

## **Dr. Alexander Henderson**

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(803)215-6316

Status: US Citizen

### **Education**

\*2008-2015 Rice University Houston, TX

-PhD Physics

\*2004-2008 Furman University Greenville, SC

-B.S. Physics/Mathematics

### **Work experience**

\*2016-Present: Post-doctoral researcher at University of Southern Mississippi

-GEANT4-DNA/Chemistry

-Radiation-body interactions focusing on DNA strand breaks

\*2015 (August-December): Adjunct Professor at San Jacinto Community College

-Introductory mechanics (algebra-based)

\*2014 (August) - 2015: Adjunct Professor at Lone Star College

-Introductory mechanics (algebra-based) x3

-Introductory E&M (calculus based) x1

-Astronomy for non-majors x3

-Concepts in physics x1

\*2009 (August)-2015 (May) Rice University Houston, TX: Research assistant under Professor Edison Liang

-Positron and gamma-ray production by laser-solid interactions

-High Energy Density Physics

-Analysis of Image Plates (Ips) and dosimeter data, and design, calibration, and use of electron and gamma-ray spectrometers (see publications)

-GEANT4 code and C++, with some Matlab.

\*2005 (September) - 2008 (April) (school year) Furman University Greenville, SC: Lab Assistant.

\*2007 (September) – 2008 (April) Furman University Greenville, SC: Tutor: Mathematics and Physics

\*2007 (summer) Georgia Institute of Technology Atlanta, GA: Research assistant under Dr. Gregory Durgin.

-Statistical analysis of signal transmission.

\*2006 (summer) Furman University Greenville, SC: Research assistant under Professor. William Baker.

-Gravitation.

\*2004 (Summer) MJW Corporation Aiken, SC

-Web design and records retention.

### **Programming Languages:**

\*GEANT4 with DNA and Chemistry packages

\*C++

\*Matlab

\*Some Java, Python, FORTRAN

### **Publications:**

1. "Permanent-magnet energy spectrometer for electron beams from radiotherapy accelerators." McLaughlin, D. J., Hogstrom, K. R., Carver, R. L., Gibbons, J. P., Shikhaliev, P. M., Matthews, K. L., Clarke, T., Henderson, A. and Liang, E. P. *Medical Physics*, 42: 5517–5529 (2015). doi:10.1118/1.4928674

2. "An Improved Characterization of Small Scale Fading Based on 2D Measurements and Modeling of a Moving Receiver in an Indoor Environment." Redhwan Mawari, Alexander H Henderson, Muhammad B. Akbar, Gregory D. Durgin, Mohamed Zohdy. *Journal of Signal and Information Processing*, 7, 160-174. (2016) doi: [10.4236/jsip.2016.73016](https://doi.org/10.4236/jsip.2016.73016).

3. "High  $e^+/e^-$  Ratio Dense Pair Creation with  $10^{21} \text{W.cm}^{-2}$  Laser Irradiating Solid Targets". E. Liang, T. Clarke, A. Henderson, W. Fu, W. Lo, D. Taylor, P. Chaguine, S. Zhou, Y. Hua, X. Cen, X. Wang, J. Kao, H. Hasson, G. Dyer, K. Serratto, N. Riley, M. Donovan, and T. Ditmire. *Scientific Reports* 2015; 5: 13968.

4. "Hot electron production using the Texas Petawatt Laser irradiating thick gold targets" Devin Taylor, Edison Liang, Taylor Clark, Alexander Henderson, Petr Chaguine, Xin Wang, Gilliss Dyer, Kristina Serratto, Nathan Riley, Michael Donovan, Todd Ditmire. High Energy Density Physics. Volume 9, Issue 2, June 2013, Pages 363–368.
5. "SU-D-BRCD-06: Measurement of Elekta Electron Energy Spectra Using a Small Magnetic Spectrometer." K Hogstrom, D McLaughlin, J Gibbons, P. Shikhaliev, T Clarke, A Henderson, D Taylor, P Shagin, E Liang. Medical Physics 06/2012; 39(6):3614.
6. "Ultra-Intense Gamma-Rays Created Using the Texas Petawatt Laser" Alexander Henderson, Edison Liang, Nathan Riley, Pablo Yepes, Gillis Dyer, Kristina Serratto, Petr Shagin. High Energy Density Physics Volume 12, September 2014, Pages 46–56
7. "Monte Carlo simulation of pair creation using petawatt lasers", Alexander Henderson, Edison Liang, Pablo Yepes, Hui Chen, Scott Wilks. [Astrophysics and Space Science](#). November 2011, Volume 336, Issue 1, pp 273-277

#### **References (Research):**

\*Edison Liang. Professor of Physics and Astronomy, Rice University, Houston, TX. [liang@spacibm.rice.edu](mailto:liang@spacibm.rice.edu). 713-348-3524

Relationship: Former Doctoral Thesis Advisor

\*Chris Winstead, Professor and Chair, Department of Physics and Astronomy, University of Southern Mississippi, Hattiesburg, MS [chris.winstead@usm.edu](mailto:chris.winstead@usm.edu). 601-266-6069

Relationship: Current Post-doc supervisor

\*Khin Maung Maung, Professor, Department of Physics and Astronomy, University of Southern Mississippi, Hattiesburg, MS [khin.maung@usm.edu](mailto:khin.maung@usm.edu). [601.266.4934](tel:601.266.4934)

Relationship: Senior lab member/secondary supervisor for post-doc work

\*Pablo Yepes, Senior Faculty Fellow, Department of Physics and Astronomy, Rice University, Houston, TX. [yepes@rice.edu](mailto:yepes@rice.edu). 713-348-5942.

Relationship: PhD Committee Member, senior lab member.

\*Redhwan Mawari, Graduate Student, Department of Electrical and Computer Engineering, Oakland University, Rochester, MI [mawarir@yahoo.com](mailto:mawarir@yahoo.com). 703-342-8362

Relationship: Independent research associate

### **References (Teaching):**

\*Katherine Keilty, Professor of Physics, Lone Star College: Kingwood. Houston, TX.  
[Katherine.Keilty@lonestar.edu](mailto:Katherine.Keilty@lonestar.edu) . 281.312.1714

Relationship: Former Adjunct teaching supervisor

\* Rachel Garcia, Department Chair, San Jacinto College, Pasadena, TX. [Rachel.Garcia@sjcd.edu](mailto:Rachel.Garcia@sjcd.edu). (281) 476-1882

Relationship: Department chair when adjunct teaching