Kansas State University
Carl R. Ice College of Engineering
Alan Levin Department of Mechanical and Nuclear Engineering
Manhattan, Kansas, United States of America
785-370-1374
bahadori@ksu.edu
scholar.google.com/citations?user=ZENxM-sAAAAJ
www.linkedin.com/in/amir-bahadori-ksu

Amir A. Bahadori

Curriculum Vitae

Education

2010–2012 **PhD Biomedical Engineering (Medical Physics Program)**, *J. Crayton Pruitt Family Department of Biomedical Engineering – University of Florida*, Gainesville, FL, US.

2008–2010 **MS Nuclear Engineering Sciences (Medical Physics Program)**, *Department of Nuclear and Radiological Engineering – University of Florida*, Gainesville, FL, US.

2003–2008 **BS Mechanical Engineering with Nuclear Engineering Option**, *Alan Levin Department of Mechanical and Nuclear Engineering – Kansas State University*, Manhattan, KS, US.
Summa Cum Laude, with Honors

2003–2008 **BS Mathematics**, *Department of Mathematics – Kansas State University*, Manhattan, KS, US.
Summa Cum Laude

Experience

2021 **Associate Professor**, *Alan Levin Department of Mechanical and Nuclear Engineering – Kansas State University*, Manhattan, KS, US.
2021–Present, Steve Hsu Keystone Research Faculty Scholar
2021–Present, Senior Reactor Operator, KSU TRIGA Mark II Nuclear Reactor Facility
Director, Radiological Engineering Analysis Laboratory
Affiliate Faculty, KSU Biomedical Engineering Program
Faculty Scientist, KSU Johnson Cancer Research Center

2015–2021 **Assistant Professor**, *Alan Levin Department of Mechanical and Nuclear Engineering – Kansas State University*, Manhattan, KS, US.
June–December 2017, KSU TRIGA Mark II Nuclear Reactor Facility Manager (Interim)

2013–2015 **Physical Scientist**, *Space Radiation Analysis Group (SRAG) – NASA Lyndon B. Johnson Space Center*, Houston, TX, US.
Principal Scientist, NASA Advanced Exploration Systems (AES) RadWorks Radiation Environment Monitor (REM) Project

2010–2013 **Radiation Scientist**, *University of Houston System*, Houston, TX, US.
Contractor for Radiation Health Officer Group - NASA Lyndon B. Johnson Space Center

2008–2012 **Graduate Assistant**, *Advanced Laboratory for Radiation Dosimetry Studies – University of Florida*, Gainesville, FL, US.

Funding

Current Extramural

2022 **Science Principal Investigator, Appendix C: Radiation-Induced Carcinogenesis Biomarker Identification with Hydrogel-Based Organ-on-a-Chip System**, *National Aeronautics and Space Administration/Wichita State University*, $141,169, Funded via NASA EPSCoR Program (Award in Process).
1 October 2022 - 30 September 2023

2021 **Principal Investigator, Analytical and Computational Support for Evaluation of Dementia and Neurocognitive Tests among Workers Exposed to Low-LET Radiation**, *National Aeronautics and Space Administration/National Council on Radiation Protection and Measurements*, $438,730.
16 September 2021 - 15 September 2026

2021 **Principal Investigator, Kansas State University Nuclear Engineering Fellowship Program**, *US Nuclear Regulatory Commission*, $452,696.
7 April 2021 - 6 April 2025

2020 **Principal Investigator, Radiation Detection with Novel High Voltage Switch Structure**, *US Department of Energy/Honeywell FM&T*, $398,859, (FY23 Award in Process).
5 November 2020 - 31 August 2023

2020 **Principal Investigator, X-DSMSND: A Dual-Sided Microstructured Semiconductor Neutron Detector with Integrated Pixel Read-Out**, *US Department of Energy/Radiation Detection Technologies, Inc.*, $494,953, STTR Phase II.
6 April 2020 - 5 October 2022

2017 **Principal Investigator, Radiation Transport Simulations in Support of Active Shielding Measurement Campaign**, *National Aeronautics and Space Administration/KBR*, $667,591.
13 October 2017 - 30 September 2022

Current Intramural

2022 **Fellow, Big 12 Faculty Fellowship**, *KSU Office of the Provost and Executive Vice President*, $2,411.
24 May 2022 - 1 September 2023

2021 **Co-Investigator, A Novel Multi-Disciplinary Approach to Improve Cancer Therapeutics (Cancer Research Collaboration of Excellence)**, *KSU Johnson Cancer Research Center Cancer*, $100,000.
1 May 2021 - 1 May 2023

Completed Extramural

2017–2022 **Co-Investigator, Kansas State University Nuclear Research Fellowship Program**, *US Nuclear Regulatory Commission*, $393,820.
30 June 2017 - 29 June 2022

2017–2020 **Principal Investigator, Electronics X-Ray Inspection Shielding and Prediction Simulation**, *US Department of Energy/Honeywell FM&T*, $514,544.
12 December 2017 - 30 September 2020

2018-'20 **Co-Investigator, Proposal for a Consortium for Nonproliferation-Enabling Capabilities**, *US Department of Energy/North Carolina State University*, $1,465,878.
31 July 2014 - 30 July 2020
Assumed Co-I role on 31 July 2018

2017–'20 **Co-Investigator, Radiological Systems Research for Detection, Localization, and Isotope Identification**, *US Department of Defense/Space and Naval Warfare Systems Command (SPAWAR)*, $463,322.
1 April 2017 - 12 June 2020

2019–'20 **Principal Investigator, X-DSMSND: A Dual-Sided Microstructured Semiconductor Neutron Detector with Integrated Pixel Read-Out**, *US Department of Energy/Radiation Detection Technologies, Inc.*, $62,892, STTR Phase I.
19 February 2019 - 18 February 2020

2018–'19 **Principal Investigator, A Dedicated Laboratory for Radioactive Sample Handling**, *US Department of Energy*, $167,493.
1 October 2018 - 30 September 2019

2018–'19 **Principal Investigator, Solid State Dual Neutron/X-Ray Imager**, *US Department of Energy/Honeywell FM&T*, $308,303.
4 January 2018 - 30 September 2019

2018–'19 **Co-Investigator, High-Resolution Scanning of Sub-Surface Lunar Water with Mobile Neutron Energy Spectrometer**, *National Aeronautics and Space Administration/Radiation Detection Technologies, Inc.*, $8,415.
27 July 2018 - 25 January 2019

2018 **Co-Investigator, Neutron Interrogation Imaging**, *US Department of Energy/Honeywell FM&T*, $90,620.
5 January 2018 - 30 September 2018

2018 **Co-Investigator, Enhanced Gamma-Ray Diagnostics and Imaging**, *US Department of Energy/Honeywell FM&T*, $56,137.
5 January 2018 - 30 September 2018

2017–2018 **Principal Investigator, Control Panel Modernization at the KSU TRIGA Reactor Facility**, *US Department of Energy*, $1,495,945.
10 September 2015 - 9 September 2018
Assumed PI role on 1 June 2017
Transferred PI role to new Reactor Manager on 12 January 2018

2009–2010 **Student Investigator, NASA Astronaut Dosimetry: Implementation of Scalable Human Phantoms and Benchmark Comparisons of Deterministic versus Monte Carlo Radiation Transport**, *National Aeronautics and Space Administration/Graduate Student Researchers Program*, $30,000, NNX09AK14H.
15 August 2009 - 14 August 2010
Year 2 (2010–2011) renewal awarded
Hired as NASA contractor prior to Years 2 and 3 of program

Completed Intramural

2020–'21 **Co-Investigator, Exercise and Nutritional Interventions on the Prevention of Cancer and Improving the Efficacy of Anti-Cancer Treatments (Center of Excellence Planning Grant)**, *KSU Johnson Cancer Research Center Cancer*, $6,000.
1 June 2020 - 31 May 2021

2018 **Mentor, KSU Johnson Cancer Research Center Cancer Research Award**, *Student: Prerona Kundu*, $1,000.

2017–2018 **Principal Investigator, Miniaturized Neutron Spectrometer for Characterizing Cancer Risk**, *KSU Johnson Cancer Research Center*, $20,000.
21 December 2017 - 20 December 2018

2018 **Mentor, KSU Johnson Cancer Research Center Graduate Student Travel Award**, *Student: Rohan Amare*, $1,200.

2018 **Mentor, KSU Johnson Cancer Research Center Graduate Student Travel Award**, *Student: Rajarshi Pal Chowdhury*, $900.

2017 **Mentor, KSU Johnson Cancer Research Center Graduate Student Travel Award**, *Student: Rohan Amare*, $985.

2016 **Mentor, KSU Johnson Cancer Research Center Cancer Research Award**, *Student: Elshaddai Abamegal*, $1,000.

Publications

Peer-Reviewed Journal Articles

[1] R. Amare*,[1], E. Hodneland, J. A. Roberts, **A. A. Bahadori**, and S. Eckels. Modeling a 3-D multiscale blood-flow and heat-transfer framework for realistic vascular systems. *Scientific Reports*, Accepted, 2022.

