

PHYSICS FACULTY PUBLICATIONS AND CREATIVE ACTIVITIES 2003-2006

Textbooks

1. R. Serway and J. Jewett, Principles of Physics, 4th ed., Brooks/Cole Thomson Learning, Belmont, 2006
2. R. Serway and J. Jewett, Physics for Scientists and Engineers, 6th ed., Brooks/Cole Thomson Learning, Belmont, 2004
3. Kai S. Lam, textbook: "Topics in Contemporary Mathematical Physics", World Scientific, Singapore, 2003.
4. Harvey Leff and Andrew F. Rex, Maxwell's Demon 2: Entropy, Classical and Quantum Information, Computing, Institute of Physics, Bristol, 2003 (purchased in 2006 by Taylor-Francis).

Journal Publications of Physics Faculty with Student Co-Authors (* indicates Cal Poly Pomona undergraduate student)

1. N. Abramzon, J.C. Joaquin*, J.D. Bray*, and G. Brelles-Mariño, "Biofilm Destruction by RF High-Pressure Cold Plasma Jet", IEEE Transactions on Plasma Science, 2006. Accepted for publication.
2. Brelles-Mariño, G., J.C. Joaquin, J.C.* , Bray, J.* and Abramzon, N. 2005. Gas discharge plasma as a novel tool for biofilm destruction. *In: Proceedings of the 2nd International Workshop on Cold Atmospheric Pressure Plasmas.* pp. 69-72. ISBN:908086692X.
3. K Becker, A Koutsospyros, S -M Yin, C Christodoulatos, N Abramzon, J C Joaquin* and G Brelles-Mariño "Environmental and biological applications of microplasmas", Plasma Phys. Control. Fusion 47 B513-B523 (2005).
4. Kurt Vandervoort, Asif Hyder*, Stephanie Barker*, and Raul Torrico*, "Including Nanoscale Investigations in Undergraduate Physics Laboratories at all Levels of the Curriculum," Proceedings of the 2006 Spring Meeting of the Materials Research Society, in press (2006).
5. K. G. Vandervoort, T. T. Nguyen*, M. A. Demine*, and W. K. Kwok, "Measurements of the Meissner fraction as a function of oxygen ordering for oxygen deficient $YBa_2Cu_3O_{7-\delta}$ single crystals," Solid State Comm., submitted (2006).
6. K. G. Vandervoort, S. L. Adams*, and A. M. Hyder*, "Revealing the blaze angle: a simple experiment for visualizing diffraction effects using microscopic and macroscopic gratings," Am. J. Phys., in press (2006).

