

Hunter Ratliff

Nuclear Engineer, Code Developer

27 years old

Tokai, Ibaraki, Japan

available upon request

hratliff.com

available upon request

United States citizenship

Skills -

Languages

English

Japanese

Programming

Python, Jupyter

Fortran (IV/77/90/08)

MATLAB

C++

CMD/Bash scripting

JavaScript, Brython

Nuclear / Scientific

MCNP6/X/5, PHITS

Git, GitHub

ROOT

SCALE/ORIGEN

Geant4

Other

LaTeX, TikZ, MetaPost •

Microsoft Office Suite

Windows local systems •

Unix remote systems

HTML, CSS, Markdown • • • • •

Summary

Hunter is a nuclear engineer whose experience is predominantly with radiation transport simulations using MCNP and PHITS, code development in Python and Fortran, hadron accelerator experiments, analysis and visualization of large datasets, activation and decay calculations, and space radiation modeling. He also has an interest in radiation protection and shielding, radioisotope production, and nuclear medicine.

Experience

Apr. 2019 present

Postdoctoral Fellow

Japan Atomic Energy Agency (JAEA)

Member of the PHITS particle transport code development team, serving as the current lead developer of the DCHAIN-PHITS activation, buildup, burnup, and decay code coupled to and distributed alongside PHITS. Implemented modern decay and cross section libraries, uncertainty propagation, reaction tracking, tetrahedral and 3-D grid mesh geometry support, performance improvements, new input/output features, and more into DCHAIN.

May 2015 -Feb. 2019

Graduate Research Assistant The University of Tennessee, Knoxville Conducted and analyzed data from accelerator experiments emulating radiation conditions within spacecraft, characterized neutron spectra, and modeled the experiment in MCNP. Other projects in-

cluded modeling the Martian surface's radiation environment from galactic cosmic rays and solar particle events in MCNP and PHITS and modernizing the CLSQ Fortran IV decay analysis code in Python.

Aug. 2015 -Dec. 2016

Graduate Teaching Assistant The University of Tennessee, Knoxville Lead laboratory experience portions of courses within the Nuclear

Engineering Department, further developing skills in troubleshooting radiation detectors and associated pulse chain equipment, teaching, communication, and providing constructive guidance to students.

May 2014 -Aug. 2014

Engineering Student Intern

Oak Ridge National Laboratory

Ran, debugged, and composed documentation for an in-house computational fluid dynamics code written in C++ and Fortran.

Education

May 2015 -Dec. 2018

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Ph.D. in Nuclear Engineering The University of Tennessee, Knoxville

Organized, conducted, and analyzed data from 400 hours of beam experiments at the NASA Space Radiation Laboratory in Brookhaven National Laboratory, characterizing the neutron environment within (emulated) spacecraft bombarded by cosmic rays using established time-of-flight and newly developed deconvolution techniques, requiring careful time management and monitoring during the experiments to maximize data quality followed by substantial scripting to filter and process the raw data into spectra and to generate, run, and process MCNPX/6 models of the experiment.

May 2015 -Dec. 2018

M.S. in Nuclear Engineering

The University of Tennessee, Knoxville Designed and conducted MCNP6 simulations of the galactic cosmic ray-induced radiation environment on the Martian surface, modeling the individual particle spectra and dosimetric data as seen by the

Radiation Assessment Detector onboard the Mars Curiosity Rover.

Aug. 2011 -May 2015

B.S. in Nuclear Engineering

The University of Tennessee, Knoxville Designed a reactor and modeled its criticality and shielding in MCNP

for a proposed critical experiment facility as a final design project.

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Short Bio

Hunter studied nuclear engineering at the University of Tennessee from 2011 to 2015 at an undergraduate level and, when presented with very interesting space radiation research opportunities, continued on with his graduate studies at UTK, graduating at the end of 2018. Afterward, he moved to Japan in early 2019 to join the PHITS development team at the Japan Atomic Energy Agency.

Proficiencies -

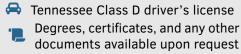
- Programing and scripting
- Monte Carlo methods/simulation
- Data analysis and visualization
- Documentation and presentation
- Nuclear data processing/formatting
- Web design/online tool development

Personal

After living his entire life in the US state of Tennessee, Hunter made his first trip abroad: moving to Japan. Since, he has thoroughly enjoyed exploring the local scenery, culture, and language. New experiences in travel, cuisine, and forces of nature (earthquakes) have truly opened his eyes to the staggering variety of experiences the world has to offer. He is enthusiastic about learning other languages and cultures on his now-international journey through life.

Other -





Publications

2020	Modernization of the DCHAIN-PHITS activation code with new fea-
	tures and updated data libraries

H.N. Ratliff, N. Matsuda, S. Abe, T. Miura, T. Furuta, Y. Iwamoto, and T. Sato

Nucl. Instrum. Methods Phys. Res., B (in institutional review)

2018 Secondary neutron yields from thick-target GCR accelerator ex-

periments

H.N. Ratliff, N.A. McGirl, L.A. Castellanos, H. Wang, A.P. Srikrishna,

and L.H. Heilbronn

Proceedings of 20th Topical Meeting of the Radiation Protection and

Shielding Division of the American Nuclear Society

Light charged ion measurements and Monte Carlo calculations 2018

from thick targets bombarded by protons and heavy ions

H. Wang, L.A. Castellanos, N.A. McGirl, H.N. Ratliff, A.P. Srikrishna,

and L.H. Heilbronn

Proceedings of 20th Topical Meeting of the Radiation Protection and

Shielding Division of the American Nuclear Society

2017 Simulation of the GCR spectrum in the Mars Curiosity Rover's RAD

detector using MCNP6

H.N. Ratliff, M.B.R. Smith, and L.H. Heilbronn

Life Sciences in Space Research

2017 The radiation environment on the surface of Mars - Summary of

model calculations and comparison to RAD data

D. Matthiä, D.M. Hassler, W. de Wet, B. Ehresmann, A. Firan, J. Flores-McLaughlin, J. Guo, L.H. Heilbronn, K. Lee, H.N. Ratliff, R.R. Rios, T. Slaba, M.B.R. Smith, L.W. Townsend, T. Berger, G. Reitz, R.F. Wimmer-

Schweingruber, and C. Zeitlin Life Sciences in Space Research

Honors and Awards

2015 – 2018	Chancellor's Distinguished Graduate Fellowship	Univ. of Tennessee
2011 – 2015	Chancellor's Honors Program	Univ. of Tennessee
2013 – 2014	Eastland Family Engineering Scholarship	
2013	US Nuclear Regulatory Commission Scholarship	

2012 – 2013 Energy Solutions Corporation Engineering Scholarship 2011 – 2012 Tennessee Society of Professional Engineers Scholarship

Hobbies

Coding Leveraging the power of scripting to automate everyday tasks like

resizing desktop wallpapers to a desired aspect ratio, managing file

properties, backing up data, and more.

Constructing and tinkering with his personal website hratliff.com, Web design

custom HTML browser new tab page, and online-viewable interactive

Jupyter notebooks with scientific applications.

Responsibly exploring the diverse world of cocktails and mixed drinks, Mixology

learning about the history of the ingredients and many recipes.

Watching educational documentaries and videos on a wide variety of Edutainment

topics including geography, mountaineering, exploration, technology, construction, engineering, linguistics, wood/metalworking, business, geopolitics, travel, chemistry, mathematics, food, and history.

References

available upon request

July 10, 2020 **Hunter Ratliff**