Thomas Evans

Distinguished R&D Staff

Education

1997 **Ph.D. Nuclear Engineering**, *Georgia Institute of Technology*, Atlanta, GA, GPA 4.0.

1994 **M.S. Health Physics**, *Georgia Institute of Technology*, Atlanta, GA, GPA 4.0.

1992 **B.S. Physics and Astronomy**, *Haverford College*, Philadelphia, PA, GPA 3.3.
Thesis, *The Dipole Anisotropy of the Cosmic X-Ray Background.*

Research

Ph.D. Dissertation

Title *The Calculation and Measurement of Nanodosimetric Energy Distributions for Electrons and Photons*

Advisor Dr. C.K. Wang

Analytical/Computational

Expert in computational science methods and applications including PDE solvers, Monte Carlo methods, linear algebra, Fourier and error analysis, and parallel algorithms. Designed source specific radiation transport codes using S_N, P_N, SP_N, MOC, and Monte Carlo transport techniques. Extensive work in radiation-hydrodynamics and multi-physics coupling. Experience using radiation transport codes including SCALE, MCNP, ITS, PARTISN, LAHET, and EGS and the radiation-hydrodynamics code RAGE. Principal and co-developer of the following Oak Ridge National Laboratory codes:

- Exnihilo: a massively parallel radiation transport library that contains the *Denovo* deterministic transport package (S_N, SP_N, and MOC), *Shift* Monte Carlo, and *Insilico* reactor-physics, neutronics application (C++, PYTHON, F95, CUDA); *Project Lead and primary developer*
- SCALE: software packages for nuclear licensing and safety analysis (F95, Java), ORNL/TM-2005/39; *team developer.*

Have been a co-developer on the following major Los Alamos National Laboratory physics codes:

- RAGE: a parallel, Adaptive Mesh, Eulerian radiation-hydrodynamics code (F90); *team developer.*
- Milagro: a parallel, Implicit Monte Carlo radiation transport code (C++); principal developer, LA-CC-03-009; *primary developer.*
- MCNP: an n-particle Monte Carlo transport code (F77), LA-13709-M; *team developer.*

Professional Experience

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www.ornl.gov/staff-profile/thomas-m-evans • *tmdelellis* • *Thomas Evans*

2007–present **Distinguished R&D Staff**, *Oak Ridge National Laboratory*, Oak Ridge, TN.
Develop computational methods, algorithms, and parallel application codes in the Reactor and Nuclear Systems Division for ORNL, DOE, and other external customers. Develop and submit proposals for scientific funding. Mentor junior staff and PhD candidates.

2003–2007 **Project Leader**, *Los Alamos National Laboratory*, Los Alamos, NM.
Project Leader of the Marmot and Jayenne projects. The Marmot project was a multi-physics code development effort within the Computational Sciences Program Element of ASC (Advanced Simulation and Computing) at LANL. Jayenne is a Monte Carlo thermal radiation project that encompasses the Milagro IMC code.

1997–2003 **Technical Staff Member**, *Los Alamos National Laboratory*, Los Alamos, NM.
Contributed to radiation transport and radiative transfer methods development in CCS-4 Transport Methods Group. Mentored junior staff members and graduate students.

Internships and Research

1997 **Postdoctoral Fellow**, *Los Alamos National Laboratory*, Los Alamos, NM.
Wrote physics, variance reduction, and capabilities packages for MCNP

1994–1997 **Graduate Research Assistant**, *Georgia Institute of Technology*, Atlanta, GA.
Investigated topics in microdosimetry, Compton camera imaging, and NCT. System administrator for the Radiological Engineering Computer Network (RECoN) which featured five SUN UNIX workstations and peripheral devices. Webmaster for the RECoN World Wide Web server.

summer 1993 **Medical Physics Intern**, *Radiation Oncology Inc.*, Atlanta, GA.
Performed instrument calibrations and therapy planning in conjunction with an ACR certified medical physicist at a radiation oncology treatment center.

