

Douglas E. Peplow
Distinguished R&D Staff Member
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Areas of technical expertise include: Monte Carlo code development, variance reduction, development of hybrid Monte Carlo/deterministic methods for shielding calculations, application of hybrid methods to difficult shielding problems. Currently active in: the application of radiation transport calculations to nuclear security and non-proliferation problems. Past areas of interest have included medical applications of radiation transport, facility vulnerability calculations and other defense-related applications of radiation transport and nuclear decay calculations.

Professional Experience

Distinguished R&D Staff Member (Nuclear Engineer), Oak Ridge National Laboratory

1/2016 – present Nuclear Energy and Fuel Cycle Division and Nuclear Nonproliferation Division
(and their predecessors)

Leadership role in projects: Strategic Laboratory Assessment of the Surplus Plutonium Disposition, Mobile Reactor Shielding, NA-22 Modeling Urban Scenarios & Experiments (MUSE), AFIDS Quick Demonstration Project.

Contributor in projects: NA-84 Transform Prompt Effects Methodology; Quick Demonstration of the Basic Capabilities of the Activation Foil Integrated Detector System (AFIDS).

Senior R&D Staff Member (Nuclear Engineer), Oak Ridge National Laboratory

10/2006 – 12/2015 Reactor and Nuclear Systems (and its predecessors)

Leadership role in projects: NA-22 Modeling and Simulation Tool to Improve Urban Search Planning (OPTUS); BAE Neutron Induced Gamma Activation Dose of the Bradley Fighting Vehicle; NA-42 Advanced Multi-Dimensional Forward and Inverse Modeling; NRC Fluence Shielding, Methods, and Data for HTGRs; ORNL Seed Project on Advanced Variance Reduction Methods for Active Interrogation Modeling; lead developer of Monaco/MAVRIC in SCALE 6, SCALE 6.1 and SCALE 6.2; NA-22 Systematic Assessment of Neutron & Gamma-ray Backgrounds Relevant to Operational Modeling; DTRA PWR Facility Dose Modeling; DTRA Nuclear Vulnerability Analyses with MCNP; Member of the SCALE Leadership Team (2008-2014).

Contributor in projects: DTRA Cherenkov/Glass Forensic Neutron Detector – developed analysis software and GUI; NA-22 Activation Foil Integrated Detector System (AFIDS) – analysis and demonstration; LDRD on Revolutionary Radiation Transport; NA-22 Methods development for ADVANTG (angular CADIS); USAF, Air Force Technical Applications Center project; Other classified projects; SCALE – various testing of nuclear data libraries.

R&D Staff Member (Nuclear Engineer), Oak Ridge National Laboratory

9/1999 – 9/2006 Nuclear Science and Technology Division (and its predecessors)

Lead developer in projects: Monaco/MAVRIC in SCALE, the first production code system to use automated hybrid variance reduction; VISAC (Visual Interactive Site Analysis Code) analysis code and GUI for DTRA Nuclear Facilities Vulnerability Analysis project.

Contributor in projects: NA-22 Activation Foil Integrated Detector System (AFIDS) for nuclear weapon attribution – GUI development; Medical physics projects including NIH grants and ORNL SEED project with UNC; Revised and benchmarked HFIR MCNP model; Explored radiation damage modeling in photographic film for Kodak.

Postdoctoral Research Associate, North Carolina State University
3/1999 – 9/1999 Department of Nuclear Engineering
Differential sampling in Monte Carlo applied to mammography image simulation.

Education

Ph.D. Nuclear Engineering, North Carolina State University, March 1999
Dissertation Title: Monte Carlo Mammography Image Simulation with Measured Coherent Scattering Form Factors and Differential Sampling

M.S. Nuclear Engineering, North Carolina State University, December 1993
Thesis Title: Sodium Iodide Detector Response Functions Using Simplified Monte Carlo Simulation and Principal Components

B.S. Physics, *Summa Cum Laude*, Western Illinois University, May 1991

Publications - Archival Journal Articles

127. James M. Ghawaly Jr., Andrew D. Nicholson, Douglas E. Peplow, Christine M. Anderson-Cook, Kary L. Myers, Daniel E. Archer, Michael J. Willis, and Brian J. Quiter, “Data for Training and Testing Radiation Detection Algorithms in an Urban Environment,” *Scientific Data* **7**, article 328 (2020). DOI: 10.1038/s41597-020-00672-2.
121. Andrew D. Nicholson, Douglas E. Peplow, Michael J. Willis, and Daniel E. Archer, “Generation of Synthetic Data for a Radiation Detection Algorithm Competition,” accepted for *IEEE Transactions on Nuclear Science* **67**(8), 1968–1975 (2020). <https://doi.org/10.1109/TNS.2020.3001754>
118. C. Celik, D. E. Peplow, M. W. Swinney, G. G. Davidson, “A Directional Detector Response Function for Anisotropic Detectors,” *Nuclear Science and Engineering* **193**(12), 1355–1370 (2019). <https://doi.org/10.1080/00295639.2019.1631028>
117. D. E. Peplow, K. Banerjee, G. G. Davidson, I. R. Stewart, M. W. Swinney, J. N. Wagner, “Preliminary Validation of the Shift Monte Carlo Code for Fixed-Source Radiation Transport Problems,” *Nuclear Technology* **206**(1), 107–125 (2020). <https://doi.org/10.1080/00295450.2019.1625663>
116. D. E. Peplow, “Specific Gamma-Ray Dose Constants with Current Emission Data,” *Health Physics* **118**, 402–416 (2020). <https://doi.org/10.1097/HP.0000000000001136>
112. M. S. Bandstra, B. J. Quiter, K. J. Bilton, J. C. Curtis, T. H. Joshi, R. Meyer, V. Neguy, K. Vetter, D. E. Archer, D. E. Hornback, D. E. Peplow, C. E. Romano, M. W. Swinney, T. L. McCullough, M. S. L. McLean, “Attribution of Gamma-ray Background Collected by a Mobile Detector System to its Surroundings using Panoramic Video,” *Nuclear Instruments and Methods in Physics Research Section, A* **954** (2020) 161126. <https://doi.org/10.1016/j.nima.2018.08.085>
110. M. W. Swinney, D. E. Peplow, B. W. Patton, A. D. Nicholson, D. E. Archer, and M. J. Willis, “A Methodology for Determining the Concentration of Naturally Occurring Radioactive Materials in an

Urban Environment,” *Nuclear Technology* **203**(3), 325–335 (2018). <https://doi.org/10.1080/00295450.2018.1458558>

