

Andrei Rykhlevskii

CONTACT INFORMATION	Graduate Research Assistant <i>University of Illinois, Urbana-Champaign</i> <i>Nuclear, Plasma, and Radiological Engineering</i>	mobile: (217) 305-2385 e-mail: andrewryh@gmail.com
RESEARCH INTERESTS	Advanced nuclear reactors and fuel cycles analysis/optimization, reactor physics and multi-physics, accident transient analysis, High Performance Computing	
PhD	University of Illinois at Urbana-Champaign, NUCLEAR ENGINEERING Aug 2016 – Present <ul style="list-style-type: none">Fuel processing simulation tool for liquid-fueled nuclear reactorsAdvisor: Professor Kathryn D. HuffConcentration in Computational Science and Engineering	
MSc	University of Illinois at Urbana-Champaign, NUCLEAR ENGINEERING Aug 2016 – May 2018 <ul style="list-style-type: none">Advanced online fuel reprocessing simulation for thorium-fueled Molten Salt Breeder ReactorAdvisor: Professor Kathryn D. Huff	
MSc	Financial University - Moscow, Russia, FINANCIAL MANAGEMENT Oct 2011 – Mar 2014 <ul style="list-style-type: none">Using stock market tools for IT-industry investmentsAdvisor: Professor Svetlana Grishkina	
BSc	Bauman Moscow State Technical University, NUCLEAR ENGINEERING Sep 2004 – Jun 2010 <ul style="list-style-type: none">Calculating structural materials activation for VVER-1200 decommissioningConcentration in Computational Reactor Physics and Nuclear Fuel Cycle	
RESEARCH EXPERIENCE	University of Illinois at Urbana-Champaign, Urbana, IL <i>Graduate Research Assistant, Advanced Reactors and Fuel Cycles Group Aug 2016 – Present</i> <ul style="list-style-type: none">Developing computational tools and models for advanced reactors and fuel cyclesInvestigating load-following capabilities of MSRsModeling MSR neutronics using Monte Carlo code SerpentCreating MSR models in multi-physics environment MOOSEGenerating problem-oriented nuclear data libraries using Serpent, SCALE, OpenMC Oak Ridge National Laboratory, Oak Ridge, TN <i>NESLS Intern – Reactor Physics Group May 2018 – Aug 2018</i> <ul style="list-style-type: none">Developed a various Fast Spectrum Molten Salt Reactor neutronics models (SCALE, Serpent)Implemented and tested continuous online separation and feeds for MSRAnalyzed MSR fuel cycle performance in comparison with Sodium-cooled Fast Reactors OKB GIDROPRESS (State Atomic Energy Corporation “ROSATOM”), Russia <i>Lead Engineer Dec 2015 – Jul 2016</i> Extending life cycle of Nuclear Power Plants (NPP) with VVER-440 BUKO Ltd, Podolsk, Russia Sep 2014 – Dec 2015 <i>Financial analyst</i> Developed and applied robots (C#, VB) for algorithmic trading Svyaz Standart Ltd, Podolsk, Russia Feb 2012 – Aug 2014 <i>Chief Technology Officer</i> Designed and managed Internet Service Provider (ISP) metro networks OKB GIDROPRESS (State Atomic Energy Corporation “ROSATOM”), Russia <i>Nuclear Engineer Nov 2009 – Feb 2012</i> <ul style="list-style-type: none">Performed neutronics calculations for expending operation period of Balakovo and Kola NPPsAnalyzed decommissioning for the Preliminary Safety Analysis Report of Belene NPP, BulgariaPerformed simulations for V&V and certification of KATRIN-2.0 deterministic S_N codeDeveloped a MATLAB code for processing neutron flux data collected from NPPs	
HONORS AND AWARDS	Kuck Computational Science & Engineering Scholarship	2019-2020
