalable High Performance Computing Conference (April 26-29, 1992), pp. 322-327.
37. D. W. Walker, P. H. Worley, and J. B. Drake, "Parallelizing the Spectral Transform Method", in Proceedings of the Sixth Distributed Memory Computing Conference (April 28 - May 1, 1991), pp. 306-313.
38. P. H. Worley, "Parallelizing Across Time When Solving Time-Dependent Partial Differential Equations", in Proceedings of the Fifth SIAM Conference on Parallel Processing for Scientific Computing (March 25-27, 1991), pp. 246-252.
39. P. H. Worley and M. T. Heath, "Performance Characterization Research at Oak Ridge National Laboratory", in Proceedings of the Fourth SIAM Conference on Parallel Processing for Scientific Computation (Dec. 11-13, 1989), pp. 431-436.

40. G. A. Geist, M. T. Heath, B. W. Peyton, and P. H. Worley, "A Machine-Independent Communication Library", in Proceedings of the Fourth Conference on Hypercubes, Concurrent Computers, and Applications (March 6-8, 1989), pp.565-568.
41. P. H. Worley and R. Schreiber, "Nested Dissection on a mesh-connected processor array", in New Computing Environments: Parallel, Vector and Systolic, SIAM, 1986, pp. 8-38.

Other Publications

1. P. H. Worley, "Impact of Communication Protocol on Performance", ORNL Technical Report ORNL/TM-13682, February, 1999.
2. E. F. D'Azevedo, J. J. Dongarra, T. H. Dunigan, G. A. Geist, C. H. Romine, P. H. Worley, "Algorithms, Tools, and Software Aid Use of High-Performance Computers", ORNL Review, 30(3-4), June, 1998, pp. 38-45.
3. J. B. Drake, R. E. Flanery, I. T. Foster, J. J. Hack, J. G. Michalakes, B. D. Semeraro, D. L. Williamson, and P. H. Worley, "Parallel Community Climate Model: Description and User's Guide", ORNL Technical Report ORNL/TM-12285, May, 1996.
4. P. H. Worley and B. Toonen, "A users' guide to PSTSWM", ORNL Technical Report ORNL/TM-12779, July, 1995.
5. P. H. Worley, "A new PICL trace file format", ORNL/TM-12125, September, 1992.
6. P. H. Worley, "Modeling Histogram Data with Piecewise Polynomials", ORNL/TM-11637, August, 1990.
7. G. A. Geist, M. T. Heath, B. W. Peyton, and P. H. Worley, "PICL: a portable instrumented communication library, C reference manual", ORNL/TM-11130, July, 1990.
8. G. A. Geist, M. T. Heath, B. W. Peyton, and P. H. Worley, "A users' guide to PICL: a portable instrumented communication library", ORNL/TM-11616, August, 1990.
9. P. H. Worley, "Information Requirements and the Implications for Parallel Computation", Ph.D. thesis, Stanford University, June, 1988.

Software

- P. H. Worley and I. T. Foster, "Parallel Spectral Transform Shallow Water Model (PSTSWM)".
- P. H. Worley, "Portable Instrumented Communication Library for MPI (MPICL)".

Recent Presentations

1. "SciDAC-2 CCSM Consortium: Software Engineering Update", Software Engineering Working Group Meeting, Access Grid Meeting, March 16, 2007.
2. "Performance Evaluation of the Cray XT3 Configured with Dual-Core Opteron Processors" (with S. Alam, R. Barrett, J. Kuehn, and J. Vetter), ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, San Jose, CA, March 14-17, 2007. [POSTER]
3. "Random Comparisons of Performance Between the Cray XT3 and Cray XT4 at ORNL", The First Annual Cray Technical Workshop - USA, Gaylord's Opryland Hotel, Nashville, Tennessee, February 26-28, 2007.

