Kathryn D. Huff

CONTACT INFORMATION

Department of Nuclear Engineering
University of California - Berkeley, Berkeley, CA

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OBJECTIVE

Seeking research and teaching opportunities in nuclear engineering and scientific computation.

RESEARCH INTERESTS

Advanced nuclear reactors and fuel cycles, scientific computation, sustainable energy systems, waste management, computational systems analysis.

EDUCATION

University of Wisconsin, Madison, WI

Doctor of Philosophy NUCLEAR ENGINEERING **Aug 2008 – Aug 2013**

- Dissertation : An Integrated Used Fuel Disposition and Generic Repository Model for Fuel Cycle Analysis
- Advisor: Professor Paul P.H. Wilson

University of Chicago, Chicago, IL

Bachelor of Arts and Sciences PHYSICS **Aug 2004 – June 2008**

- Undergraduate Thesis: Celestial Gain Calibrations of QUIET Telescope Polarimeters

HONORS AND AWARDS

Nuclear Science and Security Consortium Postdoctoral Fellowship	**2013–Present**
DOE Office of Science Laboratory Graduate Appointment.	**2011–2013**
Roy G. Post Foundation Nuclear Waste Management Graduate Scholarship.	**2011**
John Randall Memorial Scholarship, American Nuclear Society FCWMD.	**2009**
J.A. McDeavitt Scholarship, University of Chicago, Chicago, IL.	**2007–2008**
University Scholar Award, University of Chicago, Chicago, IL.	**2004 – 2008**
Los Alamos Distinguished Student Performance Award, Los Alamos, NM.	**2004**

RESEARCH EXPERIENCE

University of California - Berkeley, NE Dept., Berkeley, CA **Sept 2013 – Present**
Postdoctoral Scholar, Nuclear Science and Security Consortium
Developing computational tools and models for advanced reactor safety analysis.

Argonne National Laboratory, Argonne, IL **June 2011 – Aug 2013**
Laboratory Graduate Research Appointee, Used Fuel Disposition Campaign
Developed a used fuel disposition and generic repository computational model.

University of Wisconsin - Madison, NEEP Dept., Madison, WI **June 2008 – Aug 2013**
Graduate Research Assistant, Computational Nuclear Engineering Research Group
Developed and applied CYCLUS , a nuclear fuel cycle systems analysis tool.

Idaho National Laboratory, Idaho Falls, ID **June – Aug 2010**
Graduate Research Assistant, Systems Analysis Campaign
Developed software functions and requirements for the Fuel Cycle Simulator concept.

Kavli Institute For Cosmological Physics, Chicago, IL **Jan 2005 – June 2008**
Research Assistant, Laboratory for Astrophysics and Space Research
Programmed and machined calibration instrumentation elements for QUIET cosmological telescope. Planned a protocol for telescope polarimeter calibration.

Universidad de Chile, Physics Dept., Santiago, Chile **June – Sept 2006**
Research Assistant, Chicago-Chile Research Exchange Program
Constructed and operated a far from equilibrium granular materials experiment.

Los Alamos Neutron Science Center, Los Alamos, NM **June – Sept 2004**
Research Assistant, LANSCE-3 **May – Aug 2003**
Applied digital filtration algorithms and MCNPX models to experimental data.
Received Distinguished Student Performance award, 2004.

Teaching Experience

Computational Literacy Workshop, Chicago, IL **Jan 12–13, 2013**
Invited By : University of Chicago, Graduate School
UNIX Shell, Version Control, Databases, Python

Scientific Computing Workshop, Berkeley, CA **Oct 20–21, 2012**
Invited By : University of California, Berkeley, Dept. of Statistics
UNIX Shell, Version Control, Databases, Python

Software Carpentry Python Workshop, Berkeley, CA **Oct 17–18, 2012**
Invited By : Lawrence Berkeley National Laboratory, Office of the CIO
Python, Nose, SciPy, NumPy, MatPlotLib

Software Carpentry Scientific Computing Workshop, Chicago, IL **Apr 2–3, 2012**
Hosted By : The University of Chicago and Software-Carpentry.org
UNIX Shell, Version Control, Databases

Advanced School on Scientific Software Development, Trieste, Italy **Feb 20–Mar 2, 2012**
Invited By : UNESCO/IAEA International Center for Theoretical Physics
Version Control, Python Basics, SciPy, NumPy, MatPlotLib, Fortran and C Binding with Python

