

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	Nuclear systems modeling and analysis, reactor physics, neutron transport, Verification & Validation, neutronics and fuel cycle performance and optimization, transition to advanced reactors/fuel cycles	
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 reactors• Advisor: Professor Kathryn D. Huff• Concentration 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 Reactor• Advisor: 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 investments• Advisor: 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 decommissioning• Concentration in Computational Reactor Physics and Nuclear Fuel Cycle	
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
	Academic scholarship for distinguished student, BMSTU	2008-2010
	Student Professional Society scholarship, BMSTU	2004-2010
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 cycles• Investigating load-following capabilities for MSRs• Modeling MSR neutronics using Monte Carlo code Serpent• Creating MSR models in multiphysics environment MOOSE• Generating 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 MSR• Analyzed 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	

- Performed neutronics calculations for expending operation period of Balakovo and Kola NPPs
- Analyzed decommissioning for the Preliminary Safety Analysis Report of Belene NPP, Bulgaria
- Performed simulations for V&V and certification of KATRIN-2.0 deterministic S_N code
- Developed a MATLAB code for processing neutron flux data collected from NPPs

JOURNAL
PUBLICATIONS

- [1] 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**, <https://doi.org/10.1016/j.anucene.2019.107115>, October 2019.
- [2] **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.
- [3] 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.

SUBMITTED

- [4] 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.
- [5] Bae, J.W., Chee, G., **Rykhlevskii, A.**, Huff, K.D. “Deep Learning Approach to Nuclear Fuel Transmutation in a Fuel Cycle Simulator.” Submitted to **Annals of Nuclear Energy**, August 2019.

REFEREED
CONFERENCE
PROCEEDINGS

- [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.
- [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.
- [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.
- [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.
- [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.
- [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.
- [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.

REFEREED CONFERENCE ABSTRACTS	[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.		
	[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.		
	[15] Rykhlevskii, A. , Huff, K. “Computational Tools for Advanced Molten Salt Reactor Simulation.” Blue Waters Symposium , Sun River, OR, June 2018.		
TECHNICAL REPORTS	[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.		
OTHER PUBLICATIONS	[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.		
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. Opatowsky, 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 <i>Guest Lecturer</i> DEPT. OF NUCLEAR, PLASMA, AND RADIOLOGICAL ENGINEERING <i>NPRE 247, Modeling Nuclear Energy System</i> UNIX Shell, Basic Scripting, Serpent usage, Monte Carlo methods	Nov 29, 2017 Nov 9, 2018	
UNDERGRADUATE RESEARCHERS	<u>NAME</u> Jin Whan Bae Louis Kissinger	<u>DEGREE - YEAR</u> BS - 2017 BS - 2019	<u>ROLE</u> Mentor Mentor
SCIENTIFIC COMPUTING SKILLS	Programming Build Systems Databases Test Frameworks Version Control Transport Software Other Tools	Python, bash/csh, C++, FORTRAN, VB, MPI, OpenMP make, CMake HDF5, SQL pytest git Serpent, SCALE, MCNP, WIMS, CNCSN 2009, OpenMC MOOSE, MATLAB/Octave, ANSYS CFX, PyNE, CYCLUS, \LaTeX	
OTHER UNIVERSITY SERVICE	Hack Mentor , Hack Illinois		2017

EDITING AND
REVIEWING

Manuscript Referee

Annals of Nuclear Energy
2019 GLOBAL International Fuel Cycle Conference

PROFESSIONAL
SERVICE

Member, American Nuclear Society
Member, Society for Industrial and Applied Mathematics

2016–present
2018–present