

# Amanda M. Bachmann

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CONTACT INFORMATION	Graduate Research Assistant NEUP Fellow <i>University of Illinois, Urbana-Champaign</i> <i>Nuclear, Plasma, and Radiological Engineering</i>	mobile: (813) 495-5698 e-mail: amandab7@illinois.edu
RESEARCH INTERESTS	Advanced nuclear reactors and fuel cycles, nuclear non-proliferation nuclear fuel cycle analysis, scientific computation.	
PHD	<b>University of Illinois Urbana-Champaign, NUCLEAR ENGINEERING</b> • Anticipated Graduation: August 2023 • Advisor: Dr. Madicken Munk • GPA: 3.94/4.0	<b>Aug 2020 – Present</b>
MS	<b>University of Tennessee, Knoxville, NUCLEAR ENGINEERING</b> • Empirical Modeling of Used Nuclear Fuel Radiation Emissions for Safeguards Purposes • Advisor: Professor Jamie B. Coble • GPA: 3.96/4.0	<b>Aug 2019 – Aug 2020</b>
BS	<b>University of Tennessee, Knoxville, NUCLEAR ENGINEERING</b> • Minors: Material Science & Engineering; Nuclear Decommissioning & Environmental Management • GPA: 3.91/4.0	<b>Aug 2015 – May 2019</b>
RESEARCH EXPERIENCE	<b>University of Illinois at Urbana-Champaign, Urbana, IL</b> <i>NEUP Fellow, Advanced Reactors and Fuel Cycles Group</i> Investigating impacts of the transition to HALEU-fueled advanced reactors on the nuclear fuel cycle	<b>Aug 2020 – Present</b>
	<b>University of Tennessee, Knoxville, Knoxville, TN</b> <i>Graduate Research Assistant, Coble Research Lab</i> Developed multivariate models of used nuclear fuel signatures for used in nonproliferation safeguards	<b>Aug 2019 – Aug 2020</b>
	<b>Oak Ridge National Laboratory, Oak Ridge, TN</b> <i>NESLS Intern, Radiation Transport High Performance Computing Methods and Applications Team</i> Investigated differences in Doppler broadening of cross section data in SHIFT Monte Carlo code	<b>May 2019– Aug 2019</b>
	<b>University of Tennessee, Knoxville, Knoxville, TN</b> <i>Undergraduate Research Assistant, Coble Research Lab</i> Generated a database for use as a nonproliferation safeguard for electrochemical reprocessing Created simulated multidimensional isotopic data for the use of radiation signatures to infer used nuclear fuel characteristics for use as a nonproliferation safeguard Collected data for Equipment Condition Monitoring of motors and batteries	<b>Oct 2015 – May 2019</b>
OTHER EXPERIENCE	<b>Duke Energy, Huntersville, NC</b> <i>Nuclear Generation Intern, Reactor Engineering</i> Modified administrative and operating procedures to enhance procedure use and adherence Created VBA programs to simplify the reactor head tensioning procedure and reduce outage time Performed procedures to manage reactivity in a multi-unit plant	<b>May – Aug 2018</b> <b>May – Aug 2017</b>
	<b>University of Tennessee, Knoxville, Knoxville, TN</b> <i>Supplemental Instruction Leader, Student Success Center</i> Organized and planned review material for twice-weekly supplemental instruction sessions for students of a General Chemistry class	<b>Jan 2017 – Dec 2017</b>
	<b>University of Tennessee, Knoxville, Knoxville, TN</b> <i>Pre-College Programs Counselor, College of Engineering Office of Diversity Programs</i> Supervised student learning in multiple engineering disciplines	<b>Jan – Jun 2016</b>

HONORS AND AWARDS	Masters Graduate Research Excellence Award, UTK Nuclear Engineering Dept.	2020
	ANS Student Sections Commendations, ANS Student Sections Committee	2020
	U.S. WIN Region II Leadership Award, U.S. WIN Region II	2019
	Outstanding Student Ambassador, UTK Nuclear Engineering Dept.	2018 – 2020
	Best Presentation International Safeguards Division, ANS Student Conference	2019
