Raluca O. Scarlat

Associate Professor
Nuclear Engineering Department, University of California Berkeley
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RESEARCH AREAS

Chemistry and materials. Electrochemistry and physical chemistry of molten salts, high-temperature graphite chemistry, corrosion, tritium management. Advanced nuclear reactors, safety analysis, engineering ethics.

EDUCATION

Ph. D. Nuclear Engineering with Designated Emphasis in Energy Science and Technology, UC Berkeley, 2012
M.S. Nuclear Engineering, UC Berkeley, 2009
Certificate in Management of Technology, Haas School of Business, UC Berkeley, 2009
B.S. Chemical and Biomolecular Engineering, Cum Laude, Cornell University, 2006

EXPERIENCE

08/2023 – Present	*Chemist Faculty Scientist/Engineer*, Chemical Sciences Division, Lawrence Berkeley National Laboratory.
08/2023 – Present	*Vice-chair for Undergraduate Matters*, Department of Nuclear Engineering, University of California Berkeley.
07/2023 – Present	*Associate Professor*, Department of Nuclear Engineering, University of California Berkeley.
01/2019 – 06/2023	*Assistant Professor*, Department of Nuclear Engineering, University of California Berkeley.
08/2014 – 12/2018	*Assistant Professor*, Department of Engineering Physics, University of Wisconsin Madison.
11/2017 – 12/2018	*Affiliate Faculty*, Department of Material Science and Engineering
10/2017 – 12/2018	*Affiliate Faculty*, Department of Physics
03/2015 – 12/2018	*Affiliate Faculty*, Department of Mechanical Engineering
01/2013 – 08/2014	*Postdoctoral Scholar*, Peterson Research Group, Department of Nuclear Engineering, University of California Berkeley
09/2011 – 10/2011	*Engineering Intern*, Nuclear Reactor Engineering, Plant Engineering Department, Hitachi-GE Power Systems, Hitachi, Japan
06/2008 – 12/2012	*Ph.D Student*, Peterson Research Group, Department of Nuclear Engineering, University of California Berkeley
07/2006 – 08/2007	*Chemical Engineer*, Automation and Optimization Division, ExxonMobil Research & Engineering, Fairfax, VA
05/2005 – 08/2005	*Research Intern*, Polymer and Chemical Technology Group, GE Global Research Center, Niskayuna, NY
06/2004 – 05/2006	*Research Assistant*, Wiesner Research Group, Material Science and Engineering Department, Cornell University
08/2004 – 01/2005	*Engineering Co-op*, Technology Department of the Waterford Silicones Chemical Plant, GE Silicones, Waterford, NY

AWARDS, HONORS, AND SELECTED PROFESSIONAL ACTIVITIES

Technical Program Chair, International Congress on Advances in Nuclear Power Plants (ICAPP) 2026, 2025-2026.
Conference Organizing Chair, International Nuclear Graphite Specialists Meeting (INGSM-2024), Oct 2023-Dec.2024.
McClellan Nuclear Research Center (MNRC) Nuclear Safety Committee (NSC), Jan 2024-present.
McClellan Nuclear Research Center (MNRC) Advisory Committee, Feb. 2023-present.
External advisory board member. LIBRA ArpaE Project. MIT Plasma & Fusion Science Center. 2022.
Working Group Member. ASME Standards task group on graphite issues for MSR. 2022.
External advisory board member. Liquid Immersion Blanket, Robust (Tritium) Accountancy (LIBRA) ArpaE DOE Project, MIT Plasma & Fusion Science Center, Cambridge, MA. 2022.
Nuclear Energy Advisory Committee (NEAC), US Department of Energy, Office of Nuclear Energy, 2022-2024.
Working Group Member. Development of ANS 20.2 Standard, "Nuclear Safety Design Criteria and Functional Performance Requirements for Liquid-Fuel Molten Salt Reactor Nuclear Power Plants." 2020-2022.
ANS Mary Jane Oestmann Professional Women's Achievement Award, 2021.
Vilas Faculty Early Career Investigator Award, University of Wisconsin-Madison, 2018.
Excellence Award, Nuclear Energy Fuel Cycle R&D, US Department of Energy, 2009.
Graduate Fellowship, Nuclear Engineering University Programs (NEUP), US Department of Energy, 2009-2012.
Outstanding Graduate Student Instructor, University of California Berkeley, 2007-2008.
Leadership Award, ExxonMobil Automation & Optimization Division, 2006

