Kyle J. Knoepfel

Abbreviated Curriculum Vitae / Aug. 2014

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Education

Ph.D. — University of Notre Dame du Lac, Notre Dame, IN (2011)
Experimental High Energy Physics
Advisor: Colin P. Jessop
Dissertation Title: *A Precision Measurement of the $B \to X_s\gamma$ Branching Fraction*

M.S. — University of Notre Dame du Lac, Notre Dame, IN (2008)
Experimental High Energy Physics
Advisor: Colin P. Jessop

B.A. — Luther College, Decorah, IA (2004)
Summa Cum Laude
Majors: Physics, Piano Performance
Minor: Mathematics

Positions held

2010 –	**Research Associate**, Fermi National Accelerator Laboratory
2004 – 10	**Research Assistant**, Department of Physics, Notre Dame
2007 – 08	**Warner-Lambert Fellow**, Department of Physics, Notre Dame
2006 – 07	**Quinn Fellow**, Department of Physics, Notre Dame

Selected awards & honors

2013	**La Thuile 2013 Young Physicists Grant**
2008	**Graduate Student Research Symposium – Winner, Sciences Division**, Notre Dame
2005	**Outstanding Graduate Student Teacher Award**, Notre Dame
2004	**Summer Research Fellowship**, Notre Dame
2003/4	**ΦBK**, **ΠME (Math)**, **ΣΠΣ (Physics)**, Luther College
2003	**Research Honors Grant in Physics**, Luther College

Selected publications

1. Kyle J. Knoepfel, "Standard Model Higgs boson studies at the Tevatron", *invited review, published in* Modern Physics Letters A **29**, 1430009 (2014)
2. M. Stancari et al., "CDF Run II Silicon Vertex Detector Annealing Study", Nucl. Instrum. Methods in Physics Research, Sec. A. **743**, 68 (2014)
3. K. Knoepfel et al., "Feasibility Study for a Next-Generation Mu2e Experiment", arXiv:1307.1168 [physics.ins-det] (2013)
4. Andreas S. Kronfeld et al., "Project X: Physics Opportunities", arXiv:1306.5009 [hep-ex] (2013)

5. T. Aaltonen et al. (CDF Collaboration), "Updated search for the standard model Higgs boson in events with jets and missing transverse energy using the full CDF data set", Phys. Rev. D **87**, 052008 (2013)
6. J. P. Lees et al. (*BABAR* Collaboration), "Measurement of $\mathcal{B}(B \to X_s\gamma)$, the $B \to X_s\gamma$ photon energy pectrum, and the direct CP asymmetry in $B \to X_{s+d}\gamma$ decays", Phys. Rev. D **86**, 112008 (2012)
7. J. P. Lees et al. (*BABAR* Collaboration), "Precision Measurement of the $B \to X_s\gamma$ Photon Energy Spectrum, Branching Fraction, and Direct CP Asymmetry $A_{CP}(B \to X_{s+d}\gamma)$", Phys. Rev. Lett. **109**, 191801 (2012)
8. T. Aaltonen et al. (CDF & D0 Collaborations), "Evidence for a Particle Produced in Association with Weak Bosons and Decaying to a Bottom-Antibottom Quark Pair in Higgs Boson Searches at the Tevatron", Phys. Rev. Lett. **109**, 071804 (2012)
9. T. Aaltonen et al. (CDF Collaboration, "Combined Search for the Standard Model Higgs Boson Decaying to a $b\bar{b}$ Pair Using the Full CDF Data Set", Phys. Rev. Lett. **109**, 111802 (2012)
10. T. Aaltonen et al. (CDF Collaboration), "Search for the Standard Model Higgs Boson Decaying to a $b\bar{b}$ Pair in Events with No Charged Leptons and Large Missing Transverse Energy using the Full CDF Data Set", Phys. Rev. Lett. **109**, 111805 (2012)

Selected research experience

***BABAR*:** analysis of fully inclusive $B \to X_s\gamma$ branching fraction and photon energy spectrum, responsible for background estimates, development of analysis framework, etc.

CDF: jet-energy resolution improvement, behavior of irradiated silicon sensors before and after annealing, Higgs-boson analysis in the final state with significant missing transverse energy and two b-tagged jets ($\not\!\!E_T + b\bar{b}$), single top-quark processes, and decays of invisible particles in association with a resonant $Z \to \ell\ell$ decay; co-convener of $\not\!\!E_T + b\bar{b}$ Higgs analysis group.

Mu2e: GEANT4 geometry coordinator, contributions toward background estimates and validations, computing framework development, studies of next-generation Mu2e scenarios, and contributions toward baseline Mu2e TDR for CD2/3.

Miscellaneous

Conferences, seminars and colloquia: dozens, on topics including B physics, Higgs-boson physics, and new physics at the *BABAR*, CDF, and Mu2e experiments.

Outreach: given many tours at Fermilab and participated in *Saturday Morning Physics*.

Student supervision: supervised 5 students over the last four years, ranging from high-school to graduate-school level. Topics studied include Higgs-boson analysis, characterization of annealing behavior in silicon sensors, and using advanced statistical methods (support vector regression) to improve jet-energy resolution.

Snowmass: participated in the Snowmass and P5 processes in support of Mu2e, attending both the 2013 Community Summer Study at the University of Minnesota in August 2013, and the P5 Brookhaven Town Hall Meeting at Brookhaven National Laboratory, New York in December 2013.