

William R. Martin

Professor and Chair

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Educational

- B.S.E., Engineering Physics, University of Michigan, 1967.
- M.S., Physics, University of Wisconsin, 1968.
- M.S.E., Nuclear Engineering, University of Michigan, 1975.
- Ph.D., Nuclear Engineering, University of Michigan, 1976.

Professional

- 1969-73: Officer, U.S. Navy, Naval Reactors Division, Washington, D.C.
- 1976-77: Principal physicist, Combustion Engineering, Inc.
- 1977-present: Professor, Department of Nuclear Engineering, (1989) ; Associate Professor (1981-88); Assistant Professor (1977-81).
- 1990-94: Chair, Department of Nuclear Engineering.
- 1986-01: Director of the Laboratory for Scientific Computation (LaSC).
- 1993-94: Director of the Center for Parallel Computing (CPC).
- 1994-99: Associate Dean for Academic Affairs, College of Engineering.
- 2000-01: Long-term Visiting Staff Member, X Division, Los Alamos National Laboratory.
- 2002-04: Director, Center for Advanced Computing (merger of LaSC and CPC).
- 2002-04: Interim Director, Michigan Grid Research and Infrastructure Development (MGRID) Center.
- 2004-present: Chair, Department of Nuclear Engineering and Radiological Sciences

Honors and Awards

- Distinguished Scholar Award, College of Engineering, University of Michigan, 1967.
- Royal Society Visiting Scholar, Imperial College, London, 1989.
- Glenn Murphy Award for Outstanding Contributions to the Profession and Teaching of Nuclear Engineering, American Society for Engineering Education, 1993.
- Fellow of the American Nuclear Society, 1995.

Relevant Experience

Martin has been active in developing numerical methods for application to nuclear engineering problems, including neutron, photon, and electron transport, thermal-hydraulics and heat transfer, and reactor plant simulation. Primary interests include the development of numerical methods for solving the Boltzmann transport equation, including Monte Carlo methods, finite element methods, and discrete ordinate methods. He has also worked on advanced fuel designs and fuel cycles for light water reactors and new core designs for research reactors.

Editorial Service

- Associate Editor, *Journal of Computational Physics* (Academic Press, Inc.)
- Advisory Editor, *Nuclear Science and Engineering* (American Nuclear Society)
- Member of the Editorial Board, *Transport Theory and Statistical Physics* (Marcel Dekker)

Professional Service

- Chair, Nuclear Engineering Department Heads Organization, 1994-95.
- Various roles with the American Nuclear Society Mathematics and Computation Division, including member of the Executive Committee, Secretary, Treasurer (current), and members of several Program Committee, 1977-present.

Review Panels and Advisory Boards

- Member, External Advisory Board, Department of Mechanical, Aerospace, and Nuclear Engineering, Rensselaer Polytechnic University, 2008.
- Member, Board of Visitors, University of Tennessee Department of Nuclear Engineering, 2005 – current.
- Chair, Board of Visitors, University of Texas Institute for Computational Engineering and Science, 2007 – present.
- Member, Board of Visitors, University of Texas Institute for Computational Engineering and Science, 2003 – 2007.
- Co-Chair, Review Panel, Sandia National Laboratory ASCI Initiatives – 1999-2007.
- Member, Predictive Science Review Panel, Livermore and Los Alamos ASCI Program – 1999-2005.
- Chair, Review Panel, University of Chicago ASCI Level 1 Center – 2001, 2003-2005.
- Member, Review Panel, Georgia Tech Program in Nuclear Engineering – 2002.
- Member, Review Panel, Livermore/Los Alamos ASCI Initiatives – 1999-2005.
- Member, Blue Ribbon Panel, DOE/ASCI Programs, DoE, 1999.
- Member, Review Panel, University of Wisconsin Department of Engineering Physics – 1999.
- Chair, Review Panel, University of Missouri (Rolla) Nuclear Engineering Program, 2001.
- Member and Chair, University of Chicago Review Committee for the Reactor Engineering Division at Argonne National Laboratory, 1995-2003.
- Chair, External Advisory Board, University of Southern Mississippi Program in Scientific Computing, 1999.

Major Grants

- Project Director, "An Advanced Neutronic Analysis Toolkit with Inline Monte Carlo Capability for VHTR Analysis," DoE NERI, 2006-2009, \$600k.
- Project Director, "Global Monte Carlo Simulation with High Order Polynomial Expansions," DoE NEER, 2004-2007, \$300k.
- Co-PI, "Advanced Variance Reduction for Global k-Eigenvalue Simulations in MCNP," DoE NEER, 2004-2007, \$300k.
- Project Director, "National Partnership for Advanced Computational Infrastructure" (NPACI), NSF, 1997-2005, \$8M.
- Co-PI, "Hybrid Monte Carlo- Deterministic Methods for Criticality Problems," DoE, 2000-2003, \$400k.
- Project Director, Acquisition of Massively Parallel Processors for Scientific Computing Applications, NSF, 1992-1995, \$2M.
- Co-PI, "Advanced Computational Methods for Nodal Diffusion, Monte Carlo, and SN Problems, DoE, 1991-1994, \$650k.
- Co-PI, "Numerical Simulation of the Transmission of the HIV Virus," NIH, 1990-1993, \$550k.
- Co-PI, "Numerical Methods for Particle Transport Problems," NSF, 1990-1993, \$640k.
- Project Director, "Implementation of Monte Carlo Methods on Parallel Processors," IBM Kingston, 1986-1992, \$800k.
- Project Director, "The Slightly-Enriched Spectral Shift Reactor," DoE, 1989-1992, \$730k.