105. A. D. Nicholson, D. E. Hornback, I. Garishvili, D. E. Archer, W. R. Ray, D. E. Peplow, M. W. Swinney, and G. G. Davidson, “Multi-Agency Urban Search Experiment Detector and Algorithm Test Bed,” *IEEE Transactions on Nuclear Science* **64**(7), 1689-1695, (2017). <https://doi.org/10.1109/TNS.2017.2677092>
97. A. M. Ibrahim, D. E. Peplow, R. E. Grove, J. L. Peterson, and S. R. Johnson, “The Multi-Step CADIS Method for Shutdown Dose Rate Calculations and Uncertainty Propagation,” *Nuclear Technology* **192**(3) 286-298 (2015). <https://doi.org/10.13182/NT15-1>
95. A. M. Ibrahim, D. E. Peplow, J. L. Peterson, and R. E. Grove, “Shutdown Dose Rate Analysis Using the Multi-Step CADIS Method,” *Fusion Science & Technology* **68**(3) 700-704 (2015). <https://doi.org/10.13182/FST15-123>
92. 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**, 49-59 (2015). <https://doi.org/10.13182/NSE14-94>
91. B. T. Rearden, L. M. Petrie, D. E. Peplow, K. B. Bekar, D. Wiarda, C. Celik, C. M. Perfetti, A. M. Ibrahim, S. W. D. Hart, M. E. Dunn, and W. J. Marshall, “Monte Carlo Capabilities of the SCALE Code System,” *Annals of Nuclear Energy* **82**, 130-141 (2014). <https://doi.org/10.1016/j.anucene.2014.08.019>
82. A. M. Ibrahim, D. E. Peplow, J. L. Peterson, and R. E. Grove, “Novel Hybrid Monte Carlo/Deterministic Technique for Shutdown Dose Rate Analyses of Fusion Energy Systems,” *Fusion Engineering and Design* **89**(9-10), 1933-1938 (2014). <https://doi.org/10.1016/j.fusengdes.2014.03.014>
81. A. M. Ibrahim, P. P. H. Wilson, M. E. Sawan, S. W. Mosher, D. E. Peplow, and R. E. Grove, “Assessment of Fusion Facility Dose Rate Map Using Mesh Adaptivity Enhancements of Hybrid Monte Carlo/Deterministic Techniques,” *Fusion Engineering and Design* **89**(9-10), 1875-1879 (2014). <https://doi.org/10.1016/j.fusengdes.2014.02.046>
68. J. C. Wagner, D. E. Peplow, and S. W. Mosher, “FW-CADIS Method for Global and Semi-Global Variance Reduction of Monte Carlo Radiation Transport Calculations,” *Nuclear Science and Engineering* **176**, No. 1, 37-57 (2014). <https://doi.org/10.13182/NSE12-33>
62. D. E. Peplow, T. M. Miller, B. W. Patton, and J. C. Wagner, “Hybrid Monte Carlo/Deterministic Methods for Accelerating Active Interrogation Modeling,” *Nuclear Technology* **182**(1), 63-74 (2013). <https://doi.org/10.13182/NT13-A15827>
55. 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). <https://doi.org/10.15669/pnst.2.815>
54. A. M. Ibrahim, M. E. Sawan, S. W. Mosher, T. M. Evans, D. E. Peplow, P. P. H. Wilson, J. C. Wagner, “Global Evaluation Of Prompt Dose Rates In ITER Using Hybrid Monte Carlo/Deterministic Techniques,” Proceedings of the Nineteenth Topical Meeting on the Technology of Fusion Energy (TOFE) (Part 2), *Fusion Science and Technology* **60**(2), 676-680 (2011). <https://doi.org/10.13182/FST11-A12462>
52. 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). <https://doi.org/10.13182/NT175-251>
51. J. M. Risner, D. Wiarda, T. M. Miller, D. E. Peplow, B. W. Patton, M. E. Dunn, and B. T. Parks, “Development and Testing of the VITAMIN-B7/BUGLE-B7 Coupled Neutron-Gamma Multigroup Cross-Section Libraries,” *Journal of ASTM International* **9**(5) (2012). <https://doi.org/10.1520/JAI104130>
 50. 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). <http://dx.doi.org/10.15669/pnst.2.808>
 49. D. E. Peplow, “Monte Carlo Shielding Analysis Capabilities with MAVRIC,” *Nuclear Technology* **174**, No. 2, 289-313 (2011). <https://doi.org/10.13182/NT174-289>
 40. D. E. Peplow, T. M. Evans and J. C. Wagner, “Simultaneous Optimization of Tallies in Difficult Shielding Problems,” *Nuclear Technology* **168**(3), 785-792 (2009). <https://doi.org/10.13182/NT09-9>
 36. J. C. Wagner, D. E. Peplow and T. M. Evans, “Automated Variance Reduction Applied to Nuclear Well-Logging Problems,” *Nuclear Technology* **168**(3), 799-809 (2009). <https://doi.org/10.13182/NT09-A9309>
 23. F. C. DiFilippo, L. S. Papiez, V. P. Moskvin, D. E. Peplow, C. M. DesRosiers, J. O. Johnson, R. D. Timmerman, M. E. Randall and R. A. Lillie, “Contamination dose from photoneutron processes in bodily during therapeutic radiation delivery,” *Medical Physics* **30**(10), 2849-2854 (2003). <https://doi.org/10.1118/1.1612947>
 22. D. E. Peplow, C. D. Sulfredge, R. L. Sanders, R. H. Morris and T. A. Hann, “Calculating Nuclear Power Plant Vulnerability Using Integrated Geometry and Event/Fault Tree Models,” *Nuclear Science and Engineering* **146**(1), 71-87 (2004). <https://doi.org/10.13182/NSE04-A2394>
 15. D. E. Peplow and K. Verghese, “Digital Mammography Image Simulation Using Monte Carlo,” *Medical Physics* **27**(3), 568-579 (2000). <https://doi.org/10.1118/1.598896>
 14. D. E. Peplow and K. Verghese, “Differential Sampling for the Monte Carlo Practitioner,” An invited paper in *Progress in Nuclear Energy* **36**(1), 39-75 (2000). [https://doi.org/10.1016/S0149-1970\(99\)00024-4](https://doi.org/10.1016/S0149-1970(99)00024-4)
 13. D. E. Peplow and K. Verghese, “Differential Sampling Applied to Mammography Image Simulation,” *Nuclear Science and Engineering* **135**(2), 103-122 (2000). <https://doi.org/10.13182/NSE00-A2128> This paper won the 1999 ANS Mark Mills Award.
 9. D. E. Peplow, “Fiestaware Radiography,” *The Physics Teacher* **37**(5), 316-318 (1999).
 7. D. E. Peplow, “Direction Cosines and Polarization Vectors for Monte Carlo Photon Scattering,” *Nuclear Science and Engineering* **131**(1), 132-136 (1999). <https://doi.org/10.13182/NSE99-A2024>
 6. D. E. Peplow and K. Verghese, “Measured Molecular Coherent Scattering Form Factors of Animal Tissues, Plastics and Human Breast Tissue,” *Physics in Medicine & Biology* **43**(9), 2431-2452 (1998). <https://doi.org/10.1088/0031-9155/43/9/001>
 4. R. P. Gardner, C. L. Barrett, W. Haq and D. E. Peplow, “Efficient Monte Carlo Simulation of O-16 Neutron Activation and N-16 Decay Gamma-Ray Detection in a Flowing Fluid for On-Line Oxygen Analysis or Flow Rate Measurement,” *Nuclear Science and Engineering* **122**(3), 326-343 (1995). <https://doi.org/10.13182/NSE96-A24168>

3. P. Guo, D. E. Peplow and R. P. Gardner, "Natural Gamma-Ray Log Interpretation: Semi-Empirical, Principal Components Analysis and Monte Carlo Multiply Scattered Components Approaches," *Nuclear Geophysics* **9**(4), 305-318 (1995). [https://doi.org/10.1016/0969-8086\(95\)00007-E](https://doi.org/10.1016/0969-8086(95)00007-E)
1. D. E. Peplow, R. P. Gardner and K. Verghese, "Sodium Iodide Detector Response Functions Using Simplified Monte Carlo Simulation and Principal Components," *Nuclear Geophysics* **8**(3), 243-259 (1994).

