

# Katherine Rawlins

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## Education

- Oct. 2001 Ph.D. in physics  
Univeristy of Wisconsin - Madison  
Advisor: Albrecht Karle  
Thesis: Measuring the Composition of Cosmic Rays using the SPASE and AMANDA Detectors
- June 1996 B.S. in physics, and distinction in the major  
Yale University, New Haven, CT  
Advisor: Peter Parker  
Senior Project: Measuring the Time of Flight and Position of a Radioactive Beam

## Experience

- 2005-present Assistant Professor, Department of Physics and Astronomy, UAA  
Teaching introductory physics, cosmic-ray research with IceCube experiment
- 2003-2005 Pappalardo Fellow, MIT  
LIGO burst upper limits working group; GRB coincidences
- 2003 Researcher, University of Wisconsin-Madison  
Physics requirements for flasher board for IceCube, analysis of SPASE/AMANDA coincidences in 2000-2002, supervision of REU summer student
- 2001-2002 Winter-over Scientist and Station Science Leader, South Pole Station, Antarctica  
Maintainence of AMANDA and related detectors over Antarctic winter, science liason to NSF
- 1999-2001 Research Assistant, University of Wisconsin-Madison  
Supervisors: Albrecht Karle, Francis Halzen  
AMANDA hardware and analysis, SPASE-AMANDA coincidences
- 1997-1998 Research Assistant, University of Wisconsin-Madison  
Supervisor: Dan McCammon  
X-ray Quantum Calorimeter rocket payload, transition-edge sensors
- 1996, 1998 Teaching Assistant, University of Wisconsin-Madison  
Supervisors: Jean Buehlman, Bill Friedman, Bernice Durand  
Introductory E&M, modern physics for non-majors
- 1996 Summer Research Assistant, IBM Almaden Research Center, San Jose, CA.  
Supervisor: Michael Toney  
X-ray crystallography, multilayer thin metal films
- 1995 Summer Research Assistant, Lunar and Planetary Institute, Houston, TX.  
Supervisor: Julianne Moses  
Simulations of possible sources of water ice onto the planet Mercury
- 1994 Summer Research Assistant, Biophysics, Yale University.  
Supervisor: Axel Brunger  
Electrostatic interactions in proteins, C programming and simulations

**Awards and fellowships**

- 2003-2005 Pappalardo Fellowship at MIT
- 2000-2001 K-Through-Infinity Graduate Fellow (an NSF education and outreach fellowship)
- 2000 Hirshfelder Scholarship Award for graduate women in the physical sciences.
- 2000 Vilas Travel Award
- 1999 Scientific Secretary for 26th International Cosmic Ray Conference, Salt Lake City.

**Outreach and volunteer activities**

- 1998-2003 Volunteer instructor for Hoofers Sailing Club.
- 2003 Invited talk: Vantage Point, Madison, WI
- 2003 Classroom visit: WCATY program, Madison, WI
- 2002 Appearance on "Harsh Continent: Life in Antarctica" by CNN
- 2002 Phone conference from South Pole to LBNL Open Lab Day
- 2002 Appearance on "Hot Science From Antarctica," by Natural History New Zealand
- 2001 Live telecast from South Pole to the Exploratorium (San Francisco, CA) for "Origins: Antarctica"
- 2001 Live telecast from South Pole to Supercomputing Conference (Denver, CO)
- 1999 Science Consortium demonstration, Washington D.C.
- 1997-1999 Volunteer for "Universe in the Park" program in Wisconsin state parks.
- 1997, 98, 99 Volunteer for "Expanding Your Horizons" program for middle-school age girls

