

Asif Imran

Curriculum Vitae

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Education

- June 2010 **Ph.D.**, *Iowa State University*, Ames, Iowa, Astrophysics.
May 2003 **B.A.**, *Grinnell College*, Grinnell, Iowa, Physics.
With Honors

Skills

- Software** Currently developing the main gamma-ray outburst monitoring system for **HAWC Observatory**. The C++-package with a tightly integrated SQLite backend employs Bayesian statistics to quickly scan the sky for increased gamma-ray emissions in real-time.
- Developed C-based libraries for synchronized readout of an array of single board computers with a net throughput rate of 500 MBytes/sec and a $> 99\%$ up time.
- Developed analysis tools for the HAWC collaboration to measure sensitivity of the detector.
- Developed Monte Carlo simulation package for the VERITAS collaboration. The package was utilized for several primary analyses and featured in publications.
- Hardware** Built a data acquisition system for HAWC Observatory from ground-up and successfully deployed it. Currently in operation, the system is capable of handling an unprecedented 500 MBytes/second of raw readout.
- Languages** Python, C, C++, database query languages (SQLite & MySQL)
- Tools** ROOT, IPython, NumPy, SciPy, Matplotlib, Boost, Pandas, PyFits, SQLAlchemy, Git, L^AT_EX, SVN, bash & regexp

Research Experience

- 2013 – Present **Wisconsin IceCube Particle Astrophysics Center**, *Madison, Wisconsin*.
Postdoctoral Research Associate
Supervisor: Stefan Westerhoff
Develop analysis framework for fast, real-time monitoring of gamma ray emission with HAWC Observatory.
- 2010-2013 **Los Alamos National Laboratory**, *Los Alamos, New Mexico*.
Postdoctoral Research Associate
Supervisor: Brenda Dingus
Designed and built principal data acquisition system for the HAWC Observatory. The novel design forgoes traditional hardware trigger in favor of purely software-based triggers to allow us to detect photons with very low energies. Develop analysis tools to optimize and improve HAWC's overall sensitivity to gamma rays.

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

Graduate Student Researcher

Supervisor: Frank Krennrich

Analyzed variable gamma-ray emissions from active galaxies. Developed analysis method to measure the density of diffuse extra-galactic radiation field resulting in new limits on emissions from distant galaxies. Assembled & tested camera electronics for the VERITAS telescope.

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

Undergraduate Mentored Advanced Project

Supervisor: Charlie Duke

Extended the functionality & speed of existing Monte Carlo simulation routines to trace the propagation of Cherenkov photons from cosmic-ray showers in the Earth's atmosphere.

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.

Conferences and Workshops

- 2012 APS 4-Corners Section Meeting, Socorro, NM (*invited*)
- 2011 The 32nd International Cosmic Ray Conference, Beijing, China
- 2011 APS April Meeting, Anaheim, CA
- 2011 INPAC Meeting, Asilomar, CA (*invited*)
- 2009 The 32nd International Cosmic Ray Conference, Lodz, Poland

Selected Peer Reviewed Publications

For a complete list, see my [NASA/ADS listings](#)

“The Study of TeV Variability and Duty Cycle of Mrk 421 from 3 Years of Observations with the Milagro Observatory”, Abdo, A. A. et al. for the Milagro Collaboration, *Astrophysical Journal*, (*Accepted January 2014*)

“Sensitivity of the high altitude water Cherenkov detector to sources of multi-TeV gamma rays”, Abeysekara, A. U., et al. for the HAWC Collaboration, *Astroparticle Physics*, **50** (2013), 26A

“Constraints on Cosmic Rays, Magnetic Fields, and Dark Matter from Gamma-Ray Observations of the Coma Cluster of Galaxies with VERITAS and Fermi”, Arlen, T., et al. for the VERITAS Collaboration, *Astrophysical Journal*, **757** (2012), 123.

“On the Sensitivity of the HAWC Observatory”, Abeysekara, A. U., for the HAWC Collaboration, *Astroparticle Physics*, **35** (2012), 641.

“Detection of Pulsed Gamma Rays Above 100 GeV from the Crab Pulsar”, Aliu, E., for the VERITAS Collaboration, *Science*, **334** (2011), 69.

“VERITAS discovery of variability in the very high energy γ -ray emission of 1ES 1218+304”, Acciari, V., et al. for the VERITAS Collaboration, *Astrophysical Journal Letters*, **709L** (2010), 163.

“A connection between star formation activity and cosmic rays in the starburst galaxy M 82”, Acciari, V., et al. for the VERITAS Collaboration, *Nature*, **462** (2009), 770.

“VERITAS upper limit on the very high energy emission from the radio galaxy NGC 1275”, Acciari, V., et al. for the VERITAS Collaboration, *Astrophysical Journal Letters*, **706L** (2009), 275.

“Radio imaging of the very-high-energy γ -ray emission region in the central engine of a radio galaxy”, Acciari, V., et al. for the VERITAS Collaboration, *Science*, **325** (2009), 444.

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HR Departmnet
Corporation
123 Pleasant Lane
12345 City, State

February 3, 2014

Dear Sir or Madam,

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Sincerely yours,

Asif Imran

Attached: curriculum vitae