

6 HEPL Personnel and Faculty Vitae

(Parentheses indicate level of DoE salary coverage if not 100%)

CDF Group

Andrew Foland	Asst. Professor (summer salary)
Melissa Franklin	Professor (summer salary)
Alexey Ershov	Postdoc
João Guimarães da Costa	Postdoc
Lester Miller	Postdoc
Ayana Holloway	Grad. Student
Robin Madrak	Grad. Student (graduating Fall 03)
Sal Rappoccio	Grad. Student
Daniel Sherman	Grad. Student
Ingyin Zaw	Grad. Student

BABAR Group

George Brandenburg	Sr. Res. Fellow (25%, also ATLAS & HEPL staff)
Masahiro Morii	Asst. Professor (summer salary)
Stephen Bailey	Postdoc
Eunil Won (0)	Postdoc (100% startup funds)
Kris Chaisanguanthum	Grad. Student

MINOS Group

Gary Feldman	Professor (summer salary, also ATLAS)
Mayly Sanchez	Postdoc
Andrei Lebedev	Grad. Student
Sharon Seun	Grad. Student
New Student	Grad. Student

HEPL Personnel (cont.)

ATLAS Group

John Huth

Professor (summer salary)

Gary Feldman

Professor (also MINOS)

George Brandenburg

Sr. Res. Fellow (20%, also BABAR & HEPL staff)

Peter Hurst

Engineering Physicist

Matthew Nudell

Student Research Asst.

HEPL Staff

Administration

George Brandenburg

Lab Director (20%, also BABAR & ATLAS)

Robyn Simpson

Lab Administrative Asst.

Tom Fries

Procurement Manager (100% project funding)

Electronics Shop

John Oliver

Electronics Engineer

Nathan Felt

Asst. Electronics Engineer (50% project funding)

Sarah Harder

Technician (50% project funding)

Machine Shop

Steve Sansone

Machinist (50% project funding)

Rick Haggerty

Head Technician (50% project funding)

Sal de Santis

Technician (100% project funding)

Curriculum Vitae

George W. Brandenburg

Address: 46 Robinson Road, Lexington, Mass. 02420 (781) 861-0286

Harvard University High Energy Physics Laboratory
42 Oxford Street, Cambridge, Mass. 02138 (617) 495-2824
Email: brandenburg@huhepl.harvard.edu

Personal: Born July 26, 1944, Hempstead, New York
Married, two children

Education: Ph.D. 1969, Harvard University, Cambridge, Mass.
Thesis student with Bubble Chamber Group
NSF Traineeship, 1965-66

A.B. 1965, Harvard College, Cambridge, Mass.
Magna Cum Laude with Highest Honors in Physics
Honorary Freshman Scholarship

Employment: Harvard University, Cambridge, Mass., 1980–Present
Director of the High Energy Physics Laboratory
Senior Research Fellow
Co-Leader of the CDF Group (1980-93)
Co-Leader of the CLEO Group (1994–2002)
CLEO Experiment Co-Spokesperson (1997-99)
ATLAS Muon Electronics Coordinator (2000-)
Co-Leader of the BaBar Group (2002–)

Mass. Institute of Technology, Cambridge, Mass., 1974–80
Associate Professor of Physics
Member of Counter–Spark Chamber Group

Stanford Linear Accelerator Center, Stanford, Calif., 1971–74
Research Associate with Experimental Group B

Max Planck Institute for Physics, Munich, Germany, 1969–71
Post-doctoral Fellow with Bubble Chamber Group

Outreach: Fermilab Computer Coordination Committee, 1979-80
Fermilab Users Executive Committee, 1979-81
D.O.E. Energy Sciences Network Steering Committee, 1986-89
Federal Networking Council Advisory Committee, 1990-97
Fellow, American Physical Society, 1992-

Publications: Listing available at www-spines.slac.stanford.edu – 400 as of 2003

Curriculum Vitae

Gary J. Feldman

Birth date: March 22, 1942

Citizenship: United States

Lyman Laboratory of Physics
Harvard University
Cambridge, MA 02138
(617) 496-1044
feldman@physics.harvard.edu

Education:

B.S.	University of Chicago	1964
A.M.	Harvard University	1965
Ph.D.	Harvard University	1971

Thesis: A Determination of the Pion Form Factor by Measurements of Single π^+ Electroproduction

Academic Positions:

Research Associate at SLAC	Stanford University	1971-74
Staff Physicist at SLAC	Stanford University	1974-79
Associate Professor at SLAC	Stanford University	1979-83
Professor at SLAC	Stanford University	1983-90
Professor of Physics	Harvard University	1990-92
Frank B. Baird, Jr. Professor of Science	Harvard University	1992-present

Administrative Position:

Chairman, Department of Physics	Harvard University	1994-97
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Concurrent Position:

Scientific Associate	CERN	1982-83
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Research Activities: (Dates are of first publication)

Photoproduction of Pion Pairs at the CEA	1969
Photoproduction of e^+e^- Pairs at the CEA	1970
Single Pion Electroproduction at the CEA	1971
Hadron Electroproduction at SLAC (with Optical Spark Chambers)	1972
e^+e^- Annihilation at SPEAR (with the Mark I Detector)	1974
Hadron Electroproduction at SLAC (with MWPC)	1975
e^+e^- Annihilation at SPEAR (with the Lead Glass Wall)	1977
e^+e^- Annihilation at SPEAR (with the Mark II Detector)	1979
e^+e^- Annihilation at PEP (with the Mark II Detector)	1982
Search for Neutrino Oscillations at CERN	1984
e^+e^- Annihilation at the SLC (with the Mark II Detector)	1989
pp Collisions at the Tevatron with CDF	1991
Search for μ to e Oscillations with the NOMAD Detector at CERN	1998
Study of Neutrino Oscillations with the MINOS Detector at Fermilab	
pp Collisions at the SSC with the SDC Detector	
pp Collisions at the LHC with the ATLAS Detector	

Community Service:

Committees:

LBL Particle Data Group Advisory Committee	1981-84
Fermilab Physics Advisory Committee	1982-86
APS Division of Particles and Fields Executive Committee	1984-85, 91-93
High Energy Physics Advisory Panel (HEPAP)	1984-87, 92-93
Lawrence Berkeley Laboratory Physics Visiting Committee	1986-91
Weizmann Institute Scientific and Academic Advisory Committee	1988, 1994
CESR Program Advisory Committee	1989-91
Physical Review Letters Review Panel	1989-90
APS Division of Particles and Fields, Vice-Chairman	1991
APS Division of Particles and Fields, Chairman	1992
1992 HEPAP Subpanel on the U.S. Program of High Energy Physics Research	1992
HEPAP Subpanel on Accelerator-Based Neutrino Oscillation Experiments	1995
APS Panofsky Prize Committee, Vice-Chairman	1995
National Research Council Committee on Elementary-Particle Physics	1995-98
Universities Research Association Visiting Committee for Fermilab (Chairman, 1997)	1995-98
APS Panofsky Prize Committee, Chairman	1996
Carnegie Mellon University Physics Advisory Board	1996-99
Board of Trustees, Dibner Institute for the History of Science and Technology	1998-
DoE Outstanding Junior Investigator Selection Panel	2000-01
SLAC Scientific Policy Committee	2001-04

School and Conference Directorships:

SLAC Summer Institute on Particle Physics	1979-90
International Conference on Instrumentation for Colliding Beam Physics	1982

Editorships:

Editorial Board, International Journal of Modern Physics A	1985-90
Editorial Committee, Annual Reviews of Nuclear and Particle Science	1988-92
Divisional Associate Editor, Physical Review Letters	1990-93

Honors

Fellow, American Physical Society
Fellow, American Academy of Arts and Sciences

Hardware

As member of team, researched and tested novel design for silicon microstrip detectors, demonstrated resistance to radiation damage, and published results; design will be used for CLEO III upgrade.

Analysis

Invented novel single-time technique to measure CP violation at the $\Upsilon(4S)$. Invented technique to detect K_L particles previously thought undetectable at CLEO.

With collaborator, developed two-photon technique to search for glueball particle; carried out and published analysis. This has inspired similar analyses at other experiments.

Developed new technique to measure $B^0 - \overline{B}^0$ mixing.