Consulting Activities

- **Los Alamos National Laboratory** (2001 - present) – thermal radiation, Monte Carlo methods.
- **Lawrence Livermore National Laboratory** (1982 - present) – vectorized Monte Carlo; computational transport methods; advanced computer architectures, Monte Carlo methods.
- **Applied Research Associates** (1990) – Monte Carlo methods on advanced computers.
- **Winfrith Atomic Energy Establishment** (1989) – Monte Carlo on advanced computers.
- **Los Alamos National Laboratory** (1986 - 89) – Monte Carlo and particle-in-cell methods for particle transport on hypercube parallel processors.
- **Viking Corporation** (1987) – review of reactor plant simulation code for BWR transient simulation (for the Nuclear Regulatory Commission).
- **Rockwell International Corporation** (1985) – vector supercomputers.
- **International Business Machines Corporation** (1984-85) – the development and presentation of three short courses in scientific computation.
- **International Atomic Energy Agency** (1982-83) – low-enrichment research reactors.
- **Consumers Power Company** (1981-82) – nuclear reactor operator training.
- **Los Alamos National Laboratory** (1980-82) – vectorized Monte Carlo.
- **Bendix Aerospace Systems** (1980-81) – neutron and gamma transport computations.
- **Argonne National Laboratory** (1978-79) – neutronics methods for research reactors.

Publications

Book

J. J. Duderstadt and W. R. Martin, **Transport Theory**, Wiley-Interscience, New York (1979).

Chapters in Books

1. D.K. Wehe, J.C. Lee, W.R. Martin, R.C. Mann, W.R. Hamel, and J. Tulenko, "Intelligent Robotics and Remote Sensing Systems for the Nuclear Industry," *Nucl. Eng. Des.* **113**, 259 (1989).
2. W.R. Martin, "Monte Carlo Methods on Advanced Computer Architectures," *Advances in Nuclear Science and Technology* **22**, 105-164 (1992).
3. W.R. Martin and P. Burns, "Introduction to Monte Carlo Methods", in the electronic textbook *High Performance Computing*, Computational Science Education Project, Department of Energy, <http://csep1.phy.ornl.gov/csep.html>, 1995.

Archival Journal Articles

1. W. R. Martin and J. J. Duderstadt, "Finite Element Solutions of the Neutron Transport Equation with Applications to Strong Heterogeneities", *Nuclear Science and Engineering* **62**, 371-390 (1977).
2. W. R. Martin, C. E. Yehnert, L. Lorence, and J. J. Duderstadt, "Phase Space Finite Elements Applied to the First-Order Form of the Transport Equation", *Annals of Nuclear Energy* **8**, 633(1981).
3. J. Kornfilt, J. C. Lee, and W. R. Martin, "Simulation of the LOFW Transient During the TMI-2 Accident", published in archival proceedings of the Second International Topical Meeting on Nuclear Reactor Thermal/Hydraulics, American Society of Mechanical Engineers, Santa Barbara, CA (January 11-14, 1983).
4. B. Baggoura and W. R. Martin, "Transient Analysis of the TMI-2 Pressurizer System", *Nuclear Technology* **62**, 159(1983).
5. H. Nakata and W. R. Martin, "The Finite Element Response Matrix Method", *Nuclear Science and Engineering* **85**, 289(1983).