Publications - Full Conference Papers

119. Michael B. R. Smith and Douglas E. Peplow, "Official Release of The Radioisotope Power System Dose Estimation Tool (RPS-DET)," IEEE Aerospace Conference, Big Sky, Montana, March 7-14, 2020.
103. I. Garishvili, D. E. Hornback, D. E. Archer, A. D. Nicholson, D. E. Peplow, G. G. Davidson, M. W. Swinney, J. Peltz, M. S. L. McLean, and B. J. Quiter, "MUSE - Multi-agency Urban Search Experiments," poster at SORMA West (IEEE Symposium on Radiation Measurements and Applications), Berkeley, CA (2016).
99. B. T. Rearden, K. B. Bekar, C. Celik, K. T. Clarno, M. E. Dunn, S. W. D. Hart, A. M. Ibrahim, S. R. Johnson, B. R. Langley, J. P. Lefebvre, R. A. Lefebvre, W. J. Marshall, U. Mertyurek, D. E. Mueller, D. E. Peplow, C. M. Perfetti, L. M. Petrie, Jr., A. B. Thompson, D. Wiarda, W. A. Wieselquist, and M. L. Williams, "Criticality Safety Enhancements For Scale 6.2 And Beyond," International Cooperation in Nuclear Criticality Safety 2015, 1255-1269, Charlotte, NC, Sept. 13-17, 2015.
94. A. M. Ibrahim, D. E. Peplow, and R. E. Grove, "Acceleration Of Shutdown Dose Rate Monte Carlo Calculations Using The Multi-Step CADIS Hybrid Method," ANS MC2015 - Joint International Conference on Mathematics and Computation (M&C), Supercomputing in Nuclear Applications (SNA) and the Monte Carlo (MC) Method, Nashville, TN, April 19-23, 2015, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2015).
90. B. T. Rearden, L. M. Petrie, D. E. Peplow, K. B. Bekar, D. Wiarda, C. Celik, C. M. Perfetti, M. E. Dunn, and S. W. D. Hart, "Enhancements in Continuous-Energy Monte Carlo Capabilities for SCALE 6.2," PHYSOR 2014, Kyoto, Japan (Sept 28-Oct 3, 2014).
83. G. Radulescu, R. A. Lefebvre, D. E. Peplow, M. L. Williams, and J. M. Scaglione, "Dose Rate Analysis Capability for Actual Spent Fuel Transportation Cask Contents," Proceedings of the Institute of Nuclear Materials Management (INMM) 55th Annual Meeting, Atlanta, GA, July 20 – 24, 2014.
79. B. T. Rearden, L. M. Petrie, D. E. Peplow, K. B. Bekar, D. Wiarda, C. Celik, C. M. Perfetti, A. M. Ibrahim, S. W. D. Hart, and M. E. Dunn, "Monte Carlo Capabilities of the SCALE Code System," Joint International Conference on Supercomputing in Nuclear Applications and Monte Carlo 2013 (SNA + MC 2013), La Cité des Sciences et de l'Industrie, Paris, France, October 27-31, 2013.
78. B. T. Rearden, M. E. Dunn, D. Wiarda, C. Celik, K. Bekar, M. L. Williams, D. E. Peplow, C. M. Perfetti, I. C. Gauld, W. A. Wieselquist, J. P. Lefebvre, R. A. Lefebvre, F. Havluj, S. E. Skutnik, and K. J. Dugan, "Overview of SCALE 6.2," Nuclear Criticality Safety Topical Meeting, Wilmington, NC, September 29 -October 3, 2013, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2013).
77. T. M. Miller and D. E. Peplow, "Guidance Detailing Methods to Calculate Criticality Accident Alarm Detector Response and Coverage," Nuclear Criticality Safety Topical Meeting, Wilmington, NC, September 29 -October 3, 2013, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2013).

76. A. M. Ibrahim, D. E. Peplow, K. B. Bekar, C. Celik, J. M. Scaglione, D. Ilas, and J. C. Wagner, "Hybrid Technique in SCALE for Fission Source Convergence Applied to Used Nuclear Fuel Analysis," Nuclear Criticality Safety Topical Meeting, Wilmington, NC, September 29 -October 3, 2013, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2013).
75. K. B. Bekar, C. Celik, D. Wiarda, D. E. Peplow, B. T. Rearden, and M. E. Dunn, "Enhancements in Continuous-Energy Monte Carlo Capabilities in SCALE," Nuclear Criticality Safety Topical Meeting, Wilmington, NC, September 29 -October 3, 2013, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2013).
70. A. M. Ibrahim, D. E. Peplow, S. W. Mosher, J. C. Wagner, T. M. Evans, P. P. H. Wilson, and M. E. Sawan, "Automatic Mesh Adaptivity for CADIS and FW-CADIS Neutronics Modeling of Difficult Shielding Problems," 2013 International Conference on Mathematics & Computational Methods Applied to Nuclear Science and Engineering (M&C 2013), Sun Valley, ID, May 5-9, 2013.
69. D. E. Peplow, "Comparison of Hybrid Methods for Global Variance Reduction in Shielding Calculations," 2013 International Conference on Mathematics & Computational Methods Applied to Nuclear Science and Engineering (M&C 2013), Sun Valley, ID, May 5-9, 2013.
63. M. Monterial, V. J. Jodoin, J. P. Lefebvre, D. E. Peplow, and D. L. Hooper, "Automating the Coupling of ORIGEN with GADRAS via the Fallout Analysis Tool for National Technical Nuclear Forensics," *Proceedings of the Institute of Nuclear Materials Management (INMM) 53rd Annual Meeting*, Orlando, FL, July 2012.
60. B. T. Rearden, L. M. Petrie, D. E. Peplow, M. A. Jessee, D. Wiarda, M. L. Williams, R. A. Lefebvre, J. P. Lefebvre, I. C. Gauld, and S. Goluoglu, "SCALE 6.1 Enhancements for Nuclear Criticality Safety," Physor 2012, April 2012.
59. 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," Physor 2012, April 2012.
58. B. T. Rearden, L. M. Petrie, D. E. Peplow, M. A. Jessee, D. Wiarda, M. L. Williams, R. A. Lefebvre, J. P. Lefebvre, I. C. Gauld, and S. Goluoglu, "SCALE 6.1 Enhancements for Nuclear Criticality Safety", International Conference on Nuclear Criticality, Sept 2011.
53. V. J. Jodoin, R. W. Lee, D. E. Peplow, and J. P. Lefebvre, "Application of The Origen Fallout Analysis Tool and the DELFIC Fallout Planning Tool to National Technical Nuclear Forensics," ANS EPRRS - 13th Robotics & Remote Systems for Hazardous Environments - 11th Emergency Preparedness & Response, Knoxville, TN, August 7-10, 2011, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2011).
48. J. C. Wagner, T. M. Evans, S. W. Mosher, D. E. Peplow and J. A. Turner, "Hybrid and Parallel Domain-Decomposition Methods Development to Enable Monte Carlo for Reactor Analyses," proceedings of the Joint International Conference on Supercomputing in Nuclear Applications and Monte Carlo 2010 (SNA + MC2010), Hitotsubashi Memorial Hall, Tokyo, Japan, October 17-20, 2010.
47. 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 ORNL," proceedings of the Joint International Conference on Supercomputing in Nuclear Applications and Monte Carlo 2010 (SNA + MC2010), Hitotsubashi Memorial Hall, Tokyo, Japan, October 17-20, 2010.
38. J. C. Wagner, E. D. Blakeman, and D. E. Peplow, "FW-CADIS Method for Variance Reduction of Monte Carlo Calculations of Detailed Distributions and Multiple Localized Quantities," in the proceedings of the 2009 International Conference on Advances in Mathematics, Computational Methods, and Reactor Physics (M&C 2009), Saratoga Springs, New York, May 3-7, 2009.

