### John C. Price

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#### **Education**

Stanford University, Ph.D. in Physics (9/80–1/86) Yale University, B.S. in Physics, magna cum laude (9/76–5/80) Philips Academy, Andover (9/72-6/76)

#### **Honors**

R&D100 Award – picoSpin Miniature NMR Spectrometer, 2012 CU-LEAD Alliance Faculty Appreciation Award, 2006 Elected Fellow of the American Physical Society, 2004 University of Colorado Faculty Fellowship, 1996 NSF Presidential Young Investigator, 1990-95 Science and Engineering Fellow of the David and Lucile Packard Foundation, 1990-95 ONR Naval Young Investigator, 1990-93 Alfred P. Sloan Foundation Research Fellowship, 1991-92

### **Employment**

Professor, Department of Physics, University of Colorado at Boulder (since 9/01) QMagnetics, LLC, Chief Scientist (since 1/17) Senior Scientist, Thermo Fisher Scientific (12/12–1/14) picoSpin, LLC, President and Chief Scientist (10/10–12/12) Associate Professor, Department of Physics, University of Colorado at Boulder (9/95–8/01) Assistant Professor, Department of Physics, University of Colorado at Boulder (9/89–8/95) Research Associate, Department of Physics, Stanford University (1/86–8/89) Research Assistant, Stanford Linear Accelerator Center (9/81–12/85) Teaching Assistant, Department of Physics, Stanford University (9/80–5/81) Laboratory Assistant, Department of Physics, Yale University (9/77–9/80)

## **Refereed Journal Articles and Book Chapters**

"NMR line shape of <sup>29</sup>Si in single-crystal silicon," Brooks Christensen and John C. Price, Phys. Rev. B **95**, 134417 (2017).

"Linear-response reflection coefficient of the recorder air-jet amplifier," John C. Price, William A. Johnston, Daniel D. McKinnon, J. of the Acoust. Soc. A., **138**, 3282-3292 (2015). DOI: 10.1121/1.4935400

"Inclusion Compound Based Approach to Arrays of Artificial Dipolar Molecular Rotors: Bulk Inclusions," Lukáš Kobr, Ke Zhao, Yongqiang Shen, Angiolina Comotti, Silvia Bracco, Richard Shoemaker, Piero Sozzani, Noel Clark, John Price, Charles Rogers, Josef Michl, J. Org. Chem, **78**, 1768–1777 (2013). DOI: 10.1021/jo3009897

- "Inclusion Compound Based Approach to Arrays of Artificial Dipolar Molecular Rotors: A Surface Inclusion," Lukáš Kobr, Ke Zhao, Yongqiang Shen, Angiolina Comotti, Silvia Bracco, Richard Shoemaker, Piero Sozzani, Noel Clark, John Price, Charles Rogers, Josef Michl, J. Am. Chem. Soc., **134**, 10122–10131 (2012). DOI: 10.1021/ja302173y
- "A surface-sensitive UHV dielectric spectrometer for studies of nanoscale molecular systems on a planar surface," Jason M. Underwood and John C. Price, Rev. Sci. Instrum. **79**, 093905 (2008).
- "Dipolar molecular rotors in the metal-organic framework crystal IRMOF-2," Erick B. Winston, Peter J. Lowell, Jaroslav Vacek, Jana Chocholousova, Josef Michl, and John C. Price, Phys. Chem. Chem. Phys. **10**, 5188-5191 (2008). (Featured as a 'Hot Article' on the PCCP web site, July 2008.)
- "Artificial Dipolar Molecular Rotors," R. D. Horansky, T. F. Magnera, J. C. Price, and J. Michl., in *Controlled Nanoscale Motion*, *Nobel Symposium 131* (Lecture Notes in Physics, vol. 711) edited by Heiner Linke and Alf Mansson, (Springer, Berlin, 2007).
- "Dipolar Rotor-Rotor Interactions in a Difluorobenzene Molecular Rotor Crystal," Robert D. Horansky, Laura I. Clarke, Erick B. Winston, John C. Price, Steven D. Karlen, Peter D. Jarowski, Rosa Santillan, and Miguel Garcia-Garibay, Physical Review B. **74**, 054306 (2006).
- "Wide-Range Vibratory Vacuum Gauge," Dominic J. Thurmer and John C. Price, Journal of Vacuum Science and Technology A **24**, 1702-1705 (2006).
- "Dielectric Response of a Dipolar Molecular Rotor Crystal," Robert Horansky, Laura I. Clarke, John C. Price, Tinh-Alfredo V. Khuong, Peter D. Jarowski, and Miguel A. Garcia-Garibay, Physical Review B **72**, 014302 (2005).
- "Superconductivity in La-doped strontium titanate thin films," David Olaya, Feng Pan, Charles T. Rogers, John C. Price, Applied Physics Letters **84**, 4020-4022 (2004).
- "Thin film field-effect transistors based on La-doped SrTiO3 heterostructures," Feng Pan, David Olaya, John C. Price, Charles T. Rogers, Applied Physics Letters **84**, 1573-5 (2004).
- "Current Short-Range Tests of the Gravitational Inverse Square Law," Joshua Long and John C. Price, Comptes Rendus Physique, 337-346 (2003).
- "Upper limits to submillimetre-range forces from extra space-time dimensions," Joshua C. Long, Hilton W. Chan, Allison B. Churnside, Eric A. Gulbis, Michael C. M. Varney, and John C. Price, Nature **421**, 922–925 (2003).
- "The dielectric response of chloromethyl and dichloromethyl dipolar rotors on fused silica surfaces," Laura I. Clarke, Dominik Horinek, Gregg S. Kottas, Natalia Varaksa, Thomas

