Stephanie A. Wissel, Ph. D.

CONTACT INFORMATION

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RESEARCH INTERESTS

astroparticle physics and astronomy, high-energy astrophysics, neutrinos, cosmic rays, gamma rays, science education

EDUCATION

The University of Chicago, Chicago, IL, USA

Ph.D., Physics June 2010, S. M. Physics December 2005, Advisor: Scott P. Wakely

- Thesis: Ground-Based Observations of Direct Cerenkov Light and the Flux of Iron Nuclei at TeV Energies

The University of Dallas, Irving, TX, USA

B.S., *Magna cum Laude*, Physics with Conc. in Applied Mathematics, May 2004

EXPERIENCE

University of California, Los Angeles, Los Angeles, CA, USA

Postdoctoral Researcher, Physics **November 2012–present**

Extremely High Energy Neutrinos and Cosmic Rays

- ANITA (Antarctic Impulsive Transient Antenna): a balloon-borne telescope that measures the radio emission from ultra-high energy neutrinos and cosmic rays. Responsible for calibration using remote Antarctic pulsing stations as well as low-frequency instrumentation upgrade.
- Leading investigator on SLAC beam test T-510 of RF emission in a dielectric
- Member of science team for the Greenland Neutrino Observatory (GNO).
- PI on search for astroparticles interacting with the moon with the Long Wavelength Array (LEAP project)

Princeton Plasma Physics Laboratory, Princeton, New Jersey, USA

Postdoctoral Researcher, Science Education **April 2010–October 2012**

Topics in Physics Education

- Research in complex plasmas and laboratory astrophysics with students in middle school through undergraduate level. Development of demonstration tools for plasma physics, and research in microgravity with teachers and undergraduates.

The University of Chicago, Chicago, IL, USA

Graduate Student, Physics **2004–2010**

Measurement of TeV Cosmic-Ray Iron Spectrum

- VERITAS. Independently developed methods for measurement of very-high-energy cosmic rays by directly measuring the Cerenkov radiation from the primary particle, which required simulating hadronic air showers and VERITAS detector response. Assisted in construction, commissioning, calibration and operation of telescope array.

Pathfinding Experiment to Detect Direct Cerenkov Emission of Cosmic Rays

- TrICE: Track Imaging Cerenkov Experiment. Designed, constructed, maintained and calibrated automated optical system for mirror alignment. Developed tools for calibration and analysis after null detection. Planned and executed observing schedules. Evaluated efficacy of Multi-Anode PMTs in cosmic-ray experiments.

First-Author Publications

- S. A. Wissel, J. L. Ross, S. Gershman, A. Zwicker "The Use of DC Glow Discharges as Undergraduate Educational Tools", *The American Journal of Physics*, 81, 9, (2013), 663–669
- S. A. Wissel, K. Byrum, J. D. Cunningham, G. Drake, E. Hays, D. Horan, D. Kieda, E. Kovacs, S. Magill, L. Nodulman, S. P. Swordy, R. Wagner, S. P. Wakely,"The Track Imaging Cerenkov Experiment", *Nuclear Instruments and Methods, A*, (2011), 1–8
- S. A. Wissel, "Observations of Direct Cerenkov Light in Ground-Based Telescopes and the Flux of Iron Nuclei at TeV Energies", *Thesis*, The University of Chicago, 2010

Selected Collaborative Publications

- Dolci, M. , Romero-Wolf, A. , and Wissel, S. "Experimental sensitivity of cosmic-ray telescopes to the intergalactic magnetic field", *in prep*, 2014.
- Acciari, V. A. et al., "Observation of Markarian 421 in TeV gamma rays over a 14-year time span", *Astroparticle Physics*, 54, (2014), 1-10.
- The VERITAS Collaboration, The VLBA Monitoring Team, The H.E.S.S. Collaboration, The MAGIC Collaboration, "Radio Imaging of the Very-High-Energy Gamma-Ray Emission Region in the Central Engine of a Radio Galaxy", *Science* **325** (2009), 444-448.
- The VERITAS Collaboration, "A connection between star formation activity and cosmic rays in the starburst galaxy M82", *Nature* **462** (2009), 770-772
- Acciari, V. A. et al., "Observation of Extended Very High Energy Emission from the Supernova Remnant IC 443 with VERITAS", *ApJL* **698** (2009), L133-L137.
- Acciari, V. A., et al., "VERITAS Observations of the γ-ray Binary LS I +61 303", *ApJ* **679** (2008), 1427-1432.

