

Jim Pivarski

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Texas A&M University
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Research Interests

To discover the connections between celestial dark matter and particle physics, and general exploration of the TeV energy scale

Research Experience

Sept. 2006 **Postdoctoral Research Associate** **Texas A&M University**
to present **URA Fermilab Visiting Scholar (2009)**

- Developed and leading track-based alignment of the CMS muon system
 - Co-convener of joint track-based/hardware muon alignment group
 - Built infrastructure, workflow, and analysis of track-based alignment from the creation of dedicated triggers through studies of the final impact of misalignment on physics results
 - Supervising further studies and routine production of constants
- Developing search for collimated groups of muons from models of new physics
 - Participated in phenomenological study of NMSSM Higgs decays
 - Identified qualitatively distinct and previously unstudied region of NMSSM parameter space with a dramatic signature: two collimated pairs of muons
 - Supervising students in developing experimental search
- Served as alignment contact for trigger and exotica physics groups, reviewed CMS analyses, and contributed to many projects outside of my direct activities

Feb. 2006 **Research Assistant** **Cornell University**
to Aug. 2006

- Developed a fast algorithm for identifying electrons without the CMS pixel detector, intended for the CMS high-level trigger
- Served on a CLEO analysis review committee

Fall 1999 **Graduate Student** **Cornell University**
to Feb. 2006

- Measured di-electron partial widths of $\Upsilon(1S)$, $\Upsilon(2S)$, and $\Upsilon(3S)$ using the CLEO detector (Ph.D. dissertation; advisor: Ritchie Patterson)
 - Developed novel technique for data-driven Υ efficiency measurement
 - Planned and oversaw acquisition of special Υ lineshape scan data (2001 – 2002)
 - Aligned CLEO silicon vertex detector and drift chambers with tracks
- Studied sensitivity of a future linear collider to mSUGRA Focus Point dark matter

Publications

- [CMS Collaboration] (primary author), “Alignment of the CMS Muon System with Cosmic-Ray and Beam-Halo Tracks,” J. Inst. **5** T03020 (2009) [arXiv:0911.4022].
- A. Belyaev, J. Pivarski, A. Safonov, S. Senkin, A. Tatarinov, “LHC discovery potential of the lightest NMSSM Higgs in the $h_1 \rightarrow a_1 a_1 \rightarrow 4\mu$ channel,” Phys. Rev. D **81**, 075021 (2010) [arXiv:1002.1956].
- [CLEO Collaboration] (primary author), “Di-electron widths of the Upsilon(1S,2S,3S) resonances,” Phys. Rev. Lett. **96**, 092003 (2006) [arXiv:hep-ex/0512056].
- Ph. D. dissertation: arXiv:hep-ex/0604026 J. Pivarski, “A high-precision measurement of the di-electron widths of the Upsilon(1S), Upsilon(2S), and Upsilon(3S) mesons at CLEO-III,” arXiv:hep-ex/0604026.
- R. Gray *et al.*, “Measuring mass and cross section parameters at a focus point region,” arXiv:hep-ex/0507008.

Internal Publications

- M. Chen *et al.*, “Measurement of the Charge Ratio in Cosmic Rays using Global Muon Reconstruction in CRAFT Data” CMS AN-2009/102 and CMS AN-2009/190.
- M. Chen *et al.*, “Search for New High-Mass Resonances Decaying to Muon Pairs in the CMS Experiment,” CMS AN-2007/038.
- “The 2008 CMS Computing Software and Analysis Challenge” CMS IN-2008/044.
- “Muon Reconstruction in the CMS Detector” CMS AN-2008/97.
- J. Pivarski, J. R. Patterson and K. Berkelman, “Di-electron Widths of the Upsilon(1S,2S,3S) Resonances,” CBX NOTE 05-41 (2005).
- J. Pivarski, “What the Upsilon Scans Teach us About CESR at 5 GeV,” CBN NOTE 05-15 (2005).
- J. Pivarski, “Tools for ZD/DR Alignment,” CBX NOTE 04-4 (2004).
- K. Ecklund, R. Galik, D. Peterson, J. Pivarski, “An Inner Drift Chamber (ZD) for CLEO-c Running,” CBX NOTE 01-46 (2001).

Public Presentations

- APS Division of Particles and Fields: “CMS Muon Alignment” Aug. 2009
- LHC and Dark Matter Workshop: “Early Discovery Channels in CMS” Jan. 2009
- LHC Detector Alignment Workshop Jun. 2009, Jun. 2007
- Lake Louise Winter Institute Feb. 2006
- Particles and Nuclei International Conference Oct. 2005
- Cargèse School of Physics and Cosmology Aug. 2003
- American Physical Society May 2009, 2008, 2003, 2002

Education

- Ph. D. in Physics, Cornell University, Feb. 2006
- B. S. in Physics with a minor in Mathematics, Carnegie Mellon University, May 1999

Awards

- 2009 CMS Achievement Award for Commissioning

Teaching Experience

- Supervising Texas A&M graduate students on physics analyses and alignment studies Fall 2008 – present
- Supervised REU student developing CMS software Summer 2006
- Supervised REU student upgrading spark chamber demonstration Summer 2004
- Teaching Assistant, Cornell Physics Department Fall 1999 – Fall 2000

Outreach

- Moderator for QuarkNet’s “MasterClass at Fermilab” Feb. 2010
- Bard College Colloquium: “The Role of the Large Hadron Collider (LHC) in the Quest to Understand Matter” Feb. 2010
- Café Scientifique: “What Can We Learn about the Universe from the Large Hadron Collider (LHC)?” May 2009
- Lead the public on innumerable tours of the CLEO detector 2000 – 2006