TEACHING

COURSES, UNIVERSITY OF CALIFORNIA BERKELEY

Thermodynamics (E40). 2019, 2021, 2023, 2025. 100+ students.
Introduction to Nuclear Energy and Technology/Nuclear Engineering (NE100/200M). 2025. 100+ students.
Ethics, Engineering and Society (E125). 2012, 2013, 2020-present. 400+ students.
Nuclear Engineering Colloquium (NE 295). 2021.
Nuclear Fuel Cycle. (NE225). 2024.
Special topics in Nuclear Materials and Chemistry: Molten Salt Chemistry and Corrosion (NE290B). 2020, 2022.
Special topics in Nuclear Energy: Molten Salt Reactors and Tritium Breeding Blankets (NE290C). 2025. Engineering
A Survey of Nuclear Engineering (NE 24). 2020.
Advisor for DeCal course (NE 198). "Nuclear Science: Past, Present and Future." 2019.

COURSES, UNIVERSITY OF WISCONSIN-MADISON

Survey of Nuclear Engineering. 2018.
Nuclear Engineering Design Senior Design Capstone Course. 2018.
Economic and Environmental Aspects of Nuclear Engineering. 2018.
Molten Salt Technology. 2017, 2018.
Laboratory Safety Seminar. 2017.
Safety Analysis and Process Safety. 2016.
Introduction to Engineering Grand Challenges. Freshmen Course. Fall 2015. Created a module on safety analysis.
Nuclear Reactor Engineering
(Thermal-hydraulics). 2014, 2015, 2016.

PUBLICATIONS

FOR PUBLICATIONS ORGANIZED BY TOPIC, SEE SALT.NUC.BERKELEY.EDU:

- SALT CHEMISTRY
- CORROSION
- ELECTROCHEMISTRY
- GRAPHITE
- TRITIUM
- SAFETY ANALYSIS AND NUCLEAR REACTOR DESIGN

REFEREED ARCHIVAL JOURNAL ARTICLES

1. D Nathanael Gardner, Haley Williams, Sven C Vogel, Sean Fayfar, Boris Khaykovich, Shivani Srivastava, Andrea Hwang, Mark Asta, David Sprouster, Dan Olds, Gregory Vershbow, Jörg C Neuefeind, Raluca O Scarlat. Solid structure of Li2BeF4 (FLiBe) from room temperature to melting studied by neutron and X-ray diffraction. *Applied Crystallography* 58(2). (2025)
2. H. Williams, R. O. Scarlat. A Case for Nuclear Chemical Engineering in the Era of Fission and Fusion Reactors that Employ Molten Salts. *Nuclear Technology* (2025).
3. Effect of cold forging on the microstructure and corrosion behavior of type 316L stainless steel in molten FLiNaK salt. *Journal of Nuclear Materials* 606 (155624). (2025).
4. William B Derdeyn, Jonathan L King, Mohamed Elbakhshwan, Zahabul Islam, Yuzhe Xiao, Chunhui Yao, Raluca O Scarlat, Mikhail A Kats, Mark H Anderson. Emissivity of post-corrosion stainless steel 316 exposed to FLiBe molten salt in a non-isothermal flow loop. *Journal of Nuclear Materials*. 155988 (2025).
5. L Vergari, H Wu, RO Scarlat. Surface Fluorination of Nuclear Graphite Exposed to Molten 2LiF–BeF2 (FLiBe) Salt and Its Cover Gas at 700 °C. *ACS Applied Engineering Materials* 2 (6), 1483-1502 (2024),
6. Sean H Mills, Ryan D Hayes, Nathan Bieberdorf, Steven E Zeltmann, Alexandra M Kennedy, Laurent Capolungo, Mark Asta, Raluca O Scarlat, Andrew M Minor. Elucidating the role of Cr migration in Ni-Cr exposed to molten FLiNaK via multiscale characterization. *Acta Materialia* 279 (120206). (2024).
7. Sean Fayfar, Rajni Chahal, Haley Williams, Nathanael Gardner, Guiqiu Zheng, David Sprouster, Jörg C. Neuefeind, Dan Olds, Andrea Hwang, Joanna Mcfarlane, Ryan C. Gallagher, Mark Asta, Stephen Lam, Raluca O. Scarlat, Boris Khaykovich. Complex structure of molten FLiBe by experimental X-ray scattering, neutron scattering, and deep neural-network-based molecular dynamics. *PRX Energy* 3, 013001 (2024). https://link.aps.org/doi/10.1103/PRXEnergy.3.013001.
8. Elena Romanovskaia, Ho Lun Chan, Valentin Romanovski, Francisco Garfias, Minsung Hong, Sara Mastromarino, Peter Hosemann, Raluca Scarlat, John R. Scully. An In Situ, multi-electrode electrochemical method to assess the open circuit potential corrosion of Cr in unpurified molten FLiNaK. *Corrosion Science*. 222, 111389 (2023). doi.org/10.1016/j.corsci.2023.111389.
9. Sean H Mills, Ryan D Hayes, Nathan Bieberdorf, Steven E Zeltmann, Alexandra M Kennedy, Raluca O Scarlat, Mark Asta, Andrew M Minor. Elucidating the Role of Cr Migration in Ni-Cr Exposed to Molten FLiNaK via STEM-Based Methods. *Microscopy and Microanalysis*. 29, 1505-1506 (2023). doi.org/10.1093/micmic/ozad067.774.
10. W. B. Derdeyn, S. Mastromarino, R. Gakhar, M. H. Anderson, M. A. Kats, R. O. Scarlat. Optical Spectroscopy of Molten Fluorides: Methods, Electronic and Vibrational Data, Structural Interpretation, and Relevance to Radiative Heat Transfer. *Journal of Molecular Liquids. (2023). https://doi.org/10.1016/j.molliq.2023.121936.*
11. L. Vergari, M. Nelson, A. Droster, C. Contescu, N. Gallego, R. O. Scarlat. Infiltration of molten fluoride salts in graphite: phenomenology and engineering considerations for reactor operations and waste disposal. *Journal of Nuclear Materials. (2023). doi.org/10.1016/j.jnucmat.2022.154058.*
12. L. Vergari, J. Quincey, G.Meric, T.Merriman, M. Hackett, R. O. Scarlat. Self-lubrication of Nuclear Graphite in Argon at High Temperature. *Tribology International*. (2023). doi.org/10.1016/j.triboint.2022.107946.
13. Yao, Mei, Xiao, Shahsfi, Derdeyn, King, Wan, R. O. Scarlat, Anderson, Kats. Correcting thermal-emission-induced detector saturation in infrared reflection or transmission spectroscopy. *Optics Review*. (2023). doi.org/10.1364/OE.466102
14. L. Vergari, J. Quincey, G. Meric, R.O. Scarlat. Microstructural characterization data for nuclear graphite samples generated during tribology testing in argon. *Data in Brief*. (2023). doi.org/10.1016/j.dib.2022.108796.
15. R. Vidrio, S. Mastromarino, E. Still, L. Chapdelaine, R. O. Scarlat. Density and Thermal Expansivity of Molten 2LiF-BeF_2 (FLiBe): Measurements and Uncertainty Quantification. *J. of Chem. & Engr. Data.* (2022). doi.org/10.1021/acs.jced.2c00212. ***Issue cover: pubs.acs.org/toc/jceaax/67/12.***
16. L. Vergari, R. O. Scarlat, R. D. Hayes, M. Fratoni. The corrosion effects of neutron activation of 2LiF-BeF_2 (FLiBe). *Nuclear Materials and Energy*. (2022). doi.org/10.1016/j.nme.2022.101289.