F. Magnera, Tanja P. Hinderer, Robert D. Horansky, Josef Michl, and John C. Price, Nanotechnology **13**, 533-540 (2002).

"Frequency dependence of glass encapsulated electrometer resistors," John C. Price, Electronics Letters **38**, 413-414 (2002).

"Electrical properties of La-doped strontium titanate thin films," David Olaya, Feng Pan, Charles T. Rogers, and John C. Price, Applied Physics Letters **80**, 2928-30 (2002).

"Upper critical field and fluctuation conductivity in Nb-doped strontium titanate thin films," Arnold Leitner, David Olaya, Charles T. Rogers, John C. Price Physical Review B **62**, 1408-13 (2000).

"LaNiO3 buffer layers for high critical current density  $YBa_2Cu_3O_{7-\delta}$  and  $Tl_2Ba_2CaCu_2O_{8-\delta}$  films," Carlson, C.M.; Parilla, P.A.; Siegal, M.P.; Ginley, D.S.; Wang, Y.-T.; Blaugher, R.D.; Price, J.C.; Overmyer, D.L.; Venturini, E.L. Applied Physics Letters, vol.75, no.16, p. 2479-81 (1999).

"Experimental Status of Gravitational-Strength Forces in the Sub-Centimeter Regime," Joshua C. Long, Hilton W. Chan, and John C. Price, Nuclear Physics B **539**, 23-34 (1999).

"Taber vibration isolator for vacuum and cryogenic applications," H.W. Chan, J.C. Long, and J.C. Price, Review of Scientific Instruments **70**, 2742-50 (1999).

"Spin-Zeeman splitting and weak localization in lithium films," Eric D. Black and John C. Price, Physica B **269**, 1-12 (1999).

"Laser-ablated epitaxial LaAlO<sub>3</sub> buffer layers on biaxially textured Ni substrates for superconducting tapes," C.M. Carlson, J.C. Price, P.A. Parilla, D.S. Ginley, D.S. Niles, R.D. Blaugher, A. Goyal, M. Paranthaman, D.M. Kroeger, D.K. Christen, Physica C **304**, 82-88 (1998).

"Pulsed Laser Deposition of Superconducting Nb-Doped Strontium Titanate Thin films," Arnold Leitner, Charles T. Rogers, John C. Price, David A. Rudman, David R. Herman, Applied Physics Letters **72**, 3065–3067 (1998).

"Improved Low Frequency and Microwave Dielectric Response in Strontium Titanate Thin films Grown by Pulsed Laser Ablation," M.J. Dalberth, R.E. Stauber, J.C. Price, C.T. Rogers, David Galt, Applied Physics Letters **72**, 507–509 (1998).

"Weak localization magnetoresistance in quench condensed lithium films," Eric Black and John C. Price, Physical Review B **58**, 7844-9 (1998).

"Susceptibility of a Mesoscopic Superconducting Ring," Xiaxian Zhang and John C. Price, Physical Review B **55**, 3128 (1997).

"Ionization of Charge-Anticharge Pairs in Ultrathin Palladium Films," Ying Liu and John C. Price, Modern Physics Letters B **9**, 939 (1995).