**Publications: Journals**

- External Sources of Water for Mercury's Putative Ice Deposits (with J. I. Moses, K. Zahnle, and L. Dones) *Icarus* **137** (1999) 197-221
- Observation of High Energy Neutrinos with Cerenkov Detectors Embedded in Deep Antarctic Ice (with E. Andres et al.) *Nature* **410** (2001) 441-443
- Observation of High Energy Atmospheric Neutrinos with the Antarctic Muon and Neutrino Detector Array (with J. Ahrens et al.), *Phys. Rev.* **D66** (2002) 012005 (astro-ph/0205109)
- Limits to the muon flux from WIMP annihilation in the center of the Earth with the AMANDA detector (with J. Ahrens et al.) *Phys. Rev.* **D66** (2002) 032006 (astro-ph/0202370)
- Search for Supernova Neutrino-Bursts with the AMANDA Detector (with J. Ahrens et al.) *Astroparticle Physics* **16** (2002) 345-359 (astro-ph/0105460)
- Search for Point Sources of High Energy Neutrinos with AMANDA (with J. Ahrens et al.) *Astrophysical Journal* **583** (2003) 1040-1057 (astro-ph/0208006)
- Search for Neutrino-Induced Cascades with the AMANDA Detector (with J. Ahrens et al.), *Phys. Rev.* **D67** (2002) 012003 (astro-ph/0206487)
- Unbiased cut selection for optimal upper limits in neutrino detectors: the model rejection potential technique (with G. Hill) *Astropart. Phys.* **19** (2003) 393-402 (astro-ph/0209350)
- Limits on diffuse fluxes of high energy extraterrestrial neutrinos with the AMANDA-B10 detector (with J. Ahrens et al.), *Phys. Rev. Lett.* **90** (2003) 251101 (astro-ph/0303218)
- Muon track reconstruction and data selection techniques in AMANDA (with J. Ahrens et al.), *Nuclear Inst. and Methods in Phys. Res.* **A 524** (2004) 169-194

- Sensitivity of the IceCube detector to Astrophysical Sources of High Energy Muon Neutrinos (with J. Ahrens et al.), *Astropart.Phys.* **20** (2004) 507-532 (astro-ph/0305196)
- Search for extraterrestrial point sources of neutrinos with AMANDA-II (with J. Ahrens et al.), *Phys.Rev.Lett.* **92** (2004) 071102 (astro-ph/0309585)
- Calibration and Survey of AMANDA with the SPASE Detectors (with the AMANDA and SPASE Collaborations), *Nucl. Inst. and Methods in Phys. Res.* **A 522** (2004) 347-359
- Measurement of the cosmic ray composition at the knee with the SPASE-2/AMANDA-B10 detectors (as primary author with the AMANDA and SPASE Collaborations), *Astropart. Phys.* **21** (2004) 565-581
- Search for neutrino induced cascades with AMANDA (with M. Ackermann, et al.), *Astropart. Phys.* **22:2** (2004) 127-138 (astro-ph/0405218)
- Flux Limits on Ultra High Energy Neutrinos with AMANDA-B10 (with M. Ackermann, et al.), *Astropart. Physics* **22** (2005) 339-353
- Muon Track Reconstruction and Data Selection Techniques in AMANDA (with J. Ahrens et al.) *Nuclear Instruments and Methods* **A524** (2004) 169-194 (astro-ph/0407014)
- Search for Extraterrestrial Point Sources of High Energy Neutrinos with AMANDA-II Using Data Collected in 2000-2002 (with M. Ackermann et al.) *Phys. Rev.* **D71** (2005) 077102 (astro-ph/0412347)
- The IceCube prototype string in Amanda (with M. Ackermann et al.) *Nuclear Instruments and Methods* **A556** (2006) 169-181 (astro-ph/0601397)
- Limits to the Muon Flux from Neutralino Annihilations in the Sun with the AMANDA Detector (with M. Ackermann et al.) *Astroparticle Physics* **24** (2006) 459-466 (astro-ph/0508518)
- Muon Flux at the Geographical South Pole (with X. Bai, T. K. Gaisser, A. Karle, G. M. Spiczak and T. Stanev) *Astroparticle Physics* **25** (2006) 361-367
- Optical Properties of Deep Glacial Ice at the South Pole (with M. Ackermann et al.) *Journal of Geophysical Research* **111** (2006) D13203
- Limits on gravitational wave emission from selected pulsars using LIGO data (with B. Abbott, et al.) *Phys.Rev.Lett.* **94** (2005) 181103 (gr-qc/0410007)
- A Search for Gravitational Waves Associated with the Gamma Ray Burst GRB030329 Using the LIGO Detectors (with B. Abbott, et al.) *Phys.Rev.* **D72** (2005) 042002 (gr-qc/0501068)
- Upper limits on gravitational wave bursts in LIGO's second science run (with B. Abbott, et al.) *Phys.Rev.* **D72** (2005) 062001 (gr-qc/0505029)
- Search for gravitational waves from galactic and extra-galactic binary neutron stars (with B. Abbott, et al.) *Phys.Rev.* **D72** (2005) 082001 (gr-qc/0505041)
- Search for Gravitational Waves from Primordial Black Hole Binary Coalescences in the Galactic Halo (with B. Abbott, et al.) *Phys.Rev.* **D72** (2005) 082002 (gr-qc/0505042)

