

---

**Research Interests:** Gamma-ray astronomy, data-driven discovery, statistics, machine-learning, instrumentation.

## Education

**Iowa State University**, Ames, IA  
Ph.D, Astrophysics

June 2010

**Grinnell College**, Grinnell, IA  
B.A., Physics *With Honors*

May 2003

## Skills

### Hardware

- Designed and developed a fast, real-time data acquisition system with high throughput. The system is now being used to collect data for the [HAWC](#) experiment. Very knowledgeable about Time-to-Digital converter (TDC) chips, VME-bus, VME-controllers. Proficiency with NIM electronics.
- Firsthand experience testing and assembling the camera electronics for the [VERITAS](#) instrument.

### Software

- Expert knowledge of Python along with IPython, NumPy, SciPy, and Matplotlib.
- Highly proficient in C, C++, ROOT-analysis framework with a special emphasis on scientific computing, analysis of very large datasets, data mining and visualization.
- Use a variety of languages & tools including bash, regexp, Boost, CMake, Pandas, Pyfits, SQLAlchemy,  $\LaTeX$ , SVN, Git, and database query languages (including SQLite and MySQL) on a daily basis.
- Developed software libraries (based on C) for synchronized readout of an array of single board computers with a net throughput rate of 500 MBytes/sec.
- Developed Monte Carlo simulation tools and energy estimation package for the VERITAS collaboration. Developed analysis tools for the HAWC collaboration to measure sensitivity.
- Currently developing a C++-based package with a tightly integrated SQLite-DB backend for the real-time monitoring of gamma-ray emission to be used by the HAWC collaboration.

## Research Experience

### Wisconsin Icecube Particle Astrophysics Center - Madison, WI

Postdoctoral Research Associate

2013 – present

*Supervisor: Stephan Westerhoff*

Fast, Real-Time Monitoring of Gamma Ray Emission with HAWC Observatory.

Search for Extragalactic Neutrino Emitters with IceCube Observatory.

### Los Alamos National Laboratory - Los Alamos, NM

Postdoctoral Research Associate

2010 – 2013

*Supervisor: Brenda Dingus*

Design and Develop VME-based Data Acquisition System for the HAWC Experiment.

Study of Extragalactic Gamma-Ray Sources with HAWC and Fermi LAT.

### Iowa State University - Ames, IA

Graduate Student Researcher

2005 – 2010

*Advisor: Frank Krennrich*

Analysis of Variable VHE Gamma-Ray Emission from Active Galactic Nuclei.