Richard Knoche

8810 62nd Ave, Berwyn Heights, Maryland 20740, USA
raknoche@gmail.com • (703) 801-4456 • http://www.dealingdata.net

EXPERIENCE

University of Maryland, Physics Department

- Graduate Research Assistant — 2011 – Present
  - Worked with an international collaboration to produce the world's most sensitive limits on dark matter interaction rates.
  - Developed ground breaking techniques that produced the world's most accurate and most precise calibrations of a dark matter detector. These techniques have been adopted by experiments in Asia and Europe.
  - Developed novel techniques to produce 3D position dependent signal corrections in a spatially and time dependent electric field.
  - Automated the extraction of hundreds of data features from calibration data.
  - Built on-site gas sampling system for real-time monitoring of xenon impurities at the part-per-trillion level.
  - Directed on-site detector operations as Deputy Science Coordination Manager.
  - Responsible for monitoring system status and responding to alarm conditions as Detector Operations Manager.

National Aeronautics and Space Administration, Goddard Space Flight Center

- Research Assistant — 2010
  - Analyzed data from Swift Burst Alert Telescope (BAT) to search for hard X-ray emissions around the on-set time of supernovae.
  - Quantified the X-ray counterpart to Fermi-LAT pulsar observations using X-ray emission data from the Chandra and BeppoSax missions.

James Madison University, Physics Department

- Undergraduate Research Assistant — 2008 – 2011
  - Designed and maintained table-top experiments to characterize the complex, non-linear behavior of granular systems.
  - Implemented computer vision techniques to quantitatively characterize particle movement in a two dimensional shear flow.
  - Utilized optical polarization techniques to quantify stress networks in granular systems.
  - Performed statistical analysis to characterize relevant parameters in a two dimensional granular shear flow.

EDUCATION

University of Maryland, College Park, Maryland, USA

- Doctor of Philosophy (Ph.D.) in Physics — Aug 2011– 2016 (Expected)
  - Thesis: Signal Corrections and Calibrations in the LUX Dark Matter Detector

James Madison University, Harrisonburg, Virginia, USA

- Bachelor of Science (B.S.) in Physics, magna cum laude — Aug 2007 – May 2011

SKILLS

Physics	Mathematics	Data Analysis	Statistics
Matlab	Python	C++	MySQL
HTML	CSS	Bash	Git
Machine Learning	Machining		

HONORS

John Mather Nobel Scholar Award — Aug 2010

- Awarded for high academic achievement, and contributions to research at NASA's Goddard Space Flight Center. Funded by money from John Mather's Nobel Prize in physics.

Henry W. Leap Scholarship — Mar 2010

- Awarded to one student each year for academic excellence and significant research contributions.

Sigma Pi Sigma Inductance — Mar 2010

- Accepted into the national physics honors society.

President's List, James Madison Univesity — 2009 – 2011

- Awarded for academic excellence (3.9 GPA or higher). Received this honor every semester from Fall 2009 until graduation in Spring 2011.

Dean's List, James Madison Univesity — 2008 – 2011

- Awarded for academic excellence (3.5 GPA or higher). Received this honor every semester from Fall 2008 until graduation in Spring 2011.

References and publications available upon request