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 (S_N, SP_N, and MOC), *Shift* Monte Carlo, and *Insilico* reactor-physics, neutronics applications (C++, Python, F95, CUDA), https://code-int.ornl.gov/exnihilo/exnihilo; *Project Lead and primary developer*
- VERA: CASL's Virtual Environment for Reactor Analysis (C++), https://www.casl.gov/vera; *team 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*.

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Professional Experience

2007–present **Distinguished R&D Staff**, *Oak Ridge National Laboratory*, Oak Ridge, TN.

Develop computational methods, algorithms, and parallel application codes in the Nuclear Energy and Fuel Cycles Division for ORNL, DOE, and other external customers. Develop and submit proposals for scientific funding. Mentor junior staff and PhD candidates. Leadership roles:

- *Group Leader*: HPC Methods and Nuclear Applications Group, 2020–present
- *Team Leader*: HPC Methods and Applications Team, Radiation Transport Group, 2017–present
- *Level 3 Deputy*: Energy Applications, ECP Applications Development Focus Area, Exascale Computing Project, 2017–present
- *Deputy*: Radiation Transport Methods Focus Area, Consortium for Advanced Simulation of LWRs (CASL) Energy Innovation Hub, 2012–2017

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 and BSD 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++(98,11,14,17), C, CUDA, HIP, 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 Cray XT4/5, XK7 (Jaguar/Titan) and IBM/Nvidia (Summit) at OLCF. Advanced CUDA experience developing kernels for GPUs in hetergeneous systems including both Nvidia and AMD series GPUs. 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.

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Tools and Applications

Developed advanced build models utilizing GNU Libtools and CMake. Expert user of the Git version control system including gitlab and github variations. 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 Python, Mathematica, and MatLab. Extensive experience utilizing massively parallel visualization software including VisIt, Paraview, and Ensight. Extensive experience utilizing scientific software libraries, programming models, and frameworks including BLAS, LAPACK, ATLAS, Trilinos, Kokkos, ADIOS, HDF5, and SPRNG. Extensive experience using common desktop applications including MS Office. Extensive experience testing open-source software.

Professional Courses Taken

Jan 2018 **Software Contruction Boot Camp**, *Construx Software*, Oak Ridge, TN.

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

2016–2020 **DOE ASCR**, *Exascale Computing Project*, 2.5M annually, PI.
Coupled Monte Carlo Neutronics and Fluid Flow Simulation of Small Modular Reactors

2010–2020 **DOE NE**, *DE-FOA-0000170*, 25M annually, Radiation Transport Methods Deputy.
CASL: Consortium for Advanced Simulation of LWRs

2012–2015 **DOE ASCR**, *LAB12-742*, 900k, PI.
MCREX: Using Monte Carlo algorithms to achieve resiliency and performance at scale for linear and non-linear solver applications

2014–2016 **DOE ASCR**, *XStack Program*, 440k, ORNL Site PI.
eXascale PRogramming Environment and System Software (XPRESS)

2015–2017 **DOE NE**, *NEUP*, 120k, Co-PI.
Improved Hybrid Modeling of Spent Fuel Storage Facilities

2012–2013 **DOE ASCR**, *INCITE*, 19 MCPU-Hours, PI.
The Solution of Three-Dimensional PWR Neutronics Benchmark Problems for CASL

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2010–2011 **DOE ASCR**, *INCITE*, 26 MCPU-Hours, PI.
Uncertainty Quantification for Three-Dimensional Reactor Assembly Simulations

2010–2012 **ORNL Director's R&D Fund**, *LDRD*, 896k, PI.
Revolutionary Radiation Transport for Next-Generation Predictive Multi-Physics Modeling and Simulation

Honors and Awards

2010–2018 **Award's Night**, *Oak Ridge National Laboratory*, Oak Ridge, TN.
- *Mentor of Early Career Researchers*, 2018
- *Distinguished Researcher*, 2016
- *Research Accomplishment*, 2014
- *Engineering Research and Development*, 2010

2016 **Best Paper Award**, *Math. Comp. Div.*, ANS Winter Meeting, Las Vegas, NV.
GPU Acceleration of History-Based Multigroup Monte Carlo

2016 **R&D 100 Award**, *R&D Magazine*.
Virtual Environment for Reactor Applications (VERA)