1992–1993 **Graduate Health Physics Assistant**, *Neely Nuclear Research Center*, Atlanta, GA.
Performed radiation surveys, instrument calibrations, and ALARA enforcement. Managed Georgia Tech campus low-level radioactive waste.

summer 1991, 1990 **Research Assistant**, *Haverford College*, Haverford, PA.
Investigated large scale galactic structure including the cosmic x-ray and microwave backgrounds.

Consulting

spring 2002 **Instructor**, *University of New Mexico, Los Alamos*, Los Alamos, NM.
Taught CS 351: Design of Large Programs, a 3-credit hour graduate course required by the Computer Science Department at UNM.

1994–1996 **R&D Consultant**, *MGP Instruments*, Smyrna, GA.
Performed MCNP simulations and assisted with primary calibrations to determine detector responses and submitted reports through MGPI to customers. This was a one-third time consulting job.

Certifications

DOE Q-Clearance.

Teaching

Spring 2002 **CS-351, Design of Large Programs**, *University of New Mexico, Los Alamos*, Los Alamos, NM.

Nov 1997 **IEEE Short Course, Electron-Photon Transport Modeling with MCNP**, *Nuclear Science Symposium and Medical Imaging Conference*, Albuquerque, NM.

Fall 1996 **NE/HP 6750, Radiation Detection**, *Teaching Practicum, Georgia Inst. of Technology*, Atlanta, GA.

Spring 1995 **HP 6410, Advanced Radiation Dosimetry**, *Teaching Assistant, Georgia Inst. of Technology*, Atlanta, GA.

Winter 1995 **HP 6410, Radiation Dosimetry**, *Teaching Practicum, Georgia Inst. of Technology*, Atlanta, GA.

PhD Students

2013 **Stuart Slattery**, *University of Wisconsin*, Madison, WI.
Parallel Monte Carlo Synthetic Acceleration Methods for Discrete Transport Problems.

2011 **Rachel Slaybaugh**, *University of Wisconsin*, Madison, WI.
Acceleration Methods for Massively Parallel Deterministic Transport.

Software Skills

Operating Systems: Advanced user and developer on POSIX-standard systems (UNIX, LINUX, DARWIN). Expert developer on LINUX and MACOS systems. Developed advanced physics codes on platforms running AIX, SOLARIS, IRIX, Tru64, Darwin and LINUX. Have system administration experience on Linux 64-bit clusters.

Programming Languages: Expert programming ability in C++, C, and FORTRAN. Extensive experience developing Python utilities and bindings for applications and Jupyter Notebook. Advanced user of multiple scripting and extension languages including Python, TCL/TK, Lisp, sh, and BASH. Expert user of LaTeX and TeX typesetting systems.

Parallel Computing: Have developed code on large, massively parallel multi-core architectures including the Cray XT4/5 and XK7 at OLCF (Jaguar/Titan). Advanced CUDA experience developing kernels for GPUs in hetergeneous systems. Original implementor of parallel codes on Symmetric Multi-Processing (SMP) computers at Los Alamos and Livermore National Laboratories (ASCI Blue Mountain, ASCI Q, ASCI WHITE, Lightning) Extensive knowledge of parallel programming systems and libraries including MPI, Pthreads, and OpenMP.

Tools and Applications: Developed advanced build models utilizing Automake, Autoconf, Gmake, and Cmake. Expert user of the Git version control system including gitlab and github variations. Extensive knowledge of pre-processors including CPP and M4. Advanced user and administrator of the subversion and CVS version control systems. Have designed GUI code with visual tools including Visual Basic and Visual C/C++. Mathematical simulation programming experience with Mathematica and MatLab. Extensive experience utilizing massively parallel visualization software including VisIt and Ensight. Experience utilizing scientific software libraries including BLAS, LAPACK, ATLAS, Trilinos, HDF, and SPRNG. Extensive experience using common desktop applications including MS Office. Extensive experience testing open-source software.