6. D.K. Wehe, C. R. Drumm, J. C. Lee, J. S. King, W. R. Martin, and M. M. Bretscher, "Subcadmium Flux Measurements in HEU and LEU Cores Using Rhodium SPND and Wire Activations," *Atomkernenergie-Kerntechnik* **44**, Supp., 407 (1984).
7. F. B. Brown and W. R. Martin, "Monte Carlo Methods For Radiation Transport Analysis on Vector Computers", *Progress in Nuclear Energy* **14**, 269(1985).
8. L. Lorence, M. Luskin, and W. R. Martin, "Analysis of a Block Gauss-Seidel Iterative Method for a Finite Element Discretization of the Neutron Transport Equation", *Transport Theory and Statistical Physics* **14**, 35(1985).
9. W. R. Martin, J. A. Rathkopf, and P. F. Nowak, "Monte Carlo Photon Transport on a Vector Supercomputer," *IBM Journal of Research and Development* **30**, 193 (1986).
10. M. L. Adams and W. R. Martin, "Slab Geometry Transport Discretization Schemes with Infinite-Order Convergence," *Transport Theory and Statistical Physics* **15**, 651(1986).
11. J. A. Rathkopf and W. R. Martin, "The Finite Element Response Matrix Method for the Solution of the Neutron Transport Equation," *Progress in Nuclear Energy* **18**, 23 (July 1986).
12. W. R. Martin and F. B. Brown, "Present Status of Vectorized Monte Carlo for Particle Transport Analysis," *International Journal of Supercomputer Applications* **1**, No. 2, 11-32(1987).
13. W. R. Martin, T. C. Wan, T. Abdel-Rahman, and T. N. Mudge, "Monte Carlo Photon Transport on Shared Memory and Distributed Memory Parallel Processors," *International Journal of Supercomputer Applications* **1**, No. 3, 57-74 (1987).
14. W.R. Martin, "Particle Transport Monte Carlo on Vector and Parallel Architectures", in Advances in Computer Methods for Partial Differential Equations - VI, R. Vichnevetsky and R.S. Stepleman, Eds., Proc. Sixth IMACS International Symposium on Computer Methods for Partial Differential Equations, Bethlehem, PA, June 1987.
15. M. L. Adams and W. R. Martin, "Boundary Projection Acceleration: A New Approach to Synthetic Acceleration of Transport Calculations," *Nuclear Science and Engineering* **100**, 177 (1988).
16. D.K. Wehe, J.C. Lee, W.R. Martin, R.C. Mann, and W.R. Hamel, "Intelligent Robotics and Remote Sensing Systems for the Nuclear Industry," *Nucl. Eng. Des.* **113**, 259 (1989).
17. W.R. Martin, "Successful Vectorization - Reactor Physics Monte Carlo Code," *Comp. Phys. Comm.* **57**, 68-77 (1989).
18. S. Youssef, W. Martin, T.C. Wan, S. Wilderman, "A Vectorized Monte Carlo Detector Simulation Program for Electromagnetic Interactions," *Comp. Phys. Comm.* **57**, 251-254 (1989).
19. W.R. Martin and G.C. Pomraning, "Monte Carlo Analysis of the Backscattering of Radiation from a Sphere to a Plane," *J. Quant. Spect. Rad. Transfer* **43**, 115-126 (1990).
20. J.L. Vujic and W.R. Martin, "Vectorization and Parallelization of a Production Reactor Assembly Code," *Prog. in Nuclear Energy* **25**, 291-305 (1991).
21. J.S. Koopman, W.R. Martin, et al., Assessing Risk Factors for Transmission of Infection, *American Journal of Epidemiology* **133**, 1199-1209 (1991).
22. W.R. Martin, "Monte Carlo Methods on Advanced Computer Architectures," *Advances in Nuclear Science and Technology* **22**, 105-164 (1991).
23. M.L. Adams and W.R. Martin, "Diffusion-Synthetic Acceleration of Discontinuous Finite Element Transport Iterations," *Nuclear Science and Engineering*, **111**, 145-167 (1992).
24. C.T. Ballinger, J.A. Rathkopf, and W.R. Martin, "The Response History Monte Carlo Method for Electron Transport," *Nuclear Science and Engineering*, **112**, 283-295 (1992).
25. C.T. Ballinger, D.E. Cullen, S.T. Perkins, J.A. Rathkopf, W.R. Martin, and S.J. Wilderman, "Single-scatter Monte Carlo compared to condensed history results for low energy electrons," *Nuclear Instruments and Methods in Physics Research B72*, 19-27 (1992).
26. W.R. Martin, "Undergraduate Education in Nuclear Engineering in the USA," *J. of Radioanalytical and Nuclear Chemistry*, **171**, 183-192 (1993).
27. S.E. Aumeier, J.C. Lee, D.M. Cribley, and W.R. Martin, "Cross Section Parameterization Using Irradiation Time and Exposure for Global Depletion Analysis," *Nucl Tech*, **108**, 299-319 (1994).

28. D.C. Losey, J.C. Lee, W.R. Martin, and T.C. Adamson, "Singular Perturbation Solutions of the Neutron Transport Equation," *Nuclear Science and Engineering*, **123**, 68-85 (1996).
29. F. B. Brown and W. R. Martin, "Stochastic Geometry Capability in MCNP5 for the Analysis of Particle Fuel," *Annals of Nuclear Energy* **31**, 2039-2047 (2004).
30. D. P. Griesheimer, W. R. Martin, and J. P. Holloway, "Convergence Properties of Monte Carlo Functional Expansion Tallies," *Journal of Computational Physics*, 211, 129-153 (January 2006).
31. N. Tyagi, W. R. Martin, J. Du, A. F. Bielajew, and I. J. Chetty, "A Proposed Alternative to Phase-space Recycling Using the Adaptive Kernel Density Estimator Method," *Medical Physics* **33**, 553-560 (January 2006).