2014 **HPC Innovation Excellence Award**, *Hyperion Research*, HPC User Forum.
Westinghouse Electric Co. LLC., ORNL (CASL)

2009–2011 **Significant Event Award**, *Oak Ridge National Laboratory*, Oak Ridge, TN.
- *Support to DOE in response to crisis at Fukushima Dai-ichi damaged reactors*, 2011
- *Release of Version 0.9 of the AMP Nuclear Fuel Performance code for distribution through RSICC*, 2010
- *Demonstration of high-performance computing for nuclear applications on the Cray Jaguar XT5*, 2009

2010 **Best Paper Award**, *Math. Comp. Div.*, ANS Winter Meeting, Las Vegas, NV.
Massively Parallel Solutions to the k-Eigenvalue Problem

2005 **Defense Programs Award of Excellence**, *National Nuclear Security Admin.*

2002–2006 **LAAP Achievement Award**, *Los Alamos National Laboratory*, Los Alamos, NM.
(2×) July 2006; August 2005; (2×) August 2004; June 2002

2002 **Distinguished Performance Award**, *Los Alamos National Lab.*, Los Alamos, NM.
Jayenne Implicit Monte Carlo Project

1998 **Best Paper Award**, *Rad. Prot. Shield. Div. Topical Meeting*, Nashville, TN.
An enhanced geometry-independent mesh weight window generator for MCNP

1997 **Doctoral Dissertation Award**, *Sigma Xi*, Georgia Institute of Technology.
The Calculation and Measurement of Nanodosimetric Energy Distributions for Electrons and Photons

1996 **Best Paper Award**, *Rad. Prot. Shield. Div.*, ANS Winter Meeting, Washington D.C.
Radiological assessment of a mixed-waste incinerator

1996–1997 **Marquis Who's Who**, *Georgia Institute of Technology*.
Who's Who in America's Colleges and Universities

1996 **Best Paper Award**, *ANS/HPS Eastern Reg. Student Conference*, Gainesville, FA.
Risk and Safety Session; 3rd Place in Conference

1994–1995 **Graduate Student Fellowship**, *Health Physics Society*.

1994–1997 **ΑΝΣ Nuclear Engineering Honor Society**, *Georgia Institute of Technology*.

1994 **Summer School Scholarship**, *Health Physics Society*, UC Davis, Davis, CA.

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Thomas Evans

1994 **Travel Grant**, *Health Physics Society*, Atlanta Chapter.

1993 **Ph.D Qualifier Award**, *School of Mech. Eng.*, Georgia Institute of Technology. Highest test score

1993 **ΒΓΦ National Honor Society**, *Georgia Institute of Technology*.

Patents and Copyrights

2019 **Exnihilo**, *U.S. Commercial Copyright*, Author, © UT-Battelle 90000072

2019 **VERA Infrastructure**, *U.S. Commercial Copyright*, Author, © UT-Battelle 90000069

2019 **ORIGEN API**, *U.S. Commercial Copyright*, Author, © UT-Battelle 90000065

Publications

Refereed Publications

1. Matthew A Jessee, William A Wieselquist, U. Mertyurek, K. S. Kim, Thomas M Evans, Steven P. Hamilton, and Cole Gentry. Lattice physics calculations using the embedded self-shielding method in Polaris, Part I: Methods and implementation. *Annals of Nuclear Energy*, **150**:8, January 2021.

2. Paul K. Romano, Steven P. Hamilton, Ronald O. Rahaman, April Novak, Elia Merzari, Sterling M. Harper, Patrick C. Shriwise, and Thomas M. Evans. A Code-Agnostic Driver Application for Coupled Neutronics and Thermal-Hydraulic Simulations. *Nuclear Science and Engineering*, **10.1080/00295639.2020.1830620**:1–21, November 2020.

3. Elliott D. Biondo, Thomas M. Evans, Gregory G. Davidson, and Steven P. Hamilton. Singular value decomposition of adjoint flux distributions for Monte Carlo variance reduction. *Annals of Nuclear Energy*, **141**:107327, June 2020.

