

# Kathryn D. Huff

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| CONTACT INFORMATION | Department of Nuclear Engineering<br>University of California - Berkeley, Berkeley, CA   | mobile: (281) 734-1342<br>e-mail: kathyhuff@gmail.com<br>website: kathyhuff.github.com |
| 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           | <b>University of Wisconsin</b> , Madison, WI<br><i>Doctor of Philosophy</i> NUCLEAR ENGINEERING <b>Aug 2008 – Aug 2013</b> <ul style="list-style-type: none"><li>• Dissertation : An Integrated Used Fuel Disposition and Generic Repository Model for Fuel Cycle Analysis</li><li>• Advisor: Professor Paul P.H. Wilson</li></ul> <b>University of Chicago</b> , Chicago, IL<br><i>Bachelor of Arts and Sciences</i> PHYSICS <b>Aug 2004 – June 2008</b> <ul style="list-style-type: none"><li>• Undergraduate Thesis: Celestial Gain Calibrations of QUIET Telescope Polarimeters</li></ul>  |  |
| HONORS AND AWARDS   | Data Science Fellowship, Berkeley Institute for Data Science, UC Berkeley. <b>2014–2016</b><br>Nuclear Science and Security Consortium Postdoctoral Fellowship, UC Berkeley. <b>2013–2016</b><br>DOE Office of Science Laboratory Graduate Appointment, Argonne National Lab. <b>2011–2013</b><br>Roy G. Post Foundation Nuclear Waste Management Graduate Scholarship. <b>2011</b><br>John Randall Memorial Scholarship, American Nuclear Society FCWMD. <b>2009</b><br>J.A. McDeavitt Scholarship, University of Chicago, Chicago, IL. <b>2007–2008</b><br>University Scholar Award, University of Chicago, Chicago, IL. <b>2004–2008</b><br>Los Alamos Distinguished Student Performance Award, Los Alamos National Lab. <b>2004</b>  |  |
| RESEARCH EXPERIENCE | <b>University of California - Berkeley, NE Dept.</b> , Berkeley, CA<br><i>Postdoctoral Scholar, Nuclear Science and Security Consortium</i> <b>Sept 2013 – Present</b><br><i>Data Science Fellow, Berkeley Institute for Data Science</i> <b>Aug 2014 – Present</b><br>Developing computational tools and multiphysics models for advanced reactor safety analysis.<br><br><b>Argonne National Laboratory</b> , Argonne, IL <b>June 2011 – Aug 2013</b><br><i>Laboratory Graduate Research Appointee, Used Fuel Disposition Campaign</i><br>Developed a used fuel disposition and generic repository computational model.<br><br><b>University of Wisconsin - Madison, NEEP Dept.</b> , Madison, WI <b>June 2008 – Aug 2013</b><br><i>Graduate Research Assistant, Computational Nuclear Engineering Research Group</i><br>Developed and applied CYCLUS , a nuclear fuel cycle systems analysis tool.<br><br><b>Idaho National Laboratory</b> , Idaho Falls, ID <b>June – Aug 2010</b><br><i>Graduate Research Assistant, Systems Analysis Campaign</i><br>Developed software functions and requirements for the Fuel Cycle Simulator concept.<br><br><b>Kavli Institute For Cosmological Physics</b> , Chicago, IL <b>Jan 2005 – June 2008</b><br><i>Research Assistant, Laboratory for Astrophysics and Space Research</i><br>Programmed & machined instrumentation. Planned protocol for QUIET polarimeter calibration.<br><br><b>Universidad de Chile, Physics Dept.</b> , Santiago, Chile <b>June – Sept 2006</b><br><i>Research Assistant, Chicago-Chile Research Exchange Program</i><br>Constructed and operated a far from equilibrium granular materials experiment.<br><br><b>Los Alamos Neutron Science Center</b> , Los Alamos, NM <b>June – Sept 2004</b><br><i>Research Assistant, LANSCE-3</i> <b>May – Aug 2003</b><br>Applied digital filtration algorithms and MCNPX models to experimental data. |  |