	American Nuclear Society, John and Muriel Landis Scholarship	2017-2020
	Podolsk city council innovative entrepreneurship award	2014
	Graduated FU with high distinction (highest graduation honor)	2014
	Graduate scholarship for excellent students, FU	2013
	Research achievement award, OKB GIDROPRESS	2011

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| JOURNAL
PUBLICATIONS | <p>[1] Bae, J.W., Rykhlevskii, A., Chee, G., Huff, K.D. “Deep Learning Approach to Nuclear Fuel Transmutation in a Fuel Cycle Simulator.” Annals of Nuclear Energy, vol. 139. https://doi.org/10.1016/j.anucene.2019.107230, May 2020.</p> <p>[2] Ashraf, O., Rykhlevskii, A., Tikhomirov, G.V., Huff, K.D. “Whole core analysis of the single-fluid double-zone thorium molten salt reactor (SD-TMSR).” Annals of Nuclear Energy, vol. 137. https://doi.org/10.1016/j.anucene.2019.107115, March 2020.</p> <p>[3] Rykhlevskii, A., Bae, J.W., Huff, K. “Modeling And Simulation of Online Reprocessing in the Molten Salt Breeder Reactor.” Annals of Nuclear Energy, vol. 128, Pages 366 - 379. https://doi.org/10.1016/j.anucene.2019.01.030, June 2019.</p> <p>[4] Lindsay, A., Ridley, G., Rykhlevskii, A., Huff, K. “Introduction to Moltres: an Application for Simulation of Molten Salt Reactors.” Annals of Nuclear Energy, vol. 114, Pages 530 - 540. doi.org/10.1016/j.anucene.2017.12.025, April 2018.</p> |
| SUBMITTED | <p>[5] Ashraf, O., Rykhlevskii, A., Tikhomirov, G.V., Huff, K.D. “Strategies for thorium fuel cycle transition in the SD-TMSR.” Submitted to Annals of Nuclear Energy, November 2019.</p> |
| REFEREED
CONFERENCE
PROCEEDINGS | <p>[6] Rykhlevskii, A., O’Grady, D., Kozlowski, T., Huff, K. “The Impact of Xenon-135 on Load Following Transatomic Power Molten Salt Reactor.” Transactions of the American Nuclear Society Winter Meeting. Washington, DC, United States, 2019.</p> <p>[7] Park, S.M., Rykhlevskii, A., Huff, K. “Safety Analysis of the Molten Salt Fast Reactor Fuel Composition Using Moltres.” Proc. GLOBAL International Fuel Cycle Conference. Seattle, WA, United States, September 2019.</p> <p>[8] Betzler, B.R., Rykhlevskii, A., Worrall, A., Huff, K. “Impacts of Fast Spectrum Molten Salt Reactor Characteristics on Fuel Cycle Performance.” Proc. GLOBAL International Fuel Cycle Conference. Seattle, WA, United States, September 2019.</p> <p>[9] Rykhlevskii, A., Betzler, B.R., Worrall, A., Huff, K. “Fuel Cycle Performance of Fast Spectrum Molten Salt Reactors designs.” Proc. M&C 2019 - International Conference on Mathematics & Computational Methods Applied to Nuclear Science and Engineering. Portland, OR, United States, August 25-29, 2019.</p> <p>[10] Rykhlevskii, A., Lindsay, A., Huff, K. “Full-Core Analysis of Thorium-Fueled Molten Salt Breeder Reactor using the SERPENT 2 Monte Carlo code.” Transactions of the American Nuclear Society Winter Meeting. Washington, DC, United States, 2017.</p> <p>[11] Rykhlevskii, A., Lindsay, A., Huff, K. “Online Reprocessing Simulation for Thorium-Fueled Molten Salt Breeder Reactor.” Transactions of the American Nuclear Society Winter Meeting. Washington, DC, United States, 2017.</p> <p>[12] Rykhlevskii, A., Tsofin, V. “Comparing fast neutron transport calculations using code package KATRIN-2.0 for various options of VVER-440 core setup.” Scientific and technical conference of young specialists. Podolsk, Russia, March 2011.</p> |
