

Amanda M. Bachmann

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	University of Illinois Urbana-Champaign, NUCLEAR ENGINEERING • Anticipated Graduation: August 2023 • Advisors: Professor Kathryn D. Huff and Dr. Madicken Munk • GPA: 3.94/4.0	Aug 2020 – Present
MS	University of Tennessee, Knoxville, NUCLEAR ENGINEERING • Empirical Modeling of Used Nuclear Fuel Radiation Emissions for Safeguards Purposes • Advisor: Professor Jamie B. Coble • GPA: 3.96/4.0	Aug 2019 – Aug 2020
BS	University of Tennessee, Knoxville, NUCLEAR ENGINEERING • Minors: Material Science & Engineering; Nuclear Decommissioning & Environmental Management • GPA: 3.91/4.0	Aug 2015 – May 2019
RESEARCH EXPERIENCE	University of Illinois at Urbana-Champaign, Urbana, IL <i>NEUP Fellow, Advanced Reactors and Fuel Cycles Group</i> Investigating impacts of transitioning to HALEU-fueled advanced reactors on the nuclear fuel cycle	Aug 2020 – Present
	University of Tennessee, Knoxville, Knoxville, TN <i>Graduate Research Assistant, Coble Research Lab</i> Developed multivariate models of used nuclear fuel signatures for used in nonproliferation safeguards	Aug 2019 – Aug 2020
	Oak Ridge National Laboratory, Oak Ridge, TN <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	May 2019– Aug 2019
	University of Tennessee, Knoxville, Knoxville, TN <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	Oct 2015 – May 2019
OTHER EXPERIENCE	Duke Energy, Huntersville, NC <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 monitor and manage reactivity in a multi-unit plant	May – Aug 2018 May – Aug 2017
	University of Tennessee, Knoxville, Knoxville, TN <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	Jan 2017 – Dec 2017
	University of Tennessee, Knoxville, Knoxville, TN <i>Pre-College Programs Counselor, College of Engineering Office of Diversity Programs</i> Supervised student activities and learning in multiple engineering disciplines	Jan – Jun 2016

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] A. M. Bachmann , R. Fairhurst-Agosta, Z. Richter, N. Ryan, and M. Munk. Enrichment dynamics for advanced reactor HALEU support. <i>EPJ Nuclear Sciences & Technologies</i> , 7:22, 2021. Publisher: EDP Sciences. URL: https://www.epj-n.org/articles/epjn/abs/2021/01/epjn210024/epjn210024.html , doi:10.1051/epjn/2021021	
	[2] A. M. Bachmann , 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: http://www.sciencedirect.com/science/article/pii/S0168900220313917 , doi:10.1016/j.nima.2020.164994	
REFEREED CONFERENCE PROCEEDINGS	[3] A. M. Bachmann , 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: https://www.ans.org/pubs/proceedings/article-44678/	
	[4] S. E. Skutnik, J. B. Coble, A. M. Bachmann , 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: https://www-ans-org.proxy2.library.illinois.edu/pubs/proceedings/article-44677/	
REFEREED CONFERENCE ABSTRACTS	[5] A. M. Bachmann . 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] A. M. Bachmann 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: https://www.ans.org/pubs/transactions/article-49551/	
	[7] A. M. Bachmann 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] A. M. Bachmann , 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] A. M. Bachmann , 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, A. M. Bachmann , 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: http://epubs.ans.org/?a=44162	
	[11] A. M. Bachmann , 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] A. M. Bachmann , 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, A. M. Bachmann , 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: github.com/arfc/2021-04-nm-illinois	
OTHER PUBLICATIONS	[14] A. Bachmann . Empirical Modeling of Used Nuclear Fuel Radiation Emissions for Safeguards Purposes. Master’s thesis, University of Tennessee Knoxville, Aug. 2020. URL: https://trace.tennessee.edu/utk_gradthes/6272/	
OTHER MEDIA	[15] Season 3 Episode 29: Bad Bites, Cat Personalities and Amanda Bachmann on Nuclear Science - The Science Pawdcast, Sept. 2021. URL: https://bunsenbernerbmd.buzzsprout.com/413041/9245459-season-3-episode-29-bad-bites-cat-personalities-and-amanda-bachman-on-nuclear-science	
	[16] A. Bachmann , A. Balla, and J. Shehee. Webinar summary: The role of nuclear in Illinois, Apr. 2021. URL: https://www.ans.org/news/article-2788/webinar-summary-the-role-of-nuclear-in-illinois/	
PANEL APPEARANCES	Academia Panel <i>U.S. WIN Region III Conference, Virtual</i> Propelling the Next Generation for Advanced Nuclear Energy <i>U.S. DOE Atomic Wings Lunch and Learn, Knoxville, TN</i> Introduce a Girl to Engineering <i>Y-12 National Security Complex, Oak Ridge, TN</i> Sharing Organizational Activities, <i>U.S. WIN National Conference, San Francisco, CA</i>	Aug 19, 2021 Feb 10, 2020 Feb 21, 2019 July 25, 2017
ENGINEERING TEACHING	University of Tennessee, Knoxville DEPT. OF NUCLEAR ENGINEERING, TEACHING ASSISTANT <i>NE 542, Radioactive Waste Management</i> <i>NE 402, Nuclear Engineering Lab</i>	Spring 2020 Fall 2019
GUEST LECTURES	University of Illinois Urbana-Champaign, NPPE DEPT <i>NPPE 412, Nuclear Power Economics and Fuel Management</i> Nuclear Nonproliferation Safeguards	April 26, 28, 30, 2021
SCIENTIFIC COMPUTING SKILLS	Languages Databases Test Frameworks Version Control Other Tools	Python HDF5 nose git L ^A T _E X, MatLab, CYCLUS, MCNP, ORIGAMI, ORIGEN