4. Francis Alexander, Ann Almgren, John Bell, Amitava Bhattacharjee, Jacqueline Chen, Phil Colella, David Daniel, Jack DeSlippe, Lori Diachin, Erik Draeger, Anshu Dubey, Thom Dunning, Thomas Evans, Ian Foster, Marianne Francois, Tim Germann, Mark Gordon, Salman Habib, Mahantesh Halappanavar, Steven Hamilton, William Hart, Zhenyu (Henry) Huang, Aimee Hungerford, Daniel Kasen, Paul R. C. Kent, Tzanio Kolev, Douglas B. Kothe, Andreas Kronfeld, Ye Luo, Paul Mackenzie, David McCallen, Bronson Messer, Sue Mniszewski, Chris Oehmen, Amedeo Perazzo, Danny Perez, David Richards, William J. Rider, Rob Rieben, Kenneth Roche, Andrew Siegel, Michael Sprague, Carl Steefel, Rick Stevens, Madhava Syamlal, Mark Taylor, John Turner, Jean-Luc Vay, Artur F. Voter, Theresa L. Windus, and Katherine Yelick. Exascale applications: skin in the game. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, **378**(2166):20190056, March 2020.

5. Steven P. Hamilton and Thomas M. Evans. Continuous-energy Monte Carlo neutron transport on GPUs in the Shift code. *Annals of Nuclear Energy*, **128**:236–247, June 2019.

6. J. Austin Ellis, Thomas M. Evans, Steven P. Hamilton, C.T. Kelley, and Tara M. Pandya. Optimization of processor allocation for domain decomposed Monte Carlo calculations. *Parallel Computing*, **87**:77–86, September 2019.

7. R.N. Slaybaugh, M. Ramirez-Zweiger, Tara Pandya, Steven Hamilton, and T.M. Evans.

Eigenvalue solvers for modeling nuclear reactors on leadership class machines. *Nuclear Science and Engineering*, **190**(1):31–44, 2018.

8. Katherine E. Royston, Seth R. Johnson, Thomas M. Evans, Scott W. Mosher, Jonathan Naish, and Bor Kos. Application of the Denovo Discrete Ordinates Radiation Transport Code to Large-Scale Fusion Neutronics. *Fusion Science and Technology*, **74**(4):303–314, November 2018.

9. Steven P. Hamilton, Stuart R. Slattery, and Thomas M. Evans. Multigroup Monte Carlo on GPUs: Comparison of history- and event-based algorithms. *Annals of Nuclear Energy*, **113**:506–518, March 2018.

10. S. Hamilton, T. Evans, and S. Slattery. Continuous-energy Monte Carlo neutron transport on GPUs in Shift. *Trans. Am. Nucl. Soc.*, **118**:401–403, 2018.

11. Gregory G. Davidson, Tara M. Pandya, Seth R. Johnson, Thomas M. Evans, Aarno E. Isotalo, Cole A. Gentry, and William A. Wieselquist. Nuclide depletion capabilities in the Shift Monte Carlo code. *Annals of Nuclear Energy*, **114**:259–276, April 2018.

12. Elliott D. Biondo, Gregory G. Davidson, Tara M. Pandya, Steven P. Hamilton, and Thomas M. Evans. Deterministically estimated fission source distributions for Monte Carlo k-eigenvalue problems. *Annals of Nuclear Energy*, **119**:7–22, September 2018.

13. Alex Toth, J. Austin Ellis, Tom Evans, Steven Hamilton, C. T. Kelley, Roger Pawlowski, and Stuart Slattery. Local Improvement Results for Anderson Acceleration with Inaccurate Function Evaluations. *SIAM Journal on Scientific Computing*, **39**(5):847–865, 2017.

14. 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. *Numer. Linear Algebra Appl.*, **24**:e2088, 2017. https://doi.org/10.1002/nla.2088.

15. 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.

16. 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.

17. J. A. Kulesza, F. Franceschini, T. M. Evans, and J. C. Gehin. Overview of the consortium for the advanced simulation of light water reactors (casl). In *EPJ Web of Conferences*, volume 106, 2016.

18. 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.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. 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.

25. 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.

26. 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.

27. 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.

28. 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.

29. 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.

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

31. S.P. Hamilton and T.M. Evans. Deterministic fission matrix acceleration of Monte Carlo calculations. *Trans. Am. Nucl. Soc.*, **113**:649–651, 2015.

32. 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.

33. 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.

34. 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.

35. 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.

36. 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.

37. 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.

38. 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.

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

40. 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.

41. 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.

42. 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.

43. 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.

44. 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.

45. 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.

46. 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.

47. 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.

48. 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.

49. 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.

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Outside Activities

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

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