17. L. Langford, N. Winner, A. Hwang, H. Williams, L. Vergari, R. O. Scarlat, M. Asta. Constant-Potential Molecular Dynamics Simulations of Molten-Salt Double Layers for FLiBe and FLiNaK. *Journal of Chemical Physics*. (Aug. 2022). doi.org/10.1063/5.0097697.
18. S. R. Scott, F. Carotti, A. Kruizenga, R. O. Scarlat, S. Mastromarino, M. M. Shafer. Simultaneous measurement of lithium isotope and lithium/beryllium ratios in FLiBe salts using MC-ICP-MS. *J. Anal. At. Spectrom*. 37 (2022) 1193-1202. (May 2022) doi.org/10.1039/D2JA00097K.
19. A. N. Consiglio, F. Carotti, E. Liu, H. Williams, R. O. Scarlat. Design and operation of a molten salt electrochemical cell. *MethodX*. 9 (2022) 101626. (Jan. 2022). doi.org/10.1016/j.mex.2022.101626.
20. L. Vergari and R. O. Scarlat, The impact of neutron irradiation, graphite oxidation and fluorination on tritium uptake into and desorption from graphite in molten salt environments. *Fusion Engineering and Design* 168 (2021) 112627. (Apr. 2021) doi.org/10.1016/j.fusengdes.2021.112627.
21. N. Winner, H. Williams, R. O. Scarlat, M. Asta. Ab-initio simulation studies of chromium solvation in molten fluoride salts. *Journal of Molecular Liquids*. 335 (2021) 116351. (Apr. 2021) doi.org/10.1016/j.molliq.2021.116351.
22. L. Vergari and R. O. Scarlat, Kinetics and Transport of Hydrogen in Graphite at High Temperature and the Effects of Oxidation, Irradiation and Isotopics. *Journal of Nuclear Materials* (2021) 153142. (Jun. 2021) doi.org/10.1016/j.jnucmat.2021.153142.
23. L. Vergari and R. O. Scarlat, Thermodynamics of hydrogen in graphite at high temperature and the effects of oxidation, irradiation and isotopics. *Journal of Nuclear Materials* (2021) 152797. (Jan. 2021) doi.org/10.1016/j.jnucmat.2021.152797.
24. F. Schmidt, P. Hosemann, R. O. Scarlat, D. K. Schreiber, J. R. Scully, B. P. Uberuaga. Effects of Radiation-Induced Defects on Corrosion. *Annual Reviews of Materials Research*. 51 (2021) 293-328. (May 2021). doi.org/10.1146/annurev-matsci-080819-123403.
25. H. Wu, R. Gakhar, Z. Zhou, A. Chen, C. Marshall, R. O. Scarlat. Data Analysis for Characterization of IG110 and A3 by X-Ray Diffraction and Raman Spectroscopy. *Data in Brief*. 32, 106193. (Oct. 2020). doi.org/10.1016/j.dib.2020.106193.
26. F. Carotti, E. Liu, D. Macdonald, R. O. Scarlat. An Electrochemical Study of Hydrogen in Molten FLiBe with Addition of LiH. *Electrochimica Acta*. 137114 (Sept. 2020). doi.org/10.1016/j.electacta.2020.137114.
27. M. Abou Dbai, R. O. Scarlat, M. Trujillo. Radiative Heat Transfer in FLiBe Molten Salt Participating Medium in a Vertical Heated Tube Under Forced and Mixed Convection Laminar Flows. *Nuclear Engineering and Design*. 368, 110775 (Nov. 2020). doi.org/10.1016/j.nucengdes.2020.110775.
28. J. Qiu, A. Wu, D. Macdonald; J. Yao; R. O. Scarlat; Y. Li; Y. Xu. Kinetic study of hydrogen transport in graphite under molten fluoride salt environment. Electrochimica Acta. 352, 136459 (Aug. 2020). doi.org/10.1016/j.electacta.2020.136459.
29. J. Qiu, A. Wu, Y. Li, Y. Xu, R. O. Scarlat, D. Macdonald. Galvanic corrosion of Type 316L stainless steel and Graphite in molten fluoride salt. Corrosion Science. 170, 108677 (Jul. 2020). doi.org/10.1016/j.corsci.2020.108677.
30. J. Yao, J. Qiu, F. Carotti, R. O. Scarlat, D. Macdonald. Kinetic study of the hydrogen charging reaction on the graphite e in aqueous solution and in room temperature ionic liquid (RTIL). Electrochimica Acta. 330 (2020) 135291 (Jan. 2020). doi.org/10.1016/j.electacta.2019.135291.
31. F. Carotti, A. Laudenbach, H. Wu, M. Straka, R. O. Scarlat. Characterization of a Thermodynamic Reference Electrode for Molten LiF-BeF2 (FLiBe). Part II: Materials Analysis. Journal of the Electrochemical Society. 166(15) H835-H841 (Nov. 2019). doi.org/10.1149/2.1161914jes.
32. H. Wu, R. Gakhar, A. Chen, S. Lam, C. P. Marshall, R. O. Scarlat. Comparative analysis of microstructure and reactive sites for nuclear graphite IG-110 and graphite matrix A3. *Journal of Nuclear Materials*. 528 (2020) 151802 (Sept. 2019). doi.org/10.1016/j.jnucmat.2019.151802.
33. J. E. Seifried, R. O. Scarlat, P. F. Peterson, E. Greenspan. A General Approach for Determination of Acceptable FLiBe Impurity Concentrations in FHRs. *Nuclear Engineering and Design*. 343: 85-95 (Mar. 2019). doi.org/10.1016/j.nucengdes.2018.09.038.
34. F. Carotti, B. Goh, M. Shafer, R. O. Scarlat. Datasets for Elemental Composition of 2LiF-BeF2 (FLiBe) Salt Purified by Hydro-Fluorination, Analyzed by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) using Two Digestion Methods. *Data in Brief*. 21: 1612-1617. (Dec. 2018). doi.org/10.1016/j.dib.2018.09.053.
35. J. Zhang, C. W. Forsberg, M. Simpson, S. Guo, S. T. Tang Lam, R. O. Scarlat, F. Carotti, K. J. Chan, P. Singh, W. Donniger, K. Sridharan, J. R. Keiser. Redox Potential Control in Molten Salt Systems for Corrosion Mitigation. *Corrosion Science*. 144: 44-53. (Nov. 2018) doi.org/10.1016/j.corsci.2018.08.035.
36. R. O. Scarlat. CrF_2 Solubility in 2LiF-BeF_2: Comment on "An integrated model of tritium transport and corrosion in Fluoride Salt-Cooled High-Temperature Reactors (FHRs) – Part I: Theory and benchmarking." *Nuclear Engineering and Design*. 335 (2018) 389-390. doi.org/10.1016/j.nucengdes.2018.04.021.
37. H. Wu, F. Carotti, N. Patel, R. Gakhar, R. O. Scarlat. Fluorination of Nuclear Graphite IG-110 in Molten FLiBe salt at 700 oC. *Journal of Fluorine Chemistry*. 211. 159-170 (2018). doi.org/10.1016/j.jfluchem.2018.04.001.