4. "Performance Evaluation and Analysis Consortium (PEAC) End Station", SC'06, Oak Ridge National Laboratory Exhibit Booth, Tampa Convention Center Tampa, FL, November 13-16, 2006.
5. "Performance Engineering Research Institute (PERI)", SC'06, Oak Ridge National Laboratory Exhibit Booth, Tampa Convention Center Tampa, FL, November 13-16, 2006.
6. "Performance Evaluation and Analysis Consortium (PEAC) End Station", Fall Creek Falls 2006, Fall Creek Falls State Resort Park, TN, Oct. 22-24, 2007. (Also presented at NCCS Users Meeting, Joint Institute for Computational Sciences, Oak Ridge National Laboratory, Oak Ridge, TN, March 27-29, 2007.) [POSTER]
7. "Performance Engineering in the Community Atmosphere Model" (with A. A. Mirin, J. B. Drake, W. B. Sawyer), 2006 SciDAC Conference, Hyatt Regency Denver at Colorado Convention Center, Denver, CO, June 25-29, 2006. [POSTER]
8. "SciDAC CCSM Consortium: Software Engineering Update", CCSM Software Engineering Working Group Meeting, 11th Annual CCSM Workshop, The Village at Breckenridge, Breckenridge, CO, June 22, 2006.
9. "Performance Engineering of the Community Atmosphere Model" (with A. Mirin), 11th Annual CCSM Workshop, The Village at Breckenridge, Breckenridge, CO, June 20-22, 2006. [POSTER]
10. "CAM Performance on the X1E and XT3", 48th Cray User Group Conference, Palazzo dei Congressi, Lugano, Switzerland, May 8-11, 2006.
11. "Software and Performance Engineering of the Community Atmosphere Model" (with A. Mirin), Science Team Meeting, Climate Change Prediction Program, Royal Sonesta Hotel Boston, Cambridge, MA, April 24-26, 2006. [POSTER]
12. "Topics in Performance and Performance Engineering in Climate Modeling", Workshop on Petascale Computation for the Geosciences, San Diego Supercomputer Center, University of California, San Diego, San Diego, CA, April 4, 2006.
13. "Performance Intercomparison of Community Atmosphere Model on High-End Computing Platforms" (with A. Mirin, W. Sawyer, L. Oliker, M. Wehner, D. Parks), SIAM Conference on Parallel Processing for Scientific Computing Sir Francis Drake Hotel, San Francisco, CA, February 23, 2006. [POSTER]
14. "Performance and Scalability of the Community Atmosphere Model", The 8th International Workshop on Next Generation Climate Models for Advanced High Performance Computing Facilities, Hilton Albuquerque, Albuquerque, NM February 23, 2006.
15. "Performance Evaluation of the Cray XT3" (with Jeffrey S. Vetter, Sadaf R. Alam, Thomas H. Dunigan, Jr., Mark R. Fahey, Philip C. Roth), SIAM Conference on Parallel Processing for Scientific Computing Sir Francis Drake Hotel, San Francisco, CA, February 22, 2006.
16. "Performance Characterization of the Cray X1E", SIAM Conference on Parallel Processing for Scientific Computing Sir Francis Drake Hotel, San Francisco, CA, February 22, 2006.
17. "Performance Evaluation and Analysis Consortium End Station", 2006 NCCS Users Meeting, Joint Institute for Computational Sciences, Oak Ridge National Laboratory, Oak Ridge, TN, February 14, 2006.
18. "SciDAC CCSM Consortium: Software Engineering Update", CCSM Software Engineering Working Group Meeting, Access Grid / National Center for Atmospheric Research, Boulder, CO, January 25, 2006.