| REFEREED
CONFERENCE
ABSTRACTS | <p>[13] Rykhlevskii, A., Lindsay, A., Huff, K. “Simulation of Molten Salt Reactors with Moltres.” 2019 SIAM Conference on Computational Science and Engineering, Spokane, WA, February 2019.</p> <p>[14] Rykhlevskii, A., Betzler, B.R., Bae, J.W., Huff, K. “Fuel Cycle Performance of Fast Spectrum Molten Salt Reactor Designs.” (poster) Oak Ridge National Laboratory Nuclear Engineering Science Laboratory Synthesis Poster Session. Oak Ridge, TN, United States, 2018.</p> <p>[15] Rykhlevskii, A., Huff, K. “Computational Tools for Advanced Molten Salt Reactor Simulation.” Blue Waters Symposium, Sun River, OR, June 2018.</p> |
| TECHNICAL
REPORTS | <p>[16] Rykhlevskii, A., Huff, K. “Milestone 2.1 Report: Demonstration of SaltProc.” Advanced Reactors and Fuel Cycles Report Series, Nuclear Plasma and Radiological Engineering, University of Illinois. Report UIUC-ARFC-2019-04, https://doi.org/10.5281/zenodo.3355649, June 2019.</p> |
| OTHER
PUBLICATIONS | <p>[17] Rykhlevskii, A. Advanced online fuel reprocessing simulation for Thorium-fueled Molten Salt Breeder Reactor. M.Sc. thesis. University of Illinois at Urbana-Champaign. May 2018.</p> |

SOFTWARE PRODUCTS	[18] Rykhlevskii, A. , Bae, J.W., Huff, K. “SaltProc v0.2.” zenodo , July 2018. http://dx.doi.org/10.5281/zenodo.1196454 .		
	[19] Lindsay, A., Huff, K., Rykhlevskii, A. “moltres v0.1.” zenodo , June 2017. http://dx.doi.org/10.5281/zenodo.801823 .		
	[20] Bates, C., Biondo, E., Brachem, C., Carlsen, R., Cary, J., Davis, A., Dembia, C., Elfring, M., Flanagan, R., Gidden, M., Haines, T., Howland, J., Huff, K., Jackson, S., Kiesling, K., Klebenow, M., Kuett, M., Manalo, K., M. McCormick, A. Opotowsky, C., Pavlovsky, R., Rabbani, M., Relson, E., Romano, P., Rykhlevskii, A. , Scopatz, A., Shriwise, P., Slaybaugh, R., Wilson, P., Xia, J., J. Zachman, C., and Zweig, M. “PyNE v0.5.11.” github . github.com/pyne/pyne/releases/tag/0.5.11 . March 2018.		
INVITED TALKS	U. Illinois , Nuclear, Plasma, & Radiological Engineering. <i>Seminar</i> .		Apr 10, 2018
ENGINEERING TEACHING	University of Illinois at Urbana-Champaign		Nov 29, 2017
	<i>Guest Lecturer</i>		Nov 9, 2018
	DEPT. OF NUCLEAR, PLASMA, AND RADIOLOGICAL ENGINEERING <i>NPRE 247, Modeling Nuclear Energy System</i> UNIX Shell, Basic Scripting, Serpent usage, Monte Carlo methods		
UNDERGRADUATE RESEARCHERS	<u>NAME</u>	<u>DEGREE - YEAR</u>	<u>ROLE</u>
	Jin Whan Bae	BS - 2017	Mentor
	Louis Kissinger	BS - 2019	Mentor
SCIENTIFIC COMPUTING SKILLS	Programming		Python, bash/csh, C++, FORTRAN, VB, MPI, OpenMP
	Build Systems		make, CMake
	Databases		HDF5, SQL
	Test Frameworks		Travis CI, pytest
	Version Control		git
	Transport Software		Serpent, SCALE, MCNP, WIMS, CNCSN 2009, OpenMC
	Other Tools	MOOSE, MATLAB/Octave, PyNE, CYCLUS, ANSYS CFX, Nek5000, L ^A T _E X	
OTHER UNIVERSITY SERVICE	Judge , HackIllinois		2020
	Mentor , HackIllinois		2017
EDITING AND REVIEWING	Manuscript Referee		<i>Annals of Nuclear Energy</i> <i>2019 GLOBAL International Fuel Cycle Conference</i>
PROFESSIONAL SERVICE	Member , American Nuclear Society		2016–present
	Member , Society for Industrial and Applied Mathematics		2018–present