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Casey A. Anderson

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Engineer, **scientist**, **researcher**, and **software developer** with ten years experience involving scientific computing, critical thinking, and analytical problem solving. Publisher and presenter of results, mentor of students, leader in scientific organizations, and effective collaborator in diverse work environments.

Professional Experience

Los Alamos National Laboratory *Los Alamos, New Mexico*

2017 - *Present*	**Research Scientist**	*XTD-PRI, Primary Physics*
2016 - 2017	**Graduate Research Assistant**	*NEN-5, Systems Design & Analysis* | *ISR-1, Space Science & Applications*
2011 - 2012	**Post Master's Research Assistant**	*E-13, Advanced Engineering Analysis*
2010	**Summer Intern**	*XCP-3, Monte Carlo Codes*

Computational physics code development, physicist, TITANS enrollee

- Gaining knowledge of primary physics, nuclear weapons systems, and the U.S. stockpile
- Software development in Python, C/C++, C#, Fortran, Matlab, Javascript, and HTML
- Developer of MCNP™, the Common Modeling Framework (CMF), and the Nuclear Detection Figure of Merit (NDFOM) project, implementing features such as:
  - δ-ray production, correlated secondary particles, detector response functions, and multi-physics coupling to MCNP6
  - Full software testing (regression, unit, integration, validation) packages for the Continuous Integration of CMF
  - Automated analysis of detector systems, sources, configurations, and scenarios for NDFOM
- Performing physics and engineering analysis of systems on the high performance computing systems at LANL
- Developing software using tools such as Git and BitBucket for version control and Jenkins-CI for software testing
- Mentoring students at the undergraduate and high-school level
- Presenting at conferences and publishing articles in their proceedings [Pubs: 2, 3, 4, 5, 6, 7, 11, 12, 13, 14]

Medical College of Wisconsin *Milwaukee, Wisconsin*

2012 - 2016 | **Graduate Research Assistant** *Department of Biophysics*

Research in translational medicine and Magnetic Resonance Imaging

- Funded my graduate research by contributing to a successful R21 National Institute of Health research grant
- Patented a segmented reconstruction technique for artifact reduction in Magnetic Resonance Imaging (MRI) [Pat: i.]
- Performed data analytics on large imaging datasets seeking clinical applications and trends in our imaging technique
- Interacted with patients, researched on animals, acquired hands-on laboratory experience, and collaborated with medical doctors while conducting clinical and pre-clinical research

University of Wisconsin - Madison *Madison, Wisconsin*

2008 - 2011	**Student Research Assistant**	*Department of Medical Physics*
2010 - 2011	**Chapter President**	*American Nuclear Society*

Medical physics research and organizational management

- Researched methods for non-invasive Quality Assurance assessment of radioactive brachytherapy seeds
- Managed our student chapter of the American Nuclear Society (ANS) as chapter president

Technical & Professional Skills

Physics/Engineering
- ● Computational Physics
- ● Nuclear Weapons
- ● Modeling and Simulation
- ● Nuclear Engineering
- ● Signal and Image Processing
- ● Fourier Analysis
- ● Monte Carlo Methods
- ◓ Statistical Analysis
- ◓ Radiation Detectors
- ◓ Regularization Methods
- ◓ Lagrangian & Eularian Methods
- ○ Computer Aided Engineering
- ○ Finite Element Analysis

Software
- ● Linux / MacOS
- ● LaTeX
- ● Matplotlib
- ● Jenkins-CI
- ● Bitbucket
- ● Confluence
- ● MCNP
- ● Django
- ● Microsoft Office
- ◓ Abaqus/CAE
- ◓ PostgreSQL
- ○ FLAG

Programming
- ● Python
- ● Git / Mercurial
- ● Version Control
- ● Continuous Integration
- ● Unit Testing
- ● Scripting/Bash
- ● Matlab
- ◓ Parallel Programming
- ◓ C/C++/C#
- ◓ Fortran
- ◓ SQL
- ○ HTML/Javascript

Other Skills
- ● Technical Writing
- ● Presentations
- ● High Performance Computing
- ● Group Collaboration
- ● Independent Work
- ● File Input/Output
- ◓ Student Mentoring
- ◓ Data Collection
- ◓ Data Analytics
- ◓ Data Visualization
- ◓ Validation & Verification
- ◓ Relational Databases
- ○ Linux Servers

Key (*Experience Level*)
● **Expert** ◓ **Intermediate** ○ **Novice**

Education

Enrolled	**Theoretical Institute of Thermonuclear and Nuclear Studies**	*Los Alamos National Laboratory*
April, 2016	**M. Sc, Biophysics**†	*Medical College of Wisconsin*
May, 2011	**M. Sc, Nuclear Engineering & Engineering Physics**	*University of Wisconsin - Madison*
May, 2011	**B. Sc, Nuclear Engineering**	*University of Wisconsin - Madison*

†Thesis: "Quantitative Susceptibility Mapping: Exploratory Development and Initiation of Processing Pipelines"