19. "Benchmarking using the Community Atmospheric Model", 2006 SPEC Benchmark Workshop, Joe C. Thompson Conference Center, University of Texas, Austin, Texas, January 23, 2006.
20. "Tools or No tools? A parallel performance analysis case study" (with P. Roth, J. Candy, L. Carrington, K. Huck, T. Kaiser, G. Mahinthakumar, A. Malony, S. Moore, D. Reed, H. Shan, S. Shende, A. Snavely, S. Sreepathi, F. Wolf, Y. Zhang), SC'05 Washington State Convention and Trade Center, Seattle, Washington, November 13, 2005. [POSTER]
21. "Early Evaluation of the Cray XT3" (with S. R. Alam, T. H. Dunigan, Jr, M. R. Fahey, P. C. Roth, J. S. Vetter), SC'05 Washington State Convention and Trade Center, Seattle, Washington, November 13, 2005. [POSTER]
22. "Portable Performance Characterization of the CCSM with TAU" (with G. R. Carr, Jr, S. Shende, J. B. Drake, M. W. Ham, F. M. Hoffman), SC'05 Washington State Convention and Trade Center, Seattle, Washington, November 13, 2005. [POSTER]
23. "Performance and Performance Portability of the Community Atmospheric Model", Workshop on Performance and Productivity of Extreme-Scale Parallel Systems, 2005 LACSI Symposium, Eldorado Hotel, Santa Fe, NM, October 11, 2005.
24. "Cray X1: Architecture and Performance Evaluation", SIAM Annual Meeting, Hilton New Orleans, New Orleans, Louisiana, July 14, 2005.
25. "SciDAC CCSM Consortium: Overview and Recent Progress", Software Engineering Working Group Meeting, Tenth Annual CCSM Workshop, Inn at Breckenridge, Breckenridge, CO, June 23, 2005.
26. "Optimization of CAM with Finite-Volume Dynamical Core on the Cray X1" (with A. A. Mirin), Tenth Annual CCSM Workshop, Inn at Breckenridge, Breckenridge, CO, June 21-23, 2005. [POSTER]
27. "Performance Analysis of GYRO: A Tool Evaluation" (with P. Roth, J. Candy, H. Shan, G. Mahinthakumar, S. Sreepathi, L. Carrington, T. Kaiser, A. Snavely, D. Reed, Y. Zhang, K. Huck, A. Malony, S. Shende, S. Moore, F. Wolk), 2005 SciDAC Conference, Grand Hyatt San Francisco, San Francisco, CA, June 26-30, 2005. [POSTER]
28. "Comparative Analysis of Interprocess Communication on the X1, XD1, and XT3", 47th Cray User Group Conference, Albuquerque Marriott Pyramid North, Albuquerque, New Mexico, May 18, 2005.
29. "Porting and Performance of the Community Climate System Model (CCSM3) on the Cray X1" (with G. R. Carr Jr., J. B. Drake, M. W. Ham, F. M. Hoffman, M. J. Cordery, and I. L. Carpenter), SC'04 David L. Lawrence Convention Center, Pittsburgh, Pennsylvania, November 9, 2004. [POSTER]
30. "Performance Evaluation of the SGI Altix 3700" (with T. H. Dunigan, Jr., M. R. Fahey, and J. S. Vetter), SC'04 David L. Lawrence Convention Center, Pittsburgh, Pennsylvania, November 9, 2004. [POSTER]
31. "Vectorizing the CCSM: SciDAC's Contribution (and other feats and marvels of software engineering)", Fifth Science Team Meeting, DOE Climate Change Prediction Program, Seattle Hilton Hotel, Seattle, Washington, October 19, 2004. [POSTER]
32. "The Performance Evolution of the Parallel Ocean Program on the Cray X1", Workshop on Performance and Productivity of Extreme-Scale Parallel Systems, 2004 LACSI Symposium, Eldorado Hotel, Santa Fe, New Mexico, October 12, 2004.
33. "Federation Performance on the ORNL p690 Cluster", ScicomP 10, Texas Advanced Computing Center, Austin, Texas, August 12, 2004.

