

Department of Physics – 2002 Faculty Publications

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Astrophysics

1. J. Roser, G. Manicó, V. Pirronello, and **G. Vidali**, "Formation of Molecular Hydrogen on Amorphous Water Ice: Influence of Morphology and Ultraviolet Exposure," *Astrophys. J.* **581**, 276 (2002).
2. **G. Vidali**, J. Roser, G. Manicó, and V. Pirronello, "Investigations of formation of molecular hydrogen on dust grain analogues," in *Proceedings of the NASA Laboratory Astrophysics Workshop*, Ed. by F. Salama, NASA Center for Aerospace Information (NASA/CP2002-211863), 224 (2002).

Particle Physics

3. **A.P. Balachandran**, S. Kurkcuglu and E. Rojas, "The Star Product On The Fuzzy Supersphere," *J. High Energy Phys.* **0207**, 056 (2002).
4. **A.P. Balachandran** and S. Dital, "Nonabelian Topological Strings And Metastable States In Linear Sigma Model," *Phys. Rev.* **D66**, 034018 (2002).
5. **A.P. Balachandran** and G. Alexanian "On The Failure of Spin Statistics Connection In Quantum Gravity," *Phys. Lett.* **B537**, 03-116 (2002).
6. **A.P. Balachandran** and S. Dital "Topological String Defect Formation During The Chiral Phase Transition," *Int. J. Mod. Phys.* **A17**, 1149-1158 (2002).
7. **A.P. Balachandran**, Brian P. Dolan, Joo-Han Lee, X. Martin and Denjoe O'Connor, "Fuzzy Complex Projective Spaces and Their Star Products," *J. Geom. Phys.* **43**, 184-204 (2002).
8. **A.P. Balachandran**, G. Alexanian, G. Immirzi and B. Ydri, "Fuzzy CP²," *J. Geom. Phys.* **42**, 28-53 (2002).
9. **A.P. Balachandran**, S.M. Roy, "Continuous Time Dependent Measurements: Quantum Anti-Zeno Paradox with Applications," *Int. J. Mod. Phys.* **A17**, 4007 (2002).
10. **M. Bowick**, A. Cacciuto and A. Travesset, "Formation of vortex loops (strings) in continuous phase transitions," *Phys. Rev.* **E65**, 02613 (2002).
11. **M. Bowick**, D. Nelson, A. Travesset and A. Cacciuto "Crystalline Order on a Sphere and the Generalized Thomson Problem," *Phys. Rev. Lett.* **89**, 185502 (2002).
12. **S. Catterall** and S. Karamov, "Exact Lattice Supersymmetry: the Two-Dimensional N=2 Wess Zumino Model," *Phys. Rev.* **D65**, 094501 (2002).
13. **S. Catterall** and S. Karamov, "Testing a Fourier Accelerated Hybrid Monte Carlo Algorithm," *Phys. Lett.* **B528**, 301 (2002).

14. **S. Catterall**, “A Two-Dimensional Lattice Model with Exact Supersymmetry,” Nucl. Phys. Proc. Suppl. **106**, 935 (2002).
15. **J. Schechter**, S. Moussa, S. Nasri and F. Sannino, “Possible Z-width probe of a “brane-world” scenario for neutrino masses,” Phys. Rev. **D65**, 096003 (2002).
16. **J. Schechter**, D. Black and M. Harada, “Vector-meson-dominance model for radiative decays involving light scalar mesons,” Phys. Rev. Lett. **88**, 181603 (2002).
17. **J. Schechter**, D. Black, A.H. Fariborz, S. Moussa and S. Nasri, “Investigating the light scalar mesons,” in *Hadron Spectroscopy (Ninth international conference on hadron spectroscopy*, Protvino, Russia), Ed. by D. Amelin and A.M. Zaitsev, AIP Conference Proceedings **619**, 178 (2002).
18. **K. Wali**, A. Davidson, B.F. Toner, and R. Volkas, “Clash of Symmetries on the brane,” Phys. Rev. **D65**, 125013 (2002).