Established technique to image and measure alignment and length scale of physically inaccessible SVX detector.

Software

Wrote user interface to all tracking data gathered by CLEO II experiment.

Wrote tracking package to integrate new silicon detector into experiment.

Rewrote parts of $\frac{dE}{dx}$ particle identification package.

SLD Collaboration (Stanford University)

Summer 1993

Stanford Linear Accelerator Center, Palo Alto, CA

Software: Integrated CLEO Monte Carlo into SLD event generator.

Analysis: With G. Gladding, developed topological technique to measure B^0/B^+ lifetime ratio; published leaving SLD.

University of Illinois

Summer 1992 – Spring 1994

Hardware

Tested novel CsI crystal detector design for τ -Charm Factory in two-week beam test at Triumf.

Measured position resolution of CsI crystals and published results establishing design's viability.

Software: Wrote data acquisition system and online monitoring for calorimeter beam test.

OTHER EXPERIENCE

Consultant

Leslie L. Christianson, Spring 1994

Wrote technical analyses for defense concerning alleged mechanical failures in two liability lawsuits. Both lawsuits ultimately dropped.

PUBLICATIONS

I am listed as an author or coauthor on 68 refereed publications. As a member of the SLD and CLEO Collaborations, I am listed as a coauthor on 60 refereed papers; the full list is available upon request. Below are those refereed articles (many outside of these collaborations) which I either wrote or to which I contributed directly and significantly.

Hardware Publications

- Design and Initial Performance of the CLEO III Silicon Tracker
E. von Torne *et al.*, **Nuclear Instruments and Methods in Physics Research A473**, 17(2001)
- The Design and Performance of the Silicon Detectors for CLEO III
C.W. Ward *et al.*, **IEEE Transactions on Nuclear Science** 44, 606(1997)
- Radiation-Induced Surface Leakage Currents in Silicon Microstrip Detectors
A. D. Foland *et al.*, **IEEE Transactions on Nuclear Science** 43-3, 1746(June 1996)
- Optimization of Silicon Microstrip Detector Design for CLEO III
P.I. Hopman, A. D. Foland, J. Alexander, C. Ward, P. Kim, **Nuclear Instruments and Methods in Physics Research A383**, 98(1996).
- Low noise electronics for the CLEO III silicon detector
H. Kagan *et al.*, **Nuclear Instruments and Methods in Physics Research A383**, 189(1996).
- Performance of a Longitudinally Segmented CsI(Tl) Array Suitable for a Detector in a Low-Energy or Medium-Energy e^+e^- Storage Ring
R. Baggs, *et al.*, **Nuclear Instruments and Methods in Physics Research A344**, 547(1994)

Accelerator Publications

- Observation of the dynamic beta effect at the Cornell Electron-Positron Storage Ring with the CLEO detector
D. Cinabro *et al.*, **Physical Review E** 57, 1193(1998).

Phenomenology Publications

- Measurement of CP violation at the $\Upsilon(4S)$ without time ordering or Δt
A. D. Foland, accepted for publication in **Physical Review D Rapid Communications** 1999.

CLEO Publications

- Precise Measurements of B^0 Mixing Parameters at the $\Upsilon(4S)$
B. Behrens *et al.*, Physics Letters B **490**, 36 (2000)
- Limit on the Two-Photon Production of the Glueball Candidate $f_J(2220)$ at the Cornell Electron Storage Ring
R. Godang *et al.*, Physical Review Letters **79**, 3829 (1997)
- Further Search for the Two-Photon Production of the Glueball Candidate $f_J(2220)$
M.S. Alam *et al.*, CLNS 98/1560, CLEO 98-8
(submitted to Physical Review Letters)
- Measurement of Charm Meson Lifetimes
B. Nemati *et al.*, Submitted to Physical Review Letters Jan. 1999
- Search for Color-Suppressed B Hadronic Decay Processes at the $\Upsilon(4S)$ Resonance
B. Nemati *et al.*, Physical Review D **57**, 5363 (1998)
- Search for A Scalar Bottom Quark with Mass 3.5 GeV-4.5 GeV
V. Savinov *et al.*, Physical Review D **63**, 51101 (2001)
- First Observation of the Decay $B^0 \rightarrow D^{*-} p \bar{p} \pi^+$ and $B^0 \rightarrow D^{*-} p \bar{n}$
Physical Review Letters **86**, 2732 (2001),