38. Huali Wu, Francesco Carotti, Ruchi Gakhar, R. O. Scarlat. Spectroscopy (Raman, XPS, and GDMS) and XRD analysis for studying the interaction between nuclear grade graphite and molten 2LiF-BeF2 (FLiBe) at 700 °C. *Data in Brief*. 2018 (20) 1816-1821. doi.org/10.1016/j.dib.2018.08.079.
39. Feng Xie, Jianzhu Cao, Liqiang Wei, Jiejuan Tong, Yujie Dong, Zuoyi Zhang, R. O. Scarlat. Study of Tritium in the Primary Loop of HTR-10: Experiment and Theoretical Calculations. *Progress in Nuclear Energy*. 105. 99-105 (2018). https://doi.org/10.1016/j.pnucene.2017.12.018.
40. F. Carotti, H. Wu, and R. O. Scarlat. Characterization of a Thermodynamic Reference Electrode for Molten LiF-BeF2 (FLiBe). *Journal of The Electrochemical Society*, 164 (12) H854-H861 (2017). doi.org/10.1149/2.1591712jes.
41. C. W. Forsberg, D. M. Carpenter, D. G. Whyte, R. O. Scarlat, L. Wei. Tritium Control and Capture in Salt-Cooled Fission and Fusion Rectors. *Fusion Science and Technology*. 71 (2017) 584-589. doi.org/10.1080/15361055.2017.1289450.
42. C. W. Forsberg, S. Lam, D. Carpenter, D. Whyte, R. O. Scarlat, C. Contescu, L. Wei, J. Stempien, E. Blandford. Tritium Control and Capture in Salt-Cooled Fission and Fusion Reactors: Status, Challenges and Path Forward. *Nuclear Technology*. 197 (2) 2017. 119-139. doi.org/10.13182/NT16-101.
43. C. Andreades, A. Cisneros, J. Choi, A. Chong, M. Fratoni, S. Hong, L. Huddar, K. Huff, J. Kendrick, D. Krumwiede, M. Laufer, M. Munk, R. O. Scarlat, N. Zweibaum, E. Greenspan, X. Wang, P. Peterson. Design Summary of the Mark I Pebble-Bed, Fluoride-Salt-Cooled, High-Temperature Reactor Commercial Plant. *Nuclear Technology*. 195 (3) 2016. 223-238. doi.org/10.13182/NT16-2.
44. R. O. Scarlat, M. R. Laufer, E. D. Blandford, N. Zweibaum, D. L. Krumwiede, A.T. Cisneros, C. Andreades, C.W. Forsberg, E. Greenspan, L. Hu, P. F. Peterson. Design and licensing strategies for the fluoride-salt-cooled, high-temperature reactor (FHR) technology. *Progress in Nuclear Energy*. 77, 2014. 406-420. https://doi.org/10.1016/j.pnucene.2014.07.002.
45. N. Zweibaum, G. Cao, A.T. Cisneros, B.K., M.R. Laufer, R. O. Scarlat, J.E. Seifried, M.H. Anderson, C.W. Forsberg, E. Greenspan, L. Hu, P.F. Peterson, K. Sridharan. Phenomenology, methods and experimental program for fluoride-salt-cooled, high-temperature reactors (FHRs). Progress in Nuclear Energy. 77, 2014. 390-405. https://doi.org/10.1016/j.pnucene.2014.04.008.
46. C. Andreades, R. O. Scarlat, L. Dempsey, P. Peterson. Reheat-Air Brayton Combined Cycle Power Conversion Design and Performance Under Nominal Ambient Conditions. Journal of Engineering for Gas Turbines and Power. 136 (6) 2014. https://doi.org/10.1115/1.4026506.
47. R. O. Scarlat, P. F. Peterson. The current status of fluoride salt cooled high temperature reactor (FHR) technology and its overlap with HIF target chamber concepts. Nuclear Instruments and Methods in Physics Research A. 733. 57-64 (2014). https://doi.org/10.1016/j.nima.2013.05.094.
48. R. O. Scarlat, A.T. Cisneros, T. Koutchesfahani, R. Hong, P. F. Peterson, Preliminary safety analysis of a PBMR supplying process heat to a co-located ethylene production plant. Nuclear Engineering and Design 251 53-59 (2012). https://doi.org/10.1016/j.nucengdes.2011.10.069.
49. M. Kamperman, P. Du, R. O. Scarlat, E. Herz, U. Werner-Zwanziger, R. Graf, J. Zwanziger, H. Spiess, U. Wiesner. Composition and Morphology Control in Ordered Mesostructured High-Temperature Ceramics from Block Copolymer Mesophases. Macromolecular Chemistry and Physics. 2007, 208(19-20), 2096-2108. https://doi.org/10.1002/macp.200700194