37. D. E. Peplow and Lester M. Petrie, Jr., “Criticality Accident Alarm System Modeling With SCALE,” in the proceedings of the 2009 International Conference on Advances in Mathematics, Computational Methods, and Reactor Physics (M&C 2009), Saratoga Springs, New York, May 3-7, 2009.
21. D. E. Peplow and Y. Y. Azmy, “GipGui: A GUI for the GIP Cross Section Preparation Code,” Poster/presentation at the ANS M&C 2003, the Nuclear Mathematical and Computational Sciences Conference, *A Century in Review - A Century Anew* April 6-10, 2003, Gatlinburg, TN.
18. C. D. Sulfredge, R. L. Sanders, D. E. Peplow, R. H. Morris and T. A. Hann, “Graphical Expert System for Analyzing Nuclear Facility Vulnerability,” *Transactions of IITSEC 2002* (Interservice/Industry Training, Simulation and Education Conference).
11. D. E. Peplow and K. Verghese “Differential Sampling for Monte Carlo Mammographic Image Simulation” *Proceedings of SPIE* **3771**, 98-111 (1999).

Publications – Technical Reports

126. Nicholas J. Prins, Anthony P. Ulses, Randall J. Belles, Jeffrey J. Powers, and Douglas E. Peplow, *Application of a Phenomena Identification Ranking Table to Battle Damage Assessment*, ORNL/LTR-2020/43, Oak Ridge National Laboratory, Oak Ridge, TN, August 2020.
125. Douglas E. Peplow, Keith C. Bledsoe and Jeffrey O. Johnson, *Activation Foil Integrated Detector System (AFIDS) Research and Development During 2017-2020*, ORNL/TM-2020/1558, Oak Ridge National Laboratory, Oak Ridge, TN, July 2020 (report is classified S/RD-NF-N).
124. Brandon R. Grogan, Keith C. Bledsoe, Douglas E. Peplow, Eric D. Sword, *Mantis Shrimp Modeling and Validation - Baggage X-Ray Systems Characterization*, ORNL/SPR-2020/1563, for Nuclear Smuggling Detection and Deterrence, July 2020.
123. Georgeta Radulescu, Thomas M. Miller, Kaushik Banerjee, and Douglas E. Peplow, *Dose Rate Analysis of the Proposed WCS Consolidated Interim Spent Nuclear Fuel Facility*, ORNL/SPR-2019/1070, Oak Ridge National Laboratory, Oak Ridge, TN, June 2020.
122. Nicholas J. Prins, Anthony P. Ulses, Randall J. Belles, Jeffrey J. Powers, and Douglas E. Peplow, *Input to the Battle Damage Specification Plan*, ORNL/LTR-2020/22, Oak Ridge National Laboratory, Oak Ridge, TN, May 2020.
119. Michael B. R. Smith, Douglas E. Peplow, Robert A. Lefebvre, William A. Wieselquist, “Radioisotope Power System Dose Estimation Tool (RPS-DET) User Manual,” ORNL/TM-2019/1249, Oak Ridge National Laboratory, Oak Ridge, Tennessee, August 2019.
114. D. E. Archer, M. S. Bandstra, D. S. Bolme, S. L. Cleveland, J. C. Curtis, G. G. Davidson, I. Garishvili, J. O. Johnson, A. K. Mikkilineni, M. S. Lance McLean, A. D. Nicholson, D. E. Peplow, A. A. Plionis, M. J. Poska, B. J. Quiter, W. R. Ray, A. J. Rowe, I. R. Stewart, M. W. Swinney, and M. J. Willis, *Mid-Project Report for the Modeling Urban Scenarios & Experiments (MUSE) Project*, ORNL/TM-2018/964, Oak Ridge National Laboratory, Oak Ridge, Tennessee, August 2018.
109. D. E. Archer, M. S. Bandstra, G. G. Davidson, S. L. Cleveland, I. Garishvili, D. E. Hornback, J. O. Johnson, M. S. Lance McLean, A. D. Nicholson, B. W. Patton, D. E. Peplow, A. A. Plionis, B. J. Quiter, W. R. Ray, A. J. Rowe, M. W. Swinney, M. J. Willis, *Fort Indiantown Gap Data Collections Summary and Analysis*, ORNL/TM-2017/371, Oak Ridge National Laboratory, Oak Ridge, Tenn., September 2017.
104. K. C. Bledsoe, B. K. Daniel, S. C. Wilson, and D. E. Peplow *Neutron Induced Gamma Activation Dose of the Bradley Fighting Vehicle*, ORNL/SR-2016/112, Oak Ridge National Laboratory, Oak Ridge, Tennessee, March 2016.