Professional Courses Taken

Oct 2003 **Software Project Survival**, *Construx Software*, Los Alamos, NM.

Oct 2003 **Real World Requirements**, *Construx Software*, Los Alamos, NM.

Oct 2003 **Success through Risk Management**, *Construx Software*, Los Alamos, NM.

Oct 2003 **Configuration Management**, *Construx Software*, Los Alamos, NM.

Oct 1999 **Python for Scientists and Engineers**, *LANL*, Los Alamos, NM.

Aug 1998 **Mastering Projects Workshop**, *True North pgs, Inc.*, Los Alamos, NM.

Jun 1997 **Introduction to DANTSYS**, *LANL*, Los Alamos, NM.

May 1997 **Advanced MCNP Topics**, *LANL*, Los Alamos, NM.

Jun 1994 **Internal Radiation Dosimetry**, *Health Physics Society Summer School*, UC-Davis, CA.

Organizations

1997–present **American Nuclear Society**, *LaGrange Park, IL.*
Mathematics Computation Division: Nominating Committee, 2015; Chair, 2014; Vice-Chair, 2013; Executive Committee, 2009–2012; Secretary, 2000–2001.

2014–present **Society for Industrial and Applied Mathematics**, *Philadelphia, PA.*

Grants

- PI, "Coupled Monte Carlo Neutronics and Fluid Flow Simulation of Small Modular Reactors", *DOE ASCR*, Exascale Computing Project, 2.5M annually, 2016–2020.
- Radiation Transport Methods Focus Area Deputy, "CASL: Consortium for Advanced Simulation of LWRs", *DOE NE*, 25M annually, 2010–2020.
- PI, "MCREX: Using Monte Carlo algorithms to achieve resiliency and performance at scale for linear and non-linear solver applications", *DOE ASCR*, LAB12-742, 900K, 2012–2015.
- ORNL Site PI, "eXascale PRogramming Environment and System Software (XPRESS)", *DOE ASCR*, XStack Program, 440K, 2014–2016.
- Co-PI, "Improved Hybrid Modeling of Spent Fuel Storage Facilities", *DOE NEUP*, 120K, 2015–2017.
- PI, "The Solution of Three-Dimensional PWR Neutronics Benchmark Problems for CASL", *DOE INCITE*, 19 MCPU-Hours, 2012–2013.
- PI, "Uncertainty Quantification for Three-Dimensional Reactor Assembly Simulations", *DOE INCITE*, 26 MCPU-Hours, 2010–2011.

Honors and Awards

- Best Paper Award, *GPU Acceleration of History-Based Multigroup Monte Carlo*, Math & Computation Division, ANS Winter Meeting, Las Vegas, NV, 2016.
- ORNL Award's Night *Distinguished Researcher*, 2016.
- R&D 100, *Virtual Environment for Reactor Applications (VERA)*, 2016.
- ORNL Award's Night *Research Accomplishment*, 2014.
- International Data Corporation (IDC) HPC Innovation Excellence Award, 2014.
- ORNL Significant Event Award, *Support to DOE in response to crisis at Fukushima Dai-ichi damaged reactors*, 2011.
- Best Paper Award, *Massively Parallel Solutions to the k-Eigenvalue Problem*, Math & Computation Division, ANS Winter Meeting, Las Vegas, NV, 2010.
- ORNL Award's Night, *Engineering Research and Development*, 2010.
- ORNL Significant Event Award, *Release of Version 0.9 of the AMP Nuclear Fuel Performance code for distribution through RSICC*, 2010.
- ORNL Significant Event Award, *Demonstration of high-performance computing for nuclear applications on the Cray Jaguar XT5*, 2009.
- NNSA Defense Programs Award of Excellence, 2005.
- Los Alamos LAAP Achievement Award, (2×) July 2006, August 2005, (2×) August 2004, June 2002.

