Curriculum Vitae

Jeffrey Berryhill
Associate Scientist, Wilson Fellow

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Education:

- *Ph.D., Physics*,
  Dissertation: *A Search for New Physics in Photon-Lepton Events in Proton-Antiproton Collisions at* $\sqrt{s} = 1.8$ *TeV*
  Adviser: Henry Frisch
  December 2000: University of Chicago
  Chicago, Illinois

- *B.A., Physics and Mathematics*,
  with Highest Honors in Mathematics
  and High Distinction in General Scholarship,
  May 1993: University of California, Berkeley
  Berkeley, California

Research Experience:

- *Wilson Fellow, Fermi National Accelerator Laboratory,*
  August 2006 – present:

  CMS Trigger Performance, devising software for trigger performance monitoring in the online and offline environments, including official coordination of data quality monitoring of the CMS trigger in the offline software environment.

  Co-organizer, within the LHC Physics Center (LPC) at FNAL, of projects for electron and photon reconstruction/identification in US CMS, as overseen by the CMS electron/photon physics object group.

  Creation of a framework for automating physics performance measurements (efficiencies, fake rates, and other high-level physics object studies) for use in physics analysis

Systematic measurement and study of lepton identification efficiency

Devising strategies for the measurement of W and Z production cross sections with the first CMS data

Reviewer of the search for a W' boson at CMS

Participating in numerous commissioning exercises (MTCC, CMS Global Runs, CRUZET runs) for training shifters, taking shifts (remotely and on-site), and exercising monitoring software.

- *Postgraduate Researcher, University of California*
  Santa Barbara, California, April 2001 – July 2006:

Co-Convenor of the Radiative Penguin Analysis Working Group for the BaBar Collaboration, October 2003–July 2006
oversaw 20 active research topics with 13 recent publications
responsibilities included: chief organizer, planner, and public representative
broad advising role for all group activities including direct supervision of several graduate students.

Manager of a team of scientists and engineers who assembled and tested replacement modules for the silicon vertex tracker (SVT) in the BaBar detector, April 2001–December 2002

Observation of the flavor-changing neutral current decays $B \rightarrow K\ell^+\ell^-$ and $B \rightarrow K^*\ell^+\ell^-$ with the BaBar detector, and measurement of their angular distributions

Search for the rare decay $B \rightarrow \pi\ell^+\ell^-$

Reviewer of BaBar results in semileptonic decays of B mesons and a precision measurement of $|V_{cb}|$

Supervisors: Jeff Richman and Claudio Campagnari

- *Research Associate, University of Chicago*
  Chicago, Illinois, January 2001 – April 2001:

Searches for new physics in lepton-photon events with the CDF detector
Supervisor: Henry Frisch

- *Graduate Student Research Assistant, University of Chicago*
  Chicago, Illinois, June 1994 – December 2000:
  Searches for new physics in lepton-photon events with the CDF detector
  Measurement of the forward-backward asymmetry of lepton pairs in Z/γ^* production with the CDF detector
  Design of CDF Run II silicon vertex Level 2 trigger (SVT Hit Finder Board)
  Creation of a comprehensive data format for high-level CDF physics objects ("Standard Ntuples")
  Maintained event generation software for CDF data simulation (PYTHIA)
  Developer for the silicon vertex event display package for CDF data (DF)
  Supervisor: Henry Frisch

- *Research Assistant, University of Chicago*
  CERN, Geneva, Switzerland, June 1993-October 1993:
  Analysis of silicon-tungsten luminometer data from the OPAL detector
  Supervisor: Mark Oreglia

- *Research Assistant, Lawrence Berkeley National Laboratory*
  Berkeley, California, May 1991-May 1993:
  Design of cooling systems in silicon vertex detectors, for the D0 and SDC collaborations
  Supervisor: Mark Strovink

Honors and Awards:

- *Enrico Fermi Institute 2000 Sugarman Award*
  Awarded to advanced graduate students for excellence in research.

- *Mentor Graphics 2000 PCB Technology Leadership Award*
  University Design Category, First Place
  Awarded to Bill Ashmanskas, Jeff Berryhill, Mircea Bogdan, and Ray Culbertson for the SVT Hit Finder board design.

Teaching Experience:

- *Graduate Student Teaching Assistant, University of Chicago*
  October 1993 – December 1994:
  Taught recitation, led lab sections, and graded homework in introductory physics courses.

- *Dept. of Mathematics Course Reader, University of California, Berkeley*
  August 1992 – May 1993:
  Graded homework in advanced mathematics courses for junior and senior undergraduates.

