



I. Joseph Kroll

Education

Harvard University, Ph.D. in Physics, 1989.

University of California, Berkeley, B.A. in Physics, *summa cum laude*, 1982.

Professional Experience

Professor, University of Pennsylvania, 2006-present.

Associate Professor (with tenure), University of Pennsylvania, 2001-2006.

Assistant Professor, University of Pennsylvania, 1997-2001.

Scientific Associate, Wilson Fellow, Fermilab, 1993-1997.

Research Associate, University of Chicago, 1989-1992.

Research Assistant, Harvard University, 1984-1989.

Teaching Assistant, Harvard University, 1983.

Research Assistant, Univ. of California, Los Angeles, 1982-1983.

Honors

Fellow of the American Physical Society 2009

Citation: For major contributions to the observation and measurement of B_s - B_s bar mixing, including early recognition of the importance of the measurement, proposal and construction of the CDF time-of-flight system to improve particle identification, studies of B -tagging, and leadership during the final phases of the measurement. Nominated by: Division of Particles and Fields

Outstanding Junior Investigator, Department of Energy, 1998-2001

Wilson Fellow, Fermilab, 1993-1997

Department Citation, Physics, University of California, Berkeley, 1982

Phi Beta Kappa, University of California, Berkeley, 1982

Recent Particle Physics Community Activities

2010 APS W.K.H. Panofsky Prize in Experimental Particle Physics Selection Committee

2009 APS W.K.H. Panofsky Prize in Experimental Particle Physics Selection Committee

Vice-Chair, 34th International Conference on High Energy Physics (ICHEP 2008)

Research Experience

I have worked on both hadron colliders and electron-positron colliders. My interests have spanned precision tests of the electroweak model, flavor physics studies—particularly the physics of hadrons containing b quarks—and searches for the Higgs boson and particles not contained in the standard model.

I began my career in particle physics between undergraduate and graduate school when I spent one year at CERN working on the CERN ISR experiment R608 (Peter Schlein, spokesperson). As a graduate student, I worked on the UA1 experiment on the CERN Sp \bar{p} S collider. I worked on the analysis of minimum bias events and events with large missing transverse energy including the first observation of $W \rightarrow \tau\nu$ and searches for heavy leptons. My dissertation was the search for long-lived strongly-produced heavy particles in proton-antiproton collisions at $\sqrt{s} = 630$ GeV (advisor: Carlo Rubbia).

As a post-doc at the University of Chicago (supervisor: Jim Pilcher), I worked on the OPAL experiment at the CERN Large Electron Positron collider. I performed searches for heavy neutral leptons, organized electron identification in hadronic events (Chicago was responsible for the presampler, which played an important role in electron identification) and used electrons to measure the branching ratio of $Z \rightarrow b\bar{b}$, a unique and important test of the electroweak model.

In 1993 I moved to Fermilab as a Wilson Fellow, and I worked on the CDF experiment during both Run I and Run II of the Tevatron. In Run I, I focused on B physics, in particular, the first search for $B \rightarrow \mu^+\mu^-$ and the development of b flavor tags (first application of jet-charge at a hadron collider), which were used in measurements of B^0 flavor oscillations and the first measurement of the CP asymmetry in $B^0 \rightarrow J/\psi K_S^0$ at a hadron collider. I co-convened the CDF B physics group during a particularly active period from 1996 to 1998. In 1997 I moved to the University of Pennsylvania (Penn) as a tenure-track assistant professor.

In Run II of the Tevatron, I led the proposal for a time-of-flight detector (TOF) for CDF. The primary motivation for the TOF was same-side flavor tagging with kaons for B_s^0 . I was awarded an Outstanding Junior Investigator award by the Department of Energy for this work. I co-led the construction and installation of the TOF, and I co-led the precise measurement of Δm_s and the observation of B_s^0 flavor oscillations. In recognition of this work, I was elected a Fellow of the American Physical Society. I also worked on searches for the Higgs boson. In 2003 I co-led the Higgs Sensitivity Study, a joint study with DØ, and I worked on searching for associated production of the Higgs boson using the all-hadronic channel. In addition, I participated in the first upgrade of the second level of the CDF trigger.

Penn joined ATLAS in 1994 and has made major contributions to the TRT in electronics, data acquisition, commissioning and maintenance and offline calibration, performance and alignment. I first focused on the TRT alignment, an effort I initiated when I began working on ATLAS in 2007. My students are playing a leading role in electron identification, both for online event selection (the trigger) and offline data analysis for physics. My focus has been

on the search for the standard model Higgs boson in the decay channel $H \rightarrow WW^{(*)} \rightarrow \ell\ell'\nu\nu'$.

Since March 2011 I have been a member of the twelve-person ATLAS publication committee. I am currently one of two proceedings monitors for ATLAS.

I have been an active member of the particle physics community, particularly in conference organization. My most notable effort was in co-leading the organization of ICHEP 2008, which was held in Philadelphia at Penn.

Recent Selected Publications

1. *Search for the Higgs boson in the $H \rightarrow WW^{(*)} \rightarrow \ell\nu\nu$ decay channel in pp collisions at $\sqrt{s} = 7$ TeV with the ATLAS detector*, ATLAS Collaboration (G. Aad *et al.*), Phys. Rev. Lett. **108**, 111802 (2012).
2. *Measurement of the WW Cross Section in $\sqrt{s} = 7$ TeV pp Collisions with ATLAS*, ATLAS Collaboration (G. Aad *et al.*), Phys. Rev. Lett. **107**, 041802 (2011).
3. *A Search for the Associated Production of the Standard-Model Higgs Boson in the All-Hadronic Channel*, T. Aaltonen *et al.* (CDF Collaboration) Phys. Rev. Lett., **103**, 221801 (2009).
4. *Particle physicists measure matter antimatter flip*, J. Kroll, Phys. World **19N7**, p. 32-34 (2006).
5. *Observation of B_s^0 - \bar{B}_s^0 Oscillations*, A. Abulencia *et al.* (CDF Collaboration) Phys. Rev. Lett. **97**, 242003 (2006).
6. *Measurement of the B_s^0 - \bar{B}_s^0 Oscillation Frequency*, A. Abulencia *et al.* (CDF Collaboration), Phys. Rev. Lett. **97**, 062003 (2006).
7. *CDF level 2 trigger upgrade*, K. Anikeev *et al.*, IEEE Trans. Nucl. Sci. **53**, p. 653-658 (2006).
8. L. Babukhadia *et al.* (CDF and DØ Collaborations) *Results of the Tevatron Higgs Sensitivity Study*, FERMILAB-PUB-03-320-E, Oct. 2003, 64pp, unpublished.
9. *Measurement of Prompt Charm Meson Production Cross Sections in $p\bar{p}$ Collisions at $\sqrt{s} = 1.96$ TeV*, D. Acosta *et al.* (CDF Collaboration) Phys. Rev. Lett. **91**, 241804 (2003).
10. *Front-end electronics for the CDF-II time-of-flight system*, C. Chen, M. Jones, W. Kononenko, J. Kroll, G.M. Mayers, F.M. Newcomer, R.G.C. Oldeman, D. Usynin, R. Van Berg, IEEE Trans. Nucl. Sci. **50**, p. 2486-2490 (2003).