- Los Alamos National Laboratory Distinguished Performance Award, *Jayenne Implicit Monte Carlo Project*, 2002.
- Best Paper Award, *An enhanced geometry-independent mesh weight window generator for MCNP*, ANS Radiation Protection and Shielding Division Topical Meeting, Nashville, TN, 1998.
- Sigma Xi award for Best Ph.D. Thesis, Georgia Institute of Technology, 1997.
- Best Paper Award, *Radiological assessment of a mixed-waste incinerator*, Radiation Protection and Shielding Division, ANS Winter Meeting, Washington D.C., 1996.
- *Who's Who in America's Colleges and Universities*, 1996-1997.
- Best Paper Award, 3rd Place in Conference, ANS/HPS Eastern Regional Student Conference, Gainesville, FA, 1996.
- Best Paper Award, Risk and Safety Session, ANS/HPS Eastern Regional Student Conference, Gainesville, FA, 1996.
- Health Physics Society Graduate Student Fellowship, 1994-1995.
- ANΣ Nuclear Engineering Honor Society, 1994–1997.
- Health Physics Society Summer School Scholarship, 1994.
- Health Physics Society, Atlanta Chapter, Travel Grant, 1994.
- Ph.D Qualifier Award (highest test score), School of M.E., Georgia Tech, 1993.
- BΓΦ National Honor Society Member, 1993.

Publications

Refereed Publications

1. A. Toth, J. A. Ellis, T.M. Evans, S. Hamilton, C. T. Kelley, R. Pawlowski, and S. Slattery. Local improvement results for Anderson acceleration with inaccurate function evaluations. to appear in *SIAM. J. Sci. Comp.*, 2017.

2. M. Benzi, T.M. Evans, S.P. Hamilton, M.L. Pasini, and S.R. Slattery. Analysis of Monte Carlo accelerated iterative methods for sparse linear systems. *Numerical Linear Algebra With Applications*, DOI:10.1002/nla.2088, 2017.

3. T.M. Pandya, S.R. Johnson, T.M. Evans, G.G. Davidson, S.P. Hamilton, and A.T. Godfrey. Implementation, capabilities, and benchmarking of Shift, a massively parallel Monte Carlo radiation transport code. *Journal of Computational Physics*, **308**:239–272, 2016.

4. M. Munk, R.N. Slaybaugh, T.M. Pandya, S.R. Johnson, and T.M. Evans. FW/CADIS-Ω: An angle-informed hybrid method for deep-penetration radiation transport. In *PHYSOR 2016—Unifying Theory and Experiments in the 21st Century*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2016. American Nuclear Society.

5. S.P. Hamilton, T.M. Evans, and S.R. Slattery. GPU acceleration of history-based multigroup Monte Carlo. *Trans. Am. Nucl. Soc.*, **115**:527–530, 2016.

6. S.P. Hamilton, T.M. Evans, G.G. Davidson, S.R. Johnson, T.M. Pandya, and A.T. Godfrey. Hot zero power reactor calculations using the Insilico code. *Journal of Computational Physics*, **314**:700–711, 2016.

7. S.P. Hamilton, G.G. Davidson, T.M. Evans, and K. Banerjee. Accelerated Monte Carlo fission source convergence with fission matrix and kernel density estimators. *Trans. Am. Nucl. Soc.*, **114**(1):385–387, 2016.

8. S.P. Hamilton, M. Berrill, K.T. Clarno, R.P. Pawlowski, A. Toth, C.T. Kelley, T.M. Evans, and B. Phillip. An assessment of coupling algorithms for nuclear reactor core physics simulations. *Journal of Computational Physics*, **311**:241–257, 2016.