Internal Technical Reports

- CLEO CBX 99-59 *A Measurement of B - \bar{B} Mixing Using Partial Hadronic Reconstruction*
- CLEO CBX 99-39 *A Flavor Tagging Package for CLEO*
- CLEO CBX 99-29 *Can CLEO Measure $\sin 2\beta$?*
- CLEO CBX 98-59 *Length Scale in the CLEO Detector*
- CLEO CBX 98-14 *Measuring $B^0 - \bar{B}^0$ Mixing Using Partial Hadronic Reconstruction*
- CLEO CBX 98-4 *Studies of Tracking with the CLEO II.V SVX Detector*
- CLEO CSN 97-354 *Tracking Common Blocks for the Kalman Era*
- CLEO CBX 97-70 *Observation of $B^0 \rightarrow \psi K_L$*

- CLEO CBX 96-91 $f_J(2220)$ *Anti-Search in Two-Photon Interactions at CLEO*
- CDFNOTE 5837, Foland, Rappoccio, Miller: *Offline Studies of the SVX Barrel Positions*
- CDFNOTE 5733, Culbertson, Foland: *Beam Steering Tests, September 2001*
- CDFNOTE 5554, Waschke, D'Auria, Foland: *Results on Test on SVXII Ladders During Barrel Assembly*

CURRICULUM VITAE

Melissa Eve Bronwen Franklin

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Home address: 35 Hudson Street
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Education: B.S. University of Toronto (1977)
Ph.D. Stanford University (1982)

Positions: 1975-1976 Summer Research Associate, University of Toronto at Fermilab
1977 Summer Research Associate, Columbia University at CERN
1977-1982 Research Associate, Stanford Linear Accelerator
1983-1986 Post-doctoral Fellow, Lawrence Berkeley Laboratory
1986-1987 Assistant Professor, University of Illinois
1987-1989 Junior Fellow, Society of Fellows, Harvard University
1989-1991 Assistant Professor, Harvard University
1991-1992 John Loeb Associate Professor of the Natural Sciences, Harvard University
1992- Professor of Physics, Harvard University

Honors: Fellow, Alfred P. Sloan Foundation (1988)
Loeb Endowed Chair, Harvard University (1991-92)
Fellow, American Physical Society (1994)
Doctor of Law, Queens University Canada (1997)

John E. Huth

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Professional Preparation

Princeton University, New Jersey	Physics	AB (Hons) 1975-1979
University of California, Berkeley, CA	Physics	PhD, 1979-1984
Fermi National Accelerator Laboratory	Physics	Postdoc 1985-1988

Appointments

1993-present Professor of Physics, Harvard University
1999-present Computing Project Manager, U.S. ATLAS Collaboration
1998-present Brookhaven Science and Technology Steering Committee
1993-1997 Fermilab Physics Advisory Committee
1991-1993 Co-manager, Collider Detector at Fermilab
1991-1993 Staff Scientist, Fermilab
1992-1998 Robert Wilson Fellow, Fermilab
1988-1992 Coordinator of Studies of Quantum Chromodynamics for the CDF Detector at Fermilab

Related Publications

- [1] CDF Collaboration, "A measurement of the CP violation parameter $\sin(2\gamma)$ from $B \rightarrow J/\psi K_s^0$ ", *Phys. Rev. Lett.* **81**:5513, 1999
[2] CDF Collaboration, "Measurement of the top quark mass with the Collider Detector at Fermilab", *Phys. Rev. Lett.* **83**:3124, 1998
[3] CDF Collaboration, "Observation of the B_c meson in proton-antiproton Collisions at $\sqrt{s} = 1.8$ TeV" *Phys. Rev. Lett.* **81**:2432, 1998
[4] CDF Collaboration, "Evidence for top quark production in proton-antiproton collisions $\sqrt{s} = 1.8$ TeV", *Phys. Rev. Lett.* **73**:225, 1994
[5] John Huth, QCD and Jets, *Proceedings, Stanford 1988 Lepton and photon interactions at high energies*, 1988.