Awards & Honors

June, 2019	**LAAP Award**	*XTD-PRI, Los Alamos National Laboratory*
August, 2017	**SPOT Award**	*NEN-5, Los Alamos National Laboratory*
May, 2016	**Magna Cum Laude**	*Abstract, ISMRM Proceedings*
May, 2014	**Silver Medal**	*Student Poster Presentation, ISMRM Conference*
2009, 2010	**Exelon Scholarship**	*University of Wisconsin - Madison*

Classes & Trainings

May, 2018	**Introduction to FLAG**	*Los Alamos New Mexico*
May, 2016	**MCNP6 Intermediate Workshop**	*Los Alamos New Mexico*
May, 2015	**CPR Certification Training**	*Milwaukee, Wisconsin*
August, 2011	**Dale Carnegie Training**	*Los Alamos, New Mexico*
June, 2011	**Introduction to Abaqus**	*Minneapolis, Minnesota*
July, 2011	**Introduction to Python Programming**	*Los Alamos, New Mexico*
May, 2010	**MCNP5 Beginner Workshop**	*Los Alamos, New Mexico*

References

Managers / Advisors

Roy Baty	rbaty@lanl.gov	505-667-9319
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Co-workers / Collaborators

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Eugene Dougherty	eed@lanl.gov	505-665-5068
James Tutt	jtutt@lanl.gov	505-695-3249

Publications & Presentations

1. Christopher Werner, Casey Anderson, and et. al. *MCNP User's Manual Code Version 6.2 (LA-UR-17-29981)*. Oct. 2017
2. Casey Anderson and Gregg McKinney. "MCNP6 Built-in High Level Detector Responses". In: *2017 IEEE Nuclear Science Symposium and Medical Imaging Conference* (Atlanta, Georgia). Oct. 2017,
3. ‡ Casey Anderson et al. "Neutron and Gamma Correlations using CGM in MCNP 6.2.0 (LA-UR-20353)". In: *Proceedings of the 27th American Nuclear Society Summer Meeting* (San Fransisco, California). 2017
4. § James Tutt and Gregg McKinney. "Speed and Memory Improvements to MCNP6 Delayed-Gamma Line Treatment (LA-UR-21050)". In: *Proceedings of the 27th American Nuclear Society Summer Meeting* (San Fransisco, California). 2017
5. ‡ Casey Anderson et al. "Delta-ray production in MCNP6.2.0 (LA-UR-16-25402)". In: *24th Conference on Applications of Accelerators in Research and Industry* (Forth Worth, Texas). Nov. 2016
6. ‡ James Tutt, Casey Anderson, and Gregg McKinney. "Background-Source Cosmic-Photon Elevation Scaling and Cosmic-Neutron/Photon Date Scaling in MCNP6 (LA-UR-16-24928)". In: *24th Conference on Applications of Accelerators in Research and Industry* (Forth Worth, Texas). Nov. 2016
7. James Tutt, Casey Anderson, and Gregg McKinney. "Delayed-Gamma Energy Biasing with Exact Energy Sampling in MCNP6.2.0 (LA-UR-16-24057)". In: *Proceedings of the 26th American Nuclear Society Winter Meeting* (Las Vegas, Nevada). Oct. 2016
8. || Casey Anderson et al. "Volume-Paracellated Quantitative Susceptibility Mapping". In: *Proceedings of the International Society of Magnetic Resonance in Medicine 24th Conference* (Singapore, Singapore). May 2016
9. ‡ Casey Anderson and Kevin Koch. "Volume-parcellated Quantitative Susceptibility Mapping of the Human Brain at 7T". in: *2015 Minnesota Workshop on High and Ultra-High Field Imaging* (Minneapolis, Minnesota). Oct. 2015
10. Casey Anderson, Kimberley Pechman, and Kathleen Schmainda. "Quantitative Susceptibility Mapping to Assess Iron Levels in Rat Brain Tumors". In: *Proceedings of the International Society of Magnetic Resonance in Medicine 22nd Conference* (Milan, Italy). May 2014
11. Tim Goorley, Casey Anderson, and et. al. *Useful prompt radiation applications and capabilities with MCNP6 (LA-CP-12-00490)*. Nuclear Weapons Effects User Group. 2012
12. Tim Goorley, Jeff Bull, and et. al. "MCNP6 Efforts for EMP, atmospheric dispersal, and unstructured mesh tracking (LA-CP-01705)". In: *Proceedings of the Nuclear Explosives Design Physics Conference 2011* (Los Alamos National Laboratory, Los Alamos, New Mexico). Oct. 2012
13. Casey Anderson, Karen Kelley, and Tim Goorley. "Unstructured mesh human phantoms with MCNP". in: *Transactions of the American Nuclear Society* 106 (2012), pp. 50–51
14. ‡ Casey Anderson, Tim Goorley, and Karen Kelley. "Mesh Human Phantoms with MCNP (LA-UR-12-01307)". In: *2012 3DS Simulia Community Conference Proceedings* (Providence, Rhode Island). May 2012, pp. 556–568

‡Presentation Included; §Presentation Only; ||*Magna Cum Laude*

Patents

i. Kevin Koch and Casey Anderson. *System and method for localized processing of quantitative susceptibility maps in magnetic resonance imaging*. WO Patent App. PCT/US2016/038,723. Dec. 2016. URL: https://www.google.com/patents/WO2016209930A1?cl=en