Selected Conferences & Proceedings

- S. A. Wissel for the ANITA Collaboration, "Development of a Low-Frequency Horizontally-Polarized Antenna for Detection of Ultra-High Energy Cosmic Rays with ANITA-III," *Topics in Astroparticle and Underground Physics*, Monterrey, CA, September 2013
- S. A. Wissel, A. Zwicker, et al, "Making a Splash in Microgravity with Teachers", *53^{rd} Annual Meeting of the APS Division of Plasma Physics*, Salt Lake City, UT, November 2011

- S. A. Wissel, "Lifting Up Young Women at the Princeton Plasma Physics Laboratory", *Invited Talk and Panel Discussion at New Jersey Women in Science and Technology 5^{th} Annual Workforce Summit*, May 2011

- International School of Cosmic Ray Astrophysics 2008, 16^{th} Course: "Gamma Ray and Cosmic Ray Astrophysics: From below GeV to beyond EeV Energies", Erice, Sicily, Italy, July 2008

- Wissel, S. A. for the VERITAS Collaboration, "Studies of Direct Cherenkov Emission with VERITAS", *30th International Cosmic Ray Conference*, Merida, Mexico, July 2007.

Teaching Experience

UCLA **2012–2013**

- Guest lecturer for Prof. Lindley Winslow's class, "Special Topics in Nuclear Physics: The Neutrino" on Ultra-High-Energy Neutrinos, November 2012

Princeton Plasma Physics Laboratory **2010–2012**

- Mentored underprivileged high-school students in building experiment flown on microgravity flights. Teaching and curriculum development for numerous workshops on general physics, microgravity, energy, plasmas, and fusion aimed at middle-school, high-school, undergraduate, and K-12 teachers.

The University of Chicago **2004–2010**

- Teaching Assistant for General Physics Series. Teacher at the Adler Planetarium Teen Astronomers Camp which introduced gifted middle school students to the basics of high-altitude ballooning by launching a weather balloon with simple atmospheric detectors and Geiger counters. Taught at a weekly after-school program, S.T.O.M.P., for at-risk elementary-school students which required designing activities that emphasized experimentation and scientific inquiry.

The University of Dallas **2001–2004**

- Laboratory Assistant and Tutor for Optics, Basic Ideas of & General Physics, and Introductory Astronomy

Outreach Experience

Women in Physics and Astronomy at UCLA **2012–present**

- Leader of mentoring group consisting of postdocs, grad. students, and undergrads.
- Invited presenter at PPPL's Young Women's Conference 2012

Mentor for NASA / PPPL Flight Week on the "Weightless Wonder" **2011–2012**

- Led 4 teams of K–12 teachers and museum educators on zero-gravity flights to investigate science topics that could translate into K–12 curricula, including fluid dynamics of splashes, the Rayleigh-Taylor instability, and rocket fuel. Worked with teacher groups for months in preparing for flights and developing curricula.

Head of PPPL's Outreach Efforts for Women **2010–2012**

- Expanded PPPL's work with girls through mentoring program, longitudinal tracking, and an essay contest. Doubled student and scientist participation as director of Young Women's Conference in 2011 & 2012. Several lectures and invited talks on women in physics.

Lecturer at "Astro Conversations" at the Adler Planetarium SVL Lab **2009–2010**

- Lead informal discussions about modern astronomy research, emphasizing cosmic rays & gamma rays

Co-founder of the Women in Physics Chat & Chow (WPCC) **2008–2010**
- Worked towards increasing camaraderie and visibility among female physics graduate students, by organizing events for graduate students and undergraduates

Service

Organizer of Astroparticle Group Journal Club **2008–2010, 2012**
- Planned and facilitated weekly sessions for members of the Kavli Institute for Cosmological Physics (KICP) Astroparticle Group to present current research and discuss recent advances in astroparticle physics, and later similar group at UCLA

Conference Organizer **2012, 2011, 2008**
- PPPL's Young Women's Conference (YWC) 2011, 2012: Director of conference in which 200–400 young women in grades 7–10 meet professional female scientists, placing special emphasis on underrepresented minorities and diverse career paths.
- KICP IMPACT Workshop 2008: Planned sessions for 3-day astrophysical workshop on the impact of messenger-particle astrophysics on cosmology

Physics Dept. Graduate Admissions Committee Member **2007**
- Ranked and selected candidates for admission to graduate school

University of Dallas Society of Physics Students **2002–2004**
- President 2003–2004
- Vice President 2002–2003

Professional Memberships

American Physical Society; 2003–present
Phi Beta Kappa; 2004–present
Sigma Pi Sigma; 2003–present
Association of Women in Science; 2012–present

Awards

Illinois Space Grant Consortium
- Graduate Merit Fellowship, 2007, 2009

The University of Dallas
- Cardinal Spellman Award, 2004
- Montosorri Award for Outstanding Physics Student, 2004
- National Merit Scholarship, 2000–2004
- Clare Boothe Luce Scholarship, 2002–2004

References

- Scott P. Wakely
  Associate Professor, Dept. of Physics, Enrico Fermi Institute, and the College
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  The University of Chicago
  933 E. 56th St. LASR 227
  Chicago IL 60637
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- David Saltzberg
  Professor & Vice Chair, Dept. of Physics & Astronomy, University of California, Los Angeles
  Knudsen 4-107G
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