34. "Cray X1 Optimization: A Customer's Perspective", 46th Cray User Group Conference, Knoxville Marriott, Knoxville, Tennessee, May 18, 2004.
35. "The Performance Evolution of the Parallel Ocean Program on the Cray X1", 46th Cray User Group Conference, Knoxville Marriott, Knoxville, Tennessee, May 18, 2004.
36. "Cray X1 Evaluation: Overview and Scalability Analysis", SIAM Conference on Parallel Processing for Scientific Computing 2004, Hyatt at Fisherman's Wharf, San Francisco, California, February 26, 2004. (Minor variations of this talk were also given at the ANL/ORNL Site Visit of the National Research Council/National Academies Computer Science and Telecommunications Board, Argonne National Laboratory, Argonne, Illinois, March 2, 2004 and at the Cray X1 Review, Oak Ridge National Laboratory, Oak Ridge, Tennessee, February 10, 2004.)
37. "Early Evaluation of the Cray X1", SC2003, Phoenix Convention Center, Phoenix, Arizona, November 19, 2003.
38. "Early Evaluation of the Cray X1 - Part 1.5", SC2003, Cray Exhibit Booth, Phoenix Convention Center, Phoenix, Arizona, November 18, 2003.
39. "Latest Performance Results from ORNL: Cray X1 and SGI Altix", System and Application Performance Workshop, 2003 LACSI Symposium, Eldorado Hotel, Santa Fe, New Mexico, October 27, 2003. (A minor variation of this talk was also given at the Computer Science Department, University of Tennessee, Knoxville, Tennessee, January 9, 2004.)
40. "CCSM Component Performance Benchmarking and Status of the Cray X1 at ORNL", Computing in the Atmospheric Sciences Workshop 2003, L'Imperial Palace Hotel, Annecy, France, September 10, 2003.
41. "Early Evaluation of the Cray X1 at Oak Ridge National Laboratory", 45th Cray User Group Conference, Hyatt on Capital Square, Columbus, Ohio, May 13, 2003.
42. "Recent Performance Improvements in the Community Atmospheric Model (CAM2)", Climate Change Prediction Program Science Team Meeting, Mills House Hotel, Charleston, South Carolina, March 18, 2003.
43. "Scaling the Unscalable: A Case Study on the AlphaServer SC", SC2002, Baltimore Convention Center, Baltimore, Maryland, November 19, 2002.
44. "Early Evaluation of the IBM p690", SC2002, Baltimore Convention Center, Baltimore, Maryland, November 17, 2002.
45. "Practical Performance Evaluation of the p690", ORNL Power4 Workshop, University of Tennessee, Knoxville, TN, July 25, 2002.
46. "Early Evaluation Results for the p690 System at Oak Ridge National Laboratory", Scicomp5, Daresbury Laboratory, Daresbury, England, May 9, 2002.
47. "Allreduce Performance and Performance Characterization on Compaq and IBM Cluster Architectures", SC2001, Denver Convention Center, Denver, Colorado, November 13, 2001. [POSTER]
48. "Performance Evaluation of Allreduce ScicompP", The Radisson Summit Hill, Knoxville, Tennessee, October 9, 2001.
49. "Two Performance Studies in Support of the NSF/DOE Coupled Climate Model", Workshop on the Performance Characterization of Algorithms, Lawrence Livermore National Laboratory, Livermore, California, July 19, 2001.

50. "Promise and Problems in the Performance Characterization of Algorithms", Workshop on the Performance Characterization of Algorithms, Oakland Marriott Hotel, Oakland, California, July 16-17, 2001.
51. "Designing Code and Data Structures for Portable Performance", SIAM Conference on Parallel Processing for Scientific Computing, Portsmouth, VA, March 12, 2001.
52. "Evaluation of Early Systems", ORNL Booth, SC'2000, Dallas Convention Center, Dallas, Texas, November 6-9, 2000.
53. "Performance Comparison of Winterhawk I and Winterhawk II Systems", ScicomP 2000 San Diego Supercomputing Center, La Jolla, California, August 14, 2000.
54. "Kernel and Application Code Performance for a Spectral Atmospheric Global Circulation Model on the Cray T3E and IBM SP", NERSC Users Group Meeting Oak Ridge, Tennessee, June 6, 2000.
55. "Performance Evaluation of the IBM SP and the Compaq AlphaServer SC", ACM International Conference of Supercomputing 2000 Santa Fe, New Mexico, May 10, 2000.
56. "Performance Tuning and Evaluation of a Parallel Community Climate Model", SC99, Portland, Oregon, November 16, 1999.
57. "Performance Tuning and Evaluation of a Parallel Community Climate Model on the IBM SP3", SP SciComp 1999, IBM Thomas J. Watson Research Center, Yorktown Heights, New York, October 8, 1999.
58. "Tuning Message Passing Performance on the T3E: Experiences with a Spectral Atmospheric Circulation Model", NERSC T3E Training, Oak Ridge National Laboratory, Oak Ridge, Tennessee, January 22, 1999.
59. "Performance Evaluation for Spectral Atmospheric Global Circulation Models", Center for Computational Sciences, University of Kentucky, Lexington, Kentucky, January 19, 1999.
60. "Tutorial on Performance Evaluation of Parallel Applications: Measurement, Modeling, and Analysis", Supercomputing 98, Orlando, FL, November 8, 1998.
61. "Benchmarking Beatitudes, Platitudes, and Attitudes", Workshop on Numerical Benchmarks for the Climate/Ocean/Weather Modeling Community, National Center for Atmospheric Research, Boulder, CO. September 22-23, 1998.
62. "Impact of Communication Protocol on Performance", Second International Workshop on Software Engineering and Code Design in Parallel Meteorological and Oceanographic Applications, Scottsdale, Arizona, June 15-18, 1998.
63. "Tutorial on Performance Evaluation of Parallel Applications: Measurement, Modeling, and Analysis", Supercomputing 97, San Jose, CA, November 16, 1997.