CLEO Collaboration*

(includes professors M. Artuso, S. Blusk, G. Moneti, T. Skwarnicki, S. Stone, J.C. Wang)

19. M. Artuso,... **CLEO Collaboration**,? et al, “Measurement of the masses and widths of the Λ_c^0 and Σ_c^0 charmed baryons,” Phys. Rev. **D65**, 071101 (2002).
20. G. Masek,... **CLEO Collaboration**,? et al, “Further experimental studies of two-body radiative Λ_c^0 decays,” Phys. Rev. **D65**, 072002 (2002).
21. R. Godang,... **CLEO Collaboration**,? et al, “A Search for Charmless $B \rightarrow VV$ Decays,” Phys. Rev. Lett. **88**, 021802-1 (2002).
22. T.E. Coan,... **CLEO Collaboration**,? et al, “Observation of $\bar{B}^0 \rightarrow D^0 \eta^0$ and $\bar{B}^0 \rightarrow D^{*0} \eta^0$,” Phys. Rev. Lett. **88**, 062001-1 (2002).
23. R. Mahapatra,... **CLEO Collaboration**,? et al, “Observation of Exclusive $\bar{B} \rightarrow D^{*+} K^-$ Decays,” Phys. Rev. Lett. **88**, 101803-1 (2002).
24. G. Bonvicini,... **CLEO Collaboration**,... et al, “Search for CP Violation in $B \rightarrow K^* \eta$ Decays,” Phys. Rev. Lett. **88**, 111803 (2002).
25. A. Bornheim,... **CLEO Collaboration**,... et al, “Improved Measurement of $|V_{ub}|$ with Inclusive Semileptonic B Decays,” Phys. Rev. Lett. **88**, 231803 (2002).

* The CLEO collaboration is a team of over 150 high energy physicists from 25 universities studying the production and decay of beauty and charm quarks and tau leptons produced in the [Cornell Electron Storage Ring \(CESR\)](#).

26. R.A. Briere,... **CLEO Collaboration**,... et al, “Improved Measurement of $|V_{cb}|$ Using $\bar{B} \rightarrow D^* \bar{\nu} \bar{\nu}$,” Phys. Rev. Lett. **89**, 081803 (2002).
27. S.E. Csorna,... **CLEO Collaboration**,... et al, “Lifetime differences, direct CP violation, and partial widths in D^0 meson decays to $K^+ K^-$ and $\eta^+ \eta^-$,” Phys. Rev. **D65**, 092001 (2002).
28. K.W. Edwards,... **CLEO Collaboration**,... et al, “Search for lepton-flavor-violating decays of B mesons,” Phys. Rev. **D65**, 111102 (2002).
29. S.B. Athar,... **CLEO Collaboration**,... et al, “Measurement of the ratio of branching fractions of the $\Lambda_c^0(4S)$ to charged and neutral B mesons,” Phys. Rev. **D66**, 052003 (2002).
30. S. Chen,... **CLEO Collaboration**,... et al, “Search for neutrinoless Λ_c^0 decays involving the K_s^0 meson,” Phys. Rev. **D66**, 071101 (2002).
31. Z. Metreveli,... **CLEO Collaboration**,... et al, “Correlated inclusive Lambda anti-Lambda production in e^+e^- annihilations at $s^{*1/2}$ approx. 10.5-GeV,” Phys. Rev. **D66**, 052202 (2002).
32. A.H. Mahmood,... **CLEO Collaboration**,... et al, “Measurement of the Λ_c^0 Lifetime,” Phys. Rev. **D65**, 031102 (2002).

HAPPEX & JLHA Collaboration

(includes professors P. Souder and R.S. Holmes)

33. M. Amarian, **R. Holmes**, **P. Souder**? et al, “Q² Evolution of the Generalized Gerasimov-Drell-Hearn Integral for the Neutron using a ³He Target,” Phys. Rev. Lett. **89**, 242301-1 (2002).

Condensed Matter, Biological And Medical Physics

34. M.J. Korenberg, **E.D Lipson**, J.R Green, and J.E Solomon, “Parallel cascade recognition of exon and intron DNA sequences,” *Annals of Biomedical Engineering* **30** 129–140 (2002).
35. A. Krol, I. Echeruo, R.B. Salgado, A.S. Hardikar, J.E. Bowsher, D.H. Feiglin, F.D. Thomas, **E. Lipson**, and I. Coman, “EM-IntraSPECT algorithm with ordered subsets (OSEMIS) for non-uniform attenuation correction in cardiac imaging,” in *Medical Imaging 2002: Image Processing*, Ed. by M. Sonka, and J. M. Fitzpatrick, Proc. SPIE Vol. **4684** 1022-1027 (2002).
36. P. Benetatos and **M.C. Marchetti**, “Plasticity in current-driven vortex lattices,” Phys. Rev. **B65**, 134517 (2002).
37. P. Benetatos and **M.C. Marchetti**, “Plasticity in current driven vortex lattices in type-II superconductors,” *Physica A* (2002).