[2] N. Simerl*, J. Beavers, **A. A. Bahadori**, and W. J. McNeil. Aerial and collimated sensor radiological mapping following dispersal of activated potassium bromide. *Health Physics*, Accepted, 2022.

[3] S. Sharma*, T. Ochs, D. S. McGregor, S. L. Bellinger, W. J. McNeil, and **A. A. Bahadori**. Charge carrier motion and effect of fixed oxide charge in a microstructured silicon radiation detector. *Journal of Applied Physics*, In Review, 2022.

[4] S. Sharma*, D. Laramore*, T. Ochs, D. S. McGregor, S. L. Bellinger, W. J. McNeil, and **A. A. Bahadori**. Preliminary benchmarks and analysis of boundary conditions in a trenched microstructured silicon radiation detector. *Journal of Applied Physics*, 131:134503, 2022.

[5] M. P. Pfeifer*, N. Simerl*, R. Strahler, J. T. Casburn*, J. Porter, W. J. McNeil, and **A. A. Bahadori**. Methods for estimating x-ray machine output through measurement and simulation. *Applied Radiation and Isotopes*, 183:110125, 2022.

[6] D. Laramore*, S. Sharma*, S. L. Bellinger, L. C. Henson, T. R. Ochs, D. S. McGregor, L. Pinsky, **A. A. Bahadori**, and W. J. McNeil. Advancements in modeling conformally

[1] Students advised noted with asterisk

doped X-MSND radiation imagers. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 1038:166799, 2022.

[7] B. Kim, D. Nikolić, S. Madzunkov, J. Simcic, A. Belousov, D. Fry, E. Giunta*, R. Santillana Padilla*, L. Stegeman*, R. Pal Chowdhury*, **A.A. Bahadori**, and M. Lund. Systematic modeling of electrostatic radiation shields for deep space flight. *Radiation Physics and Chemistry*, 193:110007, 2022.

[8] L. Stegeman*, R. Pal Chowdhury*, D. Fry, M. L. Lund, S. Madzunkov, A. Belousov, and **A. A. Bahadori**. Experimental validation of the active shielding particle pusher code. *Journal of Applied Physics*, 129(2):024902, 2021.

[9] L. Stegeman*, T. Hieber, D. Sarkar, S. W. Oxandale, S. L. Bellinger, Z. C. Leseman, and **A. A. Bahadori**. Planar miniaturized fast neutron detector spectroscopy evaluation. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 1020:165865, 2021.

[10] N. Simerl*, J. Beavers, J. Milburn, M. Dodson, R. Strahler, R. Kroeger, I. Ulloa-Garcia, B. Moosman, T. Sin, J. Kagan, K. Nelson, N. Paradis, **A. A. Bahadori**, and W. McNeil. Contamination measurements from simultaneous activated potassium bromide radiological dispersal devices with a collimated vehicular sensor. *Health Physics*, 120(6):618–627, 2021.

[11] S. Sharma*, L. Vo., M. P. Pfeifer*, W. L. Dunn, W. J. McNeil, and **A. A. Bahadori**. Bulk material interrogation experimental results and validation with Geant4 for replacement of dangerous radiological sources in oil-well logging industries. *Applied Radiation and Isotopes*, 170:109602, 2021.

[12] R. Pal Chowdhury*, L. Stegeman*, R. F. Santillana Padilla*, M. L. Lund, S. Madzunkov, D. Fry, and **A. A. Bahadori**. Space radiation electrostatic shielding scaling laws: Beam-like and isotropic angular distributions. *Journal of Applied Physics*, 130(3):034903, 2021.

[13] J. Wilson, C. Werneth, T. Slaba, F. Badavi, B. Reddell, and **A. A. Bahadori**. Effects of the Serber first step in 3DHZETRN-v2.1. *Life Sciences in Space Research*, 26:10 – 27, 2020.

[14] R. Pal Chowdhury*, N. N. Stoffle, R. R. Rios, L. A. Stegeman*, and **A. A. Bahadori**. A novel, population-based approach to astronaut radiation risk assessment. *Radiation Physics and Chemistry*, 172:108736, 2020.

[15] D. Laramore*, S. Sharma*, K. C. Smallfoot*, S. L. Bellinger, L. C. Henson, T. R. Ochs, D. S. McGregor, **A. A. Bahadori**, and W. J. McNeil. Simulation of charge drift in surface doped, pixelated Micro-structured Semiconductor Neutron Detectors. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 978:164351, 2020.

[16] R. Amare*, **A. A. Bahadori**, and S. Eckels. A structured cleaving mesh for bioheat transfer application. *IEEE Open Journal of Engineering in Medicine and Biology*, 1:174 – 186, 2020.

[17] G. Wilson*, **A. A. Bahadori**, and H. Bindra. Radioactively driven colloids: A special case of anomalous diffusion. *Journal of Applied Physics*, 126:124308, 2019.

[18] **A. A. Bahadori**, R. Pal Chowdhury*, M. Kroupa, T. Campbell-Ricketts, A. Firan, D. J. Fry, R. Gaza, S. P. George, L. S. Pinsky, N. N. Stoffle, R. R. Rios, and C. J. Zeitlin. Slowing-down and stopped charged particles cause angular dependence for absorbed dose measurements. *Radiation Physics and Chemistry*, 155:89–96, 2019.

[19] M. Kroupa, T. Campbell-Ricketts, **A. A. Bahadori**, R. Pal Chowdhury*, A. Empl, S. George, and T. O'Brien. Extravehicular electron measurement based on an intravehicular pixel detector. *Journal of Geophysical Research: Space Physics*, 124:8271–8279, 2019.

[20] M. Kroupa, **A. A. Bahadori**, T. Campbell-Ricketts, S. P. George, N. Stoffle, and C. Zeitlin. Light ion isotope identification in space using a pixel detector based single layer telescope. *Applied Physics Letters*, 113(17):174101, 2018.

[21] M. Kroupa, **A. A. Bahadori**, T. Campbell-Ricketts, S. George, and C. Zeitlin. Kinetic energy reconstruction with a single layer particle telescope. *Applied Physics Letters*, 112(13):134103, 2018.

[22] T. C. Slaba, **A. A. Bahadori**, B. D. Reddell, R. C. Singleterry, M. S. Clowdsley, and S. R. Blattnig. Optimal shielding thickness for galactic cosmic ray environments. *Life Sciences in Space Research*, 12:1 – 15, 2017.

[23] M. M. Sands, D. Borrego, M. R. Maynard, **A. A. Bahadori**, and W. E. Bolch. Comparison of methods for individualized astronaut organ dosimetry: Morphometry-based phantom library versus body contour autoscaling of a reference phantom. *Life Sciences in Space Research*, 15:23 – 31, 2017.

[24] M. Kroupa, T. Campbell-Ricketts, **A. Bahadori**, and A. Empl. Techniques for precise energy calibration of particle pixel detectors. *Review of Scientific Instruments*, 88(3):033301, 2017.

[25] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Solar proton exposure of an ICRU sphere within a complex structure part I: Combinatorial geometry. *Life Sciences in Space Research*, 9:69–76, 2016.

[26] T. C. Slaba, J. W. Wilson, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Solar proton exposure of an ICRU sphere within a complex structure part II: Ray-trace geometry. *Life Sciences in Space Research*, 9:77–83, 2016.

[27] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. 3DHZETRN: Shielded ICRU spherical phantom. *Life Sciences in Space Research*, 4:46–61, 2015.

[28] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. 3DHZETRN: Neutron leakage in finite objects. *Life Sciences in Space Research*, 7:27–38, 2015.

[29] **A. Bahadori**, D. Miglioretti, R. Kruger, M. Flynn, S. Weinmann, R. Smith-Bindman, and C. Lee. Calculation of organ doses for a large number of patients undergoing CT examinations. *American Journal of Roentgenology*, 205(4):827–833, 2015.

[30] N. Stoffle, L. Pinsky, M. Kroupa, S. Hoang, J. Idarraga, C. Amberboy, R. Rios, J. Hauss, J. Keller, **A. Bahadori**, et al. Timepix-based radiation environment monitor measurements aboard the International Space Station. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 782:143–148, 2015.

[31] M. Kroupa, **A. Bahadori**, T. Campbell-Ricketts, A. Empl, S. M. Hoang, J. Idarraga-Munoz, R. Rios, E. Semones, N. Stoffle, L. Tlustos, et al. A semiconductor radiation imaging pixel detector for space radiation dosimetry. *Life Sciences in Space Research*, 6:69–78, 2015.

[32] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Advances in NASA radiation transport research: 3DHZETRN. *Life Sciences in Space Research*, 2:6–22, 2014.

[33] **A. A. Bahadori**, T. Sato, T. C. Slaba, M. R. Shavers, E. J. Semones, M. Van Baalen, and W. E. Bolch. A comparative study of space radiation organ doses and associated cancer risks using PHITS and HZETRN. *Physics in Medicine and Biology*, 58(20):7183–7207, 2013.

[34] T. C. Slaba, S. R. Blattnig, B. Reddell, **A. Bahadori**, R. B. Norman, and F. F. Badavi. Pion and electromagnetic contribution to dose: Comparisons of HZETRN to Monte Carlo results and ISS data. *Advances in Space Research*, 52(1):62–78, 2013.