Conference Proceedings

1. W. R. Martin and J. J. Duderstadt, "Computational Techniques in Nuclear Reactor Analysis", *Notices of the American Mathematical Society* **22**, (6) A-659, 1975.
2. W. R. Martin, "Convergence of the Finite Element Method in Neutron Transport", *Trans. Am. Nucl. Soc.* **22**(1975).
3. W. R. Martin, A. Jonsson, and A. J. Mockel, "Adjustment of Diffusion Coefficients Using Transport Theory Results", *Trans. Am. Nucl. Soc.* **27**,349 (1977).
4. L. Lorence and W. R. Martin, "Response Matrix Finite Element Solution of the Neutron Transport Equation", *Trans. Am. Nucl. Soc.* **32**, 305 (1979).
5. H. Komoriya, J. C. Lee, and W. R. Martin, "Reduced-Enrichment Fuel Element Loading Calculations for the Ford Nuclear Reactor", *Trans. Am. Nucl. Soc.(ANS-ROD)* **32** (Suppl. 1), 31 (1979).
6. D. C. Losey, F. B. Brown, D. Wehe, W. R. Martin, J. C. Lee, and H. Komoriya, "Impact of Reduced Enrichment Fuel on Research Reactor Performance and Utilization", *Trans. Am. Nucl. Soc.* **33**, 748 (1979).
7. F. B. Brown, D. C. Losey, D. Wehe, J. C. Lee, and W. R. Martin, "Neutronic Analysis of Low Enrichment Fuels for Research Reactors", *Trans. Am. Nucl. Soc.* **33**, 746 (1979).
8. J. C. Lee, W. R. Martin, J. Kornfilt, Y. C. Feng, and F. Dayo, "Transient Analysis of Nuclear Steam Generators", *Proc. of Fourth Power Plant Dynamics, Control and Testing Symposium*, Knoxville, TN (1980). [invited]
9. D. C. Losey, F. B. Brown, J. C. Lee, and W. R. Martin, "Equilibrium Core Analysis of Low Enrichment Research Reactor Fuel", *Trans. Am. Nucl. Soc.* **35**, 569 (1980).
10. D. C. Losey, F. B. Brown, W. R. Martin, and J. C. Lee, "Core Physics Analysis of the FNR HEU-LEU Demonstration Experiment", presented at the *Int Meeting on Reduced Enrichment Fuels for Research and Test Reactors*, Argonne National Laboratory, CONF-801144 (November, 1980).
11. F. B. Brown, D. A. Calahan, and W. R. Martin, "Investigation of Vectorized Monte Carlo Algorithms", presented at the *First Conference on High Speed Computing*, Gleneden Beach, Oregon, March 31-April 2, 1981.
12. W. R. Martin, C. Yehnert, L. Lorence, and J. J. Duderstadt, "Phase Space Finite Element Methods Applied to the First Order Form of the Transport Equation", presented at the *International Seminar on the Role of the Finite Element Method in Radiation Physics*, Imperial College, London, April 23-24, 1981. [invited]
13. F. B. Brown, W. R. Martin, and D. A. Calahan, "A Discrete Sampling Method for Vectorized Monte Carlo Calculations", *Trans. Am. Nucl. Soc.* **38**, 354 (1981).
14. F. B. Brown, W. R. Martin, and D. A. Calahan, "Investigation of Vectorized Monte Carlo Algorithms", *Trans. Am. Nucl. Soc.* **39** 755(1981).
15. H. Nakata and W. R. Martin, "The Finite Element Response Matrix Method for Coarse-Mesh Calculations", *Trans. Am. Nucl. Soc.* **39**, 464(1981).
16. Y. C. Feng, W. R. Martin, and J. C. Lee, "Nonequilibrium Transient Two-Phase Flow Modeling and Analysis", *Trans. Am. Nucl. Soc.* **39**, 505(1981).

17. W. R. Martin and D. A. Calahan, "Vectorized Monte Carlo for Nonlinear Radiation Transport", *Trans. Am. Nucl. Soc.* **43**, 399 (1982). [invited]
18. J.A. Rathkopf, C.R. Drumm, W.R. Martin and J.C. Lee, "Analysis of the Ford Nuclear Reactor LEU Core," presented at the *International Meeting on Research and Test Reactor Core Conversions from HEU to LEU Fuels*, Argonne National Laboratory (November 1982).
19. D.K. Wehe, C.R. Drumm, J.C. Lee, J.S. King, W.R. Martin, and M.M. Bretscher, "Subcadmium Flux Measurements in HEU and LEU Cores Using Rhodium SPND and Wire Activations", presented at the *Int Symp on the Use and Development of Low and Medium Flux Research Reactors*, MIT, (October 1983).
20. D.K. Wehe, C.R. Drumm, J.S. King, W.R. Martin, and J.C. Lee, "Operating Experience, Measurement, and Analysis of the LEU Demonstration Cores at the FNR", presented at the *Int Meeting on Reduced Enrichment for Research and Test Reactors*, Tokai, Japan (October 1983).
21. J. A. Rathkopf and W. R. Martin, "A Coarse-Mesh Transport Theory Response Matrix Method", *Trans. Am. Nucl. Soc.* **46**, 403(1984).
22. S. Wilderman, M.J. Flynn, and W.R. Martin, "The Effect of Electron Scattering Approximations on Low Energy Monte Carlo Electron Transport Calculations," *Med. Phy.* **12**, 521 (1985).
23. W. R. Martin, J. A. Rathkopf, and P. F. Nowak, "Vectorized Monte Carlo Photon Transport for the Cray-XMP", *Trans. Am. Nucl. Soc.* **50**, 278(1985).
24. M. L. Adams and W. R. Martin, "Slab Geometry Spatial Discretization Schemes with Infinite-Order Convergence", *Trans. Am. Nucl. Soc.* **50**, 263(1985).
25. M.L. Adams and W.R. Martin, "A New Approach to Synthetic Acceleration of Transport Calculations," *Trans. Am. Nucl. Soc.* **53**, 282(1986).
26. J.A. Rathkopf and W.R. Martin, "A Transport Theory Response Matrix Method in Two Dimensions," *Trans. Am. Nucl. Soc.* **53**, 286(1986).
27. T. C. Wan and W. R. Martin, "Parallel Algorithms for Photon Transport Monte Carlo" *Trans. Am. Nucl. Soc.* **53**, 285(1986).
28. W.R. Martin, H. Nakata, T.C. Wan, J. Vujic, and J.C. Lee, "Analysis of Uranium Silicide Fuel for the Ford Nuclear Reactor," *International Meeting on Reduced Enrichment for Research and Test Reactors*, Gatlinburg, TN (November 1986).
29. W.R. Martin, T. C. Wan, D. Poland, T. N. Mudge, and T. S. Abdel-Rahman, "Monte Carlo Photon Transport on the NCUBE," *Hypercube Multiprocessors 1987*, M.T. Heath, ed., SIAM Press , Philadelphia (1987).
30. W.R. Martin, T.C. Wan, T. Abdel-Rahman, and T.N. Mudge, "Monte Carlo Photon Transport on Shared Memory and Distributed Memory Parallel Processors," *Tenth International Conference on Transport Theory*, La Jolla, March 1987. [invited]
31. J. A. Rathkopf, L. J. Lorence, and W. R. Martin, "The Explicitly-Interfaced Method and the Response Matrix Method : Two Methods for the Solution of the Transport Equation," *Int Topical Meeting on Advances in Reactor Physics, Mathematics, and Computation*, Paris (April,1987).
32. W.R. Martin, "Present Status of Vectorization in Monte Carlo," *International Topical Meeting on Advances in Reactor Physics, Mathematics, and Computation*, Paris (April,1987). [invited]
33. M. L. Adams and W. R. Martin, "Boundary Projection Acceleration: A New Approach to Synthetic Acceleration of Transport Calculations," *Int Topical Meeting on Advances in Reactor Physics, Mathematics, and Computation*, Paris (April,1987).
34. W.R. Martin, "Particle Transport Monte Carlo on Vector and Parallel Architectures", *Sixth IMACS International Symposium on Computer Methods for Partial Differential Equations*, Bethlehem, PA, (June 1987). [invited]
35. P.F. Nowak and W.R. Martin, "An S2 Synthetic Acceleration Method for Two-Dimensional Nodal SN Calculations", *Trans. Am. Nucl. Soc.* **54**, 189 (1987).
36. W.R. Martin, "Case Study in Vectorization", *Workshop on Detector Simulation for the SSC*, Argonne National Laboratory, August 1987. [invited]