PROFESSIONAL SERVICE	Member , Nuclear Engineering Student Delegation	2021
	Member , NPPE Graduate Student Advisory Committee, UIUC	2021
	Student Director , Board of Directors, ANS	2021–Present
	DEI Co-Chair; Sponsorship Chair , 2022 ANS Student Conference	2021–2022
	Member , Diversity and Inclusion Committee, ANS	2020–Present
	Member , Scholarship and Policy Coordination Committee, ANS	2020–Present
	Co-Vice Chair , Student Sections Committee, ANS	2019–2021
	Twitter Lead , Communications Committee, U.S. WIN	2018–Present
	Member , NEED Committee, ANS	2018–2020
	Member , Region II Conference Planning Committee, U.S. WIN	2018–2019
	President , UTK Chapter, U.S. WIN	2018–2019
	Member , Alpha Nu Sigma Honor Society, ANS	2017
VOLUNTEER WORK	Rules Judge , Tennessee Science Bowl	Febs 2017–2020
	Troop Leader , Girl Scouts of the Southern Appalachians	2016–2019
WORKSHOPS & SHORT COURSES	Nonproliferation and International Safeguards Summer Course Pacific Northwest National Laboratory	Jun 2021
	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	
	Consortium for Monitoring, Technology, and Verification Nuclear Engineering Summer School University of Michigan, Ann Arbor	May-Aug 2020
	12 week summer lecture series, focusing on aspects of nuclear nonproliferation safeguards, gamma and neutron detector systems, and experimental data analysis	
	Developing Future Faculty Facilitating Undergraduate Evidence-Based Learning Seminar University of Tennessee, Knoxville	Jan–March 2020
	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	
	Consotium for Montoring, Technology, and verification Workshop on Fuel Cycle Facility Monitoring University of Wisconsin-Madison	Oct 2019
	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	
	TRANSFORM Training Workshop 2019 Oak Ridge National Laboratory	Sept 2019
	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	
	Best Practices in Modeling and Simulation of Nuclear Materials for Nuclear Safeguards Practitioners and Early Career Professionals Oak Ridge National Laboratory	Aug 2019
	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	