"Ferroelectric thin film characterization using superconducting microstrip resonators," David Galt, John C. Price, James A. Beall, Todd E. Harvey, Applied Superconductivity 5, 2575 (1995).

"Some Microwave Applications of BaSrTiO<sub>3</sub> and High Temperature Superconductors," Frank S. Barnes, John C. Price, Allen Hermann, Zhihang Zhang, Huey-Daw Wu, David Galt, Ali Naziripour, Integrated Ferroelectrics **8**, 171 (1995).

"A model of voltage-dependent dielectric losses for ferroelectric MMIC devices," J.F. Scott, David Galt, John C. Price, James A. Beall, Ronald H. Ono, Carlos A. Paz de Araujo, and L.D. McMillan, Integrated Ferroelectrics **6**, 189 (1995).

"Frequency Dependence of h/e Conductance Oscillations in Mesoscopic Ag Rings," John B. Pieper and John C. Price, Physical Review Letters **72**, 3586 (1994).

"A sensitive low-power homodyne reflectometer for impedance measurements at 0.25–1.0 GHz," John B. Pieper and John C. Price, Rev. Sci. Instrum. **65**, 445 (1994).

"Correlation Functions for Mesoscopic Conductance at Finite Frequency," John B. Pieper and John C. Price, Physical Review B **49**, 17059 (1994).

"Characterization of a Tunable Thin Film Microwave YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub>/SrTiO<sub>3</sub> Coplanar Capacitor," David Galt, John C. Price, James A. Beall, and Ronald Ono, Applied Physics Letters, **63** (22), 3078–3080 (1993).

"Growth and Characterization of YBCO/Insulator/YBCO Trilayers," N. Missert, C. Reintsema, J. Beall, T. Harvey, R. Ono, D. Rudman, D. Galt, and J. Price, IEEE Transactions in Applied Superconductivity 3, 1741 (1993).

"Measurement of weak localization complex conductivity at 1 GHz in disordered Ag wires," John B. Pieper, John C. Price, and John M. Martinis, Physical Review B **45**, 3857 (1992).

"Monte Carlo Simulation of the Effect of Cosmic Rays Hadrons and Muons on a Resonant-Mass Gravitational Wave Antenna," James Chiang, Peter Michelson, and John Price, Nuclear Instruments and Methods **A311**, 603 (1992).

"Spin precession and weak localization," John Price, Phys. Rev. B 44, 8997 (1991).

"Measurements of Mechanical Dissipation in High Sound Velocity Materials: Implications for Resonant-Mass Gravitational Radiation Detectors," Hu En-Ke, C. Zhou, L. Mann, P. Michelson, and John Price, Physics Letters A **157**, 209 (1991).

"Report on Localization 1990 Conference," D. H. Liebenberg and John Price, European Scientific Notes Information Bulletin 3, 36 (1991).

"A Method for Calibrating Resonant-Mass Gravitational Wave Detectors," S. Boughn, M. Bassan, W.M. Fairbank, R.P. Giffard, P.F. Michelson, J.C. Price, R.C. Taber, Review of Scientific Instruments **61**, 1 (1990).

"Stochastic cooling of solids," John C. Price, Physics Letters A 134, 380 (1989).

"Low noise switching of a superconducting circuit by a laser induced weak link," Charles E. Cunningham, Blas Cabrera, David P. Saroff, John Price, and Thomas Stevenson, IEEE Trans. Mag. **25**, 1022 (1989).

"First gravity wave coincidence experiment between resonant cryogenic detectors: Louisiana-Rome-Stanford," E. Amaldi *et al.* (30 authors), Astron. Astrophys. **216**, 325 (1989).

"Resonant-Mass Detectors of Gravitational Radiation," Peter F. Michelson, John C. Price, and Robert C. Taber, Science **237**, 150 (1987).

"Optimal design of resonant-mass gravitational wave antennas," John C. Price, Physical Review D **36**, 3555 (1987).

"Rotor electrometer: New instrument for bulk matter quark search experiments," John C. Price, Walter Innes, Spencer Klein, and Martin Perl, Review of Scientific Instruments 57, 2691 (1986).

"Audiofrequency measurement of JFET noise versus temperature in a high impedance preamplifier," Spencer Klein, Walter Innes, and John C. Price, Review of Scientific Instruments **56**, 1941 (1985).