37. S.J. Wilderman, M.J. Flynn, and W.R. Martin, "Comparison of Monte Carlo Algorithms for Kilovolt Electron Transport Modeling," *Med. Phys.* **14**, 475 (1987).
38. P.F. Nowak, E.W. Larsen, and W.R. Martin, "Multigrid Methods for S_N Problems", *Trans. Am. Nucl. Soc.* **55**, 355 (1987).
39. T.C. Wan and W.R. Martin, "The Monte Carlo Response Matrix Method", *Trans. Am. Nucl. Soc.* **55**, 359 (1987).
40. W.R. Martin, "Monte Carlo Particle Transport on Parallel Processors", *Trans. Am. Nucl. Soc.* **55**, 324 (1987). [invited]
41. W.R. Martin, J. Vujic, and T.C. Wan, "Monte Carlo Particle Transport on Parallel Processors", *12th IMACS World Conference on Scientific Computation*, Paris, July 1988. [invited]
42. P.F. Nowak, E.W. Larsen, and W.R. Martin, "A Multigrid Method for S_N Calculations in X-Y Geometry", *Trans. Am. Nucl. Soc.* **56**, 291 (1988).
43. R. Raghvan, J.P. Hayes, and W.R. Martin, "Logic Simulation of Vector Processors," *Digest 1988 International Conference on Computer-Aided Design*, Santa Clara, CA, 268-271 (1988).
44. W.R. Martin, "Successful Vectorization -- Reactor Physics Monte Carlo Code," Proc. Conf. *Computing in High Energy Physics CHEP89*, Univ. of Oxford, Oxford, England (1989). [invited]
45. W.R. Martin and F.B. Brown, "Monte Carlo Methods for Particle Transport," *Trans. Am. Nucl. Soc.* **60**, 336-337 (1989). [invited]
46. J.L. Vujic and W.R. Martin, "Global Restructuring of the CPM-2 Algorithm for Vector and Parallel Processing," *Trans. Am. Nucl. Soc.* **60**, 543-544 (1989).
47. S. Park and W.R. Martin, "Reactor Plant Simulation on a Distributed-Memory Processor," *Trans. Am. Nucl. Soc.* **60**, 353-355 (1989).
48. R.E. Grove, J.C. Lee, and W.R. Martin, "Preliminary Design of a Slightly-Enriched Spectral Shift Reactor," *Trans. Am. Nucl. Soc.* **60**, 634-635 (1989).
49. R.E. Grove, W.R. Martin, J.C. Lee, A. Oukebdane, and M.C. Edlund, "Preliminary Design and Analysis of a Slightly-Enriched Spectral Shift Reactor," *Int. Conf. on the Physics of Reactors: Operation, Design, and Computation*, Marseille, France (April 1990).
50. J.L. Vujic and William R. Martin, "Two-Dimensional Collision Probability Method with Anisotropic Scattering for Vector and Parallel Processing," *International Conference on the Physics of Reactors: Operation, Design, and Computation*, Marseille, France (April 1990).
51. W.R. Martin, "The Impact of Advanced Computers on Nuclear Reactor Analysis," *Third Int. Seminar on Finite Element and Allied Methods in Radiation Transport*, Imperial College, London (April 1990). [invited]
52. J.L. Vujic and W.R. Martin, "Vectorization and Parallelization of a Production Reactor Assembly Code," *Third Int. Seminar on Finite Element and Allied Methods in Radiation Transport*, Imperial College, London (April 1990).
53. J.L. Vujic and W.R. Martin, "Solution of Two-Dimensional Boltzmann Transport Equation on a Multiprocessor IBM 3090," *Proc. of the 1990 ASME Intl. Computers in Engineering Conference and Exhibition*, Boston, MA (April 1990).
54. C.T. Ballinger and W.R. Martin, Response Matrix Monte Carlo for Electron Transport," *Trans. Am. Nucl. Soc.* **62**, 275-276 (1990).
55. C.T. Ballinger, J.A. Rathkopf, and W.R. Martin, "Response Matrix Monte Carlo Based on a General Geometry Local Calculation for Electron Transport," v5, 21.2 4-1, *Int Topical Meeting on Advances in Mathematics, Computations, and Reactor Physics*, American Nuclear Society, Pittsburgh, PA (1991).
56. K.M. Abotel, E.W. Larsen, and W.R. Martin, "A 'Local' Exponential Transform Methods for Monte Carlo Transport Calculations," v5, 23.1 1-1, *Int Topical Meeting on Advances in Mathematics, Computations, and Reactor Physics*, American Nuclear Society, Pittsburgh, PA (1991).
57. C.T. Ballinger, J.A. Rathkopf, and W.R. Martin, "Limitations of the Condensed History Method for Low-Energy Electrons," *Trans. Am. Nucl. Soc.* **64**, 306-308 (1991).

58. A Oukebdane and W.R. Martin, "Coarse-Mesh Heterogeneous Response Matrix Method for Reactor Analysis," *Trans. Am. Nucl. Soc.* **64**, 280-281 (1991).
59. K.N. Abotel, E.W. Larsen, "Local Exponential Transform Methods for the Monte Carlo Simulation of Multigroup Transport Problems," Proc. American Nuclear Society Topical Meeting, *Advances in Reactor Physics*, 2-288, Charleston, SC (March 1992).
60. W.R. Martin, J.A. Rathkopf, and F.B. Brown, "The Impact of Advances in Computer Technology on Particle Transport Monte Carlo," Proc. ANS Topical Meeting, *New Horizons in Radiation Protection and Shielding*, Richland, WA (April 1992). [invited]
61. A. Majumdar and W.R. Martin, "Parallel Conditioned Conjugate Gradient Algorithm Applied to Neutron Diffusion Problem," *Trans. Am. Nucl. Soc.* **65**, 209-210 (1992).
62. S.D. Park and W.R. Martin, Reactor Plant Simulation on a Distributed-Memory MIMD Parallel Processor, *Proc. 5th International Topical Meeting on Reactor Thermal Hydraulics, NURETH-5*, vol. 6, 1780-1788, Salt Lake City, September 20-24, 1992. [invited]
63. S.E. Aumeier, J.C. Lee, D.M. Cribley, and W.R. Martin, "New Cross-Section Parameterization Scheme for Global Depletion Analysis of the Slightly Enriched Spectral Shift Reactor," *Trans. Am. Nucl. Soc.* **66**, 496-497 (1992).
64. K.N. Abotel, E.W. Larsen, and W.R. Martin, "Local Exponential Transform Methods for the Monte Carlo Simulation of Multigroup X,Y-Geometry Transport Problems," *Proc. Joint ANS-ENS Int. Conf. on Mathematical Methods and Supercomputing in Nucl Applications*, Karlsruhe, 1993.
65. W.R. Martin, A. Majumdar, J.A. Rathkopf, and M. Litvin, "Experiences with Different Parallel Programming Paradigms for Monte Carlo Particle Transport Leads to a Portable Toolkit for Parallel Monte Carlo," *Proc. Joint ANS-ENS Int. Conf. on Mathematical Methods and Supercomputing in Nuclear Applications*, Karlsruhe, April 1993.
66. K.N. Abotel, E.W. Larsen, and W.R. Martin, "Local Exponential Transform Methods for the Monte Carlo Simulation of Multigroup X,Y-Geometry Transport Problems," presented at the *International Workshop on Monte Carlo Methods*, CEA, Saclay, France, April 1993.
67. W.R. Martin, A. Majumdar, J.A. Rathkopf, and M. Litvin, "Experiences with Different Parallel Programming Paradigms for Monte Carlo Particle Transport Leads to a Portable Toolkit for Parallel Monte Carlo," presented at the *International Workshop on Monte Carlo Methods*, CEA, Saclay, France, April 1993.
68. W.R. Martin, "Advances in Monte Carlo Methods for High Performance Computer Architectures," *15th International Symposium on Mathematical Programming*, Ann Arbor, MI (1994). [invited]
69. A. Majumdar and W.R. Martin, "Calculations of Reactivity Perturbations Using Correlated Sampling Monte Carlo," *Trans. Am. Nucl. Soc.* **71**, 203-205 (1994).
70. A. Majumdar and W.R. Martin, "Multiple Reactivity Calculations Using Single Correlated Sampling Monte Carlo Simulation," *Proc. Int. Conf. on Mathematics and Computations, Reactor Physics, and Environmental Analyses*, ANS, Portland, OR (May, 1995).
71. W.R. Martin, "Recent Advances in Monte Carlo Methods for Reactor Physics and Radiation Shielding," *Tenth ENFIR / III ENAN Joint Nuclear Conferences*, Aguas de Lindoia, Brazil, August 7-11, 1995. [invited]
72. A. Majumdar and W.R. Martin, "Development of a Multiple Perturbation Monte Carlo Methods for Criticality Problems and Implementation on Parallel Processors," *Tenth ENFIR / III ENAN Joint Nuclear Conferences*, Aguas de Lindoia, Brazil, August 7-11, 1995.
73. W.R. Martin and J.A. Rathkopf, "Isotopic Depletion with Monte Carlo," *Trans. Am. Nucl. Soc.* **74**, 167-168 (June, 1996).
74. J. Du and W.R. Martin, "Adaptive Kernel Density Estimation and Monte Carlo Sampling," *Trans. Am. Nucl. Soc.* **74**, 171-172 (June, 1996).
75. M.-A. Descalle, T.J., Laing, and W.R. Martin, PUVa: a Monte Carlo Code for Intra-articular PUVa Treatment of Arthritis," *Trans. Am. Nucl. Soc.* **75**, 141-142 (Nov, 1996).

76. M.-A. Descalle, S.L. Jacques, S.A. Prahl, T.J., Laing, and W.R. Martin, Measurements of Ligament and Cartilage Optical Properties at 351 nm, 365 nm, and in the Visible Range [440-800 nm],” *Proc. Europto BioS’97, SPIE* 3195-52, 280-285 (1997).
77. M.-A. Descalle, T.J., Laing, and W.R. Martin, “Virtual Geometrical Model of the Knee,” *Proc. 10th Int Conf on Mechanics in Medicine and Biology*, 185-188 (1998).
78. A. Majumdar and W.R. Martin, “Performance Measurement of Monte Carlo Photon Transport on Parallel Machines,” *PHYSOR 2000: ANS Int. Top. Meeting*, Pittsburgh, May 2000 [invited].
79. Brown, F.B., and Martin, W.R., “Monte Carlo Particle Transport in Media with Exponentially Varying Time-dependent Cross-sections,” *Trans. Am. Nucl. Soc.* 84, 220-221 (June, 2001). LA-UR-01-0675, Los Alamos National Laboratory (2001).
80. Martin, W.R., and Brown, F.B., “The Analytical Monte Carlo Method for Radiation Transport Calculations,” *Trans. Am. Nucl. Soc.* 84, 217-220 (June, 2001). LA-UR-01-0680, Los Alamos National Laboratory (2001).
81. Martin, W.R., and Brown, F.B., “Comparison of Monte Carlo Methods for Nonlinear Radiation Transport,” presented at *17th Int Conference on Transport Theory*, London (July 8-14, 2001).
82. Martin, W.R., and Brown, F.B., “Comparison of Monte Carlo Methods for Nonlinear Radiation Transport,” *Proceedings of the ANS Mathematics and Computations Topical Meeting*, Salt Lake City (September 2001). LA-UR-01-1728, Los Alamos National Laboratory (2001).
83. Martin, W.R., and Brown, F.B., "Error Modes in Implicit Monte Carlo," *Trans. Am. Nucl. Soc.* 85, 329-332 (November 2001). LA-UR-01-3755, Los Alamos National Laboratory (2001).
84. Brown, F.B., and Martin, W.R., "Improved Monte Carlo Methods for Radiative Transfer Calculations," presented at the Joint LANL/LLNL Conference NEDPC2001, Lawrence Livermore National Laboratory (October 2001). LA-UR-01-6771, Los Alamos National Laboratory (2001).
85. Brown, F.B. and Martin, W.R., "Improved Method for Implicit Monte Carlo," *Trans. Am. Nucl. Soc.* 86 (June 2002). Also LA-UR-01-6772, Los Alamos National Laboratory (2001).
86. Brown, F.B. and Martin, W.R., “Improved Monte Carlo Methods for Radiative Transfer Calculations,” presented at Joint Working Group Conference JOWOG-42, AWE Aldermaston, England (March 2002).
87. Brown, F.B., and Martin, W.R., "Direct Sampling of Flight Paths In Media with Continuously Varying Cross Sections," presented at the Joint LANL/LLNL Conference NECDC2002, Monterey, California (November 2002).
88. Brown, F.B. and Martin, W.R., "Direct Sampling of Monte Carlo Flight Paths in Media with Continuously Varying Cross-Sections”, *Proceedings of the American Nuclear Society Mathematics and Computations Topical Meeting*, Gatlinburg, TN (April 2003). Also LA-UR-02-6530, Los Alamos National Laboratory (2002).
89. Griesheimer, D.P. and Martin, W.R., “Estimating the Global Scalar Flux Distribution with Orthogonal Function Expansions”, *Trans. Am. Nucl. Soc.* 89, 462-464 (2003).
90. Griesheimer, D.P. and Martin, W.R., “Monte Carlo Based Angular Flux Response Functions”, *Trans. Am. Nucl. Soc.* 89, 370-372 (2003).
91. Griesheimer, D.P., Martin, W.R., and Holloway, J.P., "Estimation of Fluence Distributions with Monte Carlo Functional Expansion Tallies", *Proc. Tenth International Conference on Radiation Shielding (ICRS-10)*, Madeira, Portugal, May 2004.
92. Griesheimer, D.P. and Martin, W.R., "Two Dimensional Functional Expansion Tallies for Monte Carlo Simulations," *Proc. American Nuclear Society Topical Conference*, PHYSOR-2004, Chicago, Illinois, April 2004.
93. Brown, F.B., Griesheimer, D.P., and Martin, W.R., "Continuously Varying Material Properties and Tallies for Monte Carlo Calculations", *Proc. American Nuclear Society Topical Conference*, PHYSOR-2004, Chicago, Illinois, April 2004.
94. F. B. Brown and W. R. Martin, "Stochastic Geometry for MCNP5," *Trans. Am. Nucl. Soc.* 91, 171-173, Washington, DC (2004).