REFEREED CONFERENCE PROCEEDINGS ARTICLES

50. Charles Forsberg, David M Carpenter, Raluca O. Scarlat, Robb, Kevin, Ayman I. Hawari. Lessons Learned In How to Conduct Loop and Irradiated Salt Experiments: Workshop II. *American Nuclear Society 2025 Summer Meeting.* Paper: 48474, June 14-18, 2025.
51. Jesse Sloane, Matt Waples, Chris Parker, Steve Sisley, David Garrido, Jeffrey R. McLachlan, Randall Chiu, Ta-Chun Wang, Sean Tang, Raluca Scarlat, Per F. Peterson, Rebecca Abergel, LianGe Zheng, Stefan Finsterle, Mikey Hannon. Progress on the Development of the Universal Canister System for Advanced Reactor Waste Forms. *Waste Management (WM2025) Conference*, March 9 - 13, 2025.
52. Haley Williams, University of California, Berkeley Dr. Denia Djokic, Curriculum-embedded Epistemological Foundations in Nuclear Engineering. *2024 American Society for Engineering Education (ASEE) Annual Conference & Exposition.* (2024).
53. Williams, Scarlat. A Scaffolded Approach to Undergraduate Research in Nuclear Engineering. *ANS Winter Meeting.* Nov. 2023.
54. L. Vergari, J. Xu, R. O. Scarlat. Wear and Friction of Nuclear Graphite in FLiBe. *ANS Winter Meeting.* Nov. 2023.
55. R. O. Scarlat, R. Chiu. Drivers and limiting steps for corrosion in molten salt loops. *ANS Winter Meeting.* Nov. 2023.
56. Gardner, Denis, Falkowski, Vergari, Scarlat. Sources of Error in the Measurement of Thermophysical Properties of Fluoride Molten Salts. *ANS Winter Meeting.* Nov. 2023.