100. D. E. Peplow and Claudio P. Santiago, *Radiation Background and Attenuation Model Validation and Development*, LLNL-TR-675956, Lawrence Livermore National Laboratory, Livermore, California, July 2015.
98. J. O. Johnson, K. C. Bledsoe, D. Ilas, R. A. Joseph, III, J. P. Lefebvre, R. A. Lillie, T. M. Miller, D. E. Peplow, J. M. Risner, W. W. Sallee, R. T. Santoro, C. O. Slater, and M. L. Williams, *Development of the Activation Foil Integrated Detector System (AFIDS)*, ORNL/TM-2014/688, Oak Ridge National Laboratory, Oak Ridge, Tennessee, August 2015.
93. D. E. Archer, D. E. Hornback, J. O. Johnson, T. M. Miller, A. D. Nicholson, B. W. Patton, D. E. Peplow, and B. Ayaz-Maierhafer, *Systematic Assessment of Neutron & Gamma Backgrounds Relevant to Operational Modeling and Detection Technology Implementation*, ORNL/TM-2014/687, Oak Ridge National Laboratory, Oak Ridge, Tennessee, December 2014.
74. T. M. Miller and D. E. Peplow, *Guide to Performing Computational Analysis of Criticality Accident Alarm Systems*, ORNL/TM-2013/211, August, 2013.
67. D. E. Peplow, S. W. Mosher, and T. M. Evans, *Consistent Adjoint Driven Importance Sampling using Space, Energy and Angle*, ORNL/TM-2012/7, August, 2012.
57. J. M. Risner, D. Wiarda, M. E. Dunn, T. M. Miller, D. E. Peplow, and B. W. Patton, *Production and Testing of the VITAMIN-B7 Fine-Group and BUGLE-B7 Broad-Group Coupled Neutron/Gamma Cross-Section Libraries Derived from ENDF/B-VII.0 Nuclear Data*, NUREG/CR-7045, ORNL/TM 2011/12 (2011).
39. D. Wiarda, M. E. Dunn, D. E. Peplow, T. M. Miller and H. Akkurt, *Development and Testing of ENDF/B-VI.8 and ENDF/B-VII.0 Coupled Neutron-Gamma Libraries for SCALE 6*, NUREG/CR-6990 ORNL/TM-2008/047, U.S. Nuclear Regulatory Commission, February 2009.
32. E. D. Blakeman, D. E. Peplow, J. C. Wagner, B. D. Murphy and D. E. Mueller, *PWR Facility Dose Modeling Using MCNP5 and the CADIS/ADVANTG Variance-Reduction Methodology*, ORNL/TM-2007/133, September 2007
25. D. E. Peplow, *A Computational Model of the High Flux Isotope Reactor for the Calculation of Cold Source, Beam Tube, and Guide Hall Nuclear Parameters*, ORNL/TM-2004/237, Nov. 2004.
24. C. D. Sulfredge, R. L. Sanders, R. H. Morris and D. E. Peplow, *Detailed Reactor Models for the Visual Interactive Site Analysis Code (VISAC)*, ORNL/NRC/LTR-04/16, U.S. Nuclear Regulatory Commission, Oak Ridge National Laboratory, February 7, 2005.

Publications – Conference Summaries

115. Jackson N. Wagner and Douglas E. Peplow, “Validation of the Shift Monte Carlo Code – Neutron Field Measurements in a Concrete Labyrinth,” *Transactions of the American Nuclear Society* **120** 763-766 (2019)
113. K. C. Bledsoe, M. A. Jessee and D. E. Peplow, “Uncertainty Analysis for Neutron Active Interrogation Calculations,” accepted for *Proceedings of 2018 Advances in Nuclear Nonproliferation Technology and Policy Conference*, Wilmington, NC, Sept. 23-27, 2018.
111. G. Radulescu, T. M. Miller, K. Banerjee, and D. E. Peplow, “Detailed SCALE Dose Rate Evaluations for a Consolidated Interim Spent Nuclear Fuel Storage Facility,” *Transactions of the American Nuclear Society* **118**, 765-768 (2018).
108. D. E. Peplow, M. W. Swinney, G. G. Davidson, A. D. Nicholson and B. W. Patton, “Initial Modeling of Urban Search Measurements,” *Transactions of the American Nuclear Society* **116**, 913-916 (2017).

107. M. W. Swinney, D. E. Peplow, and A. D. Nicholson, "Characterization of NORM in an Urban Environment using HPGe Measurements and MCNP6 Simulations," *Transactions of the American Nuclear Society* **116**, 917-920 (2017).
106. D. E. Peplow, "A Comparison of the FW-CADIS and MR-CADIS Variance Reduction Methods," *Transactions of the American Nuclear Society* **116**, 540-543 (2017).
102. I. Garishvili, D. E. Hornback, D. E. Archer, A. D. Nicholson, D. E. Peplow, G. G. Davidson, M. W. Swinney, J. Peltz, M. S. Lance McLean, and B. J. Quiter, "MUSE - Multi-agency Urban Search Experiments," SORMA (IEEE Symposium on Radiation Measurements and Applications) West, Berkeley, CA (2016).
101. M. W. Swinney, D. E. Peplow, A. D. Nicholson and B. W. Patton, "NORM Concentration Determination in Common Construction Materials in an Urban Environment," *Transactions of the American Nuclear Society* **114**, 635-638 (2016).
96. A. M. Ibrahim, D. E. Peplow, J. L. Peterson, and R. E. Grove, "Analysis of Shutdown Dose Rate in Fusion Energy Systems Using Hybrid Monte Carlo/Deterministic Techniques," *Transactions of the American Nuclear Society* **112**, 609-612 (2015).
89. A. M. Ibrahim, D. E. Peplow, R. E. Grove, and S. R. Johnson, "The Multi-Step CADIS Method for Shutdown Dose Rate Calculations and Uncertainty Propagation," ANS RPSD Topical Meeting, Knoxville, TN, Sept. 14 – 18, 2014, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2014).
88. A. M. Ibrahim, D. E. Peplow, J. L. Peterson, and R. E. Grove, "Analysis of Shutdown Dose Rate in Fusion Energy Systems Using Hybrid Monte Carlo/Deterministic Techniques," ANS RPSD Topical Meeting, Knoxville, TN, Sept. 14 – 18, 2014, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2014).
87. G. Radulescu, D. E. Peplow, Mark L. Williams, and J. M. Scaglione, "Dose Rate Analysis of As-Loaded Spent Nuclear Fuel Casks," ANS RPSD Topical Meeting, Knoxville, TN, Sept. 14 – 18, 2014, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2014).
86. D. E. Peplow, Z. W. Bell and S. P. Hamilton, "Identification of Leakage Spectra from Neutron Activation in Glass/Cherenkov Detectors," for ANS RPSD Topical Meeting, Knoxville, TN, Sept. 14 – 18, 2014, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2014).
85. D. E. Peplow, G. Radulescu, M. L. Williams, and R. A. Lefebvre, "SCALE Enhancements for Detailed Cask Dose Rate Analysis," ANS RPSD Topical Meeting, Knoxville, TN, Sept. 14 – 18, 2014, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2014).
84. D. E. Peplow and C. R. Daily, "ADVANTG Validation with Simple Shielding Measurements," for ANS RPSD Topical Meeting, Knoxville, TN, Sept. 14 – 18, 2014, on CD-ROM, American Nuclear Society, LaGrange Park, IL (2014).
80. B. T. Rearden, M. E. Dunn, D. Wiarda, C. Celik, K. B. Bekar, M. L. Williams, D. E. Peplow, C. M. Perfetti, J. P. Lefebvre, F. Havluj, K. J. Dugan, "SCALE and AMPX Advancements to Support NCS Applications," *Transactions of the American Nuclear Society* **109**, 907-910 (2013).
73. T. M. Miller and D. E. Peplow, "Corrected User Guidance to Perform Three-Dimensional Criticality Accident Alarm System Modeling with SCALE," *Transactions of the American Nuclear Society* **108**, 498-501 (2013).
72. A. M. Ibrahim, D. E. Peplow, and R. E. Grove, "Hybrid Monte Carlo/Deterministic Technique for Shutdown Dose Rate Calculations," *Transactions of the American Nuclear Society* **108**, 647-650 (2013).