	Best Presentation Nuclear Nonproliferation Division, ANS Student Conference	2018
	Outstanding Undergraduate Research Assistant, UTK Nuclear Engineering Dept.	2017
	Girl Scout Gold Award, Girl Scouts of America	2015
SCHOLARSHIPS AWARDED	UIUC NPPE Barclay G. Jones Scholarship \$5,000	2021
	UIUC Grainger College of Engineering SURGE Fellowship \$5,000	2020
	ANS Oak Ridge/Knoxville Section Graduate Student Scholarship \$1,000	2020
	NEUP Fellowship \$161,000	2020
	NEUP Fellowship \$155,000	2019
	NEUP Scholarship \$7,500	2017
	NRC Scholarship \$5,000	2015
	UTK Volunteer Scholarship \$72,000	2015
JOURNAL PUBLICATIONS	[1] <b>A. M. Bachmann</b> , R. Fairhurst-Agosta, Z. Richter, N. Ryan, and M. Munk. Enrichment dynamics for advanced reactor HALEU support. <i>EPJ Nuclear Sciences &amp; Technologies</i> , 7:22, 2021. Publisher: EDP Sciences. URL: <a href="https://www.epj-n.org/articles/epjn/abs/2021/01/epjn210024/epjn210024.html">https://www.epj-n.org/articles/epjn/abs/2021/01/epjn210024/epjn210024.html</a> , doi:10.1051/epjn/2021021	
	[2] <b>A. M. Bachmann</b> , J. B. Coble, and S. E. Skutnik. Comparison and uncertainty of multivariate modeling techniques to characterize used nuclear fuel. <i>Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment</i> , 991:164994, Mar. 2021. URL: <a href="http://www.sciencedirect.com/science/article/pii/S0168900220313917">http://www.sciencedirect.com/science/article/pii/S0168900220313917</a> , doi:10.1016/j.nima.2020.164994	
REFEREED CONFERENCE PROCEEDINGS	[3] <b>A. M. Bachmann</b> , J. B. Coble, and S. E. Skutnik. Elemental and Isotopic Concentration Tracking for Electrochemical Reprocessing Safeguards. In <i>Proceedings of the 2018 Advances in Nuclear Nonproliferation Technology and Policy Conference</i> , pages 121–124, Orlando, FL, Nov. 2018. URL: <a href="https://www.ans.org/pubs/proceedings/article-44678/">https://www.ans.org/pubs/proceedings/article-44678/</a>	
	[4] S. E. Skutnik, J. B. Coble, <b>A. M. Bachmann</b> , M. P. Cooper, N. Gilliam, and J. T. Mitchell. A Signatures-Based Approach to Electrochemical Reprocessing Safeguards Modeling & Evaluation. In <i>Proceedings of the 2018 Advances in Nuclear Nonproliferation Technology and Policy Conference</i> , pages 117–120, Orlando, FL, Nov. 2018. URL: <a href="https://www-ans-org.proxy2.library.illinois.edu/pubs/proceedings/article-44677/">https://www-ans-org.proxy2.library.illinois.edu/pubs/proceedings/article-44677/</a>	
REFEREED CONFERENCE ABSTRACTS	[5] <b>A. M. Bachmann</b> . Modeling Material Requirements of the Transition to HALEU Fueled Reactors. In <i>Proceedings of the Technical Workshop on Fuel Cycle Simulation 2021</i> , Virtual, June 2021	
	[6] <b>A. M. Bachmann</b> and K. D. Huff. Comparing HALEU Demand Along Advanced Reactor Fuel Cycle Transitions. In <i>Proceedings of the 2021 ANS Virtual Annual Meeting</i> , volume 124, pages 134–137, Virtual Meeting, June 2021. URL: <a href="https://www.ans.org/pubs/transactions/article-49551/">https://www.ans.org/pubs/transactions/article-49551/</a>	
	[7] <b>A. M. Bachmann</b> and K. D. Huff. Enriched Uranium Supply Requirements for the Transition to Advanced Reactors. In <i>Proceedings of the American Nuclear Society 2021 National Student Conference</i> , Virtual, Apr. 2021	
	[8] <b>A. M. Bachmann</b> , J. B. Coble, and S. E. Skutnik. Multivariate modeling of nuclear fuel characteristics for safeguards purposes. In <i>Proceedings of the American Nuclear Society 2020 National Student Conference</i> , Raleigh, NC, Mar. 2020. Cancelled due to COVID-19	
