# Asif Imran

*Résumé*

*4153 Tobin Circle*
*Santa Clara, CA 95054*
*(515) 450 3117*
*aimran@icecube.wisc.edu*
*aimran.github.io*

## Education

June 2010 **Ph.D.**, *Iowa State University*, Ames, Iowa, Astrophysics.

May 2003 **B.A.**, *Grinnell College*, Grinnell, Iowa, Physics.
*With Honors*

## Skills

Languages Python, C, C++, database query languages (SQLite & MySQL)

Tools ROOT, IPython, NumPy, SciPy, Matplotlib, Boost, Pandas, PyFITS, SQLAlchemy, Git, LaTeX, SVN, bash & regexp

## Experience

2014 – Present **Insight Data Science**, *Palo Alto, California.*
*Data Science Fellow*

2013 – 2014 **Wisconsin IceCube Particle Astrophysics Center**, *Madison, Wisconsin.*
*Research Associate*

1. Leading the development of the main gamma-ray flare monitoring system for **HAWC Observatory** to support one of HAWC's primary missions to discover sources of astrophysical flares and provide real-time alerts to the astrophysical community at-large. Designed and developing a C++-based toolkit with a tightly integrated SQLite backend that will allow HAWC to perform real-time searches for the first time.
2. Design and apply statistical algorithms to evaluate and analyze the performance of the monitoring system using Monte-Carlo simulations.
3. Analyze and model complex, high-volume and high-dimensionality telescope data using *cutting-edge* imaging techniques and statistical tools.

2010 – 2013 **Los Alamos National Laboratory**, *Los Alamos, New Mexico.*
*Postdoctoral Research Scientist*

1. Led the data acquisition group to develop the principal data acquisition system for HAWC. Selected an innovative design that forgoes traditional hardware trigger in favor of flexible software-based triggers to allow us to achieve an order of magnitude improvement in sensitivity at low energies. Successfully built several prototypes to demonstrate the feasibility of the groundbreaking design.
2. Designed and built the data acquisition system from ground-up and successfully deployed it. Currently in operation, the new design allowed us to achieve an unprecedented $> 99\%$ live time – a core objective of HAWC's operational mission.
3. Wrote C-based libraries for synchronized readout of an array of single board computers with a net throughput rate of 500 MBytes/sec – unprecedented in current generation of astrophysical experiments with comparable size and mission.

2004 – 2010 **Iowa State University**, *Ames, Iowa.*

*Graduate Student Researcher*

1. Developed a novel analysis technique to measure the density of diffuse radiation field that resulted in new limits on emissions from distant galaxies.
2. Developed a Monte Carlo simulation package for the VERITAS collaboration. Algorithms developed were essential to characterizing the performance and sensitivity of the detector.
3. Developed a neural network to estimate the energies of incoming photons that led to a 20% improvement in accuracy over previous measurements.

2002 **Grinnell College**, *Grinnell, Iowa.*

*Summer Research Student*

Awarded a competitive undergraduate mentored advanced project. Within 10 weeks, improved speed (by up to 30%) and significantly extended functionality of existing Monte Carlo simulation routines by porting them from C to C++.

## Grants

2013 – 2014 **NASA *Swift* Guest Investigator Program**, *Cycle 10.*

Co-Investigator, *Swift Localization & Follow-up of HAWC Transients*, PI: T. Ukwatta

2009 – 2010 **NASA Fermi Guest Investigator Program**, *Cycle 2.*

Co-Investigator, *A Search for Unique Signatures from Extragalactic Background Light (EBL) Absorption Effects in TeV Blazar Spectra*, PI: F. Krennrich

## Awards and Honors

### Iowa State University

2005 Graduate teaching excellence award

2004 Teaching assistant of the year, Department of Physics & Astronomy

2003 – 2005 Hardware scholarship, Department of Physics & Astronomy

### Grinnell College

1999 – 2003 International merit scholarship

## Teaching Experience

2013 – Present **Undergraduate Student Mentor**, *Stephen Sturdevant.*
University of Wisconsin-Madison

Fall 2013 **Instructor**, *WIPAC High School Internship Program.*
Co-taught high school students about basic electronic circuits and building data acquisition system with arduino boards.

2010 – 2013 **Graduate Student Mentor**, *Peter Karn.*
University of California-Irvine

2003 – 2005 **Teaching Assistant**, *Iowa State University*, Department of Physics & Astronomy.
Performed TA duties and conducted help sessions for both undergraduate and graduate level physics/astrophysics courses.

2000 – 2003 **Teaching Assistant**, *Grinnell College*, Department of Math & Physics.
Provided structured mentoring and one-on-one help sessions to students enrolled in undergraduate physics and math courses.