71. D. E. Peplow, A. M. Ibrahim, and R. E. Grove, "Propagation of Uncertainty from a Source Computed with Monte Carlo," *Transactions of the American Nuclear Society* **108**, 643-646 (2013).
66. A. M. Ibrahim, P. P. H. Wilson, M. Sawan, 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," *Transactions of the American Nuclear Society* **107**, 934-937 (2012).
65. D. E. Peplow, "Comparison of Hybrid Methods for Global Variance Reduction in Shielding Calculations," *Transactions of the American Nuclear Society* **107**, 512-515 (2012).
64. A. M. Ibrahim, P. P. H. Wilson, M. Sawan, S. W. Mosher, T. M. Evans, D. E. Peplow, and J. C. Wagner, "Automatic Mesh Adaptivity For Hybrid Monte Carlo/Deterministic Neutronics Modeling Of Fusion Energy Systems," 12th International Conference on Radiation Shielding (ICRS-12) 17th Topical Meeting of the Radiation Protection and Shielding Division of the American Nuclear Society (RPSD-2012) Nara, Japan, September 2-7, 2012.
61. D. E. Peplow and L. L. Wetzel, "Methods for Detector Placement and Analysis of Criticality Accident Alarm System," *Transactions of the American Nuclear Society* **106**, 497-500, June 24-28, 2012, Chicago, IL.
56. 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," *Transactions of the American Nuclear Society* **105**, 539-541 (2011).
46. D. E. Peplow and L. M. Petrie, Jr., "Criticality Accident Alarm System Modeling Made Easy With SCALE 6.1," *Transactions of the American Nuclear Society* **102**, 297-299 (2010).
45. A. Ibrahim, D. E. Peplow, T. M. Evans, P. P. H. Wilson, and J. C. Wagner, "Improving the SN Adjoint Source and Geometry Representation Capabilities in the SCALE Hybrid Shielding Analysis Sequence," proceedings of the American Nuclear Society Joint Topical Meeting of the Radiation Protection and Shielding Division, Isotopes and Radiation Division, and Biology and Medicine Division, Las Vegas, NV, April 19-23, 2010.
44. A. Ibrahim, S. W. Mosher, T. M. Evans, D. E. Peplow, M. E. Sawan, P. P. H. Wilson, and J. C. Wagner, "ITER Neutronics Modeling Using Hybrid Monte Carlo/SN and CAD-based Monte Carlo Methods," proceedings of the American Nuclear Society Joint Topical Meeting of the Radiation Protection and Shielding Division, Isotopes and Radiation Division, and Biology and Medicine Division, Las Vegas, NV, April 19-23, 2010.
43. D. E. Peplow, S.W. Mosher, and T. M. Evans, "Hybrid Monte Carlo/Deterministic Methods for Streaming/Beam Problems," proceedings of the American Nuclear Society Joint Topical Meeting of the Radiation Protection and Shielding Division, Isotopes and Radiation Division, and Biology and Medicine Division, Las Vegas, NV, April 19-23, 2010.
42. D. E. Peplow, T. M. Miller and B. W. Patton, "Hybrid Monte Carlo/Deterministic Methods for Active Interrogation Modeling," proceedings of the American Nuclear Society Joint Topical Meeting of the Radiation Protection and Shielding Division, Isotopes and Radiation Division, and Biology and Medicine Division, Las Vegas, NV, April 19-23, 2010.
41. 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," *Transactions of the American Nuclear Society* **100**, 302-304 (2009).
35. J. C. Wagner, D. E. Peplow and T. M. Evans, "Automated Variance Reduction Applied to Nuclear Well-Logging Problems," *Transactions of the American Nuclear Society* **99**, 566-569 (2009).
34. D. Ilas, M. L. Williams, D. E. Peplow and B. L. Kirk, "Multidimensional Coupled Photon-Electron Transport Simulations using Neutral Particle S_N Codes," in the CD-ROM proceedings of the

American Nuclear Society's Computational Medical Physics Working Group Workshop II University of Florida, Gainesville, FL, September 30 -October 3, 2007.

33. D. E. Peplow and J. C. Wagner, "Simultaneous Optimization of Tallies in Difficult Shielding Problems," Transactions of the 11th International Conference on Radiation Shielding (ICRS-11) and the 15th Topical Meeting of the Radiation Protection and Shielding Division (RPSD-2008) of the American Nuclear Society, p. 29, Callaway Gardens, GA, April, 2008.
31. J. C. Wagner, E. D. Blakeman and D. E. Peplow, "Forward-Weighted CADIS Method for Global Variance Reduction," *Transactions of the American Nuclear Society* **97**, 630-633 (2007).
30. D. E. Peplow, E. D. Blakeman and J. C. Wagner, "Advanced Variance Reduction Strategies for Optimizing Mesh Tallies in MAVRIC," *Transactions of the American Nuclear Society* **97**, 595-597 (2007).
29. R. N. Slaybaugh, M. L. Williams, D. Ilas, D. E. Peplow, B. L. Kirk, T. L. Nichols, Y. Y. Azmy and M. P. Langer, "Radiation Treatment Planning Using Discrete Ordinates Codes," *Transactions of the American Nuclear Society* **96**, 343-345 (2007).
28. D. E. Peplow, S. M. Bowman, J. E. Horwedel and J. C. Wagner, "Monaco/MAVRIC: Computational Resources for Radiation Protection and Shielding in SCALE," *Transactions of the American Nuclear Society* **95**, 669-671 (2006).
27. D. E. Peplow and J. C. Wagner, "Automated Variance Reduction for SCALE Shielding Calculations," proceedings of *The American Nuclear Society's 14th Biennial Topical Meeting of the Radiation Protection and Shielding Division*, p. 391-393, Carlsbad, NM, April 2-6, 2006.
26. R. A. Lillie, D. E. Peplow, M. L. Williams, B. L. Kirk, M. P. Langer, T. L. Nichols and Y. Y. Azmy, "Photon Beam Transport in a Voxelized Human Phantom Model: Discrete Ordinates vs Monte Carlo," In the proceedings of *The American Nuclear Society's 14th Biennial Topical Meeting of the Radiation Protection and Shielding Division*, p. 40-43, Carlsbad, NM, April 2-6, 2006.
20. D. E. Peplow, C. D. Sulfredge, R. L. Sanders, R. H. Morris and T. A. Hahn, "Calculating Nuclear Power Plant Vulnerability Using Integrated Geometry and Event/Fault Tree Models," *Transactions of the American Nuclear Society* **87**, 559-561 (2002).
19. F. C. Difilippo, R. A. Lillie, D. E. Peplow, J. O. Johnson, L. S. Papiez, V. P. Moskvina, R. D. Timmerman, C. M. DesRosiers and M. E. Randall, "Photoneutron doses in radiotherapy treatments simulated with MCNPX code version 2.2.6," Works in Progress Poster Presentation at the 44th Ann. Meeting of the American Association of Physicists in Medicine, July 2002, Montreal, Quebec.
17. B. T. Rearden and D. E. Peplow, "Comparison of Sensitivity Analysis Techniques in Monte Carlo Codes for Multi-Region Criticality Calculations," *Transactions of the American Nuclear Society* **85**, 163-165 (2001).
16. G. B. Zeigler, D. E. Peplow and K. Verghese, "Simulation of Microcalcification Clusters in Digital Mammography," *Transactions of the American Nuclear Society* **83**, 514-516 (2000).
12. D. E. Peplow and K. Verghese, "Differential Sampling Applied to Mammography Image Simulation," *Transactions of the American Nuclear Society* **81**, 145-147 (1999). This is a summary of the paper that won the 1999 ANS Mark Mills Award.
10. K. Verghese and D. E. Peplow, "Collaborative Learning in Small Groups in a Mathematics Intensive NE Course," *Proceedings of the ASEE Annual Conf & Expo*, Charlotte, NC, June 1999.
8. D. E. Peplow and K. Verghese, "Monte Carlo Modeling of Mammographic Images," *Transactions of the American Nuclear Society* **79**, 163-164 (1998).