57. Borrello, Williams, Scarlat. Nanofabricated Electrochemical Sensors for Redox Measurements in Molten Salts. *ANS Winter Meeting.* Nov. 2023.
58. Vergari, Falkowski, Ooi, Scarlat. Wetting Behavior of Molten Fluoride Salts on Graphite. *ANS Student Meeting.* Nov. 2023.
59. Lorenzo Vergari, Raluca O. Scarlat. Infiltration of molten fluoride salts in graphite: effects on reactor operation and waste disposal. *ANS Winter Meeting.* Nov. 2022.
60. H. Williams, N. Gardner, M. Asta, B. Khaykovich, S. C. Vogel, I. Farnan, R. O. Scarlat. Probing Speciation of Light Elements in Molten Salts by Electrochemistry, High Temperature Liquid NMR, and Neutron Diffraction. *ANS Annual Conference*. Anaheim, CA. May 2022.
61. M. A. Borrello, C. M. Sclafani, R. O. Scarlat. Design of Natural Circulation Molten Salt Loop to Study Long-term Loop Corrosion Effects of NaF-BeF2 on SS316H in Argon Glovebox Environment. *ANS Annual Conference 2022*. Anaheim, CA. May 2022.
62. S. Mastromarino, A. Kennedy, R. O. Scarlat. Digestion of FLiNaK for Elemental Analysis by ICP-OES. *ANS Annual Meeting*. Anaheim, CA. May 2022.
63. Lorenzo Vergari, Raluca O. Scarlat. Graphite in fluoride salt reactors: Tritium sequestration, tribology and salt infiltration. *ANS Annual Meeting*. May 2022.
64. L. Vergari, A. Bhat, R. O. Scarlat. Modeling of Hydrogen Adsorption and Diffusion in Graphite Using a Genetic Algorithm. *ANS Student Conference*. University of Illinois. April 2022.
65. C. Sclafani, M. Borrello, D. Rappleye, R. Fuller, R. O. Scarlat. Molten Salt Glovebox Design. *ANS Student Conference*. University of Illinois. April 2022.
66. C. Forsberg, D. M. Carpenter, A. Hawri, R. O. Scarlat, K. Robb. Building a Molten-Salt Forced-Circulation Loop for the MIT Reactor. *ANS Winter Meeting*. November 15-19, 2020.
67. F. Ambrogi, K. K. Ahmed, F. Carotti, R. O. Scarlat, R. Hu. Modeling of Tritium transport and absorption in the PB-FHR core using TRIDENT and the System Analysis Module (SAM). *ICAPP 2019 – International Congress on Advances in Nuclear Power Plants. Juan-les-pins, France*. May 12-15, 2019.
68. W. Derdeyn, A. Shahsafi, M. A. Kats, R. O. Scarlat. Infrared Spectroscopy Studies of Molten Fluoride Salts. *ICAPP 2019 – International Congress on Advances in Nuclear Power Plants*. Juan-les-pins, France. May 12-15, 2019.
69. K. K. Ahmed, M. Abou Dbai, R. Hu, R. O. Scarlat. Development and Application of the System Analysis Module (SAM) for Simulation of Passive Cooling Systems in Salt Reactors. *ICAPP 2019 – International Congress on Advances in Nuclear Power Plants*. Juan-les-pins, France. May 12-15, 2019.
70. H. Wu, A. Chen, R. O. Scarlat. Comparative Characterization of IG-110 Nuclear Graphite and A3 Matrix Graphite. *ANS Winter Meeting*. Washington, DC. November, 11-15, 2018.
71. A. R. Delmore, W. Derdeyn, R. Gakhar, R. O. Scarlat. Wetting of Nuclear Graphite by Molten Fluoride Salts: Initial Experiments. *American Nuclear Society Annual Meeting*. Philadelphia, PA. June 17-21, 2018.
72. W. Derdeyn, M. Abou Dbai, R. O. Scarlat. FLiBe Radiative Heat Transfer. *American Nuclear Society Annual Meeting*. Philadelphia, PA. June 17-21, 2018.
73. C. Falconer, W. H. Doniger, G. Zheng, R. O. Scarlat, K. Sridharan, A. Couet. Investigation of Materials Corrosion in Molten Fluoride Salts. *American Nuclear Society Annual Meeting. Embedded Topical Nuclear Fuels & Structural Materials for Next Generation Nuclear Reactors*. Philadelphia, PA. June 17-21, 2018.
74. W. Derdeyn, R. Gakhar, R. O. Scarlat. A Review of IR Spectroscopic Studies of Molten Fluoride Salts. American Institute of Chemical Engineers Conference (AIChE). *2017 Annual Meeting*. Minneapolis, MN. October 2017.
75. B. Goh, F. Carotti, R. O. Scarlat. A Review of Electrochemical and Non-Electrochemical Approaches to Determining Oxide Concentration in Molten Fluoride Salts. *233th ECS Meeting*. Seattle, WA. May 13-17, 2018.
76. F. Carotti, L.Liu, B. Goh, H.Wu, R. O. Scarlat. Electrochemical Studies of Hydrogen in FLiBe Salt. *233th ECS Meeting*. Seattle, WA. May 13-17, 2018.
77. M. Abou Dbai, K. Ahmed, R. O. Scarlat. Stability Analysis of Natural Circulation with Salt Freezing: Application to FHR DRACS. *NURETH-17*. Xian, China. Sept. 3-8, 2017.
78. K. Ahmed, R. O. Scarlat, R. Hu. Benchmark Simulations of Natural Circulation Cooling Systems with Salt and Oil Working Fluids using SAM. *Proceedings of the International Topical Meeting on Nuclear Reactor Thermal hydraulics (NURETH-17).* Xian, China. Sept. 3-8, 2017.
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AWARDED GRANTS