ENGINEERING  
GUEST  
LECTURES

- University of Wisconsin Dept. of Nuclear Engineering**, Madison, WI      **Apr 1&3, 2013**  
*NE 571, Economic and Environmental Aspects of Nuclear Energy*  
 Nuclear Waste Repository Technology, Policy, and History
- Diablo Valley College Dept. of Engineering**, Diablo Valley, CA      **Sept 9&11, 2009**  
*ENG 110, Introduction to Engineering*  
 Science, Computing, and the Future
- University of Wisconsin Dept. of Nuclear Engineering**, Madison, WI      **Sept 9&11, 2009**  
*NE 406, Nuclear Reactor Analysis*  
 UNIX Shell, Basic Scripting, Environment Variables, Permissions, Regular Expressions, Makefiles
- University of Wisconsin Dept. of Nuclear Engineering** Madison, WI      **Feb 10, 2010**  
*NE 506, Practicum in Monte Carlo Radiation Transport*  
 UNIX Shell, Basic Scripting, Environment Variables, Permissions, Regular Expressions, Makefiles

SCIENTIFIC  
COMPUTING  
WORKSHOPS

- Lawrence Berkeley National Laboratory**, Berkeley, CA      **Apr 14–15, 2014**  
 Women in Science and Engineering Bootcamp
- SciPy Conference (invited)**, Austin, TX      **Jun 25, 2013**  
 Version Control and Unit Testing For Scientific Software
- University of Chicago, Graduate School (invited)**, Chicago, IL      **Jan 12–13, 2013**  
 Computational Literacy Workshop
- University of California, Berkeley (invited)**, Berkeley, CA      **Oct 20–21, 2012**  
 Department of Statistics Scientific Computing Workshop
- Lawrence Berkeley National Laboratory (invited)**, Berkeley, CA      **Oct 17–18, 2012**  
 Software Carpentry Python Workshop
- The University of Chicago**, Chicago, IL      **Apr 2–3, 2012**  
 Software Carpentry Scientific Computing Workshop
- International Center for Theoretical Physics (invited)**, Trieste, Italy      **Feb 20–Mar 2, 2012**  
 UNESCO/IAEA Advanced School on Scientific Software Development
- University of Toronto (invited)**, Toronto, ON, Canada      **Nov 7–8, 2011**  
 SciNet Consortium For High Performance Computing Software Carpentry Bootcamp
- American Nuclear Society Winter Meeting (invited)**, Washington, D.C.      **Nov 1, 2011**  
 Young Professionals Congress Hacker Within Scientific Computing Tutorial
- Michigan State University (invited)**, East Lansing, MI      **June 4–5, 2011**  
 Institute for Cyber Enabled Research (iCER) and BEACON Center THW Bootcamp
- The University of Wisconsin**, Madison, WI      **Jan 12–14, 2011**  
 The Hacker Within Software Carpentry Bootcamp
- The University of Wisconsin**, Madison, WI      **Jan 12–14, 2010**  
 The Hacker Within Python Bootcamp
- The University of Wisconsin**, Madison, WI      **Mar 24–31, 2009**  
 The Hacker Within C++ Bootcamp
- The University of Wisconsin**, Madison, WI      **Jan 12–15, 2009**  
 University of Wisconsin, Hacker Within UNIX Bootcamp