University of Toronto Software Carpentry Bootcamp, Toronto, Canada **Nov 7–8, 2011**
Invited By : Univeristy of Toronto SciNet Consortium For High Performance Computing
Version Control, Python, Testing, Auto-Documentation

The Hacker Within Scientific Computing Tutorial, Washington, D.C. **Nov 1, 2011**
Invited By : Young Professionals Congress, American Nuclear Society Winter Meeting
Version Control, Testing, Auto-Documentation, Collaboration Tools

Michigan State Univ. Scientific Computing Bootcamp, East Lansing, MI **June 4–5, 2011**
Invited By : MSU Institute for Cyber Enabled Research (iCER) and BEACON Center
UNIX Shell, Version Control, Text Editors, Databases, Auto-Documentation, Testing, Debugging

The Hacker Within Software Carpentry Bootcamp, Madison, WI **Jan 12–14, 2011**
Hosted By : The University of Wisconsin and The Hacker Within
UNIX Shell, Version Control, Text Editors, Databases, Auto-Documentation, Testing, Debugging

The Hacker Within Python Bootcamp, Madison, WI **Jan 12–14, 2010**
Hosted By : The University of Wisconsin and The Hacker Within
Data Structures, Flow Control, SciPy, NumPy, MatPlotLib, Fortran and C Binding with Python

UW Department of Nuclear Engineering : 506 Madison, WI **Feb 10, 2010**
Guest Lecturer
UNIX Shell, Basic Scripting, Environment Variables, Permissions, Regular Expressions, Makefiles

The Hacker Within C++ Bootcamp, Madison, WI **Mar 24–31, 2009**
Hosted By : The University of Wisconsin and The Hacker Within
Object Oriented Programming, Data Structures, C++ Basics

UW Department of Nuclear Engineering : 406, Madison, WI **Sept 9&11, 2009**
Guest Lecturer
UNIX Shell, Basic Scripting, Environment Variables, Permissions, Regular Expressions, Makefiles

University of Wisconsin, Hacker Within UNIX Bootcamp, Madison, WI **Jan 12–15, 2009**
Hosted By : The University of Wisconsin and The Hacker Within
UNIX Shell, Scripting, Environment, Permissions, Build Systems, Sed, Grep Awk, Common Utilities

Journal Publications

[1] Aruliah, D.A., Brown, C.T., Chue Hong, N.P., Davis, M., Guy, R.T., Haddock, S.H.D., **Huff, K.**, Mitchell, I., Plumbley, M., Waugh, B., White, E.P., Wilson, G.V., and Wilson, P.P.H. "Best Practices For Scientific Computing." *Accepted PLOS Biology*, arXiv:1210.0530 [cs.MS].

[2] Clerc, M., Dunstan, J., **Huff K.**, Mujica, N., Varas, G. "Liquid-Solid-Like Transition in Quasi-One-Dimensional Driven Granular Media ", *Nature Physics*, Vol 4, 249 - 254, 2008.

Refereed Conference Publications

[3] **Huff K.** "Cyclus Fuel Cycle Simulation Capabilities with the Cyder Disposal System Model," Paper 7730. *Proceedings of Global*, Salt Lake City, UT. October 2013.

[4] **Huff K.**, Nutt, M. "Hydrologic Nuclide Transport Models in Cyder, a Geologic Disposal Software Library," Paper 13328. *Proceedings of the Waste Management Symposium*, Phoenix, AZ. February 2013.

[5] Oliver, K.M., Wilson, P.P.H., Reveillere, A., **Huff K.** "Studying international fuel cycle robustness with the GENIUSv2 discrete facilities/materials fuel cycle systems analysis tool ", Paper 9166. *Proceedings of Global*, Paris, France. 2009.

Conference Publications

[6] **Huff K.**, Bara, A. "Dynamic Determination of Thermal Repository Capacity For Fuel Cycle Analysis." *Transactions of the American Nuclear Society Annual Conference.* Atlanta, GA. June 2013.

[7] **Huff K.**, Nutt, M. "Key Processes and Parameters in a Generic Clay Disposal System Model." *Transactions of the American Nuclear Society Winter Conference.* San Diego, CA. November 2012.

[8] Scopatz, A.M., Romano, P.K., Wilson, P.P.H., **Huff K.** "PyNE: Python For Nuclear Engineering." *Transactions of the American Nuclear Society Winter Conference.* San Diego, CA. November 2012.

[9] **Huff K.**, Bauer, T. "Numerical Calibration of an Analytical Generic Nuclear Repository Heat Transfer Model." *Transactions of the American Nuclear Society Annual Conference.* Chicago, IL. June 2012.

