

Research Experience

Rachel N. Slaybaugh

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University of California, Berkeley

Assistant Professor of Nuclear Engineering

Jan. 2014 – Present

Berkeley, CA

- Researching numerical methods for neutral particle transport with an emphasis on supercomputing and advanced architectures as well as data science
- 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

Program Director

Oct. 2017 – Jul. 2020

Washington, DC

- Program creation and management
Special Government Employee Jan. 2017 – Oct. 2017 and Special Advisor Aug. 2020 – Dec. 2020
- Director for MEITNER, the Nuclear OPEN+ cohort, LISE, and GEMINA Programs, supporting research for enabling technologies for advanced nuclear fission reactors
- Co-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

Senior Engineer in the Shield Design and Development group

Mar. 2012 – Aug. 2014

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
- Built two software tools in support of using FW-CADIS for shield design
- Scientific Software Development Committee: leader in developing internal website for sharing software carpentry tools and resources

University of Wisconsin–Madison*Research Assistant / Rickover Fellow*

Sept. 2006 – Nov. 2011

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

Forschungszentrum Karlsruhe (KIT)*Visiting Researcher*

May 2008 – Dec. 2008

Karlsruhe, Germany

- Learned about the Rigorous 2 Step method for Monte Carlo geometry conversion while working in the Reactor Safety group
- Helped group incorporate the Direct Accelerated Geometry Monte Carlo (DAGMC) library into MCNP workflow

Penn State Breazeale Reactor*Reactor Operator*

Aug. 2003 – Apr. 2006

University Park, PA

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