Journal Publications of Physics Faculty

1. P. Kurunczi, N. Abramzon, M. Figus, and K. Becker, "Measurement of Rotational Temperatures in High-Pressure MHC and CPE Discharge Plasmas", *Acta Physica Slovaca* 54, 115-124. (2004).
2. Stefano Ansoldi, Antonio Aurilia and Euro Spallucci, "Fuzzy Dimensions and Planck's Uncertainty Principle from p-brane Theory" *Classical & Quantum Gravity* 19, 3207 (2003)
3. Antonio Aurilia and Euro Spallucci, "Quantum Fluctuations of a "Constant" Gauge Field" *Physical Review D* 69, 105004 (2004)
4. Antonio Aurilia and Euro Spallucci, "Quantum Effects of a Massive 3-Form Coupled to a Dirac Field" *Physical Review D* 69, 105005 (2004)
5. A. Aurilia and E. Spallucci, 2003. "Planck's Uncertainty Principle and the Saturation of Lorentz Boosts by Planckian Black Holes" Presented to the Gravity Research Foundation for the *2003 Essay Contest on Gravitation* (Unpublished)
6. Kamales Kar, Soumya Chakravarti, V.R. Manfredi "Beta decay rates for nuclei with $115 < A < 140$ for r-process nucleosynthesis", To be published in *Pramana, Journal of Physics*, Indian Academy of Sciences, 2006
7. Jan Pfannes, Surajit Sen, Soumya Chakravarti, and Farhat I. Surve "Energy Absorption and Recovery in Tapered Granular Chains: Small Chains and Low Tapering", Symposium on Granular Material-Based Technologies, Materials Research Society Symposium Proceedings Volume 759, S. Sen, M. L. Hunt, A. J. Hurd eds., Materials Research Society, Warrendale, PA, 2003
8. Surajit Sen, Soumya Chakravarti, Donald P. Visco, Jr., Masami Nakagawa, Juan Agui, Jr. and David T. Wu "Proceedings of PASI on Modern Challenges in Statistical Mechanics", AIP Conference Proceedings, vol. 658, pp. 357-379, V.M. Kenkre and K. Lindenberg ed., AIP, New York, 2003
9. John Fang, "Einstein's Mistakes or His Disciples' Mistakes?" letter submitted to *Physics Today* (2006)
10. A. John Mallinckrodt "Line'em Up," *Phys. Teach.* 44, 134, (2006).
11. A. John Mallinckrodt "On 'Reinterpreting the famous train/embankment experiment of relativity'," *Eur. J. Phys.* 25, L49-50, (2004).
12. A. John Mallinckrodt "Drag Forces," *Phys. Teach.* 41, 261, (2003).
13. S. Demirtas, M.R. Hossu, R.E. Camley, H.C. Mireles and A.R. Koymen, *Tunable Magnetic Thermal Hysteresis in Transition Metals (Fe, Co and CoNi)/Rare Earth (Gd) Multilayers.* *Physical Review B.* 72, 184433, (2005)

14. H.C. Mireles and J.L. Erskine, *Effects of Step Decoration by Oxygen on Ultrathin Film Magnetic Anisotropy: p(1X1)Fe on vicinal W(100)*.. Journal of Applied Physics **93**, No. 10. (2003)
15. Yugui Yao, Hector C. Mireles, Jie Liu, Qian Niu, and J.L. Erskine *Negative Differential Magnetization in Ultrathin Fe on vicinal W(100)*.. Physical Review B **67**, 174409 (2003)
16. M. Mogge, and R. Shurtz, "A Report on the 2003 International Physics Olympiad" Announcer **33**, 10-13 (Fall 2003).
17. M. Mogge, and R. Shurtz, "Report on the 2004 International Physics Olympiad" Announcer **34**, 10-13 (Fall 2004).
18. M. Mogge, and R. Shurtz, "A Report on the 36th International Physics Olympiad" Announcer **35**, 10-13 (Fall 2005).
19. Rudolph, A.L., Fich, M., Bell, G.R., Norsen, T., Simpson, J.P., Haas, M.R., & Erickson, E.F., "Abundance Gradients in the Galaxy", 2006, ApJS, 162, 346.
20. E. Salik, E. Rubiola, N. Yu, and L. Maleki, Dual photonic-delay line cross correlation method for ultra-low phase noise measurement, to be submitted to J. Optical Society of America B: Optical Physics, 2006.
21. E. Salik, N. Yu, and L. Maleki, "Ultra-low phase noise coupled opto-electronic oscillator", to be submitted to IEEE Photonics Technology Letters, 2006.
22. E. Rubiola, E. Salik, N. Yu, and L. Maleki, "Flicker noise in high-speed p-i-n photodiodes," to be published in IEEE Transactions on Microwave Theory and Techniques, Microwave Photonics special issue, 2006.
23. N. Yu, E. Salik, and L. Maleki, "Ultra-low phase noise in a regeneratively modelocked laser of a coupled opto-electronic oscillator configuration," Optics Letters, Vol. 30, Issue 10, pp. 1231-1233, 2005.
24. E. Rubiola, E. Salik, N. Yu, and L. Maleki, "Photonic-delay technique for phase noise measurement," J. Optical Society of America B: Optical Physics, Vol. 22, Issue 5, pp. 987-997, 2005.
25. E. Rubiola, E. Salik, N. Yu, and L. Maleki, "Phase noise measurements of low power signals," Electronics Letters, Vol. 39, No. 19, 1389-1390, 2003.
26. "Heart Rate Variability after training periods of different intensity in swimmers", Lothar Schwarz, A. Urhausen, J. Sperber, B. Coen, J. Wilkinson, P.B. Siegel, W. Kindermann, Deutsche Zeitschrift fur Sportmedizin, Jahrgang 54, Nr. 7/8, Po-044(December 2003).

