RACHEL N. SLAYBAUGH

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EDUCATION

Ph.D.	**University of Wisconsin–Madison** Nuclear Engineering and Engineering Physics, with a certificate in Energy Analysis and Policy	2011
M.S.	**University of Wisconsin–Madison** Nuclear Engineering and Engineering Physics	2008
B.S.	**Pennsylvania State University** Nuclear Engineering	2006

RESEARCH EXPERIENCE

University of California, Berkeley Jan. 2014 - Present
Assistant Professor of Nuclear Engineering *Berkeley, CA*

- Researching numerical methods for neutral particle transport with an emphasis on supercomputing and advanced architectures; specialization in deterministic, Monte Carlo, and Hybrid methods
- Applications in reactor design, shielding, and nuclear security and nonproliferation
- Design Emphasis in Computational Science and Engineering Affiliated Faculty member
- Applied Science & Technology Faculty member

Advanced Research Projects Agency – Energy Oct. 2017 – present
Program Director *Washington, DC*

- Director for MEITNER Program, supporting research for enabling technologies for advanced nuclear fission reactors
- Director for TERRA and ROOTS Programs, supporting research for sensing and data analytics for above- and below-ground plant outcomes
- Director for FOCUS Program, supporting research for solar technologies that combine photovoltaic and concentrated solar power technologies

Bettis Laboratory Mar. 2012 - Aug. 2014
Senior Engineer in the Shield Design and Development group *West Mifflin, PA*

- Implemented the Forward-Weighted Consistent Adjoint Driven Importance Sampling (FW-CADIS) method for variance reduction in Monte Carlo; accredited method for use in shield design
- Developed new Resonance Factor variance reduction method for streaming through materials with space and energy self-shielding

University of Wisconsin–Madison Sept. 2006 - Nov. 2011
Research Assistant / Rickover Fellow *Madison, WI*

- Researched Acceleration Methods for Massively Parallel Deterministic Transport: added parallelization in the energy domain, an advanced eigenvalue solver, and a new multigrid in energy preconditioner to Denovo, developed at Oak Ridge National Lab
- Developed two Monte Carlo source sampling methods for arbitrarily shaped plasma sources; the sources are generated directly from plasma physics data

Penn State Breazeale Reactor Aug. 2003 - Apr. 2006
Reactor Operator *University Park, PA*

- NRC licensed Reactor Operator for TRIGA Mark III reactor
- Analyzed core burn-up anomaly; calibrated gamma irradiation facilities

SELECTED PUBLICATIONS

Kelly L. Rowland, Cory D. Ahrens, Steven Hamilton, and R.N. Slaybaugh. "Assessment of the Lagrange Discrete Ordinates Equations for Three-Dimensional Neutron Transport" *Nuclear Science and Engineering*. (Accepted 2018)
`https://github.com/kellyrowland/ldo-deterministic`

James E. Bevins, R.N. Slaybaugh. "Gnowee: A Metaheuristic Optimization Algorithm for Solving Engineering Problems Containing Continuous and Discrete Design Parameters." *Nuclear Technology*. (Accepted 2018)
`http://arxiv.org/abs/1804.05429`

I. Makine, R. Vasques, R.N. Slaybaugh. "Exact Transport Representation of the Classical and Non-classical Simplified P_N Equations." *Journal of Computational and Theoretical Transport*. (Accepted 2018).

R.N. Slaybaugh, M. Ramirez-Zweiger, Tara Pandya, Steven Hamilton, T.M. Evans. "Eigenvalue Solvers for Modeling Nuclear Reactors on Leadership Class Machines," *Nuclear Science and Engineering*. **190** (2017) 31-44.
`https://arxiv.org/abs/1708.04928`

S.C. Wilson and R.N. Slaybaugh. "Improved Monte Carlo Variance Reduction for Space and Energy Self-Shielding," *Nuclear Science and Engineering*. **179** (2015) 22-41.

SYNERGISTIC ACTIVITIES

Nuclear Energy Advisory Committee, Appointed Member 2016-2017

Senior Fellow of the Breakthrough Institute 2017-present

Software and Computing

Berkeley Institute for Data Science	Senior Fellow; Advisory Board Member
Berkeley Research Computing	User Advisory Group
The Hacker Within	UCB Faculty Advisor 2014-present; UW Founding member 2009
Software Carpentry	Instructor since 2013

American Nuclear Society, National Level

Math and Comp. Division	Chair rotation 2016-2019, Exec. Comm. 2013-2016
Rad. Protection and Shielding Div.	Exec. Comm. 2015-2018
Young Members Group	Exec. Comm. 2014-2017
Past Chair / Vice Chair	NEED Comm, Professional Divisions Comm, Student Sections Comm, Professional Women in ANS
Board of Directors	Student Member 2007-2009

Society of Industrial and Applied Mathematics (SIAM) member since 2009

SELECTED AWARDS

American Nuclear Society (ANS) Young Member Excellence Award	2014
ANS Presidential Citation	2014
Rickover Fellowship	2008-2011
Tau Beta Pi Honor Society	invited 2006
Alpha Nu Sigma Honor Society	invited 2005