

## Priscilla Cushman      Biographical Sketch

### Education

Harvard University	Physics and Philosophy AB	1976
Rutgers University	Physics	PhD 1985

### Professional Experience

2000-present	Professor of Physics, University of Minnesota
2000-2005	Director of Undergraduate Studies in Physics, University of Minnesota
1993-2000	Associate Professor of Physics, University of Minnesota
1988-93	Assistant/Associate Professor of Physics, Yale University
1985-88	Research Associate, Rockefeller University
1979-85	Research Assistant, Fermi National Laboratory
1976-79	Senior Scientist, Aeronautical Research Associates of Princeton

### Professional Societies

American Physical Society,  
American Association of University Professors  
American Association for the Advancement of Science  
IEEE: Institute of Electrical and Electronics Engineers

### Selected Recent Publications

G.W. Bennett *et al.* (Muon ( $g-2$ ) Collab.) Search for Lorentz and CPT violation effects in muon spin precession. Submitted to Phys.Rev.Lett. Sept 2007. arXiv:0709.4670 [hep-ex]

P. Cushman, Dark matter searches: Technology and backgrounds, Nucl. Instr. and Meth. **A579**, pp 437-442 (2007)

G.W. Bennett *et al.* (Muon ( $g-2$ ) Collab), Statistical equations and methods applied to the precision muon ( $g-2$ ) experiment at BNL, Nucl. Instr. and Meth. **A579**, pp 1096-1116. (2007)

P. Cushman, Low Level Counting Infrastructure and Requirements. Chapter 8 of the DUSEL NSF Solicitation 1 White Paper. December 2006. peer-reviewed and posted at [http://www.deepscience.org/docs\\_reports/](http://www.deepscience.org/docs_reports/)

D.S. Akerib et al. (CDMS Collab), Limits on Spin-Independent Interactions of Weakly Interacting Massive Particles with Nucleons from the Two-Tower Run of the Cryogenic Dark Matter Search, Phys. Rev. Lett. **96**, 011302 (2006)

G. W. Bennett *et al.* (Muon ( $g-2$ ) Collaboration), Final report of the E821 muon anomalous magnetic moment measurement at BNL, Phys. Rev. **D73**, 072003 (2006)

E. Aprile, P. Cushman, K. Ni, P. Shagin Detection of liquid xenon scintillation light with a Silicon Photomultiplier, Nucl. Instr. and Meth. **A556**, pp 215-218 (2006). physics/0501002

D. S. Akerib et al. (CDMS Collaboration) Limits on spin-dependent WIMP-nucleon interactions from the Cryogenic Dark Matter Search, Phys. Rev. **D73**, 011102 (2006)

P. Cushman, Muon  $g-2$  constraints on SUSY dark matter reviewed and predicted, New Astronomy Reviews **Vol 49**, Pages 125-131 (2005); hep-ph/0501190.

D.S. Akerib et al. (CDMS Collab) Exclusion Limits on the WIMP-Nucleon Cross-Section from the First Run of the Cryogenic Dark Matter Search in the Soudan Underground Lab Phys. Rev. **D72**, 052009 (2005). arXiv:astro-ph/0507190

P. Cushman, Status of Low Background Counting Facilities in the USA, LRT2004, Sudbury, Canada, Dec 12-14, 2004. AIP Conf Proc **785**, pp 20-26. (ed. B. Cleveland, R. Ford, M.Chen).

G.W. Bennett et al. (g-2 Collab) Measurement of the Negative Muon Anomalous Magnetic Moment to 0.7 ppm, hep-ex/0401008, Physical Review Letters **92**, 161802 (2004).

D.S. Akerib et al. (CDMS Collab) First Results from the Cryogenic Dark Matter Search in the Soudan Underground Laboratory, Physical Review Letters **93**, 211301 (2004).

P. Cushman, A. H. Heering, N. Pearson, J. Elias, J. Freeman, D. Green, S. Los and A. Ronzhin., Crosstalk properties of the CMS HCAL hybrid photodiode, Nucl. Instr. and Meth. A504 (2003) 62-69.

D. S. Akerib et al. (CDMS Collaboration), New results from the Cryogenic Dark Matter Search experiment, Phys. Rev. D 68, 082002 (2003), hep-ex/0306001.

P.B. Cushman and A.J.Heering Problems and Solutions in high-rate multi-channel Hybrid Photodiode design: The CMS Experience, IEEE Trans.Nucl.Sci.49:963-970 (2002)

G.W. Bennett et al. (Muon g-2 Collab) Measurement of the Positive Muon Anomalous Magnetic Moment to 0.7 ppm. Phys.Rev.Lett.89:101804, Erratum-ibid.89:129903 (2002)

H.N. Brown *et al.* (Muon g-2 Collab) Precise measurement of the positive muon anomalous magnetic moment. Phys.Rev.Lett.**86**:2227-2231 (2001) hep-ex/0102017

### **Recent Invited Talks**

*The Cryogenic Dark Matter Search: Results from the 2007 extended run*, Results and Perspectives in Particle Physics - La Thuile 2008, Feb 24-Mar 1, 2008 Aosta, Italy.

*Status of Underground Science in North America: New Facilities and Plans*, 4<sup>th</sup> Annual ILIAS Meeting, February 26-28, 2007 Champéry, France.

*Underground Facilities in the USA*, Low Radioactivity Techniques 2006, Aussois, France, (Canfranc Lab) Oct 1-4, 2006.

*Dark matter searches: detection technology and radioisotope screening*, Symposium on Radiation Measurements and Applications *SORMA XI*, May 23-25, 2006, Ann Arbor, Michigan, USA

*Low Background Counting*, Topical Workshop on Physics at Henderson DUSEL, Nov 18-19, 2005. Colorado State, Fort Collins, CO

*The Cryogenic Dark Matter Search: Limits and Projections*, 9<sup>th</sup> Intl. Conf. on Topics in Astroparticle and Underground Physics, Zaragoza, Spain, Sept 10-14, 2005. J.Phys.Conf.Ser.39:63-69 (2006)

*Overview of Low Background Counting Facilities in the USA*, Low Radioactivity Techniques 2004, Laurentian University, Sudbury, Canada, December 12-14, 2004.

*Dark Matter Limits from the g-2 Experiment*, Dark 2004 – 5<sup>th</sup> Heidelberg Conf., Texas A&M University, Oct 3-9 2004. Proceedings in “Dark MATter in Astro and Particle Physics”, ed. H.V. Klapdor-Kleingrothus and R. Arnowitt, Springer-Verlag Berlin 2005, pp 323-336

*Experimental and Theoretical Status of g-2 Limits on Dark Matter*, 6<sup>th</sup> UCLA Symposium on Sources and Detection of Dark Matter and Dark Energy in the Universe, Marina del Rey, CA, Feb 18-20, 2004

*First Results from CDMS II*, 32<sup>nd</sup> Intl. Conf. on High Energy Physics, Beijing, China, Aug 16-22, 2004.

*Does g-2 Point to New Physics? Current Status and Future Plans*, 32<sup>nd</sup> Intl. Conf. on High Energy Physics, Beijing, China, Aug 16-22, 2004.

*Performance of the Multi-Channel HPD for CMS HCAL*, 32<sup>nd</sup> Intl. Conf. on High Energy Physics, Beijing, China, Aug 16-22, 2004.

## **Review Committees, Panels, and Service**

### 1. National Physics Advisory Committees:

HEPAP: High Energy Physics Advisory Panel (DOE 2007-2009)

Natural Sciences and Engineering Research Council of Canada - Review of SNOLab  
DEAP/CLEAN collaboration (2008)

Convenor: Radiopurity Planning for the NSF DUSEL S4 Solicitation (2007-8)

University of Wisconsin (Madison) High Energy Physics Review (2007)

Argonne Lab DOE Review (2006)

PI of Counting Facilities Working Group, for the NSF Deep Underground Science and  
Engineering Lab National Project (2004-2006)

NSF Division of Particle and Nuclear Astrophysics Review panel (2005)

NSF-DOE SAGENAP (Scientific Assessment Group for Experiments  
in Non-Accelerator Physics) (2002)

Stanford Linear Collider Review (2001)

Brookhaven User's Executive Committee (1997- 1999)

APS Member-at-large: Topical Group on Fundamental Constants (1996-98)

2. Principle Investigator: QuarkNet chapter of University of Minnesota: Summer conferences for high school teachers, development of a network for HEP-related special ed materials for HS
3. Outreach coordinator for CDMS at Soudan and for the new internship for teaching program at Soudan, in coordination with the summer RET (NSF grant)
4. Performed numerous reviews of University Physics Departments via site visits (2000-2006). Organized by APS Committee on the Status of Women in Physics, researching climate for women and minorities.

5. Developed new physics LibEd curriculum at Minnesota using energy and environmental themes. Wrote textbook: Energy and the Environment: Physics Principles and Applications, P.Cushman, ISBN 0-7872-5391-X, Kendall/Hunt Publishers (1998).
6. Science Editor (pro bona) Carolrhoda Books (division of Lerner) - Biographies of scientists and inventors for Middle School readers: Einstein, Farnsworth, etc.
7. "Science Works!" a Minneapolis public schools systematic reform effort in K-8 science. A program supported in part by the National Science Foundation and Medtronics. Worked in the Partnership Teaching program and the Science Kit Training Sessions for Elementary Teachers.

**Graduate Students (last 5 yrs)**

Joel Kindem (VP, DigiRad Corp.), Long Duong (NRL-SBIR), Ron McNabb (University of Illinois, Champaign-Urbana), Steven Giron (College of St Catherine), Dean Miller (Robins, Kaplan, Miller & Ciresi), Ben Bousquet (College of Gustavus Adolphus), Angela Reisetter (University of Minnesota), Tao Qian (UPenn), Xinjie Qiu, Matt Fritts

**Postdoctoral Scholars (last 5 yrs)**

Charles Timmermans (University of Nijmegen, Netherlands), David Zimmerman (Lawrence Berkeley National Laboratory), Ivan Kronkvist (Software Services, Minneapolis), Arjan Heering (FNAL/CERN), Long Duong (NRL-SBIR), Petr Shagin (Rice University), Oleg Kamaev

**A snapshot of the undergraduates whose research I have advised or paid for under my grant in the last 5 years.**

John Roberts (00-03)  
 Derek Larson (00-03)  
 Adam Powell (01-03)  
 Brian Sherwood (01-04)  
 Crystal Austin (02-03, Senior thesis)  
 Katy Boyle (03)  
 Eric Ortlip (03)  
 Matt Kauer (03-04)  
 Aaron Martell (03-04)  
 Jacob Erickson (03-04)  
 Yousi Ma (03-05, UROP)  
 Matt Luzum (02 REU)  
 Erica Raber (03 REU)  
 Lauren Barth-Cohen (04 REU)  
 Julie Jozwiak (05 REU)  
 Michael Ehrlichman (05 UROP)  
 Brian Pemble (summer 05 and MXP project)  
 Nick Vasilakes (summer 05 and MXP project)  
 Dan Steilen (04-06)  
 John Bongaarts (06-07, and Senior Thesis)  
 Katrina Legursky (07 REU)  
 Joe Pastika (05-08, and Senior Thesis)