9. A. Godfrey, M.A. Jessee, S. Stimpson, B. Collins, T.M. Evans, M. Kromar, F. Franceschini, and D. Salazar. VERA benchmarking results for the Krško nuclear power plant cycle 1. In *PHYSOR 2016—Unifying Theory and Experiments in the 21st Century*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2016. American Nuclear Society.

10. G.G. Davidson, T.M. Pandya, A. Isotalo, S.R. Johnson, T.M. Evans, and W.A. Wieselquist. Nuclide depletion capabilities in the Shift Monte Carlo code. In *PHYSOR 2016—Unifying Theory and Experiments in the 21st Century*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2016. American Nuclear Society.

11. R.N. Slaybaugh, T.M. Evans, G.G. Davidson, and P.P.H. Wilson. Rayleigh quotient iteration with a multigrid in energy preconditioner for massively parallel neutron transport. In *ANS MC2015—Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method*, ANS M&C Topical Meeting, LaGrange Park, IL, 2015. American Nuclear Society.

12. S.R. Slattery, S.P. Hamilton, and T.M. Evans. A modified moving least square algorithm for solution transfer on a spacer grid surface. In *ANS MC2015—Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method*, ANS M&C Topical Meeting, LaGrange Park, IL, 2015. American Nuclear Society.

13. S.R. Slattery, T.M. Evans, and P.P.H. Wilson. A spectral analysis of the domain decomposed Monte Carlo method for linear systems. *Nuclear Engineering and Design*, **295**:632–638, 2015.

14. R.P. Pawlowski, K.T. Clarno, R.O. Montgomery, R. Salko, T.M. Evans, J.A. Turner, and D. Gaston. Design of a high fidelity core simulator for analysis of pellet-clad interaction. In *ANS MC2015—Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method*, ANS M&C Topical Meeting, LaGrange Park, IL, 2015. American Nuclear Society.

15. T.M. Pandya, S.R. Johnson, G.G. Davidson, T.M. Evans, and S.P. Hamilton. Shift: A massively parallel Monte Carlo radiation transport package. In *ANS MC2015—Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method*, ANS M&C Topical Meeting, LaGrange Park, IL, 2015. American Nuclear Society.

16. A.M. Ibrahim, P.P.H. Wilson, M.E. Sawan, S.W. Mosher, D.E. Peplow, J.C. Wagner, T.M. Evans, and R.E. Grove. Automatic mesh adaptivity for hybrid Monte Carlo/deterministic neutronics modeling of difficult shielding problems. *Nuclear Science and Engineering*, **181**(1):48–59, 2015.

17. S.P. Hamilton and T.M. Evans. Efficient solution of the simplified P_N equations. *Journal of Computational Physics*, **284**:155–170, 2015.

18. T.M. Evans, W. Joubert, S.P. Hamilton, S.R. Johnson, J.A. Turner, G.G. Davidson, and T.M. Pandya. Three-dimensional discrete ordinates reactor assembly calculations

on GPUs. In *ANS MC2015—Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method*, ANS M&C Topical Meeting, LaGrange Park, IL, 2015. American Nuclear Society.

19. K.T. Clarno, R.P. Pawlowski, R.O. Montgomery, T.M. Evans, B.S. Collins, B. Kochunas, D. Gaston, and J.A. Turner. High fidelity modeling of pellet-clad interaction using the CASL virtual environment for reactor applications. In *ANS MC2015—Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method*, ANS M&C Topical Meeting, LaGrange Park, IL, 2015. American Nuclear Society.

20. M.A. Jessee, W.A. Wieselquist, T.M. Evans, S.P. Hamilton, J.J. Jarrell, K.S. Kim, J.P. Lefebvre, U. Mertyurek, A.B. Thompson, and M.L. Williams. Polaris: A new two-dimensional lattice physics analysis capability for the SCALE code system. In *PHYSOR 2014—The Role of Reactor Physics towards a Sustainable Future*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2014. American Nuclear Society.