#### **Articles for Conference Proceedings**

"Surface mounted molecular dipolar rotors and rotor arrays," John Price, Josef Michl, Mark Ratner, Laura Clarke, Gregg Kottas, and Tom Magnera, NSF Partnership in Nanotechnology conference, Arlington, Jan. 29–30, 2001. Web published at www.unix.oit.umass.edu/~nano/NewFiles/FN23\_UCBoulder.pdf (Text of an invited talk by John Price).

"Gravitational Experiment Below 1 Millimeter and Comment on Shielded Casimir Backgrounds for Experiments in the Micron Regime," Joshua C. Long, Allison B. Churnside, and John C. Price, to appear in Proceedings of the 9<sup>th</sup> Marcel Grossmann Meeting, Rome, July 2-8, 2000 (Text of an invited talk by John Price).

"Microwave Dielectric Tuning and Losses in Epitaxial Lift-Off Thin Films of Strontium Titanate," Charles T. Rogers, Mark J. Dalberth, John C. Price, Materials Research Society Symposium – Proceedings v. 603, Materials Issues for Tunable RF and Microwave Devices, 2000, p.265-75.

"Epitaxial BaSrTiO<sub>3</sub> Thin Films for Tunable Devices: Correlation of Dielectric Properties with Microstructure," C.M. Carlson, T.V. Rivkin, P.A. Parilla, J.D. Perkins, J.C. Price, P. Ahrenkiel, D.S. Ginley, 1999 Fall Meeting of the Materials Research Society, Boston, Nov. 29 – Dec. 3, 1999.

"30 GHz Steerable Antennas Using BaSrTiO<sub>3</sub> Based Room-Temperature Phase Shifters," A. Kozyrev, V. Osadchy, A. Pavlov, A Golovkov, M. Sugak, D. Kalinikos, C.M. Carlson, T.V. Rivkin, P.A. Parilla, J.D. Perkins, D.S. Ginley, J.C. Price, L.C. Sengupta, L. Chiu, X. Zhang, Y. Zhu, S. Stowell, S. Sengupta, 1999 Fall Meeting of the Materials Research Society, Boston, Nov. 29 – Dec. 3, 1999.

"Dielectric response of free standing strontium titanate thin films from 10 kHz to 1 GHz as a function of temperature and applied voltage," M.J. Dalberth, J.C. Price, C.T. Rogers, Materials Research Society Symposium – Proceedings v. 574, 1999 p. 299-304.

"Epitaxial lift-off of strontium titanate thin films and the temperature dependence of the low frequency dielectric properties of the films," M.J. Dalberth, J.C. Price, C.T. Rogers, Materials Research Society - Proceedings, v. 493, Ferroelectric Thin Films VI, 1998, p. 371-376.

"Improved Dielectric Response in SrTiO<sub>3</sub> Thin Films Grown by Pulsed Laser Ablation," M.J. Dalberth, R.E. Stauber, J.C. Price, and C.T. Rogers, D. Galt, Materials Research Society Symposium – Proceedings, v. 477, Epitaxial Oxide Thin Films III, 1997, p. 43-48.

"Ferroelectric High Temperature Superconducting Tunable Microwave Devices," R.M. Yandrofski, J.C. Price, D. Galt, A.M. Hermann, American Institute of Aeronautics and Astronautics Conference, San Diego, February 1994.

"Dielectric properties of thin film SrTiO<sub>3</sub> grown on LaAlO<sub>3</sub> with YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> electrodes," Huey-Daw Wu, Frank S. Barnes, David Galt, John C. Price, James A. Beall, Proceedings of the SPIE-ISOC Conference on High-T<sub>c</sub> Superconductors and Applications, SPIE Proceedings Vol. 2156, January 1994. (Text of an invited talk.)

"Observation of the Aharonov-Bohm effect at finite frequency in mesoscopic Ag rings," John B. Pieper and John C. Price, Proceedings of the XXth International Conference on Low Temperature Physics, Eugene, Oregon, August 4–11, 1993 [Physica B **194-196**, 1051–1052 (1994)].

"Transport properties of ultrathin Pd films," Y. Liu and John C. Price, Proceedings of the XXth International Conference on Low Temperature Physics, Eugene, Oregon, August 4–11, 1993 [Physica B **194–196**, 1351–1352 (1994)].

"Tunable High Temperature Superconductor Microstrip Resonators," James A. Beall, Ronald H. Ono, David Galt, John C. Price, 1993 IEEE MTT-S International Microwave Symposium Digest, vol. 3, 1421-3.

