

Adam Richie-Halford

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Education

- 2013 – 2020 ◇ **Ph.D. Physics, University of Washington, Seattle, WA**
Thesis title: *Quantum Monte Carlo Studies of the BCS-BEC crossover.*
- 2008 – 2010 ◇ **M.S. Physics, California State University, Long Beach, CA**
Thesis title: *Numerical modeling of the singlet proximity effect in a superconductor-ferromagnet trilayer.*
Graduate Dean's List—Top 1% of College of Natural Sciences
- 2001 – 2006 ◇ **B.S. Engineering Physics, Embry-Riddle Aeronautical University, Daytona Beach, FL**
Summa Cum Laude, Minor in Mathematics

Employment History

- 2022 – pres ◇ **Postdoctoral Scholar** Developmental-Behavioral Pediatrics, Stanford University, Stanford, CA
· Developing browser-based assessments for the deep phenotyping of dyslexia
· Investigating white matter developmental trajectories associated with preterm birth
· Support lab scientists in data science and research software engineering
- 2020 – 2022 ◇ **UW Data Science Postdoctoral Fellow** eScience Institute, University of Washington, Seattle, WA
· Developed statistical techniques and software for analysis of diffusion MRI data
· Explored correlates of childhood adversity in white matter development
- 2013 – 2020 ◇ **Graduate Research Assistant** Department of Physics, University of Washington, Seattle, WA
· Ph.D. in nuclear theory, performing Monte Carlo simulations on world's largest supercomputers.
· Interdisciplinary collaboration in neuroimaging, machine learning, and cloud computing.
- 2014 ◇ **Visiting Graduate Researcher** Institute for Advanced Computational Science, SUNY–Stony Brook, NY
· Developer on open-source high-performance computing environment for peta-scale supercomputers.
- 2011 – 2013 ◇ **Rural Health Educator** United States Peace Corps, Kingdom of Morocco
· Designed and managed federally funded projects to create youth health education programs at local schools.
· Combated water-borne diseases through education programs and bathroom infrastructure projects.
- 2009 – 2010 ◇ **Lead Space Systems Analyst** United States Air Force, Los Angeles Air Force Base, El Segundo, CA
· Led utility analysis of future space systems; developed stochastic simulations for satellite operations.
· Program manager for \$8M USD software to evaluate space systems with 75+ DoD & industry users.
- 2007 – 2010 ◇ **Graduate Research Assistant** Department of Physics and Astronomy, CSULB, Long Beach, CA
· Developed numerical routines to find supercurrent in magnetic multilayers.
- 2008 – 2009 ◇ **Visiting Scientist** Communications Ground Systems, NASA Jet Propulsion Laboratory, Pasadena, CA
· Analyzed radio scintillation data from Cassini, pioneering new space weather measurement technique.
· Received Air Force Association General Phillips Award for Outstanding Young Scientist of the Year.
- 2006 – 2008 ◇ **Systems Engineer** United States Air Force, Los Angeles Air Force Base, El Segundo, CA
· Led team of 21 to form tech investment plan linking \$2.4B lab budget to \$12B satellite R&D portfolio.
· Technical experience in spacelift, precision navigation & timing, remote sensing systems.

Research Publications

Articles

- 1 Kruper, J., Yeatman, J. D., **Richie-Halford, A.**, Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I. I., Roy, E., Chandio, B. Q., Garyfallidis, E. & Rokem, A. (2021a). Evaluating the reliability of human brain white matter tractometry. *Aperture Neuro*. <https://doi.org/10.1101/2021.02.24.432740>

