

# Eric Arthur Myers

14 Spy Hill

Poughkeepsie, New York 12603

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E-mail: [myers@spy-hill.net](mailto:myers@spy-hill.net)

Telephone: 503-564-4169

## Education

- Ph.D. **Yale University**, Ph.D. in Physics (December, 1984). Thesis title: “*Calculation of the Gravitational Casimir Energy and Gauge Field Coupling Constants in non-Abelian Kaluza-Klein Theories.*”
- M.Phil. **Yale University**, M.Phil. in Physics (May, 1983).
- B.A. **Pomona College**, B.A. in Mathematics and in Physics (double major, May, 1980). Graduation honors of *cum laude*, Phi Beta Kappa, and Pi Mu Epsilon. Mathematics comprehensive exams in Numerical Analysis and Real Analysis. Physics thesis title: “*Phase Transitions and the Theory of Critical Phenomena.*”

## Professional Experience

- 2005 to present Physicist under contract to the LIGO Laboratory in support of the NSF funded pilot project *Interactions In Understanding the Universe*, with the goal of using Grid computing to make LIGO environmental data available to high school teachers and students for investigative “e-Labs”.
- Spring 2008 Visiting Associate Professor of Physics, Bard College, Annandale-on-Hudson, NY.
- 2002 to 2005 Assistant Professor of Physics, Vassar College, Poughkeepsie, New York.
- 2000 to 2002 Research Physicist, Department of Physics, University of Michigan, Ann Arbor, Michigan. Worked on the ATLAS experiment for the LHC at CERN, the DØ experiment for Tevatron Run IIa at Fermilab, and the UM-ATLAS Collaboratory Project.
- 1997 to 2000 Visiting Assistant Professor of Physics, Department of Physics, University of Michigan, Ann Arbor, Michigan.
- 1995 to 1997 Lecturer, and visitor to the High Energy Particle Theory Group, Department of Physics, University of Michigan, Ann Arbor, Michigan.
- 1993 to 1995 Visiting Assistant Professor of Physics, Vassar College, Poughkeepsie, New York.
- 1992 to 1993 Assistant Professor of Physics, Parks College of Saint Louis University, St. Louis, Missouri.
- 1989 to 1992 Postdoctoral Fellow in the Center for Relativity and Department of Physics, University of Texas at Austin.

- 1987 to 1989 Visiting Research Associate in the Physics Department at Boston University, Boston, Massachusetts (concurrent with Dalhousie position).
- 1986 to 1989 Postdoctoral Research Associate at the Institute for Computational Studies, Department of Mathematics, Statistics, and Computer Science, Dalhousie University, Halifax, Nova Scotia, Canada.
- 1984 to 1986 Postdoctoral Fellow in the High Energy Theoretical Physics group, Brookhaven National Laboratory, Long Island, New York.
- Spring, 1984 Acting Instructor of Physics, Yale University, New Haven, Connecticut.
- 1981-82 Teaching Fellow in Computer Science at Yale University.
- Summer, 1981 Graduate student assistant. Developed data analysis software (primarily track fitting) for the CRISIS detector for Fermilab experiment E570, at Yale University.
- Summer, 1980 Graduate student assistant. Analyzed data from experiments to measure nuclear stopping powers at the Wright Nuclear Structure Laboratory, Yale University.
- Spring, 1980 Member of a Mathematics Clinic at the Claremont Graduate School, Claremont, California, which studied numerical modeling of overpower accidents in breeder reactors for the U.S. Department of Energy.
- Summer, 1979 Undergraduate research assistant. Assisted with the construction and testing of the “Fly’s Eye” cosmic ray detector at the University of Utah, Salt Lake City, Utah.

### **Consulting and other employment**

- July 2006– April 2008 Consultant to a major financial services company for two internal distributed computing projects.
- July 1996 Computer security consultant to the Swedish Research Council for Engineering Sciences (Teknikvetenskapliga Forskningsrådet—TFR) and the Swedish Natural Science Research Council (Naturvetenskapliga Forskningsrådet—NFR), Stockholm, Sweden.
- Summers, 1980-82 Staff Resources Specialist (User Services) at the Yale University Computer Center, New Haven, Conn.
- 1979–80 Computer consultant and instructor in the college computer center at Pomona College, Claremont, California.

### Summer Schools

- June, 1985      Theoretical Advanced Study Institute (TASI) in elementary particle physics, at Yale University (9 June – 5 July, 1985).
- August, 1983      26th Scottish Universities Summer School in Physics, on “*Common Problems and Techniques in Statistical and Particle Physics*,” at the University of Edinburgh, Scotland (August 1–20, 1983).

### Languages

- Languages: English (native speaker), German (reading), Italian (enough to travel).  
Some Dutch and some French.
- Computer Languages: C++, C, Fortran, Perl, Python, PHP, JavaScript, SQL, TeX, ROOT, AppleScript, C and Bourne shells, sed/awk/grep/m4, LISP, APL, Basic, C\*, TPU, Pilot, Snobol4, and some R and Matlab.

### Professional Membership

- Member of the LIGO Scientific Collaboration (LSC), August 2004 to June 2005.
- American Physical Society:  
Division of Particle and Fields, Division of Computational Physics, Topical Group on Gravitation, Forum on Education
- International Society on General Relativity and Gravitation.
- Ann Arbor Relativity Group (1995-2002).
- Michigan Center for Theoretical Physics (Associate Member, 2000-2002).

### Professional Service

- Referee for *Physical Review Letters*.
- Member of the local organizing committee for the conference “*Strings 2000*” at the University of Michigan, Ann Arbor (July 10-15, 2000).
- Member of the local organizing committee for the first meeting of the American Physical Society Topical Group (now Division) on Computational Physics, at Boston University (June 5–8, 1989).

## Publications

### In Preparation

1. “First application of a coherent algorithm for gravitational-wave burst detection to data acquired by laser interferometric detectors,” by the LIGO Scientific Collaboration (B. Abbott, et al.). LIGO-P080008-00-A (To be submitted to *Classical and Quantum Gravity*)

### Submitted to arXiv.org

1. “Beating the spin-down limit on gravitational wave emission from the Crab pulsar,” by the LIGO Scientific Collaboration (B. Abbott, et al.). LIGO-P070118-00-Z, astro-ph/0805.4758
2. “Implications for the Origin of GRB 070201 from LIGO Observations,” by the LIGO Scientific Collaboration (B. Abbott, et al.). LIGO-P070081-A, astro-ph/0711.1163, to be submitted to Ap.J.
3. “The Einstein@Home search for periodic gravitational waves in LIGO S4 data,” by the LIGO Scientific Collaboration (B. Abbott, et al.). LIGO-P080021-01-Z, gr-qc/0804.1747. Submitted to Physical Review D.

### Refereed Journals

1. “Search for gravitational waves from binary inspirals in S3 and S4 LIGO data,” by the LIGO Scientific Collaboration (B. Abbott, et al.). LIGO-P060045-00-Z, gr-qc/0704.3368. Phys. Rev. D, **77** 062002 (2008)
2. “All-sky LIGO search for periodic gravitational waves in the S4 data,” by the LIGO Scientific Collaboration (B. Abbott, et al.). *Physical Review D* Phys. Rev. D **77**, 022001 (2008)
3. “Searching for Stochastic Background of Gravitational Waves with LIGO,” , by the LIGO Scientific Collaboration (B. Abbott, et al.). *Astrophys. J.* **659**, pp918-930 (2007).
4. “Search for gravitational-wave bursts in LIGO data from the fourth science run,” by the LIGO Scientific Collaboration (B. Abbott, et al.). *Class. Q. Gravity*, **24**, 5343-5369 (2007)
5. “Upper limit map of a background of gravitational waves,” by the LIGO Scientific Collaboration (B. Abbott, et al.). Phys. Rev. D **76**, 082003 (2007)
6. “Searches for periodic gravitational waves from unknown isolated sources and Scorpius X-1: results from the second LIGO science run,” by the LIGO Scientific Collaboration (B. Abbott, et al.). Phys. Rev. D **76**, 082001 (2007)

7. “Search for gravitational wave radiation associated with the pulsating tail of the SGR 1806-20 hyperflare of 27 December 2004 using LIGO,” by the LIGO Scientific Collaboration (B. Abbott, et al.). Phys. Rev. D **76**, 062003 (2007)
8. “Upper limits on gravitational wave emission from 78 radio pulsars,” by the LIGO Scientific Collaboration (B. Abbott, et al.) and M. Kramer et al. Phys. Rev. D **76**, 042001 (2007)
9. “First cross-correlation analysis of interferometric and resonant-bar gravitational-wave data for stochastic backgrounds,” by the LIGO Scientific Collaboration and the ALLEGRO Collaboration (B. Abbott, et al.) Phys. Rev. D **76**, 022001 (2007).
10. “Joint LIGO and TAMA300 search for gravitational waves from inspiralling neutron star binaries ,” , by B. Abbott et al. (LIGO Scientific Collaboration) and T. Akutsu et al. (TAMA Collaboration). Phys. Rev. D **73**, 102002 (2006).
11. “Search for gravitational waves from binary black hole inspirals in LIGO data,” , by the LIGO Scientific Collaboration (B. Abbott, et al.) Phys. Rev. D **73**, 062001 (2006).
12. “Search for gravitational wave bursts in LIGO’s third science run,” , by the LIGO Scientific Collaboration (B. Abbott, et al.) Class. Quant. Grav. **23** (2006) S29-S39.
13. “Upper limits from the LIGO and TAMA detectors on the rate of gravitational-wave bursts,” , by the LIGO Scientific Collaboration (B. Abbott, et al.), Phys. Rev. D **72** 122004 (2005).
14. “Upper Limits on a Stochastic Background of Gravitational Waves,” by the LIGO Scientific Collaboration (B. Abbott, et al), Phys. Rev. Lett. **95** 221101 (2005).
15. “First all-sky upper limits from LIGO on the strength of periodic gravitational waves using the Hough transform,” , by the LIGO Scientific Collaboration (B. Abbott, et al.), Phys. Rev. D **72** 102004 (2005).
16. “Discrete and Continuous Mathematical Models of DNA Branch Migration,” Michael F. Bruist and Eric Myers, Journal of Theoretical Biology **220**, 139-156 (2003)
17. “Triple-Helical DNA as a Reversible Block of the Branch Point of a Partially Symmetric DNA Four-Arm Junction,” A. W. Kirby, M. N. Gaskin, M. A. Antezania, and S J. Goodman, Eric Myers, and Michael F. Bruist, Journal of Molecular Biology **271**, 349 (1997).
18. “The Quantized  $O(1,2)/O(2) \times Z_2$  Sigma Model has no Continuum Limit in Four Dimensions I. Theoretical Framework,” Jorge DeLyra, Bryce DeWitt, See

- Kit Foong, Timothy Gallivan, Rob Harrington, Arie Kapulkin, Eric Myers, and Joe Polchinski, *Phys. Rev. D* **46**, 2527 (1992).
19. “The Quantized  $O(1,2)/O(2) \times Z_2$  Sigma Model has no Continuum Limit in Four Dimensions II. Lattice Simulations,” Jorge DeLyra, Bryce DeWitt, See Kit Foong, Timothy Gallivan, Rob Harrington, Arie Kapulkin, Eric Myers, and Joe Polchinski, *Phys. Rev. D* **46**, 2538 (1992).
  20. “A Study of the Interaction and Scattering of Vortices in the Abelian Higgs (or Ginzburg-Landau) Model,” by Eric Myers, Claudio Rebbi and R. Strilka, *Phys. Rev. D* **45**, 1355 (1992).
  21. “The Unbounded Action and the ‘density of states’ in Nonperturbative Quantum Gravity,” Eric Myers, *Class. and Quantum Grav.* **9**, 405 (1992). (An earlier version of this paper received Honorable Mention in the 1991 Gravity Research Foundation awards competition.)
  22. “The Density of States Method and the Velocity of Sound in Hot QCD,” S. Huang, Eric Myers, and J. Potvin, *Z. Phys. C* **50**, 221 (1991).
  23. “Dynamical Interactions of Cosmic Strings,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, *J. Comp. Phys.* **88**, 467 (1990).
  24. “Dynamical Interactions of Superconducting Flux Vortices,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, *J. Comp. Phys.* **81**, 481 (1989).
  25. “Numerical Simulation of Cosmic Strings and Flux Vortices in Superconductors on the ETA-10,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, *Comp. Phys. Comm.* **54**, 273 (1989).
  26. “Critical Slowing Down in Microcanonical Ising Dynamics,” R.C. Brower, K.J.M. Moriarty, Eric Myers, P. Orland and P. Tamayo, *Phys. Rev. B* **38**, 11471 (1988).
  27. “Dynamical Interactions of Cosmic Strings and Flux Vortices in Superconductors,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, *Physics Letters B* **207**, 411 (1988).
  28. “On the Interpretation of the Energy of the Vacuum as the Sum over Zero-Point Energies,” Eric Myers, *Phys. Rev. Lett.* **59**, 165 (1987).
  29. “Testing the Surrogate Zeta-Function Method,” A. Chodos and Eric Myers, *Can. J. Phys.* **64**, 633 (1986).
  30. “The Gravitational Casimir Energy in Even Dimensions,” Eric Myers, *Phys. Rev. D* **33**, 1563 (1986).
  31. “The Gravitational Casimir Energy in Non-Abelian Kaluza-Klein Theories,” A. Chodos and Eric Myers, *Phys. Rev. D* **31**, 3064 (1985).

32. “Gravitational Contribution to the Casimir Energy in Kaluza-Klein Theories,” A. Chodos and Eric Myers, *Ann. Phys.* **156**, 412 (1984).
33. “Quantum Instability of Dimensional Reduction,” T. Appelquist, A. Chodos and Eric Myers, *Phys. Lett. B* **127**, 51 (1983).

### Conference Reports and Proceedings

1. “Why a Particle Physicist is Interested in DNA Branch Migration,” Eric Myers and Michael F. Bruist, *Nucl. Phys. B (Proc. Suppl.)* **53**, 856 (1997).
2. “Noncompact Nonlinear  $\sigma$ -models and Numerical Quantum Gravity,” Eric Myers, B. DeWitt, R. Harrington and A. Kapulkin, *Nucl. Phys. B (Proc. Suppl.)* **20**, 744 (1991).
3. “Lattice Quantization of the  $O(1,2)/O(2) \times Z_2$  Sigma Model in 4 Dimensions,” B.S. DeWitt, Eric Myers, J. deLyra, S.K. Foong, T. Gallivan R. Harrington, and A. Kapulkin, in *Quantum Gravity (Proceedings of the Fifth Seminar)*, edited by M.A. Markov, V.A. Berezin and V.P. Frolov (World Scientific, Singapore, 1991), pp. 18–26.
4. “Information Optimization for Monte Carlo Data and Application to High-Temperature Quantum Chromodynamics,” S. Huang, K.J.M. Moriarty, Eric Myers and J. Potvin, in *Supercomputing '90* (Institute of Electrical and Electronic Engineers, Washington, D.C., 1990), pp. 742–746.
5. “An Optimization Scheme for Monte Carlo Analysis and Application to Hot Hadronic Matter Thermodynamics,” S. Huang, K.J.M. Moriarty, Eric Myers and J. Potvin, in *Supercomputing Symposium '90*, edited by D. Peltier (Ecole Polytechnique – Université de Montréal, Canada, 1990), pp. 181–196.
6. “Using Histograms in the Study of the Thermodynamics of QCD at Finite Temperature,” S. Huang, K.J.M. Moriarty, Eric Myers and J. Potvin, *Nucl. Phys. B (Proc. Suppl.)* **17**, 281 (1990).
7. “Evolution and Interaction of Cosmic Strings and Flux Vortices in Superconductors,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, in *Frontiers of Nonperturbative Field Theory*, edited by Z. Horvath, L. Palla and A. Patkós (World Scientific, Singapore, 1989) pp. 19–31.
8. “Dynamical Interactions of Cosmic Strings,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, in *Proceedings of the Storrs Meeting (DPF '88)*, edited by K. Haller, *et al.* (World Scientific, Singapore, 1989) pp. 892–897.
9. “Interactions of Cosmic Strings,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, in *Cosmic Strings: the Current Status*, (Proceedings of the Workshop

- on Cosmic Strings, May 6–7, 1988, Yale University), edited by F.S. Accetta and L.M. Krauss (World Scientific, Singapore, 1989).
10. “Numerical Simulation of Cosmic String Interactions,” K.J.M. Moriarty, Eric Myers, and Claudio Rebbi, in *Proceedings of the Third International Conference on Supercomputing*, Boston, Mass., May 15–20, 1988.
  11. “The Multigrid Method for Fermion Calculations in Quantum Chromodynamics,” R.C. Brower, Eric Myers, Claudio Rebbi, and K.J.M. Moriarty, in *Proceedings of the Third Cooper Mountain Conference on Multi-grid Methods*, April 6–10, 1987, Cooper Mountain, Colorado.
  12. “Spontaneous Compactification in Seventeen Dimensions,” A. Chodos and Eric Myers, in *Proceedings of the Eighth Johns Hopkins Workshop in Problems in Particle Theory*, Edited by G. Domokos and S. Kovsi-Domokos, (World Scientific, Singapore, 1984).

## Reports and Reviews

1. “The Web Lecture Archive Project: The Development of a Web-Based Archive of Lectures, Tutorials, Meetings and Events at CERN, the European Laboratory for Particle Physics,” Nora Bousdira, Steven Goldfarb, Eric Myers, Homer A. Neal, Charles Severance, Mick Storr, and Giosué, Vitaglione. CERN-OPEN-2001-066/UM-ACP-2001-003.
2. Review (with Cécile DeWitt-Morette) of *Mathematical Analysis and Numerical Methods for Science and Technology* by Robert Dautray and Jacques-Louis Lions (Springer-Verlag, New York, 1990), in *Physics Today*, December 1991, pp. 72–73.
3. Review of *An Introduction to Kaluza-Klein Theories*, Edited by H.C. Lee [Proceedings of the Workshop on Kaluza-Klein Theories at Chalk River/Deep River, Ontario, Canada, August, 1983] in *American Scientist*, **74**, 424-425, 1986.
4. “T<sub>E</sub>Xsis: T<sub>E</sub>X Macros for Physicists,” Eric Myers and F.E. Paige, Manual for the T<sub>E</sub>Xsis software package, available from <http://www.texsis.org>.
5. “Calculation of the Gravitational Casimir Energy and Gauge Field Couplings in Non-Abelian Kaluza-Klein Theories,” Ph.D. thesis (unpublished), Yale University, 1984.
6. “Nuclear Safety Code Study,” C. Jackson, K. Abumansoor, Eric Myers, D. Jesperson, E. Cramer, B. O’Reilly and B. Carmichael, Claremont Graduate School Mathematics Clinic report to the U.S. Department of Energy, June, 1980.

## Photo and Video Credits

1. Computer simulation of a pile of sand (a cellular automaton demonstrating self-ordered criticality) on a Connection Machine 2. Sequence of five photos in *GEO Wissen* magazine, 2 March 1992, pp 42–43.
2. Computer simulation of a pile of sand (a cellular automaton demonstrating self-ordered criticality) on a Connection Machine 2. Single photo in *Scientific American* magazine, January 1991, pg. 48.
3. Computer simulation of quenched QCD on a  $16 \times 16 \times 32 \times 4$  lattice showing domain formation, by Eric Myers, Jean Potvin, and Claudio Rebbi, in “Physics on the Connection Machine,” a video produced by the Boston University Physics Department, July, 1989.
4. Computer simulation of self-ordered percolation, modeling the spread of a slow disease or a fast forest fire, on a Connection Machine 2, by Brond Larson and Eric Myers, in “From Atoms to Forest Fires,” a video produced by the Boston University Physics Department, July 1989.

