Brad Schoenrock PhD

13593 Via Varra Rd. 1421 Broomfield CO 80020| (715)216-2249 | brads@ucar.edu

Career Summary

I'm a problem solver who constantly seeks new challenges, the more impossible the better. I've been a Scientist/Software Engineer for the past 8 years with experience in data acquisition, analysis, machine learning techniques, and software development. I'm adaptable to new programming and scripting languages for small scale testing or wide distribution and am able to fluently collaborate with and/or oversee individuals from diverse backgrounds.

Computer Skills

· Languages - C/C++, ROOT, TeX/LaTeX, Bash, Python, Java, LabView, FORTRAN, Mathematica, and others.

· Environments - Linux/Windows experience with custom hardware design and programming. Distributed computing tools such as Condor and PanDA to access high powered computing environments such as ATLAS's tiered computing network and the open science grid.

· Version control & project management tools - Github, svn, jira, concur, and others.

Experience

2016-present   **Software Engineer,** *National Center for Atmospheric Research*

· Design and implementation of a data acquisition system for the worlds first distributed lidar array using Water Vapor DIfferential Absorption Lidar (WV-DIAL) techniques with extensibility into using O_2 DIAL techniques as well. Scalability into larger number of instruments was a key design consideration alongside stability of operations.

· Hardware & software support for NCAR's mobile S-band radar warning/alert system.

· Calculation of derived fields and real time visualization of lidar variables for GV-HSRL.

· Contributed to the open source project- Lidar Radar Open Software Environment (LRose)

2010-2016   **Research Assistant,** *High Energy Physics Department, Michigan State University*

· Wrote analysis code to handle large data sets in ROOT/C++/Bash to be distributed to a condor queue of ~500 computing nodes.

· Performed first ever search for tZ 3 lepton final state (single events out of 100s of billions) in ATLAS collaboration (4500+ collaborators from 170+ institutions across 38 countries) at the LHC using descriptive statistics, hypothesis testing, classification, and profile likelihood techniques.

· Simulated particle interactions using linear and non-linear models to forecast accuracy of the single top quark measurements at 13TeV (a little less than twice previous energy studied) using FORTRAN/C++/Bash. This assessment was used by the NSF to determine what major experiments were going to get funded in the coming decade.

· Developed software algorithms to assess & improve losses in our data collection techniques.

· Created planetarium show for scientific outreach managing individuals from a variety of fields including physics, astronomy, 3D graphics, sound design, and writing for a one year run.

2006-2013   **Tutor / Teaching Assistant,** *Student Support Services, Northern Michigan University*

& Physics Department, Michigan State University

· Organized and supervised laboratory environment, assessed student performance.

· Designed, created, and implemented video supplements to introduce students to the software, hardware, and laboratory techniques used before they entered the lab.

· Voted best graduate TA 2012-2013

· Conveyed science & math concepts to students with disabilities and/or financial need

· Simultaneously tutored students in up to 7 different subjects for on demand tutoring

2006-2010	**Research Assistant,** *Physics Department, Northern Michigan University & , Physics Department, Cornell University*

· Refurbished and installed neutron detectors for construction of HAND at Jefferson Lab national laboratory using photomultiplier tubes.

· Assessed radioactive levels of soil samples by using canberra peak fitting software to perform gamma ray spectroscopy.

· Designed and implemented automated test software/hardware for Superconducting Radio Frequency accelerator cavities using LabVIEW with hardware solutions.

Education

2013-2016	PhD Physics, *Michigan State University*
2010-2013	MS Physics, *Michigan State University*
2006-2010	BS Physics & Math, minors Chemistry & Computer Science *Northern Michigan University*
	Suma Cum Laude with Honors, Outstanding physics Undergraduate

Outreach & Service Work

2017	Super Science Saturday
	Public meet & greet explaining/demonstrating atmospheric science to the public.
2012-2016	Science Olympiad
	Judged events where middle school-high school students would compete to show off their scientific knowledge in specific STEM related fields.
2010-2015	Graduate Student Recruitment
	Meeting with prospective graduate students to help ease their transition from undergraduate to graduate work and describe what being a graduate student is like.
2013-2014	Graduate Curriculum Committee
	Helped guide the creation and direction of courses for the graduate physics program.
2010-2012	Relics of the Big Bang
	Programmed and ran a planetarium show for the general public with 30 min of preprogrammed content using a language similar to pascal followed by 30 min of Q/A themed around high energy particle physics at the Large Hadron Collider.