[10] **Huff K.**, Gidden, M., Wilson, P.P.H. "Open architecture and modular paradigm of Cyclus , a fuel cycle simulation code." *Transactions of the American Nuclear Society Annual Conference.* Hollywood, FL. June 2011.

[11] **Huff K.**, Scopatz, A., Preston, N., Wilson, P.P.H. "Rapid Peer Education of a Computational Nuclear Engineering Skill Suite." *Transactions of the American Nuclear Society Annual Conference.* Hollywood, FL. June 2011.

[12] **Huff K.** "Cyclus : An Open, Modular, Next Generation Fuel Cycle Simulator Platform. " (poster) *Waste Management Symposium.* Phoenix, AZ. March 2011.

[13] **Huff K.**, "MOX Fuel Recipe Approximation Tests in GENIUSv2. " *Proceedings of the American Nuclear Society Student Conference.* Ypsilanti, MI. April 2010.

[14] **Huff K.**, Oliver, K., Wilson, P.P.H. "GENIUSv2 Discrete Facilities/Materials Modeling of International Fuel Cycle Robustness. " *Transactions of the American Nuclear Society Winter Conference.* Washington D.C. November 2009.

[15] **Huff K.**, Wilson, P.P.H., Oliver, K. "GENIUS Version 2: Modelling the Worldwide Nuclear Fuel Cycle." (poster) *eHub Conference.* University of Wisconsin - Madison. November 2009.

Technical Reports

[16] **Huff K.**, Nutt, W.M. "FY12 Sensitivity Studies Using the UFD Clay Generic Disposal System Model." *Argonne National Laboratory.* July 2012.

[17] **Huff K.**, Bauer, T.H. "Benchmarking a New Closed-Form Thermal Analysis Technique Against a Traditional Lumped Parameter, Finite-Difference Method" *Argonne National Laboratory.* (FCRD-UFD-2012-000142). July 2012.

[18] **Huff K.**, Dixon, B., Braase, L. "Next Generation Fuel Cycle Simulator Functions and Requirements Document." *Idaho National Laboratory* (FCRD-SYSA-2010-000110). July 2010.

Other Publications

[19] **Huff K.** An Integrated Used Fuel Disposition and Generic Repository Model for Fuel Cycle Analysis. Ph.D. Dissertation–Nuclear Engineering and Engineering Physics. University of Wisconsin – Madison. August 2011.

[20] **Huff K.** An Integrated Used Fuel Disposition and Generic Repository Model. Ph.D. Preliminary Examination–Nuclear Engineering and Engineering Physics. University of Wisconsin – Madison. September 2011.

[21] **Huff K.** "Celestial Calibrations of the Quiet Telescope." Undergraduate Honors Thesis. University of Chicago. June 2008.

[22] Biris, O., Gracey, K., **Huff K.**, Ng, W.K. "An Analysis of the Consolidated Fuel Treatment Center Nuclear Reprocessing Initiative." *Big Problems Energy Seminar. University of Chicago.* June 2008.

[23] **Huff K.** "Digital Filtering Application to the Lead Slowing Down Spectrometer." Los Alamos Neutron Science Center. August 2004. (*awarded los alamos distinguished student award.*)

[24] **Huff K.** "Excess Single Event Effects in the Second Chip of a Series." Los Alamos Neutron Science Center. August 2003.

Scientific Computing Skills

Languages	bash/csh, C, C++, FORTRAN, Perl, Python, XML.
Build Systems	make, CMake, automake.
Databases	HDF5, SQL.
Test Frameworks	CTest, GoogleTest, nose.
Version Control	cvs, git, hg, svn.
Other Tools	Doxygen, Sphinx, GoldSim, LaTeX, MathCAD, Mathematica, MatLab, MCNP.

Professional Service

Secretary–Treasurer, Fuel Cycle & Waste Management Division, ANS.	**2013–2015**
Secretary, Young Members Group, ANS.	**2013–2014**
Program Co-Chair, SciPy, Scientific Python Conference.	**2013**
Member, Next Generation Leadership Committee, Waste Management Symposium.	**2013–2014**
Moderator, Organizer, Panelist, inSCIght Scientific Computing Podcast.	**2011–2013**
Co-Founder, Nuclear Pride, LGBTQA Organization.	**2011–2013**
Co-Founder, Treasurer, President, Hacker Within Scientific Computing Group.	**2008–2011**
Treasurer, University of Wisconsin ANS student section.	**2009–2010**
Governor, University of Wisconsin ANS student section.	**2008–2009**

References

Available upon request