21. S.P. Hamilton and T.M. Evans. A comparison of eigensolvers for the SP_N equations. *Trans. Am. Nucl. Soc.*, **111**(1):723–724, 2014.

22. J. Gehin, A. Godfrey, T. Evans, S. Hamilton, and F. Francheschini. Watts Bar Unit 1 Cycle 1 zero power physics tests analysis with VERA-CS. In *PHYSOR 2014—The Role of Reactor Physics towards a Sustainable Future*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2014. American Nuclear Society.

23. T.M. Evans, S.W. Mosher, S.R. Slattery, and S.P. Hamilton. A Monte Carlo synthetic-acceleration method for solving the thermal radiation diffusion equation. *Journal of Computational Physics*, **258**:338–358, 2014.

24. G.G. Davidson, T.M. Evans, J.J. Jarrell, S.P. Hamilton, T.M. Pandya, and R.N. Slaybaugh. Massively parallel, three-dimensional transport solutions for the k-eigenvalue problem. *Nuclear Science and Engineering*, **177**:111–125, 2014.

25. R.N. Slaybaugh and T.M. Evans. Multigrid in energy preconditioner for Krylov solvers. *Journal of Computational Physics*, **242**:405–419, 2013.

26. S.R. Slattery, P.P.H. Wilson, and T.M. Evans. A spectral analysis of the domain decomposed Monte Carlo method for linear systems. In *International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering*, ANS M&C Topical Meeting, LaGrange Park, IL, 2013. American Nuclear Society.

27. J.J. Jarrell, T.M. Evans, G.G. Davidson, and A.T. Godfrey. Full core reactor analysis: Running Denovo on Jaguar. *Nuclear Science and Engineering*, **175**:283–291, 2013.

28. J.J. Jarrell, T.M. Evans, and G.G. Davidson. Discrete ordinate quadrature selection for reactor-based eigenvalue problems. In *International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering*, ANS M&C Topical Meeting, LaGrange Park, IL, 2013. American Nuclear Society.

29. A.M. Ibrahim, P.P.H. Wilson, M.E. Sawan, S.W. Mosher, D.E. Peplow, J.C. Wagner, and T.M. Evans. Automatic mesh adaptivity for CADIS and FW-CADIS neutronics modeling of difficult shielding problems. In *International Conference on Mathematics*

and Computational Methods Applied to Nuclear Science and Engineering, ANS M&C Topical Meeting, LaGrange Park, IL, 2013. American Nuclear Society.

30. S.P. Hamilton, K.T. Clarno, M. Berrill, T.M. Evans, G.G. Davidson, and R. Lefebvre adn R. Sampath. Multiphysics simulations for LWR analysis. In *International Conference on Mathematics and Computational Methods Applied to Nuclear Science and Engineering*, ANS M&C Topical Meeting, LaGrange Park, IL, 2013. American Nuclear Society.

31. N.C. Sly, B.T. Mervin, S.W. Mosher, T.M. Evans, J.C. Wagner, and G.I. Maldonado. Verification of the Shift Monte Carlo code. In *PHYSOR 2012—Advances in Reactor Physics Linking Research, Industry, and Education*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2012. American Nuclear Society.

32. R.N. Slaybaugh, T.M. Evans, G.G. Davidson, and P.P.H. Wilson. Rayleigh quotient iteration in 3D deterministic neutron transport. In *PHYSOR 2012—Advances in Reactor Physics Linking Research, Industry, and Education*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2012. American Nuclear Society.

33. B.T. Mervin, S.W. Mosher, T.M. Evans, J.C. Wagner, and G.I. Maldonado. Variance estimation in domain decomposed Monte Carlo eigenvalue calculations. In *PHYSOR 2012—Advances in Reactor Physics Linking Research, Industry, and Education*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2012. American Nuclear Society.

34. J.J. Jarrell, A.T. Godfrey, T.M. Evans, and G.G. Davidson. Full core reactor analysis: Running Denovo on Jaguar. In *PHYSOR 2012—Advances in Reactor Physics Linking Research, Industry, and Education*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2012. American Nuclear Society.