27. "Putting your heart into physics", P.B. Siegel, A. Urhausen, J.Sperber, and W. Kindermann, Am. J. Phys. 72, 324-332 (March 2004).
28. "Nonstationary time series analysis of heart rate variability", P.B. Siegel, J. Sperber, W. Kindermann, and A. Urhausen, Los Alamos Preprint Archive: Quantitative Biology QM/0410010 (Oct 2004).
29. "Sequential Measurements and the Commutator", P.B. Siegel, Am. J. Phys. 73, 1183-1184 (Dec 2005).
30. "Having Fun with Error Analysis", P.B. Siegel, accepted for publication (March 2006) in The Physics Teacher.
31. Mark Lord, Ginny Peterson, and Kurt Vandervoort, "Integrating Investigation Across the Geology and Physics Curricula using the Cullowhee Creek Environmental Field Station, Western North Carolina", J. Geosci. Ed. **51**, 415 (2003).
32. Ginny Peterson, Mark Lord, and Kurt Vandervoort, "Establishment of an Investigative Curricular Approach Across the Geology and Physics Programs at Western Carolina University and Implementation at Other Institutions," book chapter in *Successful Practices that Enable Faculty and Institutions to Design, Implement, and Sustain a Research-Supportive Undergraduate Curriculum* (Council of Undergraduate Research, Washington DC, 2006).
33. Kurt Vandervoort, Wrote 8 passages and 79 questions and answers for Physical Science Tests 1, 3, 5, and 6 in *The Best Test Preparation for the MCAT* (Research and Education Association, Piscataway, New Jersey, 2004).
34. Kurt Vandervoort, "Quick Quizzes" for *Physics for Scientists and Engineers*, 6th Edition by Jewett and Serway (Brooks/Cole - Thompson Learning, Belmont, California, 2003).
35. Harvey Leff and Julio Gea-Banacloche "Quantum version of the Szilard one-atom engine and the cost of raising energy barriers," Fluctuation and Noise Letters [An Interdisciplinary Scientific Journal on Random Processes in Physical, Biological and Technological Systems] **5**, No. 4 (2005) C39-C47.

Invited (Peer Reviewed) Talks of Physics Faculty with Student Co-Authors: (* indicates Cal Poly Pomona undergraduate student)

1. Brelles-Mariño, G., Joaquin, J.C.*; Bray, J.* and Abramzon, N. 2006. Biofilm Removal by Atmospheric Pressure Plasma Jet. International Workshop on Microplasma (IWS) Meeting, to be held in Germany in May 2006.
2. Joaquin, J.C.*; Kwan, C.*; Bray, J.D.*; Vandervoort, K.*; Abramzon, N.; and Brelles-Mariño, G. 2006. Kinetics and Microscopic Studies of Plasma-assisted Biofilm Destruction. International Conference on Plasma Science, to be held in Traverse City, MI, in June 2006.

