

Erin A. Miller, Ph.D.
Senior Research Scientist
Pacific Northwest National Laboratory

Biography

Erin Miller is a physicist in the Radiation Detection & Nuclear Sciences group at Pacific Northwest National Laboratory (PNNL). Her current projects include phase contrast X-ray imaging development, a technique that allows X-ray imaging based on X-ray refractive index variations in addition to X-ray absorption, and advanced radiation transport methods, which explores a variety of deterministic and hybrid methods for radiation transport simulation.

Miller received her Ph.D. from the University of Washington in experimental statistical physics, using X-ray microtomography, computer vision, and finite element simulations to study structure-property relations in solid foams. Since coming to PNNL, she has worked in a variety of areas including simulations of spectroscopic and radiographic measurements of cargo containers, air cargo screening, nuclear resonance fluorescence, applications of synchrotron radiation to national security, and studying strain fields near precipitates in CdZnTe.

Research Interests

- Applications of X-ray interrogation to problems of national security interest
- Deterministic radiation transport modeling

Education and Credentials

- Ph.D., Physics, University of Washington
- B.S., Physics, Mathematics, Astronomy, University of Washington

PNNL Publications

2009

- “Photon and neutron interrogation techniques for chemical explosives detection in air cargo: A critical review,” R.C. Runkle, T.A. White, E.A. Miller, J.A. Caggiano, B.A. Collins. Nuclear Instruments and Methods in Physics Research A v603 p510-528 (2009).
- “The Coupling of a Deterministic Transport Field Solution to a Monte Carlo Boundary Condition for the Simulation of Large Gamma-Ray Spectrometers,” M.W. Shaver, L.E. Smith, R.T. Pagh, E.A. Miller, R.S. Wittman. Nuclear Technology v168(1) p95-110 (2009).

2008

- “Coupling deterministic and Monte Carlo transport methods for the simulation of gamma-ray spectroscopy scenarios,” L.E. Smith, C.J. Gesh, R.T. Pagh, E.A. Miller, M.W. Shaver, E.D. Ashbaker, M.T. Batdorf, J.E. Ellis, W.R. Kaye, R.J. McConn, G.H. Meriwether, J.J. Ressler, A.B. Valsan, T.A. Wareing. IEEE Transactions on Nuclear Science, v55(5 pt.2) p2598-2606 (2008).

- “Coupled deterministic-Monte Carlo transport for radiation portal modeling,” L.E. Smith, E.A. Miller, R.S. Wittman, M.W. Shaver. Transactions of the American Nuclear Society, v98, p577-578 (2008).

2007

- “Differential Aperture X-ray Microscopy near Te Precipitates in CdZnTe,” E.A. Miller, M. Toloczko, A. Seifert, C. Seifert, W. Liu, and M. Bliss, in *Hard X-Ray and Gamma-Ray Detector Physics IX*. Eds. Ralph B. James, Arnold Burger, Larry A. Franks. Proceedings of the SPIE, v6706, pp. 670609-670609-7 (2007).
- “Deterministic transport methods for the simulation of gamma-ray spectroscopy scenarios,” L.E. Smith, C.J. Gesh, R.T. Pagh, R.J. McConn, J.E. Ellis, W.R. Kaye, G.H. Meriwether, E.A. Miller, M.W. Shaver, J.R. Starner, A.B. Valsan, T.A. Wareing. 2006 IEEE Nuclear Science Symposium Conference Record (IEEE Cat. No.06CH37832), p5 (2007).
- “Nuclear resonance fluorescence of ^{235}U above 3 MeV,” G.A. Warren, J.A. Caggiano, E.A. Miller, W. Bertozzi, A. Klimenko, S.E. Korbly, R.J. Ledoux, W.H. Park. 2007 IEEE Nuclear Science Symposium Conference Record, p 2047-9 (2007).
- “The chemistry of ultra-radiopure materials,” H.S. Miley, C.E. Aalseth, A.R. Day, O.T. Farmer, J.E. Fast, E.W. Hoppe, T.W. Hossbach, K.E. Litke, J.I. McIntyre, E.A. Miller, A. Seifert, G.A. Warren, in *Environmental Radiochemical Analysis III*, Ed. Peter Warwick. Royal Society of Chemistry Special Publications v313 (2007).