[35] **A. A. Bahadori**, M. Van Baalen, M. R. Shavers, E. J. Semones, and W. E. Bolch. Dosimetric impacts of microgravity: an analysis of 5th, 50th and 95th percentile male and female astronauts. *Physics in Medicine and Biology*, 57(4):1047, 2012.

[36] **A. A. Bahadori**, M. Van Baalen, M. R. Shavers, C. Dodge, E. J. Semones, and W. E. Bolch. The effect of anatomical modeling on space radiation dose estimates: a comparison of doses for NASA phantoms and the 5th, 50th, and 95th percentile male and female astronauts. *Physics in Medicine and Biology*, 56(6):1671, 2011.

[37] **A. A. Bahadori**, P. Johnson, D. W. Jokisch, K. F. Eckerman, and W. E. Bolch. Response functions for computing absorbed dose to skeletal tissues from neutron irradiation. *Physics in Medicine and Biology*, 56(21):6873, 2011.

[38] D. Jokisch, D. Rajon, **A. A. Bahadori**, and W. Bolch. An image-based skeletal model for the ICRP reference adult male—specific absorbed fractions for neutron-generated recoil protons. *Physics in Medicine and Biology*, 56(21):6857, 2011.

[39] P. B. Johnson, **A. A. Bahadori**, K. F. Eckerman, C. Lee, and W. E. Bolch. Response functions for computing absorbed dose to skeletal tissues from photon irradiation—an update. *Physics in Medicine and Biology*, 56(8):2347, 2011.

Peer-Reviewed Conference Proceedings

[1] E. Giunta*, M. Pfeifer*, B. Davidson*, S. Sharma*, K. Huddleston, N. Simerl*, D. S. McGregor, W. McNeil, and **A. A. Bahadori**. Optimization of a GaN microstructured thermal neutron detector geometry using MCNP. In *14th International Conference on Radiation Shielding and 21st Topical Meeting of the Radiation Protection and Shielding Division*, volume Accepted, 2022.

[2] E. Giunta*, A. Cebula, and **A. A. Bahadori**. Modeling dynamic voxelized biological sample irradiation with non-uniform neutron beam. In *14th International Conference on Radiation Shielding and 21st Topical Meeting of the Radiation Protection and Shielding Division*, volume Accepted, 2022.

[3] L. Stegeman*, S. M. Madzunkov, D. Fry, and **A. A. Bahadori**. Outlook on Adjoint Radiation Transport Tool for Active-Passive Shielding Analysis. *Transactions of the American Nuclear Society*, 125(1):1088–1092, 2021.

[4] S. Sharma*, D. Laramore*, W. L. Dunn, W. J. McNeil, and **A. A. Bahadori**. Investigation of a Portable Active Neutron Interrogation System using MCNP. *Transactions of the American Nuclear Society*, 125(1):1102–1105, 2021.

[5] E. Giunta*, R. Elzohery, A. Gearhardt, J. C. Boyington, A. T. Cebula, J. Roberts, and **A. A. Bahadori**. KSU TRIGA Mark II Nuclear Reactor MCNP6 Model Improvements for Cell Irradiation Facility Design. *Transactions of the American Nuclear Society*, 124(1):686–689, 2021.

[6] L. K. Vo, S. Sharma*, M. Pinilla, W. L. Dunn, **A. A. Bahadori**, and W. J. McNeil. Time dependent signatures: Moisture content interpretation in well logging applications with a D-T neutron generator. *Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms*, 466:37 – 41, 2020.

[7] L. Stegeman*, R. Pal Chowdhury*, M. L. Lund, D. J. Fry, S. M. Madzunkov, and **A. A. Bahadori**. Assessment of electrostatic radiation shielding efficacy via void area calculation. *Transactions of the American Nuclear Society*, 122:584–587, 2020.

[8] M. Pinilla, A. Hellinger, L. Vo, W. Dunn, W. McNeil, and **A. Bahadori**. Design studies using MCNP6® for an oil well logging prototype tool and a test facility. *Radiation Physics and Chemistry*, 167:108393, 2020.

[9] M. P. Pfeifer*, N. Simerl*, R. J. Strahler, J. T. Casburn*, M. L. Dodson, J. Porter, W. J. McNeil, and **A. A. Bahadori**. Validation of radiation transport methods for ball grid array inspection systems. *Transactions of the American Nuclear Society*, 122:621–624, 2020.

[10] L. Vo, A. Hellinger, M. Pinilla, W. Dunn, **A. Bahadori**, and W. McNeil. Development of test facilities for studies relevant to replacing dangerous radiological sources. *AIP Conference Proceedings*, 2160:050001, 2019.

[11] **A. A. Bahadori**, M. P. Pfeifer*, and J. K. Shultis. Fluence on the surface of an absorbing sphere. *Transactions of the American Nuclear Society*, 121(1):1271–1273, 2019.

[12] L. A. Stegeman*, Q. Pease*, T. J. Hieber, D. Sarkar, S. W. Oxandale, S. L. Bellinger, Z. C. Leseman, and **A. A. Bahadori**. Neutron spectrum unfolding with a planar miniaturized fast-neutron detector. *Transactions of the American Nuclear Society*, 120:740–743, 2019.

[13] S. Sharma*, D. Laramore*, S. Bellinger, W. J. McNeil, and **A. A. Bahadori**. Simulation of signal formation and imaging in a dual-sided micro-structured semiconductor neutron detector. In *2019 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*, pages 1–3, 2019.

[14] M. P. Pfeifer*, N. Simerl*, J. Porter, W. J. McNeil, and **A. A. Bahadori**. Comparison of MCCAD and DAGMC for predictive capability with BGA inspection systems. *Transactions of the American Nuclear Society*, 120:767–770, 2019.

[15] R. Pal Chowdhury*, L. A. Stegeman*, J. E. Barzilla, D. J. Fry, A. Goel, M. L. Lund, S. M. Madzunkov, and **A. A. Bahadori**. Three-dimensional charge distribution for electrostatic space radiation shielding. *Transactions of the American Nuclear Society*, 120:744–747, 2019.

[16] S. W. Oxandale, L. A. Stegeman*, T. J. Hieber, D. Sarkar, S. L. Bellinger, **A. A. Bahadori**, and Z. C. Leseman. Fabrication, Modeling, and Testing of a Miniaturized Fast Neutron Detector. volume 10 of *ASME International Mechanical Engineering Congress and Exposition*, 2019.

[17] D. Laramore*, S. Sharma*, S. L. Bellinger, **A. A. Bahadori**, and W. J. McNeil. Simulation of charge carrier transport in pixelated micro-structured semiconductor neutron detectors. In *2019 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*, pages 1–3, 2019.

[18] D. Laramore*, W. J. McNeil, and **A. A. Bahadori**. Design of a micro-nuclear-mechanical system for strain measurement. *Radiation Physics and Chemistry*, 155:209–212, 2019.

[19] R. Pal Chowdhury*, L. A. Stegeman*, and **A. A. Bahadori**. Evaluation of Russian Roulette and particle splitting Monte Carlo methods for space radiation transport. *Transactions of the American Nuclear Society*, 118(1):805–808, 2018.

[20] R. Amare*, **A. A. Bahadori**, and S. Eckels. Modeling heat regulation with a structured mesh, finite volume approach in a voxelized domain. In *ASME 2018 International Mechanical Engineering Congress and Exposition*, pages V003T04A057–V003T04A057. American Society of Mechanical Engineers, 2018.

[21] **A. Bahadori**, E. Semones, M. Ewert, J. Broyan, and S. Walker. Measuring space radiation shielding effectiveness. *EPJ Web Conf.*, 153:04001, 2017.

[22] **A. A. Bahadori**, J. A. Roberts, M. Kroupa, and D. J. Fry. Reconstructing solar particle event spectra from absorbed dose measurements. *Transactions of the American Nuclear Society*, 116(1):909–912, 2017.

[23] L. S. Pinsky, J. Idarraga-Munoz, M. Kroupa, H. Son, N. Stoffle, E. Semones, **A. A. Bahadori**, D. Turecek, S. Pospíšil, J. Jakubek, Z. Vykydal, H. Kitamura, and Y. Uchihori.

Medipix in space on-board the ISS. *Journal of Radiation Research*, 55(S1):i62–i63, 2014.

[24] L. Pinsky, S. M. Hoang, J. Idarraga-Munoz, M. Kroupa, N. Stoffle, **A. Bahadori**, E. Semones, H. Kitamura, S. Kodaira, J. Jakubek, et al. Summary of the first year of Medipix-based space radiation monitors on the ISS. In *2014 IEEE Aerospace Conference*, pages 1–8. IEEE, 2014.

[25] L. Pinsky, S. Hoang, J. Idarraga, M. Kroupa, N. Stoffle, E. Semones, **A. Bahadori**, S. Pospíšil, J. Jakubek, Z. Vykydal, and D. Turecek. Summary of the experience with the first use of Medipix-based radiation measurements on the ISS. In *Proceedings of the International Astronautical Congress, IAC*, volume 1, pages 106–110. IAC, 2013.