- 2 Cieslak, M., Cook, P. A., He, X., Yeh, F.-C., Dhollander, T., Adebimpe, A., Aguirre, G. K., Bassett, D. S., Betzel, R. F., Bourque, J., Cabral, L. M., Davatzikos, C., Detre, J., Earl, E., Elliott, M. A., Fadnavis, S., Fair, D. A., Foran, W., **Richie-Halford, A.**, ... Satterthwaite, T. D. (2021). QSIPrep: an integrative platform for preprocessing and reconstructing diffusion MRI data. *Nature Methods*. <https://doi.org/10.1038/s41592-021-01185-5>
- 3 **Richie-Halford, A.**, Yeatman, J., Simon, N. & Rokem, A. (2021a). Multidimensional analysis and detection of informative features in human brain white matter. *PLOS Computational Biology*, *17*(6), 1–24. <https://doi.org/10.1371/journal.pcbi.1009136>
- 4 **Richie-Halford, A.**, Narayan, M., Simon, N., Yeatman, J. & Rokem, A. (2021). Groupyr: Sparse Group Lasso in Python. *Journal of Open Source Software*, *6*(58), 3024. <https://doi.org/10.21105/joss.03024>
- 5 **Richie-Halford, A.**, Drut, J. E. & Bulgac, A. (2020). Emergence of a Pseudogap in the BCS-BEC Crossover. *Phys. Rev. Lett.*, *125*, 060403. <https://doi.org/10.1103/PhysRevLett.125.060403>
- 6 Yeatman, J. D., **Richie-Halford, A.**, Smith, J. K., Keshavan, A. & Rokem, A. (2018). A browser-based tool for visualization and analysis of diffusion MRI data. *Nature Communications*, *9*(1), 940. <https://doi.org/10.1038/s41467-018-03297-7>
- 7 **Richie-Halford, A.** & Rokem, A. (2018). Cloudknot: A Python Library to Run your Existing Code on AWS Batch. In F. Akici, D. Lippa, D. Niederhut & M. Pacer (Eds.), *Proceedings of the 17th Python in Science Conference* (pp. 8–14). <https://doi.org/10.25080/Majora-4af1f417-001>
- 8 Baker, T. E., **Richie-Halford, A.** & Bill, A. (2016). Classification of magnetic inhomogeneities and $0 - \pi$ transitions in superconducting-magnetic hybrid structures. *Phys. Rev. B*, *94*, 104518. <https://doi.org/10.1103/PhysRevB.94.104518>
- 9 Harrison, R. J., Beylkin, G., Bischoff, F. A., Calvin, J. A., Fann, G. I., Fosso-Tande, J., Galindo, D., Hammond, J. R., Hartman-Baker, R., Hill, J. C., Jia, J., Kottmann, J. S., Yvonne Ou, M.-J., Pei, J., Ratcliff, L. E., Reuter, M. G., **Richie-Halford, A.**, Romero, N. A., Sekino, H., ... Yokoi, Y. (2016). Madness: A multiresolution, adaptive numerical environment for scientific simulation. *SIAM Journal on Scientific Computing*, *38*(5), S123–S142. <https://doi.org/10.1137/15M1026171>
- 10 Baker, T. E., **Richie-Halford, A.** & Bill, A. (2014). Long range triplet Josephson current and $0 - \pi$ transitions in tunable domain walls. *New Journal of Physics*, *16*(9), 093048. <https://doi.org/10.1088/1367-2630/16/9/093048>
- 11 Baker, T. E., **Richie-Halford, A.**, Icreverzi, O. E. & Bill, A. (2014). Cascading proximity effects in rotating magnetizations. *EPL (Europhysics Letters)*, *107*(1), 17001. <https://doi.org/10.1209/0295-5075/107/17001>
- 12 Bill, A., de Rojas, J., Baker, T. E. & **Richie-Halford, A.** (2012). Properties of Magnetic-Superconducting Proximity Systems. *Journal of Superconductivity and Novel Magnetism*, *25*, 2177–2182. <https://doi.org/10.1007/s10948-012-1659-1>
- 13 Baker, T. E., Icreverzi, O. E., **Richie-Halford, A.** & Andreas, B. (2012). Classical Mechanical Analogies in Wide Dirty SFS Junctions. *Journal of Superconductivity and Novel Magnetism*, *25*, 2183–2185. <https://doi.org/10.1007/s10948-012-1646-6>
- 14 **Richie-Halford, A.**, Iess, L., Tortora, P., Armstrong, J. W., Asmar, S. W., Woo, R., Habbal, S. R. & Morgan, H. (2009). Space-time localization of inner heliospheric plasma turbulence using multiple spacecraft radio links. *Space Weather*, *7*(12). <https://doi.org/10.1029/2009SW000499>

Theses

- 1 **Richie-Halford, A.** (2020). *Quantum Monte Carlo studies of the BCS-BEC crossover* (Doctoral dissertation). University of Washington. Seattle, WA.
- 2 **Richie-Halford, A.** (2010). *Numerical modeling of the singlet proximity effect in a superconductor-ferromagnet trilayer* (Master's thesis). <https://search.proquest.com/docview/860140368?accountid=14784>

Selected Presentations and Posters

- 1 Bartley, J., Kent, J., Levitis, E., Moraczewski, D., Rapuano, K., **Richie-Halford, A.**, Salo, T., Poline, J.-B., Ghosh, S., Kennedy, D. & Laird, A. (2021). ABCD-ReproNim: A free online course providing training for reproducible analyses of Adolescent Brain Cognitive Development (ABCD) Study data [Poster presentation at FLUX Congress 2021].

