

Juan Marcos Santander

CONTACT

INFORMATION

IceCube Neutrino Observatory
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RESEARCH INTERESTS

Astroparticle physics, atmospheric monitoring techniques applied to cosmic-ray experiments, development and monitoring of cosmic-ray experiments' instrumentation.

EDUCATION

University of Wisconsin-Madison, Madison, WI, USA

Physics PhD student (since May 2009)

- Advisor: Prof. Stefan Westerhoff.

Universidad Tecnológica Nacional, San Rafael, Mendoza, Argentina

Degree in Electro-mechanical Engineering (September 2007)

- Thesis Topic: *Design and construction of a LIDAR telescope.*
- Advisor: Prof. Miguel Fortunato.

PROFESSIONAL APPOINTMENTS

Istituto Nazionale di Fisica Nucleare

- INFN Research fellow (Rome, Italy) April 2008 to April 2009.

RESEARCH EXPERIENCE

University of Wisconsin-Madison, Madison, WI, USA

Physics PhD student

May 2009 to present

- PhD student involved in the IceCube neutrino telescope.

INFN Sezione di Tor Vergata, Rome, Italy

INFN-CNEA Research fellow

April 2008 to April 2009

- Member of air fluorescence detector calibration group of the Pierre Auger Observatory. Automated processing of data from the fluorescence telescope light calibration system, and participated in the analysis of calibration data.

Pierre Auger Observatory (Staff member), Malargüe, Mendoza, Argentina

FD Observer

April 2006 to April 2008

- Full-time quality-control staff member. Monitored and optimized air fluorescence telescope operations, and participated in the development of detector monitoring software.

CITEFA (Technical and Scientific Research Center of the Armed Forces), Buenos Aires, Argentina

Undergraduate researcher

April to December 2005

- Worked in the design, simulation, and construction of a LIDAR telescope prototype for the Pierre Auger Observatory atmospheric monitoring program.

Universidad Tecnológica Nacional, Mendoza, Argentina

Undergraduate researcher

March 2003 to April 2006

- Participated in installation and operation of lidar atmospheric monitoring telescopes at the Pierre Auger Observatory. Wrote telescope software and operations manual.
- Participated in testing of surface station electronics for the Pierre Auger Observatory. Helped to standardize testing, maintenance, and repair of electronics at the Observatory Testing Facility.

ACADEMIC
EXPERIENCE

Universidad Nacional de Cuyo, Malargüe, Mendoza, Argentina

Teaching Assistant

May 2008 to May 2009

- Adjunct for "Physics I" (classical mechanics): preparation of lectures, assignments and exams.

Universidad Tecnológica Nacional, San Rafael, Mendoza, Argentina

Student member of the Engineering Department Council

2003 to 2004

CONFERENCES
AND MEETINGS

Conferences Organized

- 50th Annual Meeting of the Argentine Astronomical Association. Member of the Local Organizing Committee. September 2007, Malargüe, Mendoza, Argentina.

Conferences Attended

- ATMON'08, Atmospheric Monitoring for Astroparticle physics Workshop, Prague, Czech Republic, June 2008
- Auger Monitoring Workshop, Paris, France, March 2007
- Northern Auger R&D and Auger Extension Meeting, Buenos Aires, Argentina, July 2005.
- PMT School and FD/SD Calibration Workshop, Malargüe, Argentina, April 2003
- 9th Meeting of the Ibero-American Astronomical League, Asunción, Paraguay, October 2001.

PUBLICATIONS

Selected publications

1. Pierre Auger Collaboration [J. Abraham et al.], "The Fluorescence Detector of the Pierre Auger Observatory", *to be submitted to Nuclear Instruments and Methods in Physics Research A* (2008).
2. S.Y. BenZvi et al., "The Lidar System of the Pierre Auger Observatory", *Nuclear Instruments and Methods in Physics Research* **A574** (2007) 171. (astro-ph/0609063)
3. C. De Donato et al. for the Auger Collaboration, "Using stars to determine the absolute pointing of the fluorescence detector telescopes of the Pierre Auger Observatory", *Astroparticle Physics* **28** (2007), 216.

Conference proceedings

1. S.Y. BenZvi et al., "Measurement of Aerosols at the Pierre Auger Observatory", [Pierre Auger Collaboration], 30th International Cosmic Ray Conference (ICRC 07), Mérida, Yucatan, Mexico (3-11 July 2007)[arXiv:0706.3236]
2. R. Cester et al., "Atmospheric aerosol monitoring at the Pierre Auger Observatory", [Pierre Auger Collaboration], 29th International Cosmic Ray Conference (ICRC 05), Pune, India (2005), 00 101-104.

3. J. Pallota et al., "New optics for LIDARs at the Pierre Auger Observatory: design, simulation and construction" (in Spanish), Annals of the 91st Meeting of the Argentine Physical Association.
4. A. Pattini et al., "Light pollution: a Study Based on the Assessment of Actual Cases", Innovation in Teaching/Learning Astronomy Methods, 26th General Assembly of the International Astronomical Union, Prague, Czech Republic. Special Session 2, SPS2, #47.

Publications as a member of the Pierre Auger Collaboration

1. "Limit on the diffuse flux of ultra-high energy tau neutrinos with the surface detector of the Pierre Auger Observatory", Pierre Auger Collaboration [J. Abraham et al.], Physical Review D Vol.79, No.10 p102001, 2009 (arXiv:0903.3385 [astro-ph]).
2. "Evidence for suppression of the flux of cosmic rays above 4×10^{19} eV", Pierre Auger Collaboration [J. Abraham et al.], Physical Review Letters **101** (2008), 061101 (arXiv:0806.4302 [astro-ph]).
3. "Upper Limit on the diffuse flux of UHE tau neutrinos from the Pierre Auger Observatory", Pierre Auger Collaboration [J. Abraham et al.], Physical Review Letters **100** (2008), 211101 (arXiv:0712.1909 [astro-ph]).
4. "Upper Limit on the Cosmic-Ray Photon Flux Above 10^{19} eV Using the Surface Detector of the Pierre Auger Observatory", Pierre Auger Collaboration [J. Abraham et al.], Astroparticle Physics **29** (2008), 243 (arXiv:0712.1147 [astro-ph]).
5. "Correlation of the highest-energy cosmic rays with the positions of nearby active galactic nuclei", Pierre Auger Collaboration [J. Abraham et al.], Astroparticle Physics **29** (2008), 188 (arXiv:0712.2843 [astro-ph]).
6. "Correlation of the highest energy cosmic rays with nearby extragalactic objects", Pierre Auger Collaboration [J. Abraham et al.], Science **318**, 939 (9 November 2007) (arXiv:0711.2256v1 [astro-ph]).
7. "Anisotropy studies around the galactic centre at EeV energies with the Auger Observatory", Pierre Auger Collaboration [J. Abraham et al.], Astroparticle Physics **27** (2007), 244. (astro-ph/0607382)
8. "An upper limit to the photon fraction in cosmic rays above 10^{19} eV from the Pierre Auger Observatory", Pierre Auger Collaboration [J. Abraham et al.], Astroparticle Physics **27** (2007), 155. (astro-ph/0606619)
9. "Properties and performance of the prototype instrument for the Pierre Auger Observatory", Pierre Auger Collaboration [J. Abraham et al.], Nuclear Instruments and Methods **A523** (2004), 50.