Other Significant Publications

- [1] J. Huth, "High Energy Physics: The Road Ahead", *American Scientist*, 82, July-August, 1994.
[2] J. Huth, "The Search for the Top Quark", *American Scientist*, 81, Sept-Oct. 1992.
[3] J. Huth, M. Mangano, "QCD Tests in Proton-Antiproton Collisions", *Annual Review of Nuclear and Particle Science*, 43:585:633, 1993.

Synergistic Activities

- **Pedagogical**: Developed numerous courses, including *The Physics of Music*, a course intended to fulfill science requirements for humanities majors at Harvard.
- **Research tools**: Construction of numerous kinds of detectors for high energy physics, including managing the construction of the Collider Detector at Fermilab. Development of high performance, low cost CMOS electronics for particle detector readout, development of high speed data acquisition systems for the readout of silicon vertex detectors at hadron colliders.
- **Service**: Many advisory committees: Fermilab Physics Advisory Committee, Brookhaven Science and Technology Committee, Panel on International Cooperation in Science, sponsored by the NAS and GAAS. Community service in teaching science to adults, children and minorities in many venues.

- Leadership: Chair of German-American Frontiers of Science, Munich, 1997, Chair of the U.S. ATLAS Collaboration Board, Chair of Harvard High Energy Physics Committee, Project Manager for Computing in the U.S. ATLAS Project.
- Awards and Honors: Fellow of the American Physical Society, conferred 1999.

Thesis Advisor & Postgraduate -Scholar Sponsor: 5 PhD, 6 Postdoc

Timothy Hessing (Texas A+M), Rowan Hamilton (Harvard), Maria Spiropulu (Harvard), Marc Hill (Harvard), Stephen Bailey (Harvard), Brenna Flaugher (Fermilab), Alessandra Caner (Fermilab), Colin Gay (Harvard), Petar Maksimovic (Harvard), Werner Riegler (Harvard), Andy Foland (Harvard), Joao DaCosta (Harvard).

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Employment

Assistant Professor	Harvard University	2000–present
Research Associate	Stanford Linear Accelerator Center	1996–2000
Research Associate	University of Tokyo	1992–1996

Fellowship

Alfred P. Sloan Research Fellowship 2002

Education

Ph.D.	University of Tokyo	April 1994
M.S. in physics	Kyoto University	March 1988
B.S. in physics	Kyoto University	March 1986

Research

BABAR Experiment

1996–present

BABAR is an experiment dedicated to studies of the b-quark physics, in particular the CP violation in neutral B meson decays. It has been built at the PEP-II e^+e^- storage ring at SLAC. I joined the experiment in October 1996 as a research associate of SLAC. From 1996 to 2000, my main responsibility was in the construction and the operation of the central drift chamber. In August 2000, I moved to Harvard University and started a new Harvard BABAR group, with which I am involved in the R & D of an improved level-1 trigger system. Achievements include:

- Lead the Harvard BABAR group for the development of the level-1 trigger system upgrade. Co-designed a new fast 3-d tracking trigger system that will allow BABAR to take data at substantially higher beam intensities.

- Participated in the development and the production of the readout electronics for the BABAR drift chamber [1]. Tested and evaluated the amplifier ICs designed at UC Santa Cruz. Studied the performance of the front end assembly, contributed to its design, and lead the production and testing of the final system.
- Worked for the installation and commissioning of the BABAR drift chamber [2, 3]. Served as the drift chamber operations manager in April–August 1999 when the detector saw the first beams from the PEP-II accelerator. Organized and lead a team of hardware/software experts and shift personnel. Established stable and efficient operation of the drift chamber as a part of the BABAR detector [4].

OPAL Experiment

1992–1996

OPAL was a general-purpose experiment running at the LEP e^+e^- storage ring at CERN. I joined the experiment in May 1992 as a research associate with the University of Tokyo. I was in charge of the OPAL b Electroweak Working Group from November 1995 to September 1996. Achievements include:

- Worked on the measurement of $R_b \equiv \Gamma(Z^0 \rightarrow b\bar{b})/\Gamma(Z^0 \rightarrow \text{hadrons})$ [5, 6]. Improved the measurement accuracy from several per cent to 1.0% by developing a new double-tagging technique.
- Maintained the barrel electromagnetic calorimeter, one of the four major subdetectors of OPAL. Responsible in particular for the online electronics and the data-acquisition software. Contributed to the data-taking activity as one of the experts of the OPAL data-acquisition system.