- Upper limits from the LIGO and TAMA detectors on the rate of gravitational-wave bursts (with B. Abbott, et al.) *Phys.Rev.* **D72** (2005) 122004 (gr-qc/0507081)
- Upper Limits on a Stochastic Background of Gravitational Waves (with B. Abbott, et al.) *Phys.Rev.Lett.* **95** (2005) 221101 (astro-ph/0507254)
- First all-sky upper limits from LIGO on the strength of periodic gravitational waves using the Hough transform (with B. Abbott, et al.) *Phys.Rev.* **D72** (2005) 102004 (gr-qc/0508065)
- Search for gravitational waves from binary black hole inspirals in LIGO data (with B. Abbott et. al.) *Phys.Rev.* **D73** (2006) 062001 (gr-qc/0509129)
- Joint LIGO and TAMA300 Search for Gravitational Waves from Inspiralling Neutron Star Binaries (with B. Abbott, et al.) *Phys.Rev.* **D73** (2006) 102002 (gr-qc/0512078)
- Limits on the Muon Flux from Neutralino Annihilations at the Center of the Earth with AMANDA (with A. Achterberg et al.) Accepted to *Astroparticle Physics*
- First Year Performance of the Icecube Neutrino Telescope (with A. Achterberg et al.) Accepted to *Astroparticle Physics* (astro-ph/0604450)
- Limits on the High-Energy Gamma and Neutrino Fluxes from the SGR 1806-20 Giant Flare of December 27th, 2004 with the AMANDA-II Detector (with A. Achterberg et al.) Submitted to *Phys.Rev.Lett.* (astro-ph/0607233)
- On the Selection of AGN Neutrino Source Candidates for a Source Stacking Analysis with Neutrino Telescopes (with A. Achterberg et al.) Submitted to *Astroparticle Physics*

**Publications: Conference proceedings**

- Exogenic Sources of Water for Mercury's Polar Ice. (with J. I. Moses and K. Zahnle) *Bull. Am. Astron. Soc.* **27**, 1117-1118. (1995)
- Observation of Atmospheric Neutrino Events with the AMANDA Experiment. (with E. Andres et al.) *Cape Town 1999, Weak interactions and neutrinos* (1999) 258-262 (astro-ph/9904379)
- From the First Neutrino Telescope, the Antarctic Muon and Neutrino Detector Array, to the IceCube Observatory (with F. Halzen et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Observation of Atmospheric Neutrino Events with AMANDA (with A. Karle et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Nearly Vertically Upgoing Muons in the AMANDA-B10 Detector (with E. Dalberg et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Seasonal Variation of the Muon Flux Seen by AMANDA (with A. Bouchta et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- AMANDA Search for High-Energy Neutrinos Accompanying Gamma Ray Bursts (with R. Bay et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Supernova Burst Analysis with the AMANDA Neutrino Telescope (with R. Wischniewski et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)