"Tunable Microwave Devices Using Ti-Ba-Ca-Cu-O High-Temperature Superconductors and Ba<sub>x</sub>Sr<sub>1-x</sub>TiO<sub>3</sub> Ferroelectric Thin Films," R.M. Yandrofski, A.M. Hermann, John C. Price, J.F. Scott, A. Naziripour, David Galt, H.M. Duan, M. Parathaman, R. Tello, J. Cuchiaro, R.K. Ahrenkiel, Proceedings of the 183th Meeting of the Electrochemical Society, Honolulu, May 16-21, 1993. (Text of an invited talk.)

"Frequency-Tunable Microwave Resonator Using Tl-Ba-Ca-Cu-O High Temperature Superconductor and Voltage-Biased Ba<sub>x</sub>Sr<sub>1-x</sub>TiO<sub>3</sub> Ferroelectric Thin Films," A.M. Hermann, A. Naziripour, R.M. Yandrofski, David Galt, John C. Price, Proceedings of EUCAS '93-European Conference on Applied Superconductivity, Göttingen, Germany, Oct. 4–8, 1993. (Text of an invited talk.)

"Oxide Superconductors and Ferroelectrics—Materials for a New Generation of Tunable Microwave Devices," A.M. Hermann, R.M. Yandrofski, J.F. Scott, A. Naziripour, David Galt, John C. Price, J. Cuchiaro, R.K. Ahrenkiel, Proceedings of the Molecular and Oxide Superconductors Conference, Eugene, Oregon, 1993 [Journal of Superconductivity 7, 463 (1994)]. (Text of an invited talk.)

"Tunable Microwave Devices Using Tl-Ba-Ca-Cu-O High-Temperature Superconductors and Ba<sub>x</sub>Sr<sub>1-x</sub>TiO<sub>3</sub> Ferroelectric Thin Films," A.M. Hermann, John C. Price, J.F. Scott, R.M. Yandrofski, A. Naziripour, David Galt, H.M. Duan, M. Paranthaman, and R. Tello, Proceedings of Materials and Crystallographic Aspects of High T<sub>c</sub> Superconductivity (part 3, p.406), A NATO Advanced Study Institute, Erice, Italy, 17–29 May 1993. (Text of an invited talk.)

"Ultralow Temperature Resonant-Mass Gravitational Radiation Detectors: Current Status and Future Prospects," P.F. Michelson, T. Aldcroft, J. Chiang, D. DeBra, J. Henderson, L. Mann, D. McKenzie, F. McLoughlin, H.J. Paik, R. Penny, J.C. Price, T. Stevenson, B. Vaughan, C. Zhou, in Gravitational Astronomy: Instrument Design and Astrophysical Prospects, Canberra, September 24-26 1990. (Text of an invited talk.)

"Gravitational strength forces below 1-cm," John C. Price, in Proceedings of the International Symposium on Experimental Gravitational Physics, Guangzhou, China (D. Reidel Publ. Co., Dordrecht, 1988).

"Data analysis for gravity wave coincidence experiments," Thomas R. Stevenson and John C. Price, in Proceedings of the International Symposium on Experimental Gravitational Physics, Guangzhou, China (D. Reidel Publ. Co., Dordrecht, 1988).

"Bar Gravity Wave Detectors and the Next Supernova," P.F. Michelson, W.M. Fairbank, J. Henderson, K.R. Lane, M.S. McAshan, J.C. Price, T. Stevenson, R.C. Taber, B. Vaughan, Z. Zhou, Proceedings of the XXIIIrd Rencontre de Moriond, Les Arcs, 1988.

"A Rotor Electrometer for Fractional Charge Searches," Walter Innes, Martin Perl, and John C. Price, CPEM 86 Digest, p. 11-12 (Proceedings of Conference on Precision Electromagnetic Measurements, Gaithersburg, June 23-27, 1986).

### E-prints (Not including papers where text appears above)

"New Experimental Limits on Macroscopic Forces Below 100 Microns," Joshua C. Long, Hilton W. Chan, Allison B. Churnside, Eric A. Gulbis, Michael C. M. Varney, and John C. Price, arXiv: hep-ph/0210004

# **Invited Talks and Seminars (Not including talks where text appears above)**

"How well do lumped-element models describe acoustic amplification in the recorder?" John C. Price, 5<sup>th</sup> Joint Acoustical Society of America/Acoustical Society of Japan Meeting, Honolulu, December 1, 2016.

