

# ZACHARIAH MILLER PHD

# SENIOR DATA SCIENTIST

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## SUMMARY

Senior data scientist focused on data-driven research and solutions. I solve interesting problems with data analysis, model building, machine learning, and software design. Passionate about using scientific techniques on “non-science” puzzles to extract answers for the real-world, understanding the world via data, and making models to improve decision making.

## SKILLS

**PROGRAMMING:** C++, Python, R, BASH, UNIX, LaTeX, Java, JavaScript, HTML, CSS, Pandas, SciKit Learn, TensorFlow  
**COMPUTING AND MODEL BUILDING:** Machine Learning, Deep Learning, Numerical Methods, Statistics, AWS, Monte Carlo Methods, SQL, Distributed Computing, Hadoop, Spark, Big Data Architecture, Calculus, Linear Algebra  
**EDUCATION:** Curriculum Development, Hand-on teaching, Translation of complex topics into common English, Laboratory development and administration  
**PHYSICS:** Particle Physics, Nuclear Physics, Monte Carlo Simulations, ROOT, Computational Physics

## EMPLOYMENT

**Metis, Senior Data Scientist, Chicago, IL** Mar 2017 - Current

- Instructor for 12-week, immersive data science/machine learning bootcamps.
- Create curriculum and guide students through lectures and portfolio project development.
- Working with admissions team to interview and accept the next batch of qualified students.

**University of Illinois at Chicago, Postdoctoral Researcher** Jun 2015 - Feb 2017, Chicago, IL

- Large scale data analysis to extract physics results from 100s of terabytes of data, with C++ and Python. Big data techniques.
- Member of embedding team that produces simulations for the entire collaboration. Responsible for simulation production and quality assurance. Co-supervisor of undergraduate research students (2016).
- Member of maintenance team for Intermediate Silicon Tracker detector (decommissioned 2016)

**University of Kentucky, Research Assistant,** May 2010 - May 2015  
University of Kentucky

- Research, design, and development for a prototype neutron detector for measuring neutrons produced by Uranium fission.
- Designed and built front-end GUI and back-end analyzer for a data acquisition system to interface with and record data from detectors using Java and C++. Implemented the database that stores the data.
- Measurements of neutron-induced fission cross-sections, filling in gaps in the world's knowledge about the process.

**Eastern Kentucky University, Adjunct Professor,** Aug 2011 - Dec 2011  
Richmond, KY

Designed and taught Introductory Astronomy course for non-Physics Majors.

**University of Kentucky/Eastern Kentucky University,** Aug 2007 - May 2011  
*Teaching Assistant, Lexington, KY*

Taught recitation and laboratory portions of introductory physics courses for both physics majors and non-majors.

## EDUCATION

**University of Kentucky**  
PhD Nuclear Physics 2015

**University of Kentucky**  
MS Nuclear Physics 2012

**Eastern Kentucky University**  
BS Physics 2009  
Cum Laude

## PROJECTS

**Particle Simulation Production and Quality Control at STAR** Jun 2016 - Feb 2017

Maintained and quality checked STAR's complex simulation framework. Produced simulations for the collaboration at-large and tested subsets of the simulated data.

**Analysis Tree Production** Feb 2016 - Feb 2017

Software project to read, analyze, and compress terabytes of data into a smaller, more user-friendly format without losing useful information. Developed for use across entire analysis team.

**Bottom Quark Production at RHIC Using the STAR Detector** Jun 2015 - Feb 2017

Analyzing multiple terabytes of physics data to extract information about the formation of the early universe with C++ and ROOT. Visualization of results, multiple speaking engagements on the topic, and detector maintenance and development with both software and hardware.

**Neutron Induced Fission in Uranium Isotopes** May 2012 - Apr 2015

Developed detectors via blueprinting, machining, and assembly. Wrote analysis software and data acquisition systems to measure the fission process in uranium isotopes. Talks on this topic given at multiple conferences and national laboratories.

## AWARDS

**YOUNG RESEARCHER FELLOWSHIP** Jan 2017  
*Quark Matter 2017 Conference*

A monetary award to attend the largest high energy nuclear physics conference in the world.

**OUTSTANDING TEACHING ASSISTANT AWARD** May 2011  
*University of Kentucky Arts and Sciences*

Recognizes the best teaching assistant in the physics department.

**GRADUATE FELLOWSHIP** Aug 2009  
*University of Kentucky*

A monetary award for outstanding incoming students.

## VOLUNTEERING

**Northwest Territory Alliance Officer/Board Member** Apr 2015 - Current  
Chicago, IL

The NWTA is a non-profit specializing in education about the American Revolutionary War and the associated era.

**Adopt-a-Physicist Physicist** Sep 2016 - Oct 2016  
Chicago, IL

Pairs physicists with high schools throughout the country so that students can interact with a professional in STEM.