[26] L. Pinsky, C. Amberboy, **A. Bahadori**, A. Burian, A. Empl, J. Hauss, J. Jakubek, H. Kitamura, K. Lee, S. Pospisil, E. Semones, N. Stoffle, D. Turecek, Y. Uchihori, Z. Vykydal, N. Yasuda, and N. Zapp. Preparing for active personal dosimetry on the International Space Station. In *Proceedings of the International Astronautical Congress, IAC*, volume 1, pages 193–199, 2011.

[27] A. Cebula, D. Gilland, L.-M. Su, D. Wagenaar, and **A. Bahadori**. A novel SPECT camera for molecular imaging of the prostate. In *SPIE Proceedings*, volume 8143. SPIE, 2011.

Technical Papers

[1] J. W. Wilson, T. C. Slaba, C. M. Werneth, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Neutron Diffusion Correction in 3DHZETRN-V2: ENDF/B. NASA/TP–20210020403, NASA Langley Research Center, Hampton, VA, 2021.

[2] D. Fry, M. Lund, **A. A. Bahadori**, R. Pal Chowdhury*, L. Stegeman*, and S. Madzunkov. Active Shielding Particle Pusher (ASPP): Charged-Particle Tracking Through Electromagnetic Fields. NASA/TP–2020–5002408, NASA Johnson Space Center, Houston, TX, 2020.

[3] J. W. Wilson, C. M. Werneth, T. C. Slaba, F. F. Badavi, B. Reddell, **A. A. Bahadori**, C. A. Sandridge, S. R. Blattnig, and R. B. Norman. Effects of the Serber First Step in 3DHZETRN-v2.1. NASA/TP–2019–220401, NASA Langley Research Center, Hampton, VA, 2019.

[4] J. W. Wilson, C. M. Werneth, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Neutron Angular Scatter Effects in 3DHZETRN: Quasi-Elastic. NASA/TP-2017-219597, NASA Langley Research Center, Hampton, VA, 2017.

[5] J. W. Wilson, T. C. Slaba, C. M. Werneth, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Advances in NASA Radiation Transport: 3DHZETRN-v2. NASA/TP-2017-219665, NASA Langley Research Center, Hampton, VA, 2017.

[6] N. Stoffle, H. Nounu, K. Lee, and **A. Bahadori**. Comparison of Passive and Active Exploration Flight Test 1 Radiation Detector Measurements with Trapped Proton and Vehicle Shielding Model Calculations. NASA/TP-2016-218599, NASA Johnson Space Center, Houston, TX, 2016.

[7] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Solar Proton Transport within an ICRU Sphere Surrounded by a Complex Shield: Combinatorial Geometry. NASA/TP-2015-218980, NASA Langley Research Center, Hampton, VA, 2015.

[8] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. A Study of Neutron Leakage in Finite Objects. NASA/TP-2015-218692, NASA Langley Research Center, Hampton, VA, 2015.

[9] **A. A. Bahadori**, E. J. Semones, R. Gaza, M. Kroupa, R. R. Rios, N. N. Stoffle, T. Campbell-Ricketts, L. S. Pinsky, and D. Turecek. Battery-operated Independent Radiation Detector Data Report from Exploration Flight Test 1. NASA/TP-2015-218575, NASA Johnson Space Center, Houston, TX, 2015.

[10] T. C. Slaba, J. W. Wilson, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. Solar Proton Transport within an ICRU Sphere Surrounded by a Complex Shield: Ray-Trace Geometry. NASA/TP-2015-218994, NASA Langley Research Center, Hampton, VA, 2015.

[11] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. A 3DHZETRN Code in a Spherical Uniform Sphere with Monte Carlo Verification. NASA/TP-2014-218271, NASA Langley Research Center, Hampton, VA, 2014.

[12] J. W. Wilson, T. C. Slaba, F. F. Badavi, B. D. Reddell, and **A. A. Bahadori**. 3D Space Radiation Transport in a Shielded ICRU Tissue Sphere. NASA/TP-2014-218530, NASA Langley Research Center, Hampton, VA, 2014.

Invention Disclosures

2020 — **Printed Circuit Board Real-Time Radiation Sensor Array**, Inventors: **A. A. Bahadori**, W. J. McNeil, M. P. Pfeifer*, N. Simerl*, J. Porter, KSURF Disc. No.: 2021-006.

2018 — **Switchable Passive Neutron Source**, Inventors: W. J. McNeil, **A. A. Bahadori**, D. Laramore*, KSURF Disc. No.: 2018-085; Attorney Docket No. 51452-PRO.
Provisional Patent Application Serial Number 62/722,030 filed 23 August 2018
PCT Patent Application No. PCT/US19/47925 filed 23 August 2019
US National Stage Application Serial Number 17/270,537 filed 23 February 2021

2018 — **MINIATURIZED FAST NEUTRON SPECTROMETER**, Inventors: **A. A. Bahadori**, Z. Leseman, KSURF Disc. No.: 2018-090; Attorney Docket No. 51260-PCT.
Provisional Patent Application Serial Number 62/721,239 filed 22 August 2018
PCT Patent Application No. PCT/US2019/047441 filed 21 August 2019
US National Stage Application Serial Number 17/270,101 filed 22 February 2021

Thesis/Dissertation

PhD Dissertation

TITLE NASA Astronaut Dosimetry: Implementation of Scalable Human Phantoms and Benchmark Comparisons of Deterministic versus Monte Carlo Radiation Transport

ADVISOR Professor Wesley E. Bolch

FUNDING US National Aeronautics and Space Administration

MS Thesis

TITLE Skeletal Neutron Dose Response Functions: A New Protocol for Evaluating Dose to Active Marrow and Bone Endosteum

ADVISOR Professor Wesley E. Bolch

FUNDING University of Florida

Invited Talks

Extramural

2022 **High Expectations for the Future of Low-Dose Radiation Research**, *American Nuclear Society Expert Panel*, Panelist, Virtual.
15 July 2022

2022 **President's Special Session – The Nuclear Grand Challenges: Moving the Needle**, *2022 American Nuclear Society Annual Meeting*, Panelist, Anaheim, CA, US.
14 June 2022

2022 **Computational and Experimental Approaches for Understanding Space Radiation Effects**, *NASA-CCNY Center for Advanced Batteries for Space Research Integration Meeting*, Virtual.
13 May 2022

2022 **Neutrons as Secondary Particles: Technical Overview**, *Workshop for Applied Nuclear Data Activities (WANDA) 2022*, DOE Conference ID: 11979, Virtual.
2 March 2022

2021 **Human Effects of Low Dose Ionizing Radiation Exposure**, *University of Florida American Nuclear Society Student Section*, Panelist, Virtual.
14 October 2021

2021 **NASA Active Shielding: A New Approach**, *Nuclear & Radiological Engineering/Medical Physics Programs Seminar*, Georgia Institute of Technology, Virtual.
15 April 2021

2021 **Talking About Low-Dose Radiation Risk**, *American Nuclear Society Expert Panel*, Panelist, Virtual.
21 January 2021

2020 **President's Special Session – Risky Business: Low-Dose Radiation and Public Perception**, *2020 American Nuclear Society Virtual Winter Meeting*, Panelist, Virtual due to Covid-19 Pandemic.
18 November 2020

2020 **Young Radiological Protection Expert Panel**, *NEA Workshop on Optimisation: Rethinking the Art of Reasonable*, Panelist and Moderator, Lisbon, PT.
15 January 2020

2019 **Collaborating with Industry on Radiological Engineering Research**, *Nuclear Engineering Colloquium*, The University of Tennessee, Knoxville, TN, US.
17 April 2019

2017 **NASA Timepix-based Radiation Monitoring: Past and Current Projects**, *Physics Talk*, Wichita State University, Wichita, KS, US.
29 March 2017

2016 **Bahadori Research Summary**, *Rensselaer Radiation Measurement & Dosimetry Group*, Rensselaer Polytechnic Institute, Troy, NY, US.
5 February 2016

2015 **Space Radiation Protection: An Evolving Field**, *Alan Levin Department of Mechanical and Nuclear Engineering*, Kansas State University, Manhattan, KS, US.
23 January 2015

2011 **Mathematics in Space Radiation Protection**, *KSU Undergraduate Mathematics Seminar*, Kansas State University, Manhattan, KS, US.
31 October 2011

2009 **Skeletal Neutron Absorbed Dose Response Functions**, *Committee 2 Task Group on Dose Calculations*, International Commission on Radiological Protection (ICRP), Ottawa, ON, CA.
20 April 2009

Intramural

2022 **Engineering Pathways at K-State (Panelist)**, *KSU Bridges to the Future Program*, Kansas State University, Manhattan, KS, US.
2 June 2022

2021 **"Meet the Professors" Series: Dr. Amir Bahadori**, *Student Chapter of the American Nuclear Society*, Kansas State University, Manhattan, KS, US.
16 November 2021

2018 **Monte Carlo Methods: Mathematical Foundation and Applications**, *KSU Undergraduate Mathematics Seminar*, Kansas State University, Manhattan, KS, US.
3 December 2018

2018 **KSU Nuclear Engineering Option**, *ME 101: Introduction to Mechanical Engineering*, Kansas State University, Manhattan, KS, US.
6 November 2018

2016 **Nuclear Engineering at Kansas State University**, *ME 101: Introduction to Mechanical Engineering*, Kansas State University, Manhattan, KS, US.
29 November 2016

2016 **Bahadori Research Summary**, *Student Chapter of the American Society of Mechanical Engineers*, Kansas State University, Manhattan, KS, US.
27 April 2016

2016 **Bahadori Research Summary**, *Student Chapter of the American Nuclear Society*, Kansas State University, Manhattan, KS, US.
11 February 2016

Contributed Talks

2021 **Outlook on Adjoint Radiation Transport Tool for Active-Passive Shielding Analysis**, *2021 American Nuclear Society Winter Meeting & Nuclear Technology Expo*, Presented by L. Stegeman*, Graduate Research Assistant, Washington, DC.
30 November–3 December 2021

2021 **Investigation of a Portable Active Neutron Interrogation System using MCNP**, *2021 American Nuclear Society Winter Meeting & Nuclear Technology Expo*, Presented by S. Sharma*, Graduate Research Assistant, Washington, DC.
30 November–3 December 2021

2021 **Simulation of Signal Formation and Imaging in a Dual-Sided Micro-Structured Semiconductor Neutron Detector**, *2nd AllPix^2 User Workshop*, Presented by S. Sharma*, Graduate Research Assistant, Virtual.
18 August 2021

2021 **KSU TRIGA Mark II Nuclear Reactor MCNP Model Improvements for Cell Irradiation Facility Design**, *2021 American Nuclear Society Annual Meeting*, Presented by E. Giunta*, Graduate Research Assistant, Virtual.
14–16 June 2021

2021 **NASA Active Shielding Simulation Strategy**, *43rd COSPAR Scientific Assembly*, Virtual due to Covid-19 Pandemic.
28 January–4 February 2021

2020 **Assessment of Electrostatic Radiation Shielding Efficacy via Void Area Calculation**, *2020 American Nuclear Society Annual Meeting*, Presented by L. Stegeman*, Graduate Research Assistant, Virtual due to Covid-19 Pandemic.
8–11 June 2020
Best Presentation Award, Radiation Protection and Shielding: General

2020 **Validation of Radiation Transport Methods for Ball Grid Array Inspection Systems**, *2020 American Nuclear Society Annual Meeting*, Presented by M. Pfeifer*, Graduate Research Assistant, Virtual due to Covid-19 Pandemic.
8–11 June 2020

2019 **Fluence on the Surface of an Absorbing Sphere**, *2019 American Nuclear Society Winter Meeting & Nuclear Technology Expo*, Washington, DC, US.
17–21 November 2019

2019 **Simulation of Signal Formation and Imaging in a Dual-Sided Micro-Structured Semiconductor Neutron Detector**, *2019 IEEE Nuclear Science Symposium & Medical Imaging Conference*, Presented by S. Sharma*, Graduate Research Assistant, Manchester, UK.
26 October–2 November 2019

2019 **Dual-Modality Imaging with Pixelated Microstructured Semiconductor Neutron Detector**, *Medipix Open Meeting*, Geneva, CH.
17 September 2019

2019 **Three-dimensional charge distribution for electrostatic space radiation shielding**, *2019 American Nuclear Society Annual Meeting*, Presented by R. Pal Chowdhury*, Graduate Research Assistant, Minneapolis, MN, US.
9–13 June 2019

2019 **Comparison of MCCAD and DAGMC for predictive capability with BGA inspection systems**, *2019 American Nuclear Society Annual Meeting*, Presented by M. Pfeifer*, Graduate Research Assistant, Minneapolis, MN, US.
9–13 June 2019
Best Presentation Award, Computational Tools for Radiation Protection and Shielding–1

2019 **Neutron spectrum unfolding with a planar miniaturized fast-neutron detector**, *2019 American Nuclear Society Annual Meeting*, Presented by L. Stegeman*, Graduate Research Assistant, Minneapolis, MN, US.
9–13 June 2019
Best Presentation Award, Radiation Protection and Shielding: General

2019 **A Novel, Population-based Approach to Astronaut Radiation Risk**, *3rd International Conference on Dosimetry and its Applications (ICDA-3)*, Lisbon, PT.
27–31 May 2019

2019 **Low Energy Gamma-ray Response and Time Dependent MCNP Simulation of the KSU Benchmarking Facility**, *Consortium for Nonproliferation Enabling Capabilities Workshop 2019*, Presented by S. Sharma*, Graduate Teaching Assistant, Raleigh, NC, US.
6 February 2019

2018 **Radioactively Driven Colloids**, *71st Annual Meeting of the American Physical Society's (APS) Division of Fluid Dynamics (DFD)*, Presented by G. Wilson*, Graduate Research Assistant, Atlanta, GA, US.
18–20 November 2018

2018 **Modelling Heat Regulation with a Structured Mesh, Finite Volume Approach in a Voxelized Domain**, *2018 American Society of Mechanical Engineers (ASME) International Mechanical Engineering Congress and Exposition (IMECE)*, Presented by R. Amare*, Graduate Research Assistant, Pittsburgh, PA, US.
9–15 November 2018

2018 **Radiation Dose Measurement on Printed Circuit Boards**, *47th WANTO/JOWOG 39*, Kansas City, MO, US.
6–9 November 2018

2018 **PHITS Simulation of Galactic Cosmic Rays on Mars: Code and Model Description**, *2nd MSL RAD Mars Space Radiation Modeling Workshop*, Presented by M. Pfeifer*, Graduate Research Assistant, Boulder, CO, US.
16–18 October 2018

2018 **PHITS Simulation of Galactic Cosmic Rays on Mars: Results**, *2nd MSL RAD Mars Space Radiation Modeling Workshop*, Presented by M. Pfeifer*, Graduate Research Assistant, Boulder, CO, US.
16–18 October 2018

2018 **Photon Production in Hydrogenous Space Radiation Shields**, *Health Physics Society 63rd Annual Meeting*, Cleveland, OH, US.
15–19 July 2018

2018 **Ethics in Space Radiation Protection**, *Health Physics Society 63rd Annual Meeting*, Cleveland, OH, US.
15–19 July 2018

2018 **Evaluation of Russian Roulette and Particle Splitting Monte Carlo Methods for Space Radiation Transport**, *2018 American Nuclear Society Annual Meeting*, Presented by R. Pal Chowdhury*, Graduate Research Assistant, Philadelphia, PA, US.
17–21 June 2018

2018 **PHITS Modeling to Estimate Dose on Mars Due to Solar Events**, *American Nuclear Society Student Conference 2018*, Presented by M. Pfeifer*, Graduate Research Assistant, Gainesville, FL, US.
5–7 April 2018

2018 **The Effects of Worn Detector Location on Neutron Detector Measurement**, *American Nuclear Society Student Conference 2018*, Presented by L. Stegeman*, Undergraduate Researcher, Gainesville, FL, US.
5–7 April 2018

2017 **Slowing and Stopping Charged Particles Cause Angular Dependence for Absorbed Dose Measurements**, *10th International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (IRRMA X)*, Chicago, IL, US.
9–13 July 2017

2017 **Reconstructing Solar Particle Event Spectra from Absorbed Dose Measurements**, *2017 American Nuclear Society Annual Meeting*, San Francisco, CA, US.
11–15 June 2017

2017 **Validation of Voxel Based Ray Tracer Code with 3D-HZETRN**, *American Nuclear Society Student Conference 2017*, Presented by R. Pal Chowdhury*, Graduate Teaching Assistant, Pittsburgh, PA, US.
6–9 April 2017

2016 **Measuring Space Radiation Shielding Effectiveness**, *13th International Conference on Radiation Shielding – Radiation Protection & Shielding Division Topical Meeting 2016 of American Nuclear Society*, Paris, FR.
3–6 October 2016

2016 **Penetrating Heavy Charged Particle Dose Measurements are Invariant with Angle of Incidence**, *Health Physics Society 61st Annual Meeting*, Spokane, WA, US.
17–21 July 2016

2014 **Development of the Battery-operated Independent Radiation Detector**, *The 19th Annual Workshop on Radiation Monitoring for the International Space Station*, Krakow, PL.
9–11 September 2014

2012 **NASA Medipix Space Dosimetry**, *Medipix2 Open Meeting*, Geneva, CH.
19 September 2012

2012

Medipix-Based Space Dosimetry at NASA: An Overview of Current Projects, *The 17th Annual Workshop on Radiation Monitoring for the International Space Station*, Austin, TX, US.
4–6 September 2012

2011

Improvements to the Ionizing Radiation Risk Assessment Program for NASA Astronauts, *Space Forum 2011*, Moscow, RU.
18–21 October 2011

2011

Automation of PCXMC and ImPACT for NASA Astronaut Medical Imaging Dose and Risk Tracking, *2011 Joint AAPM/COMP Meeting*, Vancouver, BC, CA.
31 July–4 August 2011

2011

Comparison of Organ Dosimetry for Astronaut Phantoms: Earth-Based vs. Microgravity-Based Anthropometry and Body Positioning, *2011 Joint AAPM/COMP Meeting*, Vancouver, BC, CA.
31 July–4 August 2011