38. **M.C. Marchetti** and K.A. Dahmen, "Hysteresis in driven disordered systems: from plastic depinning to magnets," *Phys. Rev.* **B66**, 214201 (2002).
39. **M.C. Marchetti** and K. Saunders, "Viscoelasticity from a microscopic model of dislocation dynamics," *Phys. Rev.* **B66**, 224113 (2002).
40. **M. Marchevsky**, J.J. Higgins and S. Bhattacharya, "Driven Dynamics of the Vortex-Phase Mixture near the Peak Effect: "The Vortex Capacitor," *Phys. Rev. Lett.* **88**, 087002 (2002).
41. **A. Alan Middleton** and Daniel S. Fisher, "The three-dimensional random field Ising magnet: interfaces, scaling, and the nature of states," *Physical Review B* **65**, 134411 (2002).
42. **A. Alan Middleton**, "Critical slowing down in polynomial time algorithms," *Phys. Rev. Lett.* **88**, 017202 (2002).
43. P. N. Rao, **E.A. Schiff**, L. Tsybeskov, and P. Fauchet "Photocarrier Drift Mobility Measurements and Electron Localization in Nanoporous Silicon," *Chemical Physics* **284**, 129-138 (2002).
44. Kai Zhu, **E.A. Schiff**, N.-G. Park, J. van de Lagemaat, and A. J. Frank, "Determining the Locus for Photocarrier Recombination in Dye-Sensitized Solar Cells," *Appl. Phys. Lett.* **80**, 685-687 (2002).
45. **E.A. Schiff**, "Thermionic Emission Model for Interface Effects on the Open-Circuit Voltage of Amorphous Silicon Based Solar Cells," in *Conference Record of the 29th IEEE Photovoltaics Specialists Conference*, Institute of Electrical and Electronics Engineers, Inc., Piscataway, 1086-1089 (2002).
46. Kai Zhu, **E.A. Schiff**, and G. Ganguly, "Infrared Charge-Modulation Spectroscopy of Defects in Phosphorus Doped Amorphous Silicon," in *Amorphous and Heterogeneous Silicon-Based Films-2002*, Ed. by J.R. Abelson, J.B. Boyce, J.D. Cohen, H. Matsumura, J. Robertson, Materials Research Society Symposium Proceedings Vol. **715**, Pittsburgh, 301-06 (2002).
47. K. Zhu, **E. A. Schiff**, and G. Ganguly, "Infrared Modulation Spectroscopy of Interfaces in Amorphous Silicon Solar Cells," *J. Non-Cryst. Solids* **299-302**, 1162-1166 (2002).
48. P. Sanguino, M. Niehus, S. Koynov, P. Brogueira, R. Schwarz, J.P. Conde, V. Chu, and **E.A. Schiff**, "Lifetime Regime in the Electrically-Detected Transient Grating Method Applied to Amorphous and Microcrystalline Silicon Films," in *Amorphous and Heterogeneous Silicon-Based Films- 2002*, Ed. by J.R. Abelson, J.B. Boyce, J.D. Cohen, H. Matsumura, J. Robertson, Materials Research Society Symposium Proceedings Vol. **715**, Pittsburgh, 315-320 (2002).
49. **M. Wellner**, J. Jalife, and M.A. Pertsov, "Waves in excitable media: effects of wave geometry," *International Journal of Bifurcation and Chaos* **12**, 1939 (2002).
50. **M. Wellner**, O. Berenfeld, J. Jalife, and A.M. Pertsov, "Minimal principle for rotor filaments," *Proc. Natl. Acad. Sci.* **99**, 8015 (2002).

LEGS Collaboration

(includes professor A. Honig)

51. M. Blecher, **A. Honig** ? et al, "The Legs Double Polarization Program," in *Proceedings of the Conference Bologna 2000 Structure of the Nucleus at the Dawn of the Century*, Ed. by G.C. Bonsignori, M. Bruno, A. Ventura and D. Vretenar, World Scientific, 205-208 (2002).