## Lectures Given (abbreviated list)

- April, 2007 “*LIGO and I2U2: Making LIGO Physical Environment Data Available for Discovery-based Learning*,” Invited talk at the joint meeting of the New York sections of the American Physical Society (APS) and American Association of Physics Teachers (AAPT), held at the U.S. Military Academy at West Point (14 April 2007).
- April, 2006 “*Searching for Ripples in Spacetime*,” colloquium talk in the Department of Physics at the State University of New York, College at New Paltz (18 April 2006)
- December, 2004 “*Searching for Ripples in Spacetime*,” colloquium talk in the Department of Physics at Trinity College, Hartford, Conn. (3 December 2004)
- April, 2004 “*The Effects of General Relativity on the Global Positioning System*,” colloquium talk for the Department of Physics and Astronomy, Vassar College (19 April 2004)
- March, 2002 “*High(er) Energy Physics*,” colloquium talk for the Department of Physics and Astronomy, Vassar College (1 March 2002).
- May, 1999 “*A Generalized Histogram Method for Monte Carlo Simulations of Field Theories with an Unbounded Action*,” seminar for the Ann Arbor Relativity Group, (22 May 1999)
- November 1998 “*The Effects of General Relativity on the Global Positioning System*,” colloquium talk, Eastern Michigan University Department of Physics, (9 November 1998)

- May, 1998 “*The Relativistic Time Delay in the Global Positioning System,*” seminar for the Ann Arbor Relativity Group, (15 May 1998)
- November, 1995 “*Non-perturbative Quantum Gravity and the  $SO(1,2)$  non-linear Sigma Model,*” seminar for the Ann Arbor Relativity Group, (18 November 1995)
- October, 1994 Two invited talks at the workshop *Topological Defects: Numerical Approaches*, at the Isaac Newton Institute, Cambridge University, England (October 12–14, 1994).
- June, 1993 Lecturer, College on Computational Physics, held at the International Centre for Theoretical Physics, Trieste, Italy (May 24 – June 11, 1993).
- January, 1992 Particle Theory Seminar, University of Texas at Austin, “*The  $SO(1,2)$  nonlinear sigma model and numerical quantum gravity*” (7 January 1992)
- October, 1990 “*Nonperturbative Quantum Gravity,*” Physics Colloquium, University of Texas at Austin, (3 October, 1990)
- June, 1989 “*Physics Using the Connection Machine 2,*” invited lecture in the Physics Department of Chalmers University of Technology, Göteborg, Sweden (27 June, 1989).
- June, 1989 Delivered a series of 8 lectures on parallel computing and the Connection Machine 2 supercomputer in the Physics Department of the Bergische Universität in Wuppertal, West Germany (June 12–23, 1989).
- May, 1989 Organized a three day workshop at Boston University on parallel computing and the Connection Machine 2 supercomputer, at which I presented 6 lectures (May 24–26, 1989).
- January, 1988 Lecturer, Second School on Advanced Techniques in Computational Physics, held at the International Centre for Theoretical Physics, Trieste, Italy (January 18 – February 12, 1988).
- October, 1986 Instructor, First School on Advanced Techniques in Computational Physics, held at the International Centre for Theoretical Physics, Trieste, Italy (October 6–28, 1986).
- April, 1986 Seventh Workshop on Grand Unification/ICOBAN’86, in Toyama, Japan (April 16–18, 1986). I was one of 10 young physicists chosen by the organizing committee to receive financial support to attend this conference and to then give several lectures in Japan.

### **Research Interests**

Gravitational waves; Quantum effects in General Relativity, and problems related to developing a quantum theory of gravity; classical General Relativity and related theories (such as torsion); Effects of relativity on satellites and space probes; Topological defects in field theories (specifically cosmic strings and flux vortices in superconductors); Lattice field theory; Interesting problems in mathematical and computational physics.