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| JOURNAL PUBLICATIONS             | <p>[1] Aruliah, D.A., Brown, C.T., Chue Hong, N.P., Davis, M., Guy, R.T., Haddock, S.H.D., <b>Huff, K.</b>, Mitchell, I., Plumbley, M., Waugh, B., White, E.P., Wilson, G.V., and Wilson, P.P.H. "Best Practices For Scientific Computing." <i>PLOS Biology</i>, Vol 1, Issue 12, 2014. arXiv:1210.0530 [cs.MS].</p> <p>[2] Clerc, M., Dunstan, J., <b>Huff K.</b>, Mujica, N., Varas, G. "Liquid-Solid-Like Transition in Quasi-One-Dimensional Driven Granular Media ", <i>Nature Physics</i>, Vol 4, 249 - 254, 2008.</p>   |
| REFEREED CONFERENCE PUBLICATIONS | <p>[3] Krumwiede, D.L., Andreades, C., Choi, J.K., Cisneros, A.T., Huddar, L., <b>Huff K.</b>, Laufer, M.D., Munk, M., Scarlat, R.O., Seifried, J.E., Zweibaum, N., Greenspan, E., and Peterson, P.F. "Design of the Mark-I Pebble-Bed, Fluoride-Salt-Cooled, High-Temperature Reactor Commercial Power Plant," Paper 14231. <i>Proceedings of ICAPP</i>, Charlotte, NC. April 2014.</p> <p>[4] <b>Huff K.</b> "Cyclus Fuel Cycle Simulation Capabilities with the Cyder Disposal System Model," Paper 7730. <i>Proceedings of Global</i>, Salt Lake City, UT. October 2013.</p> <p>[5] Gidden, M., Wilson, P., <b>Huff K.</b>, Carlsen, R. "An Agent-Based Framework for Fuel Cycle Simulation with Recycling," Paper 7737. <i>Proceedings of Global</i>, Salt Lake City, UT. October 2013.</p> <p>[6] <b>Huff K.</b>, Nutt, M. "Hydrologic Nuclide Transport Models in Cyder, a Geologic Disposal Software Library," Paper 13328. <i>Proceedings of the Waste Management Symposium</i>, Phoenix, AZ. February 2013.</p> <p>[7] Oliver, K.M., Wilson, P.P.H., Reveillere, A., <b>Huff K.</b> "Studying international fuel cycle robustness with the GENIUSv2 discrete facilities/materials fuel cycle systems analysis tool ", Paper 9166. <i>Proceedings of Global</i>, Paris, France. 2009.</p> <p>[8] Rochman, D., Haight, R. C., Wender, S. A., O'Donnell, J. M., Michaudon, A., <b>Huff, K.</b>, Vieira, D. J., Bond, E., Rundberg, R.S., Kronenberg, A., Wilhelmy, J., Bredeweg, T. A., Schwantes, J., Ethvignot, T., Granier, T., Petit, M., Danon, Y. "First Measurements with a Lead Slowing-Down Spectrometer at LANSCE," <i>AIP Conference Proceedings, International Conference on Nuclear Data for Science and Technology</i>. Volume 769. 2005.</p>   |
| CONFERENCE PUBLICATIONS          | <p>[9] <b>Huff K.</b>, Bara, A. "Dynamic Determination of Thermal Repository Capacity For Fuel Cycle Analysis." <i>Transactions of the American Nuclear Society Annual Conference</i>. Atlanta, GA. June 2013.</p> <p>[10] <b>Huff K.</b>, Nutt, M. "Key Processes and Parameters in a Generic Clay Disposal System Model." <i>Transactions of the American Nuclear Society Winter Conference</i>. San Diego, CA. November 2012.</p> <p>[11] Scopatz, A.M., Romano, P.K., Wilson, P.P.H., <b>Huff K.</b> "PyNE: Python For Nuclear Engineering." <i>Transactions of the American Nuclear Society Winter Conference</i>. San Diego, CA. November 2012.</p> <p>[12] <b>Huff K.</b>, Bauer, T. "Numerical Calibration of an Analytical Generic Nuclear Repository Heat Transfer Model." <i>Transactions of the American Nuclear Society Annual Conference</i>. Chicago, IL. June 2012.</p> <p>[13] <b>Huff K.</b>, Gidden, M., Wilson, P.P.H. "Open architecture and modular paradigm of CYCLUS , a fuel cycle simulation code." <i>Transactions of the American Nuclear Society Annual Conference</i>. Hollywood, FL. June 2011.</p> <p>[14] <b>Huff K.</b>, Scopatz, A., Preston, N., Wilson, P.P.H. "Rapid Peer Education of a Computational Nuclear Engineering Skill Suite." <i>Transactions of the American Nuclear Society Annual Conference</i>. Hollywood, FL. June 2011.</p> <p>[15] <b>Huff K.</b> "CYCLUS : An Open, Modular, Next Generation Fuel Cycle Simulator Platform. " (poster) <i>Waste Management Symposium</i>. Phoenix, AZ. March 2011.</p> <p>[16] <b>Huff K.</b>, "MOX Fuel Recipe Approximation Tests in GENIUSv2. " <i>Proceedings of the American Nuclear Society Student Conference</i>. Ypsilanti, MI. April 2010.</p> <p>[17] <b>Huff K.</b>, Oliver, K., Wilson, P.P.H. "GENIUSv2 Discrete Facilities/Materials Modeling of International Fuel Cycle Robustness. " <i>Transactions of the American Nuclear Society Winter Conference</i>. Washington D.C. November 2009.</p> <p>[18] <b>Huff K.</b>, Wilson, P.P.H., Oliver, K. "GENIUS Version 2: Modelling the Worldwide Nuclear Fuel Cycle." (poster) <i>eHub Conference</i>. University of Wisconsin - Madison. November 2009.</p> |

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| TECHNICAL<br>REPORTS              | [19] <b>Huff K.</b> , Nutt, W.M. “FY12 Sensitivity Studies Using the UFD Clay Generic Disposal System Model.” <i>Argonne National Laboratory</i> . July 2012.  |
|                                   | [20] <b>Huff K.</b> , Bauer, T.H. “Benchmarking a New Closed-Form Thermal Analysis Technique Against a Traditional Lumped Parameter, Finite-Difference Method” <i>Argonne National Laboratory</i> . (FCRD-UFD-2012-000142). July 2012.                                     |
|                                   | [21] <b>Huff K.</b> , Dixon, B., Braase, L. “Next Generation Fuel Cycle Simulator Functions and Requirements Document.” <i>Idaho National Laboratory</i> (FCRD-SYSA-2010-000110). July 2010.   |
|                                   | [22] <b>Huff K.</b> “Digital Filtering Application to the Lead Slowing Down Spectrometer.” Los Alamos Neutron Science Center. August 2004. ( <i>awarded los alamos distinguished student award.</i> )  |
|                                   | [23] <b>Huff K.</b> “Excess Single Event Effects in the Second Chip of a Series.” Los Alamos Neutron Science Center. August 2003.  |
| SOFTWARE<br>PRODUCTS              | [24] Carlsen, R., Gidden, M. <b>Huff, K.</b> , Opotowsky, A., Rakhimov, O., Scopatz, A., Welch, Z., Wilson, P. “Cyclus v1.0.0.” <i>figshare</i> . <a href="http://dx.doi.org/10.6084/m9.figshare.1041745">http://dx.doi.org/10.6084/m9.figshare.1041745</a> . June 2014.   |
|                                   | [25] Carlsen, R., Gidden, M. <b>Huff, K.</b> , Opotowsky, A., Rakhimov, O., Scopatz, A., Welch, Z., Wilson, P. “Cycamore v1.0.0.” <i>figshare</i> . <a href="http://dx.doi.org/10.6084/m9.figshare.1041829">http://dx.doi.org/10.6084/m9.figshare.1041829</a> . June 2014. |
| OTHER<br>PUBLICATIONS             | [26] <b>Huff K.</b> 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 2013.  |
|                                   | [27] <b>Huff K.</b> An Integrated Used Fuel Disposition and Generic Repository Model. Ph.D. Preliminary Examination–Nuclear Engineering and Engineering Physics. University of Wisconsin – Madison. September 2011.  |
|                                   | [28] <b>Huff K.</b> “Celestial Calibrations of the Quiet Telescope.” Undergraduate Honors Thesis. University of Chicago. June 2008.  |
|                                   | [29] Biris, O., Gracey, K., <b>Huff K.</b> , Ng, W.K. “An Analysis of the Consolidated Fuel Treatment Center Nuclear Reprocessing Initiative.” <i>Big Problems Energy Seminar</i> . <i>University of Chicago</i> . June 2008.  |
| SCIENTIFIC<br>COMPUTING<br>SKILLS | <b>Languages</b> bash/csh, C, C++, FORTRAN, Perl, Python, XML.   |
|                                   | <b>Build Systems</b> make, CMake, automake.  |
|                                   | <b>Databases</b> HDF5, SQL.  |
|                                   | <b>Test Frameworks</b> CTest, GoogleTest, nose.  |
|                                   | <b>Version Control</b> cvs, git, hg, svn.  |
|                                   | <b>Other Tools</b> Doxygen, Sphinx, GoldSim, L <sup>A</sup> T <sub>E</sub> X, MathCAD, Mathematica, MatLab, MCNP.  |
| PROFESSIONAL<br>SERVICE           | <b>Secretary–Treasurer</b> , Fuel Cycle & Waste Management Division, ANS. <b>2013–2015</b>   |
|                                   | <b>Secretary</b> , Young Members Group, ANS. <b>2013–2014</b>  |
|                                   | <b>Technical Program Co-Chair</b> , SciPy, Scientific Python Conference. <b>2013–2014</b>  |
|                                   | <b>Member</b> , Next Generation Leadership Committee, Waste Management Symposium. <b>2013–2014</b>   |
|                                   | <b>Moderator, Organizer, Panelist</b> , inSCIght Scientific Computing Podcast. <b>2011–2013</b>  |
|                                   | <b>Editor</b> , Proceedings of SciPy Scientific Python Conference. <b>2013</b>   |
|                                   | <b>Co-Founder</b> , Nuclear Pride, LGBTQA Organization. <b>2011–2013</b>   |
|                                   | <b>Co-Founder, Treasurer, President</b> , Hacker Within Scientific Computing Group. <b>2008–2011</b>   |
| REFERENCES                        | <b>Governor, Treasurer</b> , University of Wisconsin ANS student section. <b>2008–2010</b>   |
|                                   | Available upon request   |