3. McCauley, S. and Banks-Marrero, K*., "Acoustic Fresnel Zone Plates" USC Keck School of Medicine Bioscope 2005, April 20, 2005

Invited (Peer Reviewed) Talks of Physics Faculty

1. A. Aurilia "Generalized Maxwell fields--an overview" seminar at the Jozef Stefan Institute, Ljubljana, Slovenia --April 22, 2004
2. J. Jewett, "Mothballs, Memories, and Musty Mementos~Teaching Physics with Antiques", California State University, Los Angeles, California, February 2006

Conference Presentations of Physics Faculty with Student Co-Authors: (* indicates Cal Poly Pomona undergraduate student)

1. Bray, J.D*.; Joaquin, J.C*.; Brelles-Mariño, G. and Abramzon, N. 2006. Biofilm Destruction by He-O₂ RF High-Pressure Cold Plasma Jet. Submitted to the International Conference on Plasma Science, to be held in Traverse City, MI, in June 2006.
2. Becker, K., Koutsospyros, A., Christodoulatos, C. Abramzon, N., Joaquin, J.C*, and Brelles-Mariño, G. 2006. Environmental and Biological Applications of Microplasmas. Submitted to Symposium on Atomic and Surface Physics, to be held in Austria.
3. Kwan, C. *, Joaquin, J.C. *, Abramzon, N., Vandervoort, K. and Brelles-Mariño, G. 2006. Microscopic Studies and Kinetics of Plasma-assisted Biofilm Destruction. Submitted to the 106th ASM General Meeting, to be held in Orlando, May 2006.
4. Joaquin, J.C. *, Bray, J. *, Abramzon, N. and Brelles-Mariño, G. 2006. Bacterial Biofilm Destruction by Using Gas-discharge Plasma. California State University Program for Education and Research in Biotechnology (CSuperb) Meeting, San Jose, January 2006.
5. Joaquin, J.C. *, Bray, J. *, Abramzon, N. and Brelles-Mariño, G. 2006. Bacterial Biofilm Destruction by Using Gas-discharge Plasma. California State University Program for Education and Research in Biotechnology (CSuperb) Meeting, San Jose, January 2006.
6. S. Tseng*, N. Abramzon, J.O. Jackson and W.J. Lin 2006. Investigation of Sporicidal Effect of Gas Discharge Plasmas. California State University Program for Education and Research in Biotechnology (CSuperb) Meeting, San Jose, January 2006.
7. Abramzon, N., Bray, J. *, Joaquin, J.C.* and Brelles-Mariño, G. 2005. Investigation of Bacterial Biofilm Destruction Using Gas Discharge Plasma. Biofilm Symposium, USC, Los Angeles, CA, October 2005.
8. Abramzon, N., Bray, J., Joaquin, J.C.* and Brelles-Mariño, G. 2005. Investigation of Bacterial Biofilm Destruction Using Gas Discharge Plasma. The 58th Annual Gaseous Electronics Conference. San Jose, CA, October 2005.