"NMR Spectroscopy in a Shoebox," John C. Price, Washington University Physics Department Seminar, Saint Louis, Missouri, March 24, 2014

"picoSpin: Miniature NMR spectrometers for fun and profit," John C. Price, NIST Magnetics Seminar, NIST, Boulder, Colorado, April 24, 2012.

"picoSpin: Miniature NMR spectrometers for fun and profit," John C. Price, Physics Department Colloquium, Colorado State University, Fort Collins, February 20, 2012.

"picoSpin: Miniature NMR spectrometers for fun and profit," John C. Price, Physics Department Colloquium, University of Colorado, Boulder, January 18, 2012.

"Rotational dynamics of molecular dipoles on a MOF-5 crystal lattice," John C. Price, Institute of Organic Chemistry and Biochemistry of the Academy of Sciences, Prague, Czech Republic, October 6, 2008.

"Roto-electrics: Phenylene Molecular Rotor Crystals," John Price, PASI Bio-inspired Nanoscience and Molecular Machines, San Carlos de Bariloche, Argentina, Feb. 28-March 11, 2005.

"Electronics for Nanotechnology Research," John Price, PASI Bio-inspired Nanoscience and Molecular Machines, San Carlos de Bariloche, Argentina, Feb. 28-March 11, 2005.

"Roto-electrics: Arrays of Interacting Polar Molecular Rotors," John C. Price, Robert Horansky, Erick Winston, Jason Underwood, Matthew Myers, ICCOSS XVII, Los Angeles, July 24-29, 2005.

"Roto-electrics: Arrays of Interacting Polar Molecular Rotors," John C. Price, Robert Horansky, Erick Winston, Jason Underwood, Matthew Myers, 230<sup>th</sup> ACS National Meeting, Washington, D.C., Aug. 28-Sept. 1, 2005.

"Gravitational experiments at short distances," John Price, Physics Department Colloquium, University of California at Santa Barbara, April 22, 2003.

"Gravitational experiments at short distances," John Price, Enrico Fermi Institute Seminar, University of Chicago, January 27, 2003.

"Gravitational experiments at short distances," John Price, Joint Experimental-Theoretical Seminar, Fermi National Accelerator Center, December 6, 2002.

"Is there gravity below one millimeter?" John Price, American Physical Society, New York State Section, Fall Meeting, Syracuse, October 12, 2002.

"Is there gravity below one millimeter?" John Price, Physics Department Colloquium, Syracuse University, October 10, 2002.

"Is there gravity below one millimeter?" John Price, Weinland group seminar, NIST, Boulder, November 1, 2002.

"Gravitational Experiments at Short Distances," John Price, Allison Churnside, Eric Gulbis, Joshua Long, 16th International Conference on General Relativity and Gravitation, Durban, South Africa, July 15–21, 2001.

"Experimental Search for Extra-Dimensional Effects in the Sub-Millimeter Regime," Joshua Long, Allison Churnside, John Price, Rencontres de Moriond, Les Arcs, France, Jan. 20–27, 2001.

"Laboratory Search for Extra-Dimensional Effects in the Submillimeter Regime," Joshua Long and John C. Price, Conference on Physics Beyond Four Dimensions, Trieste, Italy, July 3-6, 2000.

"Experiments on Gravitational Strength Forces below 1 cm," John C. Price, April meeting of the American Physical Society, Long Beach, April 29-May 2, 2000.

"Gravitational Strength Forces below 1 cm," John C. Price, Colorado State University Physics Department Colloquium, Fort Collins, May 8, 2000.

"Gravitational Strength Forces below 1 cm," John C. Price, Sonoma Workshop on Cosmic Genesis and Fundamental Physics, Sonoma, Oct. 28–30, 1999.

"Gravitational Strength Forces below 1 cm," John C. Price, Aspen Winter Conference on Advances in Particle Physics, Aspen, Jan. 17-23, 1999.

"Gravitational strength forces below 1 cm," John C. Price, Packard Foundation Fellowship meeting, Santa Fe, Sept. 1-5, 1998.

"Physics of Epitaxial SrTiO<sub>3</sub> Films," John C. Price, John Hopkins University, February 18, 1998.

"Electric Field Tunable Dielectric Thin Films for Microwave Electronics," M.J. Dalberth, R.E. