

curriculum vitae**Eric C. Berg**<http://cv.ecberg.com>**EDUCATION**

Ph.D. Thesis: Hadronization and strange hadron (K^0 , Λ^0 , Ξ^- , $\Sigma^{*\pm}$, Ω^-) production in e^+e^- at 30GeV
 Ph.D. UC Los Angeles, 1994 High energy physics (Stanford Linear Accelerator Center)
 M.S. UC Los Angeles, 1989 Particle physics (Fermilab), with field theory and general relativity
 B.S. UC San Diego, 1987 Physics with minors in mathematics and philosophy, astrophysics

EMPLOYMENT

2015-present	Wells Fargo Bank, N.A.	Analytic Consultant
2001-2014	UC Irvine Physics & Astronomy	Associate Project Scientist (title since 2008)
2007-2016	University of Washington, Physics	Professional Staff
2005	UC Irvine Physics & Astronomy	Summer Sessions Lecturer (Physics 3A)
2000-2016	Zinfinite Solutions	Consultant, information technologies
1997-2001	High-Q Engineering	Communication Systems Engineer, government contractor
1995-1996	UC San Diego, Physics	Postgraduate Researcher
1994-1995	Strategic Economic Decisions	Consultant, unified field theory
1990-1992	Stanford University	Visiting Scholar
1987-1995	UC Los Angeles, Physics	Graduate Student Researcher
1986-1987	UC San Diego, Physics	Teaching Assistant

PERSONAL

Antarctic Service Medal from the U.S. Department of Defense (2011)
 California Certified Mediator (Basic Mediation training at UCI, 2007)
 Toastmasters International (1997-1998)
 Top Secret security clearance from the U.S. Defense Investigative Services (1997-2001)
 Medical imaging independent study (UCLA/USC 1992-1993)
 American Physical Society (member since 1990)
 U.S. citizen

COMPUTER/ENGINEERING

<u>Software Programming</u>		<u>Information Technology</u>		<u>Hardware Engineering</u>	
Mathematica	2001-present	IT support for ~12 persons	1996-2011	End-to-end systems	1986-2013
SAS/SQL	2015-present	Windows OS	1995-present	electrical/mechanical	
LabView	1996-2013	PC computers	1996-present	data acquisition/PID control	
LaTeX	2002-2014	TCP/IP, VPN/WAN	1996-present	digital/analog, low/high V	
VisualBasic	2001-2011	AFAR wireless net	2011-2013	PLC/microcontrollers	1999-2001
C++ & PSPICE	2000-2001	MS Office software	1992-present	3-300 kHz radio transmitters	1997-2001
DOS	1988-present	MS SQL Server	1996-2001	0.1-2.0 GHz radio detectors	2011-2013
HTML	1992-present	MAC computers	1989-1997	Torsion wire expert	2001-2011
VMS	1987-1994	VAX mainframes	1987-1994	Solar & wind power	2011-2013
FORTRAN	1987-1994	Linux familiarity		FPGA/VHDL familiarity	
Java & Python familiarity					

EXPERIENCE

Experienced Team Leader	1995-present
Statistics and Noise Analysis	1987-present
Cryogenic and Vacuum Systems	1995-2011
Radiation Detection	1986-2013
Metrologist, ~0.1 μ m Precision	2001-2011
Machinist, ~1 mil Precision	1995-2013

RESEARCH

- 2001-present Precision gravity tests with cryogenic torsion pendulums:
- measurement of Newton's constant G
 - test of the inverse-square law
 - test of the weak equivalence principle
- Riley D. Newman, UC Irvine.
Paul Boynton, University of Washington Seattle (collaborator)
Experiment Site (decommissioned 2011): Battelle Gravitation Physics Laboratory, Hanford, WA (with PNNL)
- 2008-present Search for non-exponential radioactive decay (similar to work being done at Purdue University).
- Possibly due to short-time-scale oscillations in the ratio of fundamental coupling constants
 - Possibly correlated with earth-sun distance variation
 - Possibly correlated with solar activity
- Supervising one graduate student, and with support from James W. Kelley and Riley D. Newman, UC Irvine
Experiment Site: UC Irvine Dept. of Physics and Astronomy (independent research)
- 2011-2013 Search for ultra-high energy neutrinos through radio Cherenkov interaction in glacial ice
- Search for first evidence of extragalactic neutrinos
 - Provide constraints on cosmic ray composition, acceleration and sources
 - provide constraints on neutrino interactions at 10^{17} to 10^{20} eV
- ARIANNA collaboration: P.I. Steve Barwick, UC Irvine
Experiment location: the Ross Ice Shelf, Antarctica (2011 deployment expedition leader)
- 1996-2001 LF/VLF/ELF radio transmitter system design and support, including:
- dual-antenna intermodulation distortion study for the US Navy in Cutler, ME
 - antenna bushing SF₆ insulating gas study for the US Navy in San Diego, CA
 - control system design and programming for the NIST time broadcast (WWVB) in Fort Collins, CO
 - antenna and transmitter monitor systems development, installation and support for the US Navy in N.Dakota, central California, and Okinawa
- 1995-1996 Search for chaotic escape rates in microwave-assisted tunneling of electrons electrostatically trapped on the surface of liquid helium at ~ 0.1 Kelvin (John M. Goodkind, UC San Diego).
- 1994-1995 Computational validation of a quaternionic spinor formulation of general relativity with specific focus on postdiction of the anomalous magnetic moment of the electron (Mendel Sachs, SUNY Buffalo).
- 1990-1995 Ph.D. Thesis (advisor: Charles D. Buchanan, UC Los Angeles): measured the production rates of K^0 , Λ^0 , Ξ^- , $\Sigma^{*\pm}$, and Ω^- from the last TPC/Two-gamma dataset, compiled world averages for all hadron production rates, energies, and experiments, and evaluated the best widely-used models.
- 1992-1993 Medical imaging independent study and observation with PET at UC Los Angeles (Ed Hoffman), MRI at UC Los Angeles (Roger Woods), and MRI at University of Southern California (Manbir Singh)
- 1989 E771 fixed target B-physics experiment: scintillation array and pad chamber construction at Fermi National Accelerator Laboratory (David B. Cline, UC Los Angeles).
- 1988-1990 Φ -factory experiment simulations: CP and CPT violation analysis methods and detector design for a proposal at UC Los Angeles (Charles D. Buchanan, UC Los Angeles).
- 1987-1988 B-factory simulations: CP violation detectability dependence on beam asymmetry (Donald Stork, UC Los Angeles).
- 1987 Stationary state calculation of the quartic potential (Oscar J. Lumpkin, UC San Diego).
- 1986 FFT and display programming for non-linear oscillations of Pt or Pd catalysis (M. Brian Maple, UC San Diego).

PEER-REVIEWED PUBLICATIONS

2015) "A FIRST SEARCH FOR COSMOGENIC NEUTRINOS WITH THE ARIANNA HEXAGONAL RADIO ARRAY." By ARIANNA Collaboration (S.W.Barwick *et al.*), *Astroparticle Physics* 70: pp12-26, 2015.

2015) "RADAR ABSORPTION, BASAL REFLECTION, THICKNESS AND POLARIZATION MEASUREMENTS FROM THE ROSS ICE SHELF, ANTARCTICA." By Jordan C. Hanson, Steven W. Barwick, Eric C. Berg, Dave Z. Besson, Thorin J. Duffin, Spencer R. Klein, Stuart A. Kleinfelder, Corey Reed, Mahshid Roumi, Thorsten Stezelberger, Joulie Tatar, James A. Walker, Liang Zou, *J. of Glaciology* 61: pp.438-446, 2015.

2015) "TIME-DOMAIN RESPONSE OF THE ARIANNA DETECTOR." By S.W. Barwick, E. C. Berg, D. Z. Besson, T. Duffin, J.C. Hanson, S. R. Klein, S. A. Kleinfelder, M. Piasecki, K. Ratzlaff, C. Reed, M. Roumi, T. Stezelberger, J. Tatar, J. Walker, R. Young, L. Zou. *Astroparticle Physics* 62: pp. 139-151, March 2015.

2014) "A MEASUREMENT OF G WITH A CRYOGENIC TORSION PENDULUM." R. Newman, M. Bantel, E. Berg, W. Cross (UCI). The Royal Society's "The Newtonian constant of gravitation, a constant too difficult to measure?" conference proceedings, February 2014. *Phil. Trans. R. Soc. A*, October, Vol. 372, 2026, 2014. 29pp.

2013) "DESIGN AND PERFORMANCE OF THE AUTONOMOUS DATA ACQUISITION SYSTEM FOR THE ARIANNA HIGH ENERGY NEUTRINO DETECTOR." By Stuart A. Kleinfelder and the ARIANNA collaboration. *IEEE Transactions on Nuclear Science* 60: 612-618, 2013.

2013) "A RADIO DETECTOR ARRAY FOR COSMIC NEUTRINOS ON THE ROSS ICE SHELF." By Spencer R. Klein for the ARIANNA collaboration. *IEEE Transactions on Nuclear Science* 60: 637-643, 2013.

2009) "TESTS OF GRAVITATIONAL INVERSE SQUARE LAW AT SHORT RANGES," by R.D. Newman, E.C. Berg, P.E. Boynton. *Space Science Reviews* 148, December 2009. pp175-190.

2007) "GRAVITATION PHYSICS AT BGPL," by P.E.Boynton, R.M.Bonicalzi, A.M.Kalet, A.M.Kleczewski, J.K.Lingwood, K.J.McKenney, M.W.Moore, J.H.Steffen, E.C.Berg, W.D.Cross, R.D.Newman, and R.E.Gephart. 7pp. Published in *New Astron. Rev.* 51: 334-340, 2007.

2003) "DUAL-FREQUENCY DISTORTION PREDICTIONS FOR THE CUTLER VLF ARRAY." By E.C. Berg, M.A. Roberts (Veridian) and T.L. Simpson (University of South Carolina, Electrical and Computer Engineering Department). *IEEE Transactions on Aerospace and Electronic Systems*, July 2003. pp1016-1034.

1994) "MEASUREMENT OF THE KAON CONTENT OF THREE PRONG TAU DECAYS." By TPC/Two Gamma Collaboration (D.A. Bauer *et al.*). LBL-33037, SLAC-PUB-6250, Aug 1993. 10pp. Published in *Phys.Rev.D50:13-17*, 1994.

1993) "EVIDENCE FOR SPIN ONE RESONANCE PRODUCTION IN THE REACTION GAMMA GAMMA* ---> PI+ PI- PI0." By TPC/Two Gamma Collaboration (D.A. Bauer *et al.*). SLAC-PUB-6094, UCSB-HEP-93-02, Mar 1993. 34pp. Published in *Phys.Rev.D48:3976-3987*, 1993.

1993) "STUDY OF CHI(C2) PRODUCTION IN PHOTON-PHOTON COLLISIONS." By TPC/Two-Gamma Collaboration (D. Bauer *et al.*). SLAC-PUB-5949, Oct 1992. 19pp. Published in *Phys.Lett.B302:345-350*, 1993 .

1991) "METHODS TO MEASURE (EPSILON-PRIME / EPSILON) TO THE LEVEL OF APPROXIMATELY 10**⁻⁴ AT A PHI FACTORY." By E.C. Berg, A.F. Boden, C.D. Buchanan, D.B. Cline, T. Foshe (UCLA). UCLA-HEP-90-001, Apr 1990. 15pp. Published in *Mod.Phys.Lett.A6:1163-1172*, 1991.

PRESENTATIONS

2013) speaker, "Measurement of G Using a Cryogenic Torsion Pendulum: the Story up to 2008," THE CENTER FOR GRAVITATIONAL PHYSICS, HUAZHONG UNIVERSITY OF SCIENCE AND TECHNOLOGY, Wuhan, P.R. China.

2013) speaker, "Solar and Wind Power System for the ARIANNA Array," 2013 POLAR TECHNOLOGY CONFERENCE, Annapolis, MD, USA.

2008) speaker, "A Measurement of the Gravitational Constant with a Cryogenic Torsion Pendulum," CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS, Boulder, CO, USA.

2004) speaker, "Progress in the measurement of the Gravitational Constant Using a Cryogenic Torsion Pendulum," CONFERENCE ON PRECISION ELECTROMAGNETIC MEASUREMENTS, London, UK.

2003) invited speaker, "Laboratory Tests of Gravitational Physics Using a Cryogenic Torsion Pendulum," TENTH MARCEL GROSSMANN MEETING ON GENERAL RELATIVITY, Rio de Janeiro, Brazil.

2003) speaker, "Development of a Cryogenic Torsion Pendulum for Gravitational Physics," PACIFIC COAST GRAVITY MEETING, Salt Lake City, UT, USA.

(full list including conference proceedings at <http://pubs.ecberg.com>)