95. F. B. Brown and W. R. Martin, "High Performance Computing and Monte Carlo," *Trans. Am. Nucl. Soc.* 91, 279-280, Washington, DC (2004).
96. W. Ji, J. L. Conlin, W. R. Martin, and J. C. Lee, "Reactor Physics Analysis of the VHTGR Core," *Trans. Am. Nucl. Soc.* 91, 556-558, Washington, DC (2004).
97. F. B. Brown, W. R. Martin, W. Ji, J. L. Conlin, and J. C. Lee, "Stochastic Geometry and HTGR Modeling with MCNP5," *Proc. Monte Carlo 2005 Topical Meeting*, American Nuclear Society, Chattanooga, TN, April 17–21, 2005, American Nuclear Society, LaGrange Park, IL (2005).
98. D. P. Griesheimer, W. R. Martin, J. P. Holloway, "A Functional Expansion Method for Monte Carlo Eigenvalue Calculations," *Proc. Monte Carlo 2005 Topical Meeting*, American Nuclear Society, Chattanooga, TN, April 17–21, 2005, American Nuclear Society, LaGrange Park, IL (2005).
99. W. Ji, J. L. Conlin, W. R. Martin, J. C. Lee, and F. B. Brown, "Explicit Modeling of Particle Fuel for the Very-High Temperature Gas-Cooled Reactor," *Trans. Am. Nucl. Soc.* 92, 236-238, San Diego, CA (June, 2005).
100. J. L. Conlin, W. Ji, J. C. Lee, and W. R. Martin, "Pseudo Material Construct for Coupled Neutronic-Thermal-Hydraulic Analysis of VHTGR," *Trans. Am. Nucl. Soc.* 92, 225-227, San Diego, CA (June, 2005).
101. H.-C. No, C. H. Oh, J. H. Kim, G.-C. Park, J. C. Lee, W. R. Martin, M. O. Kim, J. L. Conlin, and W. Ji, "Very-High-Temperature Gas-Cooled Reactors: Progress and Challenges," *Proc. Int Congress on Advances in Nuclear Power Plants*, ICAPP 2005, May 2005, Seoul, Korea.
102. D. P. Griesheimer, J. Cheatham, J. P. Holloway, and W. R. Martin, "Improving Monte Carlo Source Convergence with the Functional Expansion Technique," *Trans. Am. Nucl. Soc.* 93, 461-463, Washington, DC (November 2005).
103. W. Ji, J. L. Conlin, G. Yesilyurt, W. R. Martin, J. C. Lee, and F. B. Brown, "Neutronic Analysis to Support Validation of Safety Analysis Codes for the VHTR," *Trans. Am. Nucl. Soc.* 93, 931-933, Washington, DC (November 2005).
104. G. Yesilyurt, W. R. Martin, and J. C. Lee, "Preliminary Analysis of VHTR Decay Heat Source," *Trans. Am. Nucl. Soc.* 95, 445-446, Albuquerque, NM (November 2006).
105. W. Ji and W. R. Martin, "Monte Carlo Simulation of VHTR Particle Fuel with Chord Length Sampling," *Proc. M&C Topical Meeting*, American Nuclear Society, Monterey, CA (April 2007).
106. W. Ji and W. R. Martin, "Determination of Chord Length Distributions in Stochastic Media Composed of Dispersed Microspheres," *Trans. Am. Nucl. Soc.* 96, 467-469, Boston, MA (2007).
107. G. Yesilyurt, W. Ji, S. Prasad, W. R. Martin, and J. C. Lee, "Coupled Nuclear-Thermal-Hydraulics Analysis for VHTR," *Trans. Am. Nucl. Soc.* 96, 580-581, Boston, MA (June 2007).
108. J. Cheatham, J. P. Holloway, and W. R. Martin, "Improving Monte Carlo Source Convergence with the Functional Expansion Technique," *Trans. Am. Nucl. Soc.* 96, 838-840, Boston, MA (June 2007).
109. W. Ji and W. R. Martin, "Application of Chord Length Sampling to VHTR Unit Cell Analysis," submitted to PHYSOR'08, *International Conference on the Physics of Reactors*, Interlaken, Switzerland, September 2008.
110. K. Banerjee and W. R. Martin, "A Proposed Kernel Density Estimator Method for Monte Carlo Eigenvalue Calculations," submitted to PHYSOR'08, *International Conference on the Physics of Reactors*, Interlaken, Switzerland, September 2008.
111. F.B. Brown, W.R. Martin, and R.D. Mosteller, "Monte Carlo - Advances and Challenges," LA-UR-08-3228, to be presented at a workshop at PHYSOR'08, *International Conference on the Physics of Reactors*, Interlaken, Switzerland, September 2008.
112. K. Banerjee and W.R. Martin, "Monte Carlo Global Scalar Flux Estimation with Kernel Density Estimator," accepted for presentation at the ANS Winter Meeting, Reno, NV (November 2008).
113. G. Yesilyurt, J.C. Lee, and W.R. Martin, "A Coupled Monte Carlo / Collision Probability Method for VHTR Analysis," accepted for presentation at the ANS Winter Meeting, Reno, NV (November 2008).