9. S. Tseng*, N. Abramzon, and W.J. Lin 2005. Investigation of sporicidal effect of gas discharge plasma. The 58th Annual Gaseous Electronics Conference. San Jose, CA, October 2005.
10. Brelles-Mariño, G., Joaquin, J.C.* , Bray, J.* and Abramzon, N. 2005. Gas discharge plasma as a novel tool for biofilm destruction. 2nd International Workshop on Cold Atmospheric Pressure Plasmas. (Selected for oral presentation). Bruges, Belgium, August 2005.
11. Brelles-Mariño, G., Joaquin*, J.C., Bray, J* and Abramzon, N. 2005. A Novel Approach to Bacterial Biofilm Destruction. International Union of Microbiological Societies (IUMS). San Francisco, CA, July 2005.
12. Bray, J. Joaquin, J.C.* , Brelles-Mariño, G. and Abramzon, N. 2005. Destruction of Bacterial Communities Using Gas Discharge Plasma. Icops meeting. Monterrey, CA, June 2005.
13. Abramzon, N., Joaquin, J.C.* and Brelles-Mariño, G. 2005. A new approach to effectively destroy bacterial biofilms. American Society for Microbiology General Meeting. Atlanta, GA, June 2005.
14. Abramzon, N., Joaquin, J.C.* , Bray, J*., Brelles-Mariño, G. 2005. Destruction of Bacterial biofilms using gas discharge plasmas. American Physical Society, p. 563. Los Angeles, CA, March 2005.
15. Joaquin, J.C.* , Brelles-Mariño, G. and Abramzon, N. 2004. Can gas discharge plasma destroy bacterial biofilms? 2nd. International Workshop on Microplasmas and Symposium for Environmental, Biological and Medical Applications of Microplasmas, p. 85, Hoboken, NJ.
30. Kurt Vandervoort, Asif Hyder*, Stephanie Barker*, and Raul Torrico*, "Including Nanoscale Investigations in Undergraduate Physics Laboratories at all Levels of the Curriculum," Spring Meeting of the Materials Research Society, April, 2006.
16. Kurt Vandervoort, Stephanie Barker* and Raul Torrico*, "Including Nanoscale Investigations in a General Introductory Physics Course," March Meeting of the American Physical Society, Baltimore, MD, March, 2006.
17. Melodie Nguyen* and Kurt Vandervoort, "Magnetic Flux Trapping Behavior due to Oxygen Disorder in Y-Ba-Cu-O ", March Meeting of the American Physical Society, Los Angeles, CA, March, 2005.
18. Kurt Vandervoort and Asif Hyder*, "Restructuring Introductory Laboratories to Include Investigations at the Nanoscale", March Meeting of the American Physical Society, Los Angeles, CA, March, 2005.
19. Kurt Vandervoort, Matthew Demine*, Robert Frisbee*, and Melodie Nguyen*, "Universal Flux Trapping Behavior due to Oxygen Disorder in Y-Ba-Cu-O", March Meeting of the American Physical Society, Montreal, Canada, March 2004.

20. Banks-Marrero, K.* and McCauley, S., “Sound Prisms: Can optical methods of Fresnel Zone Plates and Prisms be applied to Acoustics?” Southern California Conference on Undergraduate Research, UC Irvine, November 22, 2003

Conference Presentations of Physics Faculty

1. Harvey Leff "Using data to teach energy and environment," 2003 AAPT Summer Meeting, Madison, Wisconsin.
2. Harvey Leff "Home activities on electrical energy use," SCAAPT Spring 2003 Meeting,, U. Laverne.
3. Harvey Leff “From Lord Kelvin's Warming Machine to Groundwater Heat Pumps,” 2004 AAPT Summer Meeting, Sacramento, California
4. A. John Mallinckrodt “Making use of Rarely Given wrong Answers on the FCI” AAPT Announcer 35, #2, 159 (2005). (2005 AAPT Summer Meeting, Salt Lake City)
5. A. John Mallinckrodt “Uniform (Vertical?) Circular Motion” AAPT Announcer 35, #2, 87 (2005). (2005 AAPT Summer Meeting, Salt Lake City)
6. N. Yu, E. Salik, Meirong Tu, and L. Maleki, “Frequency Stabilization of the Coupled Opto-Electronic Oscillator”, Frequency Control Symposium, Vancouver, Canada, 2005.
7. E. Rubiola, E. Salik, N. Yu, and L. Maleki, “Flicker noise in high-speed photodetectors”, Frequency Control Symposium, Vancouver, Canada, 2005.
8. E. Salik, N. Yu, and L. Maleki, “Ultra-low time jitter pulse source using mode-locked fiber laser as a high-Q resonator,” November 2004, Poster Presentation at CLEO 2005, Baltimore, Maryland.
9. E. Salik, N. Yu, L. Maleki, and E. Rubiola, “Dual photonic-delay-line cross correlation method for the measurement of microwave oscillator phase noise,” in *Proceedings of the IEEE International Ultrasonics, Ferroelectrics, and Frequency Control 50th Anniversary Joint Conference UFFC '04* (IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, Montreal, Canada, 2004).
10. N. Yu, E. Salik, and L. Maleki, “Photonic Microwave Oscillator Using Mode-locked Laser as the High Q Resonator,” in *Proceedings of the IEEE UFFC '04* (IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, Montreal, Canada, 2004).
11. E. Rubiola, E. Salik, N. Yu, and L. Maleki, “Phase Noise and Amplitude Noise Measurement of Low-Power Signals,” in *Proceedings of the IEEE UFFC '04* (IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, Montreal, Canada, 2004).