- A Search for Point Sources of High Energy Neutrinos with the AMANDA Neutrino Telescope (with J. H. Kim et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Up- and Down-Going Muons in the AMANDA-B4 Prototype Detector (with S. Hundertmark et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Search for Relativistic Monopoles with the AMANDA Detector (with P. Niessen et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Performance of the AMANDA-B10 String Array (with G. Hill et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Calibration of AMANDA with Coincident Events from SPASE-2 (with T. Miller et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Optical Properties of South Pole Ice at Depths from 140 to 2300 Meters (with K. Woschnagg et al.) *Proc. of the 26th Int'l Cosmic Ray Conference* (1999)
- Results from the AMANDA High Energy Neutrino Detector (with E. Andres et al.) *Nucl.Phys.Proc.Suppl.* **91** (2000) 423-430 (astro-ph/0009242)
- Analysis of atmospheric muons with AMANDA (with P. Desiati et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Calibration and Survey of AMANDA with SPASE (with X. Bai et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Observation of high energy atmospheric neutrinos with AMANDA (with C.H. Wiebusch et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Search for a diffuse flux from sources of high energy neutrinos with AMANDA-B10 (with G. Hill et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Search for Cascade-like events in the AMANDA-B10 detector (with I. Taboada, M. Kowalski, et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Supernova Neutrino-Burst Search with the AMANDA Detector (with T. Neunhoeffler et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- The AMANDA Search for High Energy Neutrinos from Gamma-Ray Bursts (with R. Hardtke et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Performance of the AMANDA-II Detector (with R. Wischniewski et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- A method to detect UHE neutrinos with AMANDA (with S. Hundertmark et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Potential of AMANDA-II in HE neutrino astrophysics (with S. Barwick et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Search for relativistic monopoles with the AMANDA detector (with P. Niessen, C. Spiering, et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)

- Search for neutrinos from WIMP annihilations with the AMANDA detector (with C. P. de los Heros et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Time calibration of the AMANDA neutrino telescope with cosmic ray muons (with D. Cowan, K. Hanson, et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- The IceCube Detector (with A. Goldschmidt et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Performance studies for IceCube (with M. Leuthold et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Science potential of the IceCube detector (with C. Spiering et al.) *Proc. of the 27th Int'l Cosmic Ray Conference* (2001)
- Results from AMANDA (with G. C. Hill et al.) *Proceedings of the XXXVIth Recontres de Moriond, Electroweak Interactions and Unified Theories* (2001) (astro-ph/0106064)
- Physics Results from the AMANDA-B10 Neutrino Telescope (with A. Hallgren et al.) *Nucl. Phys. Proc. Suppl.* **100** (2002) 507-509 (astro-ph/0204364)
- The AMANDA-II Neutrino Telescope (with R. Wischnewski et al.) (astro-ph/0204268)
- IceCube - the next generation neutrino telescope at the South Pole (with A. Karle et al.) *Proc. of the XXth Int'l Conf. on Neutrino Physics and Astrophysics* (2002) (astro-ph/0209556)
- Search for Muons from WIMP Annihilation in the Center of the Earth with the AMANDA-B10 Detector (with P. Olbrechts et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- AMANDA-B10 Limit on UHE Muon-Neutrinos (with S. Hundertmark et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Measurement of the Cosmic Ray Composition at the Knee with the SPASE-2/AMANDA-B10 Detectors (as primary author for the SPASE and AMANDA Collaborations), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Online Search for Neutrino Bursts from Supernovae with the AMANDA detector (with T. Feser et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Search for Extraterrestrial Point Sources of Neutrinos with AMANDA-II (with T. Hauschildt and D. Steele et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- New Capabilities of the AMANDA-II High Energy Neutrino Telescope (with W. Wagner et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Search for Diffuse Fluxes of Extraterrestrial Muon-Neutrinos with the AMANDA detectors (with G. Hill, M. Leuthold and J. Cooley et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Search for High Energy Neutrinos of All Flavors with AMANDA II (with M. Kowalski et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Cosmic Ray Flux Measurement with AMANDA-II (with D. Chirkin et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)

- Searching for High Energy Muon Neutrinos from Gamma-Ray Bursts with AMANDA (with R. Hardtke, K. Kuehn and M. Stamatikos et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Response of AMANDA-II to Cosmic Ray Muons (with P. Desiati et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Atmospheric Neutrino and Muon Spectra Measured with the AMANDA-II detector (with H. Geenen et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- IceTop: the Surface Components of IceCube (with T. Gaisser et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- Simulation of Ice Cherenkov Detectors for IceTop (with T. Stanev and R. Ulrich et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- The IceCube High Energy Neutrino Telescope (with S. Yoshida et al.), *Proc. of the 28th Int'l Cosmic Ray Conference* (2003)
- IceCube: A Multipurpose Neutrino Telescope (as primary author for the IceCube Collaboration) *Proc. of the 3rd Workshop on Very High Energy Particle Astrophysics* (2003)
- Neutrino Astronomy at the South Pole: Status of the AMANDA Experiment (with P. Desiati et al.), *Proc. of Les Rencontres de Physique de la Vallee d'Aoste* (2003) (astro-ph/0306536)
- Recent Results from the AMANDA Experiment (with P. Niessen et al.), *Proceedings of the 38th Rencontres of Moriond* (2003) (astro-ph/0306209)
- AMANDA: Status and latest Results (with M. Ribordy et al.), *Proceedings of the 38th Rencontres of Moriond* (2004) (hep-ex/0405035)
- Results from the AMANDA Neutrino Telescope (with C. de los Heros et al.) *Nucl. Phys. Proc. Suppl.* **136** (2004) 85-92
- New Results from the Antarctic Muon And Neutrino Detector Array (with K. Woschnagg et al.) *Nucl. Phys. Proc. Suppl.* **143** (2005) 343-350
- New Results from the AMANDA Neutrino Telescope (with M. Ackermann et al.) *Nucl. Phys. Proc. Suppl.* **145** (2005) 319-322
- Multi-Messenger Studies with AMANDA/IceCube: Observations and Strategies (with Elisa Bernardini et al.) *Proceedings of the Cherenkov 2005 Conference* (2005) (astro-ph/0509396)
- From AMANDA to IceCube (with M. Ribordy et al.) *Proceedings of the Vth International Conference on Non-Accelerator New Physics* (2005) (astro-ph/0509322)
- The IceCube Collaboration: Contributions to the 29th International Cosmic Ray Conference (ICRC 2005) (with A. Achterberg et al.) *Proc. of the 29th Int'l Cosmic Ray Conference* (2005) (astro-ph/0509330)
- The IceCube Neutrino Observatory (with A. Achterberg et al.) *Nucl. Phys. Proc. Suppl.* **143** (2005) 367-370
- IceTop Status in 2004 (with A. Achterberg et al.) *Nucl. Phys. Proc. Suppl.* **145** (2005) 327-330

IceCube: The State of the Art (with T. Montaruli et al.) *Proceedings of the Vulcano Workshop* (2006) (astro-ph/0608140)

Neutrino Astronomy at the South Pole (with P.A. Toale et al.) *Proceedings of the 2006 Rencontres de Moriond* (2006) (astro-ph/0607003)

Gravitational wave burst vetoes in the LIGO S2 and S3 data analyses (with A. Di Credico et al.) *Class.Quant.Grav.* **22** (2005) S1051-S1058 (gr-qc/0504106)

Veto Studies for LIGO Inspirals (with N. Christensen et al.) *Class.Quant.Grav.* **22** (2005) S1059-S1068 (gr-qc/0504067)

Search for gravitational wave bursts in LIGO's third science run (with B. Abbott, et al.) *Class.Quant.Grav.* **23** (2006) S29-S39 (gr-qc/0511146)