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2. Fratoni et. al. Bridging the gap between experiments and modeling to improve design of molten salt reactors. *DOE NEUP IRP.* 2022-2025. Contributions: lead for Salt Properties; coPI contributor for corrosion in molten salt.
3. Snead et. al. Reduction, Mitigation and Disposal Strategies for the Graphite of High Temperature Reactors. *NEUP IRP.* 2022-2026. Contributions: lead for graphite waste streams from salt-cooled reactors.
4. Whittaker et. al. The Science of Direct MINeral to Energy Storage Synthesis (MINES). DOE BES Critical Minerals. 2022-2025. Contributions: salt chemistry, electrochemistry and thermo-physical properties.
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7. R. O. Scarlat (PI), Sylvie Delpech (Université Paris, Orsay). High Temperature Molten Salt Studies. *France-Berkeley Fund.* 2021-2022. Contributions: molten salt electrochemistry, reference electrode development.
8. Vujic et. al. Nuclear Science and Security Consortium (NSSC). *NSSA.* 2021-2026. Contributions: Lead for Nuclear Chemical Engineering and Nuclear Engineering Focus Area, contributions in Molten Salt Reactor Safeguards and advanced fuel cycles.
9. Van Hentenryck etl. al. Artificial Intelligence Institute for Advances in Optimization (AI4OPT) NSF Institute. *NSF.* 2021-2026. Contributions: project collaborator, serving in the role of ethics board chair.
10. R. O. Scarlat (PI), B. Kaykovich (MIT), S. Vogel (LANL), M. Asta (UCB), I. Farnan (University of Cambridge). Probing Speciation of Light Elements in Molten Salts by Electrochemistry, High Temperature Liquid NMR, and Neutron Diffraction. *Department of Energy NEUP Grant*. 2021-2025.
11. M. Anderson (UW), R. O. Scarlat (coPI), N. Zweibaum (Kairos Power), J. Hensel (Powdermet), K. Robb (ORNL). High temperature Molten salt reactor pump component development and testing. *Department of Energy NEUP Grant*. 2021-2024. Contributions: tribology in molten salt, sensors for pump health monitoring.
12. R. O. Scarlat (PI). Thorcon Loop Corrosion Studies. *Thorcon Power.* 2021-2022. Deliverables: salt properties, corrosion performance of SS316H molten salt loop.
13. R. O. Scarlat (PI). Project 1: Thermodynamics Textbook: Creating Culturally and Historically Diverse Examples. Project 2: WriteNow Spring Session for Graduate Students and Postdocs by the National Center for Faculty

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14. C. Forsberg (MIT), D. Carpenter (MIT), A. Hawari (NCSU), R. O. Scarlat (coPI), K. Robb (ORNL). Molten Salt Reactor Test Bed with Neutron Irradiation. *Department of Energy NEUP Integrated Research Project. 2020-2025.* Contributions: on-loop electrochemical sensors, tritium transport.
15. R. Slaybaugh (PI) and in 2022 moved to R. O. Scarlat (PI). Machine Learning Informed Domain Decomposition for Monte Carlo Coupled Electron-Photon Transport. *Sandia National Laboratory*. 2021-2023. Contributions: Ph.D. Advisor for Vanessa Goss working on this project.
16. R. O. Scarlat (PI). Design and Fabrication of a Thermodynamic Reference Electrode (TRE) for molten salt cooled reactors. *Ultramet. (as part of DOE SBIR award).* 2021-2022.
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20. R. O. Scarlat (PI, initially), Mark Anderson (moved to PI for year 3), Kumar Sridharan, Mario Trujillo, Mikhail Kats (co-PIs). "Radiative heat transport and Optical Characterization of Molten Salts" *Department of Energy NEUP Grant*. 2017-2021.
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