12. E. Rubiola, E. Salik, N. Yu, S. Huang, and L. Maleki, “The Photonic Delay Technique for Phase Noise Measurement of Microwave Oscillators,” in *Proceedings of the IEEE UFFC '04* (IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, Montreal, Canada, 2004).

13. E. Salik, N. Yu, and L. Maleki, “Ultra-low phase noise coupled opto-electronic oscillator,” in *Proceedings of Conference on Lasers and Electro-Optics CLEO '04* (Optical Society of America, San Francisco, Calif., 2004).

14. E. Salik, N. Yu, M. Tu, and L. Maleki, “EDFA-based coupled opto-electronic oscillator and its phase noise,” in *Technical Digest of the Optical Fiber Communication Conference OFC '04* (Optical Society of America, Los Angeles, Calif., 2004).

Other Creative Activities

1. Computational collaboration: Soumya Chakravarti developed and expanded the Beowulf cluster for high speed parallel computing. This project originated in the Physics department, later extended to include the Chemistry department, Cal Poly Pomona. 2003-2006

2. Music collaboration: Soumya Chakravarti with Sudipto Chatterjee, UC Berkeley Department of Dance, Theater, and Performance Studies, and Suman Mukherjee, Director based in Calcutta, India “Man of the Heart: The Life and Times of Lalon Phokir” Workshop performance at Berkeley, Fall 2005. Off-Broadway, NYC shows in Spring 2006.

3. Antonio Aurilia has served as a referee for the physics journals “Physics Letters B” ; “Journal of Physics A: Math. Gen.” ; “American J. of Physics”

4. Antonio Aurilia book review: Giuliano Pancaldi, "Volta: Science and Culture in the Age of Enlightenment." Princeton University Press, 2003. Published in "Physics in Perspective, Vol.6, no.4, page 478 (2005)

5. Harvey Leff served as Co-Chair of the Gordon Research Conference on Physics Research & Education in Classical Mechanics & Non-linear dynamics, June 2004; Co-editor of theme issue (April 2004) of the American Journal of Physics on the same topic.

6. Steve McCauley, served as Panel Chair “Nonviolent Economics and Ecological Sustainability” Ahimsa and the Quality of Life Conference, Cal Poly Pomona, April 29, 2006

7. Mary Mogge served as Academic Director of the United States Physics Team (1999-2005). The team is selected from high school physics students throughout the country by means of screening exams. The 24 members of the team assemble for an one week Training Camp at the University of Maryland. Five representatives of the team compete in the **International Physics Olympiad**.

8. Mary Mogge served on the Committee of Examiners for the **GRE Physics Test** (2000-2006)

9. John Jewett, Harvey Leff, John Mallickrodt, and Jolene Houser are members of a performing country band the Outlaws of Physics.

Officers in Professional Organizations

1. Harvey Leff served as Vice President of the national organization of the American Association of Physics Teachers (2005) and is currently (2006) serving as President Elect.
2. John Mallinckrodt served as Editor and Webmaster of the Southern California Section of the American Association of Physics Teachers (2003-2006)
3. John Mallinckrodt served as Consulting Editor, American Journal of Physics 2003-2006
4. John Mallinckrodt served as Member of Editorial Board, The Physics Teacher 2006
5. John Mallinckrodt served as Chair of Nominating Committee, American Association of Physics Teachers 2003-2004
6. Mary Mogge served as Treasurer of the Southern California Section of the American Association of Physics Teachers (2003-2006)
7. Mary Mogge served as member of the Advisory Board of the World Federation of Physics Competitions (2003-2006)