

Lawrence R. Wiencke, Ph.D.

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Education

Ph.D., Columbia University, 1992
M.A., Columbia University, 1985
A.B., Dartmouth College, 1983 (cum laude, honors physics major)

Experience

2002–present Research associate professor, Department of Physics, University of Utah
2003–2005 Visiting scientist, Enrico Fermi Institute, University of Chicago
2002 Foreign fellow, International Cosmic Ray Research Institute (ICRR),
 University of Tokyo
1998–2002 Research assistant professor, Department of Physics, University of Utah
1993–1997 Postdoctoral research associate, Department of Physics, University of Utah
1985–1992 Graduate student research associate, Nevis Laboratories, Columbia
 University
1983–1985 Graduate student faculty fellow, Columbia University
1981–1983 Student assistant, Department of Physics, Dartmouth College

Teaching (University of Utah)

Taught Physics 3620/5620: Electronics/Computer Interfacing (spring 2001)
Teaching assistant for Physics 3610/5610: Electronics (fall 1997)
Teaching assistant for Physics 3410: Modern Optics (winter 1996, winter 1997)
Co-taught Physics 1410: The Clock in the Sun (spring 1995, spring 1996)
Supervised undergraduate and master's of instrumentation students (1999–present)

Students Supervised, with Graduation Dates

Chris Cannon	Undergraduate	2004
Reid Mumford	Senior honors project	2000 (now at Johns Hopkins University)
Richard Gray	Senior project	2000 (now at Cornell University)
Julien Girard	Master's of instrumentation	2000 (now at laser guide star project: ELPOA)
Paul Denholm	Master's of instrumentation	1997 (Ph.D. University of Wisconsin)

Awards

Center of Excellence Fellowship, University of Tokyo (2001)

Public Outreach

Operated portable HiRes detector and laser to measure atmospheric clarity: collaboration with Delta, Utah, high school students and Millard County, Utah, officials (summer, fall 2002)
Co-taught workshop with Astrophysics Science Projects Integrating Research and Education (ASPIRE) (summer 1998)

Research

Pierre Auger Observatory, Malargüe, Argentina (2003–present)

Hybrid Analysis Group: energy spectrum, calibration, atmospheric, timing

Atmospheric Group: head of central laser facility (<http://casab.physics.utah.edu/clf>)

Northern Site Group: site evaluations, atmospheric measurements, Millard County, Utah

2003–2005: 10 visits to Malargüe for research activities

High Resolution Fly's Eye (HiRes), Utah, USA (1993–present)

Atmospheric Group: development of techniques to measure atmospheric clarity

Atmospheric Group: supervision of design, construction, deployment, and operation of monitoring systems

Analysis Group: air shower reconstruction, energy spectrum analysis, search for exotics ($v > c$, $v < c$)

HiRes prototype: coordination of installation, operation, and analysis of prototype stereo experiment (1996–1997)

Other Experiments

Calibration by Rayleigh Scattering (CRAYS): experiment design and start-up (Kashiwa, Japan) (2002–2003)

Backscatter LIDAR system (Japan/United States R&D project) (1998)

Colloquium Presentations

“Astro-Particle Physics near the GZK Feature and Beyond,” University of Utah, Salt Lake City (2005)

“Measuring Air Showers in the Atmosphere,” Utah State University, Logan (2004)

“Viewing Air Showers in the Desert Sky with HiRes,” ICRR, University of Tokyo, Japan (2002)

“Chasing Air Showers Across the Desert Sky with HiRes,” University of Chiba, Japan (2002)

Invited Talks

“Atmospheric Monitoring,” Workshop on Calibration of Fluorescence Detectors, ICRR, Kashiwa, Japan (2004)

“The High Resolution Fly's Eye: Status and Physics,” Very High Energy Neutrino Telescope Workshop, Taipei, China (2002)

“The High Resolution Fly's Eye,” International Workshop on Extremely High Energy Cosmic Rays, Tokyo, Japan (2001)

Highlight talk: “The Energy Spectrum and the High Resolution Fly's Eye,” European Cosmic Ray Symposium, Lodz, Poland (2000)

“Status of HiRes,” Pierre Auger Cosmic Ray Workshop, Malargüe, Argentina (2000)

Contributed Talks

International Cosmic Ray Conference (1995, 1997, 1999, 2001, 2003)

Conference on Ultra High Energy Particles from Space, Aspen, Colorado (2002)

Conference on Visibility, Aerosols, and Atmospheric Optics, Vienna, Austria (2000)

International Society for Optical Engineering, Denver, Colorado (1996, 1998)

Professional Memberships

American Physical Society

Selected Publications

- Techniques for Measuring Atmospheric Aerosols at the High Resolution Fly's Eye Experiment, R. U. Abassi et al., Accepted for publication in *Astrophys. J.* (2005).
- The Central Laser Facility at the Pierre Auger Observatory (astro-ph/0507334), F. Arqueros et al., Proc. 29th ICRC (2005).
- A Study of the Composition of Ultra High Energy Cosmic Rays Using the High Resolution Fly's Eye, R.U. Abassi et al., *Astrophys. J.* 622, 910 (2005).
- Measurement of the Flux of Ultrahigh Energy Cosmic Rays from Monocular Observations by the High Resolution Fly's Eye Experiment, R.U. Abassi et al., *Phys. Rev. Lett.* 92, 151101 (2004).
- Study of Small-Scale Anisotropy of Ultrahigh Energy Cosmic Rays Observed in Stereo by HiRes, R.U. Abassi et al., *Astrophys. J.* 610, L73 (2004).
- The Energy Spectrum and the High-Resolution Fly's Eye, L.R. Wiencke on behalf of the HiRes Collaboration, *J. Phys. G: Nucl. Part. Phys.* 27, 1611 (2001).
- A Fiber-Optic-Based Calibration System for the High Resolution Fly's Eye Cosmic Ray Observatory, J.H.V. Girard et al., *Nucl. Instr. Meth.* A460, 278 (2001).
- A Measurement of the Average Longitudinal Development Profile of Cosmic Ray Air Showers Between 10^{17} eV and 10^{18} eV, T. Abu-Zayyed et al., *Astroparticle Phys.* 16, 1 (2001).
- Evidence for Changing of Cosmic Ray Composition Between 10^{17} and 10^{18} eV from Multicomponent Measurements, T. Abu-Zayyad et al., *Phys. Rev. Lett.* 84, 4276 (2000).
- Radio-Controlled Xenon Flashers for Atmospheric Monitoring at the HiRes Cosmic Ray Observatory, L.R. Wiencke et al., *Nucl. Instr. Meth.* A428, 593 (1999).
- Precise Measurement of the Λ^0 and $\Lambda\text{-bar}^0$ Masses and a Test of *CPT* Invariance, E.P. Hartouni et al., *Phys. Rev. Lett.* 72b, 1322 (1994).
- Observation of Coulomb Effects in Production of $p\bar{i}^+ p\bar{i}^-$, $p p\bar{i}^-$, and $K^+ K^-$ Pairs in pp Collisions at 27.5 GeV/c, L.R. Wiencke et al., *Phys. Rev.* D46, 3708 (1992).