35. A.M. Ibrahim, P.P.H. Wilson, D.E. Peplow, J.C. Wagner, S.W. Mosher, and T.M. Evans. Automatic mesh adaptivity for hybrid Monte Carlo/deterministic neutronics modeling of difficult shielding problems. *Trans. Am. Nucl. Soc.*, **107**:934–937, 2012.

36. A.M. Ibrahim, D.E. Peplow, J.C. Wagner, S.W. Mosher, and T.M. Evans. Acceleration of Monte Carlo criticality calculations using deterministic-based starting sources. In *PHYSOR 2012—Advances in Reactor Physics Linking Research, Industry, and Education*, ANS PHYSOR Topical Meeting, LaGrange Park, IL, 2012. American Nuclear Society.

37. C.G. Baker, G.G. Davidson, T.M. Evans, S.P. Hamilton, and W. Joubert. High performance radiation transport simulations: Preparing for Titan. In *2012 SC—International Conference for High Performance Computing, Networking, Storage and Analysis*, number DOI:10.1109/SC.2012.64 in SC Conference, 2012.

38. G. Yesilyurt, K.T. Clarno, T.M. Evans, G.G. Davidson, and P.B. Fox. A C5 benchmark problem with the discrete ordinates radiation transport code Denovo. *Nuclear Technology*, **176**(2):274–283, 2011.

39. J.C. Wagner, D.E. Peplow, S.W. Mosher, and T.M. Evans. Review of hybrid (deterministic/Monte Carlo) radiation transport methods, codes, and applications at Oak Ridge National Laboratory. *Progress in Nuclear Science and Technology*, **2**:808–814, 2011.

40. J.C. Wagner, S.W. Mosher, T.M. Evans, D.E. Peplow, and J.A. Turner. Hybrid and parallel domain-decomposition methods development to enable Monte Carlo for reactor analyses. *Progress in Nuclear Science and Technology*, **2**:815–820, 2011.

41. B. Vacaliuc, D.R. Patiolla, E. D'Azevedo, G.G. Davidson, J.K. Munro Jr, T.M. Evans, W. Joubert, and Z.W. Bell. Python for development of OpenMP and CUDA kernels for multidimensional data. In *Proceedings of the 2011 Symposium on Application Accelerators in High-Performance Computing (SAAHPC 2011)*, number DOI: 10.1109/SAAHPC.2011.26, pages 159–167. IEEE, 2011.

42. J.J. Jarrell, R.E. Grove, and T.M. Evans. A cut-cell approach for 2D cartesian meshes that preserves orthogonal grid sweep ordering. *Trans. Am. Nucl. Soc.*, **105**:435–437, 2011.

43. R.A. Joseph III, C.O. Slater, T.M. Evans, S.W. Mosher, and J.O. Johnson. Sensitivities and uncertainties related to numerics and building features in urban modeling. *Nuclear Technology*, **175**(1):286–300, 2011.

44. A.M. Ibrahim, M.E. Sawan, S.W. Mosher, T.M. Evans, D.E. Peplow, P.P.H. Wilson, and J.C. Wagner. Global evaluation of prompt dose rates in ITER using hybrid Monte Carlo/deterministic techniques. *Fusion Science and Technology*, **60**(2):676–680, 2011.

45. A.M. Ibrahim, M.E. Sawan, S.W. Mosher, T.M. Evans, D.E. Peplow, P.P.H. Wilson, and J.C. Wagner. Acceleration of Monte Carlo criticality calculations using deterministic-based starting sources. *Trans. Am. Nucl. Soc.*, **105**:539–541, 2011.

