

**Priscilla B. Cushman**  
School of Physics and Astronomy  
University of Minnesota, Minneapolis, MN 55455

ph: 612-626-8917  
fax: 612-624-4578  
email: [prisca@physics.umn.edu](mailto:prisca@physics.umn.edu).

### **Education**

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

### **Professional Experience**

#### **1976-79 Senior Scientist, Aeronautical Research Associates of Princeton**

UV Scattering, IR sensing of rocket plumes, Atmospheric aerosols

#### **1980-85 Research Assistant, Rutgers University**

FNAL Hyperon spin experiments. Thesis: "The  $\Sigma$ - $\Lambda$  Transition Magnetic Moment"  
Luise Meyer-Schutzmeister Award (APS) for outstanding doctoral work

#### **1985-88 Research Associate, Rockefeller University**

CERN experiment UA-6, direct photon physics.

#### **1988-92(93) Assistant (Associate) Professor of Physics, Yale University:**

- SSC Fellow, developed new photodetector technology for high energy collider applications, first hybrid tubes made with internal APD arrays. Built prototype scintillating fiber tracker for high magnetic fields, electron identification using synchrotron radiation.
- Planning and running the g-2 experiment at BNL to measure the muon anomalous magnetic moment to 0.35 parts per million. Built novel high-efficiency position sensitive detector scintillator tiles read out with WLS fibers for the g-2 experiment.

#### **1993-2000 Associate Professor of Physics, University of Minnesota:**

- Group leader for g-2 Data Acquisition and 1.5 Tesla Storage Ring controls (cryo, vacuum, HV, alarms, etc.). Analysis of muon anomalous magnetic moment, electric dipole moment limit, muon lifetime and a test of CPT.
- Began work with the CERN Large Hadron Collider when SSC was cancelled.  
CMS Level 3 manager - responsible for over 10,000 channels of tile/fiber readout in a 4 Tesla magnetic field for the CMS Hadronic Calorimeter. Developed custom hybrid photodiode readout for CMS.

#### **2000-present Professor of Physics, University of Minnesota:**

- Director of Undergraduate Studies (2000-2005)
- Joined the Cryogenic Dark Matter Search – commissioning new installation at Soudan, DAQ design, simulation, analysis. Co-Spokesman for SuperCDMS (from 2008)
- Backgrounds Working Group Leader for CDMS. New high purity germanium detector at Soudan, Surface characterization of samples, Geant4 simulations, cosmogenic neutrons.
- Manager, Low Background Counting Facility at Soudan (from 2004) provides an External Sales Org for non-FNAL experiments at Soudan. Refurbished Soudan-2 veto shield to create a 30' x 40' x 100' muon-shielded room with time-stamped tracks available to users.
- PI of the DUSEL S4: Assay and Acquisition of Radiopure Materials, cross-collaboration tools for underground science, including community-wide workshops, neutron benchmarking, developing a universal materials database of screened materials, design of an ultra-sensitive, water-shielded assay facility for Homestake

### **Recent Professional Service**

Board of Directors, Fermi Research Alliance, LLC. (from 2011)

National Advisor to APS DPF Task Force on Instrumentation (from 2011)

Natural Sciences and Engineering Research Council of Canada (NSERC)

12-member standing review committee for Subatomic Physics (from 2011)

Review of Laboratory Non-Accelerator Research Program (DOE -Sept 2010)  
HEPAP: High Energy Physics Advisory Panel (DOE 2007-2009)  
Review of Fermilab Facilities and Experiments (DOE July 2009)  
NSERC Review of SNOLab DEAP/CLEAN collaboration (2008, 2009)  
APS Committee on the Status of Women in Physics (ongoing, site visits)  
Science Editor (pro bona) Carolrhoda Books (division of Lerner) - Biographies of  
scientists and inventors for Middle School readers: Einstein, Farnsworth, etc.

#### **Collaborators (authors)**

CDMS II Collaboration [http://cdms.berkeley.edu/cdms\\_collab.html](http://cdms.berkeley.edu/cdms_collab.html)  
The g-2 Collaboration <http://www.g-2.bnl.gov/collab.html>  
US-CMS HCAL Collaborators: A. Heering, D. Green, J.Freeman, J. Elias, A. Skuja,

**Graduate Advisor:** Prof. Tom Devlin, Rutgers University

**Postdoc Sponsor:** Prof. Rodney Cool (deceased), Rockefeller University

#### **Graduate Students (last 5 yrs)**

Steven Giron (College of St Catherine), Dean Miller (Robins, Kaplan, Miller & Ciresi), Ben Bousquet (College of Gustavus Adolphus), Angela Reisetter (St Olaf), Tao Qian (Syracuse), Xinxe Qiu (Stanford), Matt Fritts (TU Dresden), Scott Fallows, Tom Hofer, Mark Pepin

#### **Postdoctoral Scholars (last 5 yrs)**

Arjan Heering (FNAL/CERN), Long Duong (University of Minnesota), Petr Shagin (Rice University), Oleg Kamaev (Queens Univ), Anthony Villano, Hassan Chagani

#### **Selected Recent Publications and Talks**

1. Z. Ahmed et al. (CDMS Collaboration) Search for inelastic dark matter with the CDMS II experiment Phys. Rev. **D 83**, 112002 (2011) arXiv:1012.5078
2. Z. Ahmed et al. (CDMS Collaboration) Results from a Low-Energy Analysis of the CDMS II Germanium Data Phys. Rev. Lett. **106**:131302 (2011) arXiv:1011.2482
3. P. Cushman et al. The CDMS II Data Acquisition System. Nucl. Instr. and Meth. **A638**, pp 127-133 (2011)
4. Toward and Integrated Background Structure for Underground Science. 7th Patras Workshop on Axions, WIMPs and WISPs, Mykonos, Greece. June 26-July 1, 2011
5. Overview of Direct Dark Matter Detection Techniques. Technology and Instrumentation in Particle Physics (TIPP2011), Chicago, IL. June 9-14
6. Direct Dark Matter Experiments: Current Technologies and Future Directions, Plenary talk at the Cosmic Frontier Symposium, Fermilab, Batavia, IL, March 23-26, 2011
7. A DUSEL Facility for Assay and Acquisition of Radiopure Materials. Low Radioactivity Techniques 2010, Sudbury, Canada Aug 28-29, 2010. AIP Conf. Proc. **1338**, 61 (2011).
8. Z. Ahmed et al. (CDMS Collaboration) Dark Matter Search Results from the CDMS II Experiment Science 26 March 2010 Vol. 327. no. 5973, pp. 1619 – 1621.
9. Z. Ahmed et al. (CDMS Experiment) Search for Axions with the CDMS Experiment, Cover Article: 2 Oct 2009 Phys. Rev. Lett. **103**, No.141802 (2009) arXiv:0902.4693v1
10. G.W. Bennett et al. (Muon (g-2) Collab.) An Improved Limit on the Muon Electric Dipole Moment, Phys. Rev. D **80**, 052008 (2009) arXiv:0811.1207v1 [hep-ex]