- 2 Bisson, M., Romero, J., Kurth, T., Fatica, M., Damasceno, P. F., Xie, X., **Richie-Halford, A.**, Koudoro, S., Garyfallidis, E. & Rokem, A. (2021). GPU-accelerated diffusion MRI tractography in DIPY [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].
- 3 Joseph, M., Pisner, D., **Richie-Halford, A.**, Lerma-Usabiaga, G., Mansour, S., Kent, J., Keshavan, A., Cieslak, M., Dickie, E., Tourbier, S., Voineskos, A., Satterthwaite, T., Poldrack, R., Veraart, J., Rokem, A. & Esteban, O. (2021). dMRIPrep: a robust preprocessing pipeline for diffusion MRI [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].
- 4 Kruper, J., Yeatman, J., **Richie-Halford, A.**, Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I., Roy, E. & Rokem, A. (2021). Evaluating the reliability of diffusion-MRI based tractometry [Poster Presentation at OHBM Annual Meeting 2021].
- 5 Kruper, J., Yeatman, J. D., **Richie-Halford, A.**, Bloom, D., Grotheer, M., Caffarra, S., Kiar, G., Karipidis, I. I., Roy, E., Chandio, B. Q., Garyfallidis, E. & Rokem, A. (2021b). The test-retest reliability and robustness of diffusion-MRI based tractometry [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].
- 6 Narayan, M., Simon, N., **Richie-Halford, A.**, Rokem, A. & Yeatman, J. (2021). Nonparametric causal analysis of brain and cognition, applied to developmental neuroimaging [Poster Presentation at OHBM Annual Meeting 2021].
- 7 **Richie-Halford, A.**, Cieslak, M., Franco, A. R., Sydnor, V. J., Yeatman, J., Ai, L., Milham, M., Satterthwaite, T. D. & Rokem, A. (2021). A Preprocessed Open Diffusion Derivatives Dataset from the Healthy Brain Network [Poster Presentation at OHBM Annual Meeting 2021].
- 8 **Richie-Halford, A.**, Yeatman, J., Simon, N. & Rokem, A. (2021b). Multidimensional analysis and detection of informative features in human brain white matter [Poster Presentation at ISMRM/SMRT Annual Meeting and Exhibition 2021].
- 9 **Richie-Halford, A.**, Yeatman, J., Simon, N. & Rokem, A. (2021c). Multidimensional analysis and detection of informative features in human white matter [Invited talk at Neural Computation and Engineering Connection 2021].
- 10 **Richie-Halford, A.**, Yeatman, J., Simon, N. & Rokem, A. (2021d). Relating brain connections to behavior in the era of brain observatories [Presentation at eScience Institute Postdoc Seminar 2021].
- 11 Roy, E., **Richie-Halford, A.**, Narayan, M., Kruper, J., Rokem, A. & Yeatman, J. (2021). White matter networks predict development of reading and math abilities [Poster Presentation at OHBM Annual Meeting 2021].
- 12 **Richie-Halford, A.**, Yeatman, J., Simon, N. & Rokem, A. (2020). Multidimensional analysis and detection of informative features in diffusion MRI measurements of human white matter [Interactive talk at Neuromatch 2020 conference].
- 13 **Richie-Halford, A.**, Yeatman, J., Rokem, A. & Keshavan, A. (2019). DMRIprep: a Robust, Scalable Preprocessing Pipeline for diffusion MRI [Software demonstration and poster presentation at OHBM 2019, Rome].
- 14 **Richie-Halford, A.**, Yeatman, J., Simon, N. & Rokem, A. (2019). Multidimensional analysis and detection of informative features in diffusion MRI [Poster presentation at OHBM 2019, Rome].

Service

- 2021 – 2022 ◇ **Organization for Human Brain Mapping Conference Abstract Reviewer**
- 2020 – 2022 ◇ **ABCD-ReproNim Teaching Assistant**
Teaching assistant for remote course facilitating reproducible analysis of the largest long-term study of brain development and child health in the United States.
- 2021 ◇ **Manuscript reviewer for *Human Brain Mapping***
- 2016 – pres ◇ **Software/Data Carpentry Instructor and Instructor Trainer**
· Carpentries Instructors are volunteers who teach researchers foundational computational and data skills.
· I have volunteered as a Software Carpentry Instructor since 2016 and as an instructor trainer since 2020.
- 2015 – 2018 ◇ **UW Research Computing Club, Seattle, WA.**
· Founding officer/president of student high-performance computing org with \$1M+ computing resources.
· Member of UW Hyak Governance Board.

Service (continued)

- 2016 – 2019 ◇ **Rock and Alpine Advisor, Cascade Leadership Challenge**, Seattle WA
Co-led climbing expeditions on Mts. Hood, Baker, and St. Helens for youth outdoor leadership program.

Awards

- 2022 ◇ **Amazon Cloud Credits for Research**, awarded \$20,000 for research connecting white matter development to pediatric mental health.
- 2021 ◇ **OHBM Merit Award**, merit award for top rated abstract at OHBM annual meeting.
◇ **ISMRM Magna Cum Laude Merit Award**, merit award for outstanding presentation at ISMRM/SMRT annual meeting.
◇ **eScience Institute Research Grant**, competitive funding for research advancing data-intensive discovery.
- 2020 ◇ **UW Data Science Postdoctoral Fellowship**
- 2013 – 2017 ◇ **Department of Energy Computational Science Graduate Fellowship** (accepted)
- 2016 ◇ **Amazon Cloud Credits for Research**, awarded \$20,000 from AWS to study quasiparticle properties of neutron matter.
- 2013 ◇ **Ford Foundation Predoctoral Fellowship** (awarded)