46. A.M. Ibrahim, S.W. Mosher, T.M. Evans, D.E. Peplow, M.E. Sawan, P.P.H. Wilson, J.C. Wagner, and T. Heltemes. ITER neutronics modeling using hybrid Monte Carlo/deterministic and CAD-based Monte Carlo methods. *Nuclear Technology*, **175**(1):251–258, 2011.

47. T.M. Evans, A.S. Stafford, R.N. Slaybaugh, and K.T. Clarno. Denovo—A new three-dimensional parallel discrete ordinates code in SCALE. *Nuclear Technology*, **171**:171–200, 2010.

48. T.M. Evans, G.G. Davidson, and R.N. Slaybaugh. Three-dimensional full core power calculations for pressurized water reactors. In *Proceedings of the 2010 Scientific Discovery through Advanced Computing (SciDAC) Conference*, pages 367–379, Chattanooga, TN, 2010.

49. T.M. Evans, K.T. Clarno, and J.E. Morel. A transport acceleration scheme for multigroup discrete ordinates with upscattering. *Nuclear Science and Engineering*, **165**:1–13, 2010.

50. G.G. Davidson, T.M. Evans, R.N. Slaybaugh, and C.G. Baker. Massively parallel solutions to the k-eigenvalue problem. *Trans. Am. Nucl. Soc.*, **103**:318–320, 2010.

51. J.C. Wagner, D.E. Peplow, and T.M. Evans. Automated variance reduction applied to nuclear well-logging problems. *Nuclear Technology*, **168**:799–809, 2009.

52. D.E. Peplow, T.M. Evans, and J.C. Wagner. Simultaneous optimization of tallies in difficult shielding problems. *Nuclear Technology*, **168**:785–792, 2009.

53. S.W. Mosher, T.M. Miller, T.M. Evans, and J.C. Wagner. Automated weight-window generation for threat detection applications using ADVANTG. In *International Conference on Mathematics, Computational Methods and Reactor Physics*, number ISBN: 978-0-89448-069-0 in ANS M&C Topical Meeting, LaGrange Park, IL, 2009. American Nuclear Society.

54. A.M. Ibrahim, D.E. Peplow, T.M. Evans, J.C. Wagner, and P.P.H. Wilson. Improving the mesh generation capabilities in the SCALE hybrid shielding analysis sequence. *Trans. Am. Nucl. Soc.*, **100**:302–303, 2009.

55. T.M. Evans and S.W. Mosher. A Monte Carlo synthetic acceleration method for the non-linear, time-dependent diffusion equation. In *International Conference on Mathematics, Computational Methods and Reactor Physics*, number ISBN: 978-0-89448-069-0 in ANS M&C Topical Meeting, LaGrange Park, IL, 2009. American Nuclear Society.

56. K.B. Bekar and T.M. Evans. MCNP-BRL: A linkage between MCNP and CAD geometry. *Trans. Am. Nucl. Soc.*, **101**:623–626, 2009.

57. J.C. Wagner, D.E. Peplow, and T.M. Evans. Automated variance reduction applied to nuclear well-logging problems. *Trans. Am. Nucl. Soc.*, **99**:566–569, 2008.

58. R.G. McClarren, T.M. Evans, R.B. Lowrie, and J.D. Densmore. Semi-implicit time integration for P_N thermal radiative transfer. *Journal of Computational Physics*, **227**:7561–7586, 2008.

59. J.D. Densmore, T.M. Evans, and M.W. Buksas. A hybrid transport-diffusion method for Monte Carlo radiative-transfer simulationstransport-diffusion algorithm for Monte Carlo radiation-transport simulations on adaptive-refinement meshes in XY geometry. *Nuclear Science and Engineering*, **159**:1–22, 2008.

60. R.G. McClarren, T.M. Evans, and R.B. Lowrie. Semi-implicit time integration for the P_n equations. *Trans. Am. Nucl. Soc.*, **97**:527–529, 2007.

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Outside Activities

- Competitive Cycling, USAC Category 3 License
- Soccer Coaching, USSF National "C" License

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