2010

Effect of Anatomical Modeling on Space Radiation Dose Estimates: A Comparison of Doses for NASA Dosimetry Phantoms and University of Florida Hybrid Phantoms, *Health Physics Society 55th Annual Meeting*, Salt Lake City, UT, US.
27 June–1 July 2010

2009

Skeletal Neutron Dose Response Function Development for Hydrogen, *2009 American Nuclear Society Student Conference*, Best presentation in Medical Physics Therapy Section, Gainesville, FL, US.
2–5 April 2009

Poster Presentations

2022

Development of a Random Position Machine for Combined Microgravity and Radiation Exposures, *KSU Carl R. Ice College of Engineering Undergraduate Research and Creative Inquiry Showcase*, Presented by M. Culbertson*, Undergraduate Researcher, Manhattan, KS, US.
18–27 April 2022, Virtual; 28 April 2022, In Person
Tied for Third Place

2020

Hybrid Shielding Configuration for Sensitive Space Electronics Subjected to Extreme Space Weather, *IEEE Nuclear & Space Radiation Effects Conference 2020*, Presented by R. Pal Chowdhury*, PhD Graduate (Submitted abstract as a Graduate Research Assistant), Virtual due to Covid-19 Pandemic.
1–8 December 2020

2019

Exposure Rate Mapping of an Activated KBr Dirty-Bomb with Aerial and Ground-Based Methods, *2019 American Nuclear Society Winter Meeting & Nuclear Technology Expo*, Presented by N. Simerl*, Graduate Research Assistant, Washington, DC, US.
17–21 November 2019
Second Place, 2019 ANS Winter Meeting & Nuclear Technology Expo Alpha Nu Sigma Graduate Student Poster Competition

2019 **Simulation of Charge Carrier Transport in Pixelated Micro-Structured Semiconductor Neutron Detectors**, *2019 IEEE Nuclear Science Symposium & Medical Imaging Conference*, Presented by D. Laramore*, Graduate Research Assistant, Manchester, UK.
26 October–2 November 2019

2019 **Charge Drift Modeling and Fabrication of Pixelated Semiconductor Neutron Detectors**, *Consortium for Nonproliferation Enabling Capabilities Workshop 2019*, Presented by D. Laramore*, Graduate Research Assistant, Raleigh, NC, US.
6 February 2019

2019 **Real-Time Determination of Dose to Printed Circuit Board Electronics Imparted by X-ray Inspection Machine Sources**, *Consortium for Nonproliferation Enabling Capabilities Workshop 2019*, Created by M. Pfeifer*, Graduate Research Assistant; presented by W. McNeil, Raleigh, NC, US.
6 February 2019

2018 **Statistical Analysis of Solar Energetic Particle Events and PHITS Modeling to Estimate Dose on Mars**, *Kansas State University College of Engineering Undergraduate Research Poster Forum*, Presented by F. Alghamdi*, Undergraduate Researcher, Manhattan, KS, US.
26 April 2018

2017 **Modelling Thermoregulatory Blood Flow in a Voxelized Human Phantom**, *1st IEEE EMBS International Summer School on Computer Modeling in Medicine*, Presented by R. Amare*, Graduate Research Assistant, Charleston, SC, US.
11–17 June 2017

2017 **Predicting Organ Morphometry from External Measurements: A Pilot Study**, *Kansas State University College of Engineering Undergraduate Research Poster Forum*, Presented by E. Stallbaumer*, Undergraduate Researcher, Manhattan, KS, US.
27 April 2017

2017 **Probability Modeling for Total Event Integrated Fluence of Solar Proton Events: SEPEM Server Data Adjustments**, *Kansas State University College of Engineering Undergraduate Research Poster Forum*, Presented by B. Bombardier*, Undergraduate Researcher, Manhattan, KS, US.
27 April 2017

2017 **Investigating Secondary Cancer Risk Using a Water Phantom Simulation**, *Kansas State University Developing Scholars Program Research Poster Symposium*, Presented by E. Abamegal*, Undergraduate Researcher, Manhattan, KS, US.
9 April 2017

2017 **Variance reduction using HZETRN2015 for solar particle event transport: Response function comparison**, *2017 NASA Human Research Program Investigators' Workshop*, Co-authored by M. Pfeifer*, Graduate Research Assistant, Galveston, TX, US.
23–26 January 2017

2009

Skeletal Neutron Dose Response Function Development for Use in Proton Therapy, *American Association of Physicists in Medicine 51st Annual Meeting*, Anaheim, CA, US.
26–30 July 2009

Other Conference and Workshop Participation

2021

1st PHITS Online Advanced Tutorial, Virtual.
19–22 July 2021

2021

57th Annual NCRP Meeting - Radiation & Flight: A Down-to-Earth Look at Risks, Virtual.
19–20 April 2021

2018

42nd Committee on Space Research (COSPAR) Scientific Assembly, Pasadena, CA, US.
14–22 July 2018

2018

KSU College of Veterinary Medicine Translational and Comparative Oncology Research Symposium, Manhattan, KS, US.
17 March 2018

2017

Test, Research, and Training Reactors (TRTR) 2017, San Diego, CA, US.
17–21 September 2017

2017

Solar Heliospheric and INterplanetary Environment (SHINE) Conference 2017, Saint-Sauveur, QU, CA.
24–28 July 2017

2017

Solar Energetic Particles (SEP), Solar Modulation and Space Radiation: New Opportunities in the AMS-02 Era #2, Washington, DC, US.
24–26 April 2017

2016

2016 Marshall Space Flight Center NASA EPSCoR Technical Interchange Meeting, Huntsville, AL, US.
9 September 2016

2016

1st MSL RAD Mars Space Radiation Modeling Workshop, Boulder, CO, US.
28–30 June 2016

2015

2015 NASA Human Research Program Investigators' Workshop, Galveston, TX, US.
13–15 January 2015

2014

2014 NASA Human Research Program Investigators' Workshop, Galveston, TX, US.
12–13 February 2014

2013

2013 NASA Human Research Program Investigators' Workshop, Galveston, TX, US.
12–14 February 2013

2012

23rd Annual NASA Space Radiation Investigators' Workshop, Durham, NC, US.
8–11 July 2012

2012 **12th FLUKA Course**, *Thomas Jefferson National Accelerator Facility*, Newport News, VA, US.
30 April–4 May 2012

2011 **47th Annual NCRP Meeting - Scientific And Policy Challenges Of Particle Radiations In Medical Therapy And Space Missions**, Bethesda, MD, US.
7–8 March 2011

Research Advisees

Past Graduates

2020–2022 **Eric Giunta**, *MS in Nuclear Engineering*.
Thesis: Computational Techniques for Simulation and Design of a Biological Sample Irradiation Chamber
Current Position: PhD Student in Nuclear Engineering, Kansas State University, Manhattan, KS, US

2019–'22 **Luke Stegeman**, *MS in Nuclear Engineering*.
Thesis: Computational Development of the Planar Miniaturized Fast Neutron Detector
Current Position: PhD Candidate in Nuclear Engineering, Kansas State University, Manhattan, KS, US

2018–'22 **Sanchit Sharma**, *PhD in Nuclear Engineering (Co-Major Professor: W. McNeil)*.
Dissertation: An Advanced Microstructured Semiconductor Radiation Detector for Neutron Imaging and Oil Well Logging
Current Position: TBD

2017–2022 **Nathanael Simerl**, *PhD in Nuclear Engineering (Co-Major Professor: W. McNeil)*.
Dissertation: Utilization of Aerial Sensor Platforms for Characterization of Land-Based, Distributed Radiological Sources for Radiological Event Response
Current Position: TBD
2019 ANS Winter Meeting & Nuclear Technology Expo Alpha Nu Sigma Graduate Student Poster Competition - Second Place

2016–2020 **Rajarshi Pal Chowdhury**, *PhD in Nuclear Engineering*.
Dissertation: Hybrid Methods of Space Radiation Shielding for Astronauts against Deep-space Radiation
Initial Position: Lead Scientist for Space Exploration at StemRad, Inc., Tampa, FL, US
Current Position: Research Engineer for Cosmic Shielding Corporation, Remote
2018 KSU Johnson Cancer Research Center Graduate Student Travel Award

2016–2020 **Diego Laramore**, *PhD in Nuclear Engineering (Co-Major Professor: W. McNeil)*.
Dissertation: Simulation and Validation of Charge Carrier Drift in Pixelated Microstructured Semiconductor Neutron Detectors
Current Position: Research Scientist (Radiation Subject Matter Expert) at Leidos Innovations Corporation (contractor for NASA JSC SRAG), Houston, TX, US
January 2020–May 2020, Internship with NASA JSC SRAG

2016–2019 **Michael Pfeifer**, *MS in Nuclear Engineering*.
Thesis: Modeling Radiation on Mars for Solar Particle Events and Galactic Cosmic Rays
Current Position: PhD Candidate in Nuclear Engineering, Kansas State University, Manhattan, KS, US

2018–'19 **Graham Wilson**, *MS in Mechanical Engineering (Co-Major Professor: H. Bindra)*.
Thesis: Anomalous Diffusion and Self-Propulsion of Radioactive Colloidal Particles
Current Position: Thermal Hydraulic Analyst (Nuclear Engineer) at Bettis Atomic Power Laboratory, Pittsburgh, PA, US

Current Graduate Students

2022 **Bradley Crouch**, *PhD Student*, Graduate Research Assistant.
2022–Present, US Nuclear Regulatory Commission Graduate Fellowship

2021 **Bryce Davidson**, *MS Student*, Graduate Research Assistant, GaN FinFET Benchmarking and Radiation Response Simulation.

2021 **Jonathan Conde**, *MS Student*, Graduate Advisee (Distance).

2020 **Eric Giunta**, *MS Student*, Graduate Research Assistant, Computational Techniques for Simulation and Design of a Biological Sample Irradiation Chamber; Optimizating and Parallelizing Radiation Epidemiology Analyses for the Million Person Study.
2020–Present, US Nuclear Regulatory Commission Graduate Fellowship

2019 **Luke Stegeman**, *PhD Candidate – Expected Graduation: May 2023*, Graduate Research Assistant, Simulation and Testing of a Novel, Miniaturized Fast Neutron Spectrometer; NASA Active Radiation Shielding Simulation.
2019 ANS Annual Meeting Best Presentation Award, Rad. Protection and Shielding: General
2020 ANS Annual Meeting Best Presentation Award, Rad. Protection and Shielding: General

2017 **Michael Pfeifer**, *PhD Candidate – Expected Graduation: December 2022*, Graduate Research Assistant, Honeywell Electronics X-Ray Simulation and Validation.
2017–2019, 2021, US Nuclear Regulatory Commission Graduate Fellowship
2019 ANS Annual Meeting Best Presentation Award, Computational Tools in Radiation Protection and Shielding–1

2016 **Rohan Amare**, *PhD Candidate (Co-Major Professor: S. Eckels) – Expected Graduation: May 2023*, Graduate Research Assistant, Human Thermal Modeling using Advanced Computational Phantoms.
IMECE2018 Track 4 Student Paper Competition Finalist
2017, 2018 KSU Johnson Cancer Research Center Graduate Student Travel Award

Undergraduate

2021 **Matthew Culbertson**, NASA Active Radiation Shielding Simulation; Semiconductor Physics Simulation; Random Position Machine Development.
Tied for Third Place, 2022 KSU Carl R. Ice College of Engineering Undergraduate Research and Creative Inquiry Showcase

2022 **Bradley Crouch**, NASA Active Radiation Shielding Simulation.
Jet Propulsion Laboratory internship in Summer 2022
Began graduate studies with REAL in Fall 2022

2021–2022 **Lanie Mannebach**, Random Position Machine Development.

2020–2022 **Esther Adeniji**, NASA Active Radiation Shielding Simulation.
Non-KSU Undergraduate Researcher

2021 **Bryce Teaford**, Random Position Machine Development.

2021 **Samuel Tompkins**, X-DS-MSND Design and Simulation.

2020–2021 **Rene Santillana Padilla**, NASA Active Radiation Shielding Simulation.

2019–'20 **Kaitlyn Smallfoot**, Testing of Miniaturized Fast Neutron Spectrometer; X-MSND Testing and Data Acquisition.

2020 **Hanavan Kuhn**, GUI Development for Honeywell X-Ray and NASA Active Shielding.

2020 **Mason Phelps**, CAD Modeling for Honeywell X-Ray.

2019 **Jack Casburn**, Ancillary Data Acquisition in Support of Electronics X-Ray Shielding and Prediction Project; Testing of Handheld Surface Scanner.

2019 **Emily Domann**, Geant4 Evaluation of Mouse Exposures at the NASA Space Radiation Laboratory.

2018–'19 **Eric Giunta**, MSND-Timepix Modeling with PHITS, MCNP, and AllPix^2.
Began graduate studies with REAL in Spring 2020

2018–'19 **Prerona Kundu**, Modeling Output of Photon Radiotherapy Machines; Biophysical Modeling of Radiation Effects.
2018 KSU Johnson Cancer Research Center Cancer Research Award
2018 Roy G. Post Foundation Undergraduate Scholarship
2019 Udall Undergraduate Scholarship Honorable Mention

2018–'19 **Zachary Plymesser**, MSND-Timepix Modeling with COMSOL Multiphysics.

2017–2019 **Luke Stegeman**, Human Body Shielding of Neutron Detectors; Neutron Beam Chopper Simulation; Simulation of a Novel, Miniaturized Fast Neutron Spectrometer; NASA Active Radiation Shielding Simulation.
2017 NUSIK Program Participant (US Nuclear Regulatory Commission)
2018 Alan Levin Department of Mechanical and Nuclear Engineering Outstanding Senior
Began graduate studies with REAL in Summer 2019

2018 **Austin Mackey**, Honeywell Electronics X-Ray Measurements.

2018 **Margaret Jones**, Honeywell Electronics X-Ray Measurements.

2017–2018 **Quentin Pease**, Simulation and Construction of a Novel, Miniaturized Fast Neutron Spectrometer.

2017–2018 **Faisal Alghamdi**, Exploring Relationships Among Energy Channels in Solar Particle Events.

2017 **Lucas Wodrich**, Space Nuclear Reactor Perturbation from Solar Activity.
2017 NUSIK Program Participant (US Nuclear Regulatory Commission)

2016–2017 **Elshaddai Abamegal**, Application of NASA Quality Factor to Charged Particle Radiotherapy.
2016 KSU Johnson Cancer Research Center Cancer Research Award
2016–2017 KSU Developing Scholars Program Participant

2016–2017 **Blake Bombardier**, Probability Modeling for Total Event Integrated Fluence of Solar Proton Events: SEPEM Data Server Adjustments.

2016–2017 **Emily Stallbaumer**, Predicting Organ Morphometry from External Measurements: A Pilot Study.
2016–2017 KSU Women in Engineering Laboratory Experience Participant

High School

2020 **David Wen**, Space Nuclear Propulsion, Blue Valley Northwest High School (KS).

2020 **Elijah Amos**, Space Radiation Shielding Studies, Hampton Bays High School (NY).
Hampton Bays Science Research Program

Teaching Experience

2017–2022 **NE 690, Radiation Protection and Shielding**, *Instructor of Record*, KSU Alan Levin Department of Mechanical and Nuclear Engineering (MNE).
Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2021, Fall 2022

2022 **NE 891, Advanced Radiation and Human Health**, *Instructor of Record*, KSU MNE.
Spring 2022 (first offering as a uniquely-numbered course)

2020–2022 **ME 574, Interdisciplinary Industrial Design Projects 1**, *Instructor of Record (Ethics Component)*, KSU MNE.
Fall 2020 (new course component), Spring 2021, Fall 2021, Spring 2022

2021 **NE 495, Elements of Nuclear Engineering**, *Instructor of Record*, KSU MNE.
Spring 2021

2019–'20 **NE 620/860, Radiation and Human Health**, *Instructor of Record*, KSU MNE.
Spring 2019 (new course), Spring 2020

2019 **NE 495, Elements of Nuclear Engineering**, *Instructor of Record*, KSU MNE.
Fall 2019

2016–2018 **NE 648, Nuclear Reactor Laboratory**, *Instructor of Record*, KSU MNE.
Spring 2016, Spring 2017, Spring 2018

2017 **ME 575, Interdisciplinary Industrial Design Projects 2**, *Instructor of Record*, KSU MNE.
Spring 2017

2016 **NE 495, Elements of Nuclear Engineering**, *Guest Lecturer*, KSU MNE.
Fall 2016

2016 **ME 574, Interdisciplinary Industrial Design Projects 1**, *Instructor of Record*, KSU MNE.
Fall 2016

2007 **NE 250, Reactor Operations Laboratory**, *Undergraduate Laboratory Instructor*, KSU MNE.
Spring 2007, Fall 2007

Honors and Awards

2022 **Big 12 Faculty Fellow**, *Kansas State University*, 2022–2023 Academic Year.
Guest of the Saha Lab of Radiation Biology at The University of Kansas Medical Center 12-21 July 2022

2022 **American Nuclear Society Presidential Citation**, *2022 ANS Annual Meeting*.
For effective leadership addressing radiation issues for ANS, including the revision of Position Statement 41 "Health Effects of Low-Level Radiation."

2021 **Outstanding Division Service Award**, *American Nuclear Society Radiation Protection & Shielding Division*.

2020 **"CHP in the Spotlight" for October 2020**, *American Academy of Health Physics*.

2020 **2019 Most Valued Reviewer**, *Life Sciences in Space Research*.
One of 10 selected by journal editors

2019 **NASA Group Achievement Award**, *Advanced Radiation Protection Thick Target GCR Shielding*.

2018 **Zeldovich Medal for Scientific Commission F, Life Sciences as Related to Space**, *Jointly awarded by Russian Academy of Sciences and Committee on Space Research of the International Council for Science (COSPAR)*.

2017 **Highly Regarded Nuclear Engineering Professor**, *Recognized by OnlineEngineeringPrograms.com*.

2017 **Kansas State University College of Engineering Research Proposal Teamwork Award**.

2015 **NASA Group Achievement Award**, *Advanced Exploration Systems RadWorks Project*.

2012 **NASA Group Achievement Award**, *Advanced Exploration Systems Deep Space Habitat Project*.