	[9] <b>A. M. Bachmann</b> , N. Gilliam, M. Cooper, and J. Mitchell. Detection of the Diversion of Special Nuclear Material in a Pyroprocessing Facility. In <i>Proceedings of the American Nuclear Society 2019 National Student Conference</i> , Richmond, VA, Apr. 2019	

	[10]	N. Gilliam, S. E. Skutnik, J. B. Coble, <b>A. M. Bachmann</b> , M. P. Cooper, and J. T. Mitchell. Source Term Development and Radiological Signature Analysis for Simulation in Electrochemical Reprocessing Safeguards. In <i>Transactions of the American Nuclear Society Winter Meeting</i> , volume 119, pages 92–95, Orlando, FL, Nov. 2018. Publisher: American Nuclear Society. URL: <a href="http://epubs.ans.org/?a=44162">http://epubs.ans.org/?a=44162</a>	
	[11]	<b>A. M. Bachmann</b> , J. Mitchell, M. Cooper, and N. Gilliam. Investigating Isotopic Concentration Variability in Used Nuclear Fuel. In <i>Proceedings of the American Nuclear Society 2018 National Student Conference</i> , Gainesville, FL, Apr. 2018	
	[12]	<b>A. M. Bachmann</b> , J. B. Coble, and S. E. Skutnik. Multivariate Analysis of Radiation Signatures to Infer Used Nuclear Fuel Characteristics. In <i>Proceedings of the American Nuclear Society 2017 National Student Conference</i> , Pittsburgh, PA, Apr. 2017	
TECHNICAL REPORTS	[13]	S. G. Dotson, <b>A. M. Bachmann</b> , Z. M. Richter, N. R. Panczyk, N. S. Ryan, A. C. Balla, and E. R. Fanning. Economic and Carbon Impacts of Potential Illinois Nuclear Plant Closures: The Cost of Closures. Technical Report UIUC-ARFC-2021-02, University of Illinois at Urbana-Champaign, Urbana, IL, May 2021. URL: <a href="https://github.com/arfc/2021-04-nm-illinois">github.com/arfc/2021-04-nm-illinois</a>	
OTHER PUBLICATIONS	[14]	<b>A. Bachmann</b> . Empirical Modeling of Used Nuclear Fuel Radiation Emissions for Safeguards Purposes. Master’s thesis, University of Tennessee Knoxville, Aug. 2020. URL: <a href="https://trace.tennessee.edu/utk_gradthes/6272/">https://trace.tennessee.edu/utk_gradthes/6272/</a>	
OTHER MEDIA	[15]	Season 3 Episode 29: Bad Bites, Cat Personalities and Amanda Bachmann on Nuclear Science - The Science Pawdcast, Sept. 2021. URL: <a href="https://bunsenbernerbmd.buzzsprout.com/413041/9245459-season-3-episode-29-bad-bites-cat-personalities-and-amanda-bachman-on-nuclear-science">https://bunsenbernerbmd.buzzsprout.com/413041/9245459-season-3-episode-29-bad-bites-cat-personalities-and-amanda-bachman-on-nuclear-science</a>	
	[16]	<b>A. Bachmann</b> , A. Balla, and J. Shehee. Webinar summary: The role of nuclear in Illinois, Apr. 2021. URL: <a href="https://www.ans.org/news/article-2788/webinar-summary-the-role-of-nuclear-in-illinois/">https://www.ans.org/news/article-2788/webinar-summary-the-role-of-nuclear-in-illinois/</a>	
INVITED TALKS		<b>UIUC Women in Nuclear Women’s History Month Speaker Series</b> <b>U.S. WIN Region III Conference, Virtual Academia Panel</b> <b>U.S. DOE Atomic Wings Lunch and Learn panel</b> <b>Y-12 National Security Complex Introduce a Girl to Engineering</b> <b>U.S. WIN National Conference Breakout session panel,</b>	<b>Mar 3, 2022</b> <b>Aug 19, 2021</b> <b>Feb 10, 2020</b> <b>Feb 21, 2019</b> <b>July 25, 2017</b>
ENGINEERING TEACHING		<b>University of Tennessee, Knoxville</b> DEPT. OF NUCLEAR ENGINEERING, TEACHING ASSISTANT <i>NE 542, Radioactive Waste Management</i> <i>NE 402, Nuclear Engineering Lab</i>	<b>Spring 2020</b> <b>Fall 2019</b>
GUEST LECTURES		<b>University of Illinois Urbana-Champaign, NPRe DEPT</b> <i>NPRe 247, Modeling Energy Systems</i> Nuclear Fuel Cycle <b>University of Illinois Urbana-Champaign, NPRe DEPT</b> <i>NPRe 412, Nuclear Power Economics and Fuel Management</i> Nuclear Nonproliferation Safeguards	March 21, 2022   April 26, 28, 30, 2021