KEK Experiment E-162

1988–92

KEK E-162 was a fixed-target experiment which used the KEK 12-GeV proton synchrotron to search for the CP-violating rare decay $K_L^0 \rightarrow \pi^0 e^+ e^-$. I worked for the experiment during its construction as a graduate student of Kyoto University. Achievements include:

- Designed a 39 m², 8000 sense-wire drift chamber system that used a fast gas to achieve a dead time of less than 50 ns. Studied the gas mixtures, developed the electronics, and designed the mechanical structure of the chambers and their production methods. Lead the production team of the chambers until the first unit was completed.

Teaching

I am committed to providing the best physics education to the next generation. I have taught the following undergraduate courses as an assistant professor at Harvard University.

Semester	Course	Title	CUE
Fall 2000	Physics 191r	Advanced Laboratory	4.5
Spring 2001	Physics 15c	Wave Phenomena	4.5
Fall 2001	Physics 151	Mechanics	4.6
Spring 2002	Physics 15c	Wave Phenomena	4.9
Fall 2002	Physics 151	Mechanics	4.6

The numbers in the last column above indicate the students' evaluation of my teaching, in the scale of 1 to 5, compiled by the Committee on Undergraduate Education [7]. My lectures have been among the highest-rated in the Physics Department.

Invited Talks and Seminars

- *Measurements of $\sin 2\alpha$ from the b factories*, 5th International Conference on Hyperons, Charm and Beauty Hadrons, Vancouver, Canada, 25–29 June 2002.
- *First year of BABAR/PEP-II; Measuring CP violation at an asymmetric b factory*, XXXVth Rencontres de Moriond, QCD and High-Energy Hadronic Interactions, Les Arcs, Savoie, France, 18–25 March 2000.
- *SLAC b -factory*, 54th Annual Meeting of the Physical Society of Japan, Hiroshima, Japan, 28–31 March 1999.
- *Heavy-quark electroweak measurements using leptons*, 28th International Conference on High Energy Physics, Warsaw, Poland, 25–31 July 1996.
- *Measurement of R_b by OPAL*, CERN PPE Seminar, 3 October 1994.
- *B -physics at LEP*, 49th Annual Meeting of the Physical Society of Japan, Fukuoka Institute of Technology, March 1994.
- *New measurements of $\Gamma(Z^0 \rightarrow b\bar{b})/\Gamma(Z^0 \rightarrow \text{hadrons})$ from OPAL*, XXVIIIth Rencontre de Moriond, Electroweak Interactions and Unified Theories, Les Arcs, Savoie, France, 13–20 March 1993.

References

- [1] *Electronics for the BABAR central drift chamber*, BABAR Drift Chamber Collab. (D. Coupal *et al.*), IEEE Trans. Nucl. Sci. **46**, 2027–2032 (1999).
- [2] *The BABAR drift chamber*, BABAR Drift Chamber Collab. (G. Sciolla *et al.*), Nucl. Instrum. Meth. A **419**, 310–314 (1998).
- [3] *The BABAR drift chamber project*, BABAR Drift Chamber Collab. (F. Ferroni *et al.*), Nucl. Instrum. Meth. A **409**, 46–52 (1998).
- [4] *The BABAR detector*, BABAR Collab., Nucl. Instrum. Meth. A **479**, 1 (2002).
- [5] *An improved measurement of R_b using a double tagging method*, OPAL Collab., Z. Phys. C **74**, 1–17 (1997).
- [6] *Measurement of $\Gamma(Z^0 \rightarrow b\bar{b})/\Gamma(Z^0 \rightarrow \text{hadrons})$ using a double tagging method*, OPAL Collab., Z. Phys. C **65**, 17–30 (1995).
- [7] *The CUE Guide*, Committee on Undergraduate Education, Harvard University.