Conference Talks and Seminars:

- *Rare B Decays*
  Flavor in the Era of the LHC
  CERN, March 2007

- *B Physics at e^+e^- Colliders*
  Fermilab Academic Lecture Series: Flavor Physics
  Fermilab, February 2007

- *Working Group Convenor*
  SUSY 2006: International Conference on Supersymmetry and the Unification of Fundamental Interactions
  University of California, Irvine, California, June 2006

- *New Results from BaBar: Rare Meson Decays and the Search for New Phenomena*
  XLIth Rencontres de Moriond, Electroweak Interactions and Unified Theories
  La Thuile, Italy, March 2006

- *Electroweak Penguin B Decays: $b \to s, d\gamma$ and $b \to s, d\ell\ell$*
  SLAC/INT Workshop on Flavor Physics and QCD
  University of Washington, May 2005

- *Electroweak Penguin B Decays at BaBar: $b \to s\gamma$ and $b \to s\ell\ell$*
  Cornell/LNS Journal Club Seminar
  Cornell University, April 2005

- *The Penguin and the Elephant*
  Rutgers High Energy Physics Seminar
  Rutgers University, March 2005

- *Working Group Summary on $|V_{td}|$ and $|V_{ts}|$*
  2005 CKM Workshop on the Unitarity Triangle
  University of California, San Diego, California, March 2005

- *Working Group Convenor*
  2005 CKM Workshop on the Unitarity Triangle
  University of California, San Diego, California, March 2005

- *Organizer and Discussion Leader*
  V_{ub}/Shape Function Workshop
  Stanford Linear Accelerator Center, Menlo Park, California, December 2004

- *The Physics of Flavor: Half a Billion b Quarks for BaBar*
  Texas A & M Physics Colloquium
  College Station, Texas, November 2004

- *Radiative Penguin B Decays at BaBar*
  32nd International Conference on High Energy Physics
  Beijing, China, August 2004

- *Semileptonic B Decays and the Measurement of* $|V_{cb}|$
  APS April Meeting 2004
  Denver, Colorado, May 2004

- *The Physics of* $b \to s\ell^+\ell^-$
  Super B Factory Workshop
  University of Hawaii, Manoa, Hawaii, January 2004

- *Organizer and Discussion Leader*
  V_{xb} Workshop
  Stanford Linear Accelerator Center, Menlo Park, California, December 2003

- *Photon Physics at the High Energy Frontier*
  SLAC Experimental Seminar
  Stanford Linear Accelerator Center, Menlo Park, California, January 2003

- *Photon Physics at the High Energy Frontier*
  Fermilab Joint Experimental-Theoretical Seminar
  Fermi National Accelerator Laboratory, May 2002

- *Results from Babar on the Rare Exclusive Decays* $B \to K\ell^+\ell^-$ *and* $K^*\ell^+\ell^-$
  2002 Meeting of The Division of Particles and Fields
  College of William and Mary, Williamsburg, Virginia, May 2002

- *Photon Physics at the High Energy Frontier*
  BNL Particle Physics Seminar
  Brookhaven National Laboratory, Upton, New York, March 2001

- *New Phenomena at the Tevatron*
  XXXVI Rencontres de Moriond, Electroweak Interactions and Unified Theories
  Les Arcs, France, March 2001

- *Photon Physics at the High Energy Frontier*
  UCSB High Energy Physics Seminar
  University of California, Santa Barbara, California January 2001

- *Lepton-Photon Physics at the High Energy Frontier*
  LNS Journal Club HEP Seminar
  Laboratory of Nuclear Studies, Ithaca, New York, February 2000

- *Forward-Backward Charge Asymmetry of Electron Pairs Above the Z^0 Pole at CDF*,
  American Physical Society Meeting
  Indianapolis, Indiana, May 1996

- *Measurement of Z^0 / γ^* Interference at CDF*,
  New Perspectives Conference
  Fermi National Accelerator Laboratory, Batavia, Illinois, June 1996

- *Forward-Backward Charge Asymmetry of Electron Pairs Above the Z^0 Pole at CDF*,
  HEP Lunch Seminar
  University of Chicago, Chicago, Illinois, February 1996

<u>Societies:</u>

- American Physical Society, 1993-present.

- Phi Beta Kappa Society, Alpha of California Chapter, initiated 1993.

References:

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Publications

A) Publications and Preprints with Principal Authorship or Major Contributions

CMS PAS Documents: A CMS PAS is Physics Analysis Summary document intended for public consumption by the physics community at large. It is reviewed by a CMS physics group, an internal committee, and the collaboration at large, in the same fashion expected for future CMS publications. All such results can be browsed at https://twiki.cern.ch/twik/bin/view/CMS/PhysicsResults

1. Measuring Electron Efficiencies at CMS with Early Data
   The CMS Collaboration, CMS PAS EGM-07-001.

2. Towards a Measurement of the Inclusive $W \to e\nu$ and $\gamma^*/Z \to e^+e$ Cross Sections in pp Collisions at $\sqrt{s} = 14$ TeV
   The CMS Collaboration, CMS PAS EWK-08-005.

Other public documents related to CMS

1. B, D, and K Decays
   Report of Working Group 2 of the CERN Workshop on Flavor in the Era of the LHC, Geneva, Switzerland, 6-8 Feb 2006
   M. Artuso *et al.*, arXiv:0801.1833 [hep-ph].

BaBar publications

1. Search for the Rare Decay $B \to \pi\ell^+\ell^-$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 99, 051801 (2007).

