

Joshua Peterson
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EDUCATION

Doctor of Philosophy in Mechanical Engineering; May 2011; *GPA 3.89*. The University of Texas – Austin, Texas; Courses include: Fuel Cycle, Numerical Methods in Transport, Computational Methods in Neutron Transport Theory.

Master of Science in Nuclear Engineering; May 2006; *GPA 3.91*
Idaho State University – Pocatello, Idaho; Courses include: Thermal Hydraulics, Nuclear Instrumentation Lab, Low and High Level Waste Management.

Bachelor of Science in Mechanical Engineering; December 2004; *GPA 3.64*
Idaho State University – Pocatello, Idaho.

Associate of Science in Mathematics April 2000; *GPA 3.98*
Ricks College – Rexburg, Idaho.

RESEARCH EXPERIENCE

Reactor Physics Analyst: *Oak Ridge National Laboratory*; July 2011-Present

- Implemented a method for characterizing the fission induced heating rate disposition for HFIR, including heating from delayed gammas and beta decay.
- Characterized the activation of SiC cladded fueled experiments within HFIR for multiple in core irradiations and decays using exclusively SCALE6.
- Actively involved in the planning committee for the reactor physics conference, PHYSOR 2012, in Knoxville, TN.

Visiting Scientist: *Idaho National Laboratory*; August 07-May 2011

- Worked on a team of scientists to drastically improve the neutronics modeling capabilities of the ATR
- Developed new computational tools for the ATR to accelerate the reactor physics calculations with the use of perturbation theory
- Used a 3-D deterministic Gelerkin finite element analysis code, Attila, to perform safety analyses on the ATR
- Project supervisor to graduate and undergraduate students from Idaho State University and University of Wisconsin-Madison

Adjunct Lecturer: *Idaho State University*; August 08-December 08 & January 2010-May 2010

- Taught an introductory course in nuclear engineering to undergraduate and graduate students from Idaho State University, The University of Idaho, and Brigham Young University-Idaho through satellite feed on three campuses
- Developed and taught a new course in motors and controls to mechanical engineering technicians in the Energy System Technology and Education Center.

Reactor Operations Trainer: *Idaho National Laboratory*; August 08-December 08 & January 2010-August 2010

- Taught fundamentals of nuclear physics and radiation detection to nuclear facility operators with varied educational backgrounds

Nuclear Engineering Internship: *Idaho National Laboratory*; May 07-August 07

- Developed a 3D neutronics model for the ATR from a 2D PDQ7 input deck
- Benchmarked the model against experimental data and MCNP

Graduate Research Assistant: *The University of Texas-Austin*; August 06-May 07

- Calculated the neutron spectrum and flux for the TRIGA reactor using MCNPX
- Benchmarked the MCNPX calculations against experimental data

Nuclear Engineering Internship: *Idaho National Laboratory*; May 06-August 06

- Helped characterize BWR crud using both SEM and TEM.
- Pre and post-irradiation analysis of low enriched U-Mo/Al dispersion fuel miniplates for RERTR.

Graduate Research Assistant: *Idaho National Laboratory*; Jan. 2005-May 2006

- Modeled the time to failure of spent TRISO fuel in a repository environment with Monte Carlo methodology using GoldSim to evaluate the more important parameters.
- Researched and analyzed the corrosion processes of OPyC and SiC in the TRISO fuel and compared the degradation rates to that of high level waste glass and spent nuclear fuel.

Laboratory Assistant – *Idaho State University Accelerator Center*; Fall 2004

- Supervised and engineered the construction of the radiation safety control system that conformed to NRC regulation standards for a transmutation experiment
- Supervised and engineered the construction of the water circulation and radiation contamination filtration system for a subcritical reactor.

