# J. S. Rehak

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| CONTACT INFORMATION | phone: (401) 573-7417 · email: jsrehak@gmail.com · github: https://github.com/jsrehak |

**PhD**     **University of California, Berkeley**, NUCLEAR ENGINEERING     **Summer 2021**
A Novel Tool for the Assessment and Validation of Acceleration Methods for Solving the Neutron Transport Equation
Advisor: Professor Rachel N. Slaybaugh

**MS**     **University of California, Berkeley**, NUCLEAR ENGINEERING     **Spring 2017**
Implementation of Weighted Delta-tracking with scattering in Serpent 2

**MEM**     **Old Dominion University – Norfolk VA**, ENGINEERING MANAGEMENT     **Fall 2015**

**BS**     **University of Maryland, College Park**, PHYSICS, ASTRONOMY     **Spring 2007**

WORK & RESEARCH EXPERIENCE

**Kairos Energy**, Alameda, CA
*Reactor Analyist (Engineer III)*     **September 7, 2021 – Present**
*Supervisor: Nader Satvat –* satvat@kairospower.com

**University of California, Berkeley**, Berkeley, CA
*Graduate Student Researcher*     **Fall 2015 – Summer 2021**
*Advisor: Professor Rachel N. Slaybaugh –* slaybaugh@berkeley.edu
Developing a novel finite-element-based code for the implementation and assessment of acceleration methods for deterministic solves of the transport equation. Implementing and analyzing novel methods in Monte Carlo codes.

**The Idaho National Laboratory**, Idaho Falls, ID
*Student Intern - Reactor physics group*     **Summer 2016**
*Advisor: Dr. Mark DeHart –* mark.dehart@inl.gov
Implemented a novel Monte Carlo algorithm for Nuclear Engineering applications.

**United States Navy**
*Submarine Officer – Honorably discharged as a lieutenant (O-3)*     **2008 – Fall 2015**
- Coordinated submarine operations and international participation for the Rim of the Pacific 2014 naval exercise involving 23 nations, 46 ships and six submarines.
- Supported two six-month deployments while qualified Officer of the Deck and Engineering Officer of the Watch on Los Angeles class submarines.
- Certified for assignment as Engineer Officer in charge of a Naval Nuclear Propulsion Plant.
- Led divisions responsible for the maintenance and operation of reactor plant instrumentation, radiological controls, and water chemical analysis.
- TS/SCI security clearance (single scope background investigation).

PUBLICATIONS & PROCEEDINGS

**Rehak, J.S.**, Slaybaugh, R.N. "Assessing the Effectiveness of Acceleration Methods for Deterministic Neutron Transport Solvers" **Transactions of the American Nuclear Society** Volume 122. https://doi.org/10.13182/T122-32383 June 2020.

**Rehak, J.S.**, Kerby, L.M., DeHart, M.D., Slaybaugh, R.N. "Weighted delta-tracking in scattering media" **Nuclear Engineering and Design** Volume 342. https://doi.org/10.1016/j.nucengdes.2018.12.006. December 2018.

**Rehak, J.S.**, Kerby, L.M., DeHart, M.D., Slaybaugh, R.N., Leppänen, J. "Implementation of Weighted Delta-Tracking with Scattering in the Serpent 2 Monte Carlo Code" **Transactions of the American Nuclear Society** Volume 116. https://escholarship.org/uc/item/6bg1s71k June 2017.

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| HONORS AND AWARDS | Department of Nuclear Engineering Graduate Fellowship | **2015 − 2018** |
| | Navy and Marine Corps Commendation Medal | **August 2015** |

For exceptional service as Submarine Force Exercise Officer and Submarine Watch Officer at Commander Submarine Forces Pacific

Navy and Marine Corps Achievement Medal **August 2015**

For coordination and execution of submarine operations for the Rim of the Pacific 2014 exercise

Navy and Marine Corps Achievement Medal **June 2013**

For service as a division officer on USS JACKSONVILLE (SSN-699) and successful completion of two six-month deployments and an extended dry-dock maintenance period.

Navy and Marine Corps Achievement Medal **April 2013**

For service as Chemistry/Radiological Assistant during an eight month dry-dock period.

Navy and Marine Corps Achievement Medal **January 2011**

For service as Reactor Control Assistant during a six-month deployment and Operational Reactor Safeguards Exam

CODE DEVELOPMENT

**Bay Area Radiation Transport (BART)**     https://github.com/SlaybaughLab/BART

A finite-element-based transport solver that supports 1/2/3D and MPI, based on the deal.II finite element library.

- Designed for developer end-users for maximum modification and support of methods analysis and implementation.
- Designed to support reproducibility, portability, and testing in codes. utilizes continuous integration, code coverage, and Docker containers.
- Uses a novel protocol-buffer format for materials.

SCIENTIFIC COMPUTING SKILLS

**Languages** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .C++20, python, bash

**Build Systems** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .make, CMake

**Testing** . . . . . . . . . . . . . . . . . . . . . . . . .GoogleTest, GoogleMock, continuous integration, code coverage

**Version Control** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .git

**Other** . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .Doxygen, LaTeX, MatLab, Protocol Buffers, Jupyter, Docker