2008–2012 **University of Florida Alumni Graduate Award**.

2009–2010 **NASA Graduate Student Researchers Program Fellowship**.
2010–2011, Selected for funding; declined to accept full-time position as NASA JSC contractor

2008–2010 **American Nuclear Society Graduate Scholarship**.
2008–2009 Walter Meyer Scholarship
2009–2010 Vern R. Dapp Memorial Scholarship

2008 **Honorable Mention**, *National Science Foundation Graduate Fellowship*.

2008 **Outstanding Senior**, *Kansas State University Department of Mechanical and Nuclear Engineering*.

2008 **Outstanding Senior**, *Kansas State University Department of Mathematics*.

2006–2008 **American Nuclear Society Undergraduate Scholarship**.
2006–2007 Angelo F. Bisesti Memorial Scholarship
2007–2008 Joseph R. Dietrich Memorial Scholarship

2006–2008 **Department of Energy Nuclear Engineering/Health Physics Scholarship**.

2006–2008 **National Academy for Nuclear Training Scholarship**.

2003–2007 **Kansas State University Putnam Scholarship**.

Professional Service

Extramural

2022 **Treasurer**, *International Radiation Physics Society*.

2022 **Author**, *"ANS Grand Challenge: Low-dose radiation" (Spotlight Article)*, July 2022 Issue of *Nuclear News*.

2022 **Reviewer**, *Leveraging Advances in Modern Science to Revitalize Low-Dose Radiation Research in the United States*, A Consensus Study Report of The National Academies of Sciences, Engineering, and Medicine (NASEM).

2021 **Full Member, Environmental and Siting Consensus Committee**, *American Nuclear Society*.

2021 **Executive Committee Member, Radiation Protection and Shielding Division**, *American Nuclear Society*.

2021 **Rapid Response Taskforce Member**, *American Nuclear Society*.

2020 **Technical Program Chair, Radiation Protection and Shielding Division**, *American Nuclear Society*.
2020–2021, Chair-in-Training
2021–Present, Chair

2020 **Review Editor**, *Frontiers in Energy Research - Nuclear Energy*.

2019 **Associate Member, ANS-2.22 Working Group, Environmental Radiological Monitoring at Operating Nuclear Facilities**, *American Nuclear Society*.

2017 **Reviewer**, *Various peer-reviewed journals, including Progress in Nuclear Energy, Nuclear Technology, Space Weather, Applied Radiation & Isotopes, Icarus, Life Sciences in Space Research, Advances in Space Research, Frontiers in Physics, Journal of Radiation Protection, Radiation & Environmental Biophysics, IEEE Transactions on Radiation and Plasma Medical Sciences, IEEE Transactions on Pattern Analysis and Machine Intelligence, Transactions of the American Nuclear Society, Journal of Radiation Research*.

2016 **Associate Member, ANS-6.4.2 Working Group, Specification for Radiation Shielding Material**, *American Nuclear Society*.

2021 **Reviewer**, *DOE Office of Science (Biological & Environmental Research) SBIR/STTR Program*.

2021 **Reviewer**, *NASA Space Technology Graduate Research Opportunities (NSTGRO)*.

2017–2021 **Vice Treasurer**, *International Radiation Physics Society*.

2019–'21 **Working Group on Revision to Position Statement 41 on Health Effects of Low Level Ionizing Radiation Exposure**, *American Nuclear Society*.
2019–2020, Co-Chair
2020–2021, Chair

2019–'21 **Secretary, Radiation Protection and Shielding Division**, *American Nuclear Society*.

2020 **Session Chair, Radiation Protection and Shielding: General-II**, *2020 American Nuclear Society Virtual Winter Meeting* .

2020 **Poster Judge, Alpha Nu Sigma Graduate Student Poster Competition**, *2020 American Nuclear Society Virtual Winter Meeting*.

2020 **Panelist**, *US Nuclear Regulatory Commission Scholarship Program*.

2020 **Co-Author**, *"Harnessing the Promise of Radiation: The Art of Reasonableness"*, September 2020 Issue of *Nuclear News*.

2020 **Session Chair, Computational Methods for Radiation Protection and Shielding**, *2020 American Nuclear Society Annual Meeting*.

2019 **Poster Judge, Alpha Nu Sigma Graduate Student Poster Competition**, *2019 American Nuclear Society Winter Meeting & Nuclear Technology Expo*.

2019 **Session Chair, Dosimetry in Space Applications**, *3rd International Conference on Dosimetry and its Applications (ICDA-3)*.

2019 **Reviewer**, *NASA Future Investigators in Earth and Space Science Technology (FINESST) Heliophysics Program*.

2019 **Reviewer**, *41st Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*.

2018–'19 **Member, Government Relations Committee**, *Health Physics Society*.

2018 **Panelist**, *NASA Astrophysics Science SmallSat Studies (AS^3)*.

2018 **Session Chair, Contemporary Topics**, *Health Physics Society 63rd Annual Meeting*.

2017 **Session Chair, Dosimetry and Detector Applications II**, *10th International Topical Meeting on Industrial Radiation and Radioisotope Measurement Applications (IRRMA X)*.

2017 **Session Judge, Radiation Protection and Shielding, Biology and Medicine, Accelerator Applications**, *American Nuclear Society Student Conference 2017*.

2017 **Reviewer**, *NASA Experimental Program to Stimulate Competitive Research (EPSCoR)*.

2016 **Reviewer**, *NASA Space Technology Research Fellowship Program*.

Intramural

2022 **Member**, *KSU Reactor Safeguards Committee*.

2018 **Member**, *KSU MNE Undergraduate Program & ABET Assessment Committee*.

2018 **Member**, *KSU Situational Awareness Working Group*.

2017 **Faculty Advisor**, *KSU Alpha Nu Sigma*.

2016 **Faculty Advisor**, *KSU American Nuclear Society Student Chapter*.

2021 **Senior Design Sponsor**, *KSU MNE*, Development of a Random Position Machine for Combined Exposure Studies.

2018 **Member**, *KSU TRIGA Mark II Nuclear Reactor Facility Supervisor Search Committee*.

2018 **Senior Design Poster Evaluator**, *KSU MNE*.

2017 **Senior Design Sponsor**, *KSU MNE*, X-Ray and Neutron Radiography with a DSLR Camera System.

2017 **Ex Officio Member**, *KSU Reactor Safeguards Committee*.

2017 **Chairman**, *KSU TRIGA Mark II Nuclear Reactor Facility Manager and Supervisor Search Committees*.

2016 **Judge**, *KSU Research and the State Graduate Poster Forum*.

2016 **Judge**, *KSU College of Engineering Undergraduate Research Poster Forum*.

2007 **Student Mentor**, *KSU MNE*, ME 101, Introduction to Mechanical Engineering.

Affiliations

2022 **Member**, *Radiation Research Society*.

2020 **Member**, *IEEE Engineering in Medicine and Biology Society (EMBS)*.

2018 **Associate**, *Committee on Space Research of the International Council for Science (COSPAR)*.

2017 **Member**, *International Radiation Physics Society*.
2017–2021, Vice Treasurer
2022–Present, Treasurer

2016 **Member**, *American Nuclear Society*.
2005–2011, Student Member
2019–2021, Secretary of Radiation Protection and Shielding Division (RPSD)
2020–2021, RPSD Technical Program Chair-in-Training
2016–Present, ANS-6.4.2 Standard Working Group Associate Member
2019–Present, ANS-2.22 Standard Working Group Associate Member
2021–Present, RPSD Technical Program Chair
2021–Present, RPSD Executive Committee Member
2021–Present, Rapid Response Taskforce Member
2021–Present, Environmental and Siting Consensus Committee Full Member

2015 **Member**, *American Academy of Health Physics*.

2011 **Life Member**, *Kansas State University Alumni Association*.

2009 **Member**, *Health Physics Society*.
2016–Present, Mid-America Chapter of the Health Physics Society Member
2018–2019, Government Relations Committee Member

2007 **Member**, *Alpha Nu Sigma*.

2004 **Member**, *Tau Beta Pi*.

2008–2014 **Member**, *American Association of Physicists in Medicine*.

2008–2011 **Member**, *University of Florida Society of Health and Medical Physics Students*.
2010–2011, Treasurer

Professional Development and Other Activities

2021 **Licensed Senior Reactor Operator, USNRC License No. SOP-504570**, *KSU TRIGA Mark II Nuclear Reactor Facility*, Manhattan, KS, US.

2018 **Security Clearance at TOP SECRET Level**.
Security Clearance at SECRET Level held from 2013–2018

2017 **KSU TRIGA Mark II Nuclear Reactor Facility Unescorted Access**.
Previously held from 2005–2008

2015 **Diplomate of the American Board of Health Physics**.
Certified in the comprehensive practice of Health Physics
Recertified through December 31, 2023

2010 **Medical Physics Rotation**, *Mayo School of Health Sciences*, Jacksonville, FL, US.

2005–2008 **Licensed Reactor Operator, USNRC License No. OP-70465**, *KSU TRIGA Mark II Nuclear Reactor Facility*, Manhattan, KS, US.

2007 **Passed Fundamentals of Engineering (FE) Examination**.