SCIENTIFIC COMPUTING SKILLS		<b>Languages</b> <b>Databases</b> <b>Test Frameworks</b> <b>Version Control</b> <b>Other Tools</b>	Python HDF5 nose git L <sup>A</sup> T <sub>E</sub> X, MatLab, CYCLUS, MCNP, ORIGAMI, ORIGEN

PROFESSIONAL SERVICE	<b>Member</b> , Nuclear Engineering Student Delegation	<b>2021</b>
	<b>Member</b> , NPPE Graduate Student Advisory Committee, UIUC	<b>2021</b>
	<b>Student Director</b> , Board of Directors, ANS	<b>2021–Present</b>
	<b>DEI Co-Chair; Sponsorship Chair</b> , 2022 ANS Student Conference	<b>2021–2022</b>
	<b>Member</b> , Diversity and Inclusion Committee, ANS	<b>2020–Present</b>
	<b>Member</b> , Scholarship and Policy Coordination Committee, ANS	<b>2020–Present</b>
	<b>Co-Vice Chair</b> , Student Sections Committee, ANS	<b>2019–2021</b>
	<b>Twitter Lead</b> , Communications Committee, U.S. WIN	<b>2018–Present</b>
	<b>Member</b> , NEED Committee, ANS	<b>2018–2020</b>
	<b>Member</b> , Region II Conference Planning Committee, U.S. WIN	<b>2018–2019</b>
	<b>President</b> , UTK Chapter, U.S. WIN	<b>2018–2019</b>
	<b>Member</b> , Alpha Nu Sigma Honor Society, ANS	<b>2017</b>
VOLUNTEER WORK	<b>Rules Judge</b> , Tennessee Science Bowl	<b>Febs 2017–2020</b>
	<b>Troop Leader</b> , Girl Scouts of the Southern Appalachians	<b>2016–2019</b>
WORKSHOPS & SHORT COURSES	<b>Nonproliferation and International Safeguards Summer Course</b> Pacific Northwest National Laboratory	<b>Jun 2021</b>
	Week-long course that includes lectures on safeguards topics, such as state level evaluation and environmental sampling, and table-top exercises, such as Design Information Verification and drawing conclusions about an example state's nuclear fuel cycle and facilities	
	<b>Consortium for Monitoring, Technology, and Verification Nuclear Engineering Summer School</b> University of Michigan, Ann Arbor	<b>May-Aug 2020</b>
	12 week summer lecture series, focusing on aspects of nuclear nonproliferation safeguards, gamma and neutron detector systems, and experimental data analysis	
	<b>Developing Future Faculty Facilitating Undergraduate Evidence-Based Learning Seminar</b> University of Tennessee, Knoxville	<b>Jan–March 2020</b>
	Six module seminar on disciplinary exploration of teaching and learning practices employed in undergraduate STEM courses	
	Center for the Integration of Research, Teaching, and Learning (CIRTL) certified seminar to explore methods and applications of Teaching as Research	
	<b>Consotium for Montoring, Technology, and verification Workshop on Fuel Cycle Facility Monitoring</b> University of Wisconsin-Madison	<b>Oct 2019</b>
	Two day workshop on research performed on Fuel Cycle Facility Monitoring and best approaches to future work, hosted by the Consortium for Monitoring, Technology, and Verification	
	<b>TRANSFORM Training Workshop 2019</b> Oak Ridge National Laboratory	<b>Sept 2019</b>
	Two day course on the basics of Modelica, Dymola, and the TRANSFORM library, with exercises on how to use the resources to build a pressurized water reactor model	
	<b>Best Practices in Modeling and Simulation of Nuclear Materials for Nuclear Safeguards Practitioners and Early Career Professionals</b> Oak Ridge National Laboratory	<b>Aug 2019</b>
	Four day course on modeling and simulation of used nuclear fuel using ORIGEN and ORIGAMI and their applications to safeguards	
	Hands on experience in using INDEPTH, a reverse depletion code, and the requirements of an IAEA Design Information Questionnaire	