2. Measurements of branching fractions, rate asymmetries, and angular distributions in the rare decays $B \to K\ell^+\ell^-$ and $B \to K^*\ell^+\ell^-$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **73**, 092001 (2006).

3. Measurements of the rare decays $B \to K\ell^+\ell^-$ and $B \to K^*\ell^+\ell^-$
   B. Aubert *et al.* (BaBar Collaboration), hep-ex/0507005,
   BABAR-CONF-05/07, SLAC-PUB-11330, contributed to Lepton-Photon 2005.

4. Evidence for the Rare Decay $B \to K^*\ell^+\ell^-$ and Measurement of the $B \to K\ell^+\ell^-$ Branching Fraction
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 91, 221802 (2003).

CDF Run I publications

1. Search for New Physics in Photon-Lepton Events in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV
   D. Acosta *et al.* (CDF Collaboration), Phys. Rev. Lett. 89, 041802 (2002).

2. Search for New Physics in Photon-Lepton Events in $p\bar{p}$ Collisions at $\sqrt{s} = 1.8$ TeV
   D. Acosta *et al.* (CDF Collaboration), Phys. Rev. D **66**, 012004 (2002).

3. Forward-Backward Charge Asymmetry of Electron Pairs Above the Z^0 Pole
   F. Abe *et al.* (CDF Collaboration), Phys. Rev. Lett. 77, 2616 (1996).

B) Preprints and Publications of the BaBar Radiative Penguin Group during my tenure as co-convener, 2003–2006

1. Search for the Rare Decay $B \to \pi\ell^+\ell^-$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 99, 051801 (2007).

2. Branching fraction measurements of $B^+ \to \rho^+\gamma$, $B^0 \to \rho^0\gamma$, and $B^0 \to \omega\gamma$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 98, 151802 (2007).

3. Measurement of B Decays to $\phi K\gamma$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **75**, 051102 (2007).

4. Measurement of the branching fraction and photon energy moments of $B \to X(s)\gamma$ and $A_{CP}(B \to X(s+d)\gamma)$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 97, 171803 (2006).

5. Measurements of branching fractions, rate asymmetries, and angular distributions in the rare decays $B \to K\ell^+\ell^-$ and $B \to K^*\ell^+\ell^-$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **73**, 092001 (2006).

6. Measurement of Branching Fractions in Radiative B Decays to $\eta K\gamma$ and Search for B Decays to $\eta' K\gamma$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **74**, 031102 (2006).

7. Measurements of the $B \to X_s\gamma$ Branching Fraction and Photon Spectrum from a Sum of Exclusive Final States
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **72**, 052004 (2005).

8. Measurement of the time-dependent CP-violating asymmetry in $B^0 \to K^0_S\pi^0\gamma$ decays
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **72**, 051103 (2005).

9. Measurement of branching fractions and mass spectra of $B \to K\pi\pi\gamma$
   B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 98, 211804 (2007).

10. Search for the Radiative Decay $\bar{B}^0 \to \phi\gamma$
    B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **72**, 091103(R) (2005).

11. Search for the Rare Decay $\bar{B}^0 \to D^{*0}\gamma$
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **72**, 051106(R) (2005).

12. Measurement of the $B^0 \to K_2^{*0}(1430)\gamma$ and $B^+ \to K_2^{*+}(1430)\gamma$ Branching Fractions
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **70**, 091105 (2004).

13. Search for the Radiative Penguin Decays $B^+ \to \rho^+\gamma$, $B^0 \to \rho^0\gamma$, and $B^0 \to \omega\gamma$
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 94, 011801 (2005).

14. Measurement of Branching Fractions, and CP and Isospin Asymmetries, for $B \to K^*\gamma$
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **70**, 112006 (2004).

15. Measurement of Time-dependent CP-violating Asymmetries in $B^0 \to K^{*0}\gamma(K^{*0} \to K_S^0\pi^0)$ Decays
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 93, 201801 (2004).

16. Measurement of the $B \to X_s\ell^+\ell^-$ Branching Fraction with a Sum over Exclusive Modes
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 93, 081802 (2004).

17. Measurement of the Direct CP Asymmetry in $b \to s\gamma$ Decays
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 93, 021804 (2004).

18. Evidence for the Rare Decay $B \to K^*\ell^+\ell^-$ and Measurement of the $B \to K\ell^+\ell^-$ Branching Fraction
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 91, 221802 (2003).

C) Other Publications Reviewed for BaBar

1. Observation of a Charmed Baryon Decaying to D^0p at a Mass Near 2.94 GeV/c^2
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 98, 012001 (2007).

2. Determination of the Branching Fraction for $B \to X_c\ell\nu$ Decays and of $|V_{cb}|$ from Hadronic-Mass and Lepton-Energy Moments
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. Lett. 93, 011803 (2004).

3. Measurements of Moments of the Hadronic Mass Distribution in Semileptonic B Decays
B. Aubert *et al.* (BaBar Collaboration), Phys. Rev. D **69**, 111103 (2004).

A complete list of publications with my name on them can be browsed at SPIRES