Mechanical Engineering Internship– *Idaho National Laboratory*, Summer 2004

- Engineered and analyzed a tool used for lowering contaminated ceiling pipe for a decommissioning and decontamination project.
- Inspected over ten different low head hydropower plants to assess and analyze the resources currently used in this viable renewable energy source for publication

- Helped develop a more user friendly and efficient simulation code that models stresses in a manufactured home during a windstorm

CONFERENCE PRESENTATIONS

Peterson, Joshua and Schneider, Erich. "The Use of Perturbation Theory to Augment Advanced Test Reactor Modeling Capabilities" American Nuclear Society Annual Meeting San Diego, CA 2010

Wilson , Paul P. H., Snouffer , Patrick Schneider, Erich A. and Peterson ,Joshua L. "A Monte Carlo Surface Source Method for Advanced Test Reactor Experiment Prototyping" Physor, Pittsburgh, PA, 2010

Peterson, Joshua and Schneider, Erich. "Modeling the ATR Using PDQ7e in 3D" American Nuclear Society Winter Meeting Reno, NV 2008

Janney, Dawn, Porter, Douglas, and Peterson, Josh. "Phase Identification in Crud from Commercial Boiling Water Reactors at the Idaho National Laboratory by Transmission Electron Microscopy" 2007 International LWR Fuel Performance Meeting San Francisco, Sep. 2007

Peterson, Josh, Carlton, Chris, and Schneider, Erich, "Radiation Damage Study of Nano-Scale Metals at the University of Texas-Austin," American Nuclear Society Winter Meeting Washington, D.C. November 2007

Peterson, Josh, et. al.. "Fast Breeder Reactors for the Next Century of India's Nuclear Future". International High Level Radioactive Waste Management Conference Las Vegas, NV, 2007.

Janney, Dawn, Peterson, Josh et. al. ,Report to DOE on the Crud Project, Idaho National Laboratory, INL/EXT-06-11742, 2006

Peterson, Joshua and Dunzik-Gougar, Mary Lou, "Degradation of TRISO Fuel in a Repository Environment," American Nuclear Society Annual Meeting Reno, LV, June 2006.

Peterson, Joshua and Dunzik-Gougar, Mary Lou, "Qualification Plan of Spent TRISO Fuel for Permanent Disposal" International High Level Radioactive Waste Management Conference Las Vegas, NV, 2006.

Peterson, Joshua and Dunzik-Gougar, Mary Lou, "TRISO Fuel: History of the Disposal Qualification Process and Lessons Learned" Waste Management Conference Tucson, AZ 2006.

"Panel: International Youth Conference Waste Management Conference, Tucson, AZ, 2006

TEACHING EXPERIENCE

Guest lecturer for Idaho National Laboratory Advanced Test Reactor User Week on the subject of *MCNP* and *DAG-MCNP*: Summer 2010.

Teaching Assistant at The University of Texas at Austin for *Computational Methods in Neutron Transport*: Spring 2008.

Teaching Assistant at The University of Texas at Austin for *Nuclear Reactor Engineering*: Spring 2008.

Teaching Assistant at the University of Texas at Austin for *Introduction to Nuclear Power Systems*: Spring 2007.

ADDITIONAL INFORMATION

- Nominated to the Academic Education Committee of the Health Physics Society (July 2010-July 2014)
- Awarded UT-Austin Travel Grant 2009 and 2010
- Will Rogers Scholarship, UT-Austin 2008-2009
- President of ANS at UT-Austin Fall 07-May 2008
- Recipient of the Roy G. Post Scholarship, Feb 2007
- 1st Place in the IHLWM'06 Poster Session, May 2006
- Engineering In Training certified May 2005, Idaho
- Modeling experience in ORIGEN, MCNP, GoldSim, SCALE5, and Attila
- Attended two week seminar at Lawrence Livermore National Lab on analytical methods for non-proliferation, July 2005
- Program languages include FORTRAN, C, Matlab, and Python
- Member of ANS, HPS, and SIAM
- Nominated for the Tau Beta Pi Engineering Honor Society
- Nominated for the Alpha Nu Sigma National Honor Society for Nuclear Science and Engineering