Relativity And Gravitation

52. **D. Marolf** and C. Rovelli, "Relativistic Quantum Measurement," *Phys. Rev.* **D66**, 023510 (2002).
53. **D. Marolf**, F. Leblond and R. Myers, "Tall tales from de Sitter space. I: Renormalization group flows," *Journal of High Energy Physics* **0206**, 052 (2002).
54. **D. Marolf** and S. Ross, "Stingy negative-tension branes and the second law of thermodynamics," *Journal of High Energy Physics* **0204**, 008 (2002).
55. **D. Marolf** and **R. Sorkin**, "Perfect mirrors and the self-accelerating box paradox," *Phys. Rev.* **D66**, 104004 (2002).
56. **D. Marolf**, "Summary of Session D1(ii), String Theory and Supergravity," in *Proceedings of the 16th International Conference on General Relativity and Gravitation*, Ed. by N.T. Bishop and S.D. Maharaj, World Scientific, Singapore, 483-488 (2002).
57. **D. Marolf**, "The Past, puzzles, and promise of 6-branes," in *String Theory, 10th Tohwa University International Symposium on String Theory*, Ed. by H. Aoki and T. Tada, AIP Conf. Proc. **607**, 164 (2002).
58. **D. Marolf**, "School on Quantum Gravity in Chile," *Matters of Gravity* **No 20**, 20 (2002).
59. G.M. Harry, A. M. Gretarsson, **P.R. Saulson**, S.E. Kittelberger, S.D. Penn, W.J. Startin, S. Rowan, M.M. Fejer, D.R.M. Crooks, G. Cagnoli, J. Hough, and N. Nakagawa, "Thermal Noise in Interferometric Gravitational Wave Detectors due to Dielectric Optical Coatings," *Classical and Quantum Gravity* **19**, 897-917 (2002).
60. **R. Sorkin**, "An example relevant to the Kretschmann-Einstein debate," *Modern Physics Letters* **A17**, 695-700 (2002).
61. **R. Sorkin**, G. Brightwell, F. Dowker, R. Garcia and J. Henson, "General Covariance and the 'Problem of Time' in a Discrete Cosmology," in *Correlations, Proceedings of ANPA23*, Ed. by K.G. Bowden, Alternative Natural Philosophy, 1-17 (2002).
62. **M. Trodden**, D. Huterer and G.D. Starkman, "Is the Universe Inflating? Dark Energy and the Future of the Universe," *Phys. Rev.* **D66**, 043511 (2002).

63. **M. Trodden**, S. Nasri, P. Silva and G.D. Starkman, "Radion Stabilization in Compact Hyperbolic Extra Dimensions," Phys. Rev. **D66**, 045029 (2002).

Foundations of Physics

64. **F. Rohrlich**, "Causality, the Coulomb Field, and Newton's Law of Gravitation," Amer. J. Physics **70**, 411-414 (2002).

65. **F. Rohrlich**, "The Validity Limits of Physical Theories: Response to the Preceding Letter," Phys. Lett. **A295**, 320-322 (2002).

66. **F. Rohrlich**, "Response to Jefimenko's Comment," Amer. J. Physics **70**, 964 (2002).

67. **F. Rohrlich**, "Dynamics of a Classical Quasi-Point Charge," Phys. Lett. **A303**, 307-310 (2002).

Informal or Popular Publications

68. **J. Schechter**, "Introduction to Effective Lagrangians for QCD," in *Proceedings of the conference on compact stars in the QCD phase diagram*, Nordic Institute for Theoretical Physics, Copenhagen, Ed. by R. Ouyed and F. Sannino, published in eConf C010815:76-87 (2002).

69. **E. A. Schiff**, "How Do Neon Lights Work?," Scientific American, February, 2002.

70. **R. Sorkin**, "A Library of Lisp Functions for Posets (and other purposes)," <http://www.physics.syr.edu/~sorkin/lisp.library> (2002).

71. **M. Trodden**, A. Albrecht and J. A. Frieman, "Early Universe Cosmology and Tests of Fundamental Physics: Report of the P4.8 Working Subgroup, Snowmass 2001," in *APS / DPF / DPB Summer Study on the Future of Particle Physics (Snowmass 2001)*, Snowmass, Colorado, 30 Jun - 21 Jul (2001), e-published: <http://arxiv.org/abs/hep-ph/0111080>, eConf C010630 (2001) P409.