# Research Experience

**Rachel N. Slaybaugh**

December 2, 2018

**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*

- Program creation and management
- 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
- 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** 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

**Forschungszentrum Karlsruhe (KIT)** May 2008 - Dec. 2008
*Visiting Researcher* *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** 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