5. D. E. Peplow and K. Verghese, "Monte Carlo Image Simulation in Support of Improvements in Mammography," *Transactions of the American Nuclear Society* **77**, 358-359 (1997).
2. R. P. Gardner and D. E. Peplow, "Use of N-16 for Measuring Cooling Water Flow Rate in the NCSU PULSTAR Reactor," *Transactions of the American Nuclear Society* **70**, 130-131 (1994).

Formal Presentations

"Initial Modeling of Urban Search Measurements," at the ANS Annual Meeting, San Francisco, CA, June 13, 2017.

"A Comparison of the FW-CADIS and MR-CADIS Variance Reduction Methods," at the ANS Annual Meeting, San Francisco, CA, June 13, 2017.

"ADVANTG Validation with Simple Shielding Measurements" at the ANS RPSD Topical Meeting, Knoxville, TN, September 18, 2014.

"Identification of Leakage Spectra from Neutron Activation in Glass/Cherenkov Detectors" at the ANS RPSD Topical Meeting, Knoxville, TN, September 17, 2014.

"SCALE Enhancements for Detailed Cask Dose Rate Analysis" at the ANS RPSD Topical Meeting, Knoxville, TN, September 15, 2014.

"Systematic Assessment of Neutron & Gamma-ray Backgrounds Relevant to Operational Modeling and Detection Technology Implementation" at the NA-22 sponsored Gamma Ray and Neutron Background Workshop held at the SAIC/Leidos McLean Conference Facility, Feb 19-20, 2014.

"Propagation of Uncertainty from a Source Computed with Monte Carlo" at the American Nuclear Society Annual Meeting in Atlanta, GA, June 18, 2013.

"Comparison of Hybrid Methods for Global Variance Reduction in Shielding Calculations" at the 2013 International Conference on Mathematics & Computational Methods Applied to Nuclear Science and Engineering in Sun Valley, ID, May 6, 2013.

"Uncertainty Quantification for Inverse Transport Methods" for Keith C. Bledsoe at the NA-42 Science & Technology Mid-year Review Meeting, Remote Sensing Laboratory, Nellis Air Force Base, Las Vegas, NV, April 24, 2013.

"Comparison of Hybrid Methods for Global Variance Reduction in Shielding Calculations" at the American Nuclear Society Winter Meeting in San Diego, CA, November 13, 2012.

"Methods for Detector Placement and Analysis of Criticality Accident Alarm Systems" at the American Nuclear Society Annual Meeting in Chicago, IL, June 26, 2012.

"Uncertainty Quantification for Inverse Transport Methods" for Keith C. Bledsoe at the NA-42 Technology Integration Mid-year Review Meeting, Remote Sensing Laboratory, Nellis Air Force Base, Las Vegas, NV, May 3, 2012.

“Neutron Shielding: Simulation and Validation Experiments” at MeV (Modeling, Experimentation, and Validation) Summer School (Reactor Physics Computations, Validation, and Integration in Multiphysics Codes) at Argonne National Laboratory, July 27, 2011.

“Criticality Accident Alarm Systems with SCALE 6.1” at the American Nuclear Society Annual Meeting in San Diego, June 15, 2010.

“Hybrid Monte Carlo/Deterministic Methods for Active Interrogation Modeling” at the American Nuclear Society Joint Topical Meeting of the Radiation Protection and Shielding Division, Isotopes and Radiation Division, and Biology and Medicine Division, Las Vegas, NV, April 22, 2010. (Nominated for the “Best of RPSD2010” session to be held the next National Meeting.)

“Hybrid Monte Carlo/Deterministic Methods for Streaming/Beam Problems” at the American Nuclear Society Joint Topical Meeting of the Radiation Protection and Shielding Division, Isotopes and Radiation Division, and Biology and Medicine Division, Las Vegas, NV, April 22, 2010.

“Advanced Variance Reduction Methods and Their Implementation” at the weekly seminar of the Department of Nuclear and Radiological Engineering Program at the Georgia Institute of Technology in Atlanta, Georgia, Oct 1, 2009.

“Criticality Accident Alarm System Modeling With SCALE” at the 2009 International Conference on Advances in Mathematics, Computational Methods, and Reactor Physics (M&C 2009) sponsored by the Mathematics and Computation Division of the American Nuclear Society, in Saratoga Springs, New York, May 7, 2009.

“FW-CADIS Method for Variance Reduction of Monte Carlo Calculations of Detailed Distributions and Multiple Localized Quantities” at the 2009 International Conference on Advances in Mathematics, Computational Methods, and Reactor Physics (M&C 2009) sponsored by the Mathematics and Computation Division of the American Nuclear Society, in Saratoga Springs, New York, May 5, 2009.

“Advanced Variance Reduction Methods and Their Implementation” at the Weekly Colloquium of the Department of Nuclear Engineering and Radiological Sciences at University of Michigan in Ann Arbor, Michigan, March 27, 2009. (Invited talk.)

“Simultaneous Optimization of Tallies in Difficult Shielding Problems” at the 11th International Conference on Radiation Shielding (ICRS-11) and the 15th Topical Meeting of the Radiation Protection and Shielding Division (RPSD-2008) of the American Nuclear Society, in Pine Mountain, GA, April 14, 2008.

“Advanced Variance Reduction Strategies for Optimizing Mesh Tallies in MAVRIC” at the American Nuclear Society Winter Meeting, Washington, DC, November 14, 2007. (Invited talk.)

“Monaco/MAVRIC: Computational Resources for Radiation Protection and Shielding in SCALE” at the American Nuclear Society Winter Meeting, Albuquerque, NM, November 16, 2006. (Invited talk.)

“Automated Variance Reduction for SCALE Shielding Calculations,” at the American Nuclear Society’s 14th Biennial Topical Meeting of the Radiation Protection and Shielding Division, Carlsbad, NM, April 5, 2006.

“Photon Beam Transport in a Voxelized Human Phantom Model: Discrete Ordinates vs Monte Carlo” at the American Nuclear Society’s 14th Biennial Topical Meeting of the Radiation Protection and Shielding Division, Carlsbad, NM, April 3, 2006.

Invited panelist in “Java Pros and Cons - Roundtable” at the American Nuclear Society Annual Meeting, Pittsburgh, PA, June 16, 2004.

“GipGui: A GUI for the GIP Cross Section Preparation Code” Poster/presentation at the Nuclear Mathematical and Computational Sciences Conference (Mathematics & Computation Division of the American Nuclear Society), Gatlinburg, TN, April 9, 2003.

“Calculating Nuclear Power Plant Vulnerability Using Integrated Geometry and Event/Fault Tree Models” at the American Nuclear Society Winter Meeting, 8th Topical Meeting for Emergency Preparedness & Response, Washington, DC, November 20, 2002.

“Differential Sampling Applied to Mammography Image Simulation” at the American Nuclear Society Winter Meeting, Long Beach, CA, November 17, 1999. This was an invited talk to discuss the *Nuclear Science and Engineering* paper that won the American Nuclear Society’s Mark Mills award.

“Differential Sampling for Monte Carlo Mammographic Image Simulation” at the Annual Meeting of SPIE (International Society for Optical Engineering), Denver, CO, July 19, 1999.

“Collaborative Learning in Small Groups in a Mathematics Intensive NE Course” at the American Society for Engineering Education (ASEE) Annual Conference & Exposition, Charlotte, NC, June 22, 1999.

“Monte Carlo Modeling of Mammographic Images” at the American Nuclear Society Winter Meeting, Washington, DC, November 18, 1998.

“Monte Carlo Image Simulation in Support of Improvements in Mammography” at the American Nuclear Society Winter Meeting, Albuquerque, NM, November 17, 1997. (Invited talk.) Winner of the American Nuclear Society Reactor Physics Division's “Best Paper” Award.

SCALE Training Instructor

Monaco/MAVRIC 6.2, February 5-7, 2020 at ORNL (2 days)

Monaco/MAVRIC 6.2, January 31-February 1, 2019 at ORNL (2 days)

Monaco/MAVRIC 6.2, November 8-9, 2018 at ORNL (2 days)

KENO-IV/ORIGEN, November 13-15, 2017 at AFIT (3 days)

Monaco/MAVRIC 6.2, October 19-20, 2017 at ORNL (2 days)

Monaco/MAVRIC 6.2, March 2-4, 2016 at ORNL (2 days)

Monaco/MAVRIC 6.2, June 15-18, 2015 at NRC Headquarters (3.5 days)

New Features in SCALE 6.2 Workshop & Poster, April 19, 2015 at the M&C 2015 Nashville Topical

Monaco/MAVRIC 6.1, February 4-6, 2015 at ORNL (2 days)

SCALE 6.1 MAVRIC Tutorial, September 13, 2014 at the RPSD 2014 Knoxville Topical (2 hours)

Monaco/MAVRIC 6.1, March 26-28, 2014 at ORNL (2 days)

Monaco/MAVRIC 6.1, Oct 30-Nov 1, 2013 at ORNL (2 days)

Monaco/MAVRIC 6.1, materials preparation for April 2011 ORNL class

Monaco/MAVRIC 6.1, October 20-22, 2010 at ORNL (2 days)

Monaco/MAVRIC 6.1, August 17-18, 2010 at NRC Headquarters (2 days)

Monaco/MAVRIC 6.1, June 9-11, 2010 at ORNL (2 days)
SCALE6/MAVRIC Tutorial, April 23, 2010 at the RPSD 2010 Topical (Half-day)
SCALE6/Denovo Tutorial, April 23, 2010 at the RPSD 2010 Topical (Half-day)
SCALE6/MAVRIC Tutorial, April 8, 2010 at the ANS Student Conference (Half-day)
Monaco/MAVRIC, March 10-12, 2010 at ORNL (2 days)
SCALE6/MAVRIC Tutorial, November 19, 2009 at the ANS Winter Meeting (Half-day)
Monaco/MAVRIC, October 21-23, 2009 at ORNL (2 days)
SCALE6/MAVRIC Tutorial, May 3, 2009 at the M&C 2009 Topical (Half-day)
Monaco/MAVRIC, April 1-3, 2009 at ORNL (2 days)
Monaco/MAVRIC, October 29-31, 2008 at ORNL (2 days)
CAAS Modeling, July 29-30, 2008 at NRC (2 days)
Monaco/MAVRIC, September 20-21, 2007 at ORNL (2 days)
Monaco/MAVRIC, August 22-23, 2006 at NRC Headquarters (2 days)

Professional Organizations

American Nuclear Society
Member, 1991-current
Mathematics & Computation Division Treasurer, 2005-2006
Radiation Protection and Shielding Division Executive Committee, 2011-2014
RPSD 2014 Conference Treasurer
Sigma Xi, 1994-2007
American Society for Engineering Education, 1994-2007

Awards

UT-Battelle Award – Community Outreach, 2018
Significant Event Award, for Support to DOE in response to the crisis at Fukushima, 2011
UT-Battelle Award – Team Accomplishment, Engineering Research and Development, 2010
Nuclear Science & Technology Division Scientific and Technical Award, December 2006
American Nuclear Society Mark Mills Award, 1999
Alpha Nu Sigma, the nuclear engineering honor society (NCSU), 1995
National Science Foundation Engineering Education Scholar, 1995
Graduate Student Certificate for Outstanding Teaching (NCSU), 1994, 1995, 1996
Nuclear Engineering Teaching Fellow (NCSU), 1994-1996
Preparing the Professoriate (NCSU), 1994-1995
Sigma Xi, the Scientific Research Society (NCSU), 1994
Institute of Nuclear Power Operations Graduate Fellowship (NCSU), 1991
Dean's Fellowship (NCSU), 1991
Sigma Pi Sigma physics honor society (WIU), 1991
Walter Eller physics scholarship (WIU), 1991
Phi Kappa Phi honor society (WIU), 1991
Foundation Scholarship (WIU), 1988
Eagle Scout, Boy Scouts of America, 1986

Student Interns at Oak Ridge National Laboratory

2006	Kun Li	University of Illinois
2008	Ahmad M. Ibrahim Jinan Yang	University of Wisconsin University of Michigan
2009	Ahmad M. Ibrahim	University of Wisconsin
2010	Timothy M. Flaspoebler David P. Hartmangruber	Georgia Institute of Technology Georgia Institute of Technology
2011	Timothy M. Flaspoebler Nicholas E. Horelik	Georgia Institute of Technology Massachusetts Institute of Technology
2015	Jeffrey M. Miller	Grand Valley State University
2018	Jackson N. Wagner	Texas A&M University

Thesis Committees

LTC Peter R. Exline, *Optimization of Activation Foil Passive Neutron Detectors*, Ph.D., Georgia Institute of Technology, advised by Prof. Nolan Hertel, March 25, 2019.

Timothy M. Flaspoebler, *Evaluating Radiation Indicators in the VHTR Power Plant Using MAVRIC*, Master of Science, Georgia Institute of Technology, advised by Prof. Bojan Petrovic, June 14, 2012.

Gary B. Zeigler, II, *Direct Detection of Microcalcification Pairs in Simulated Digital Mammograms*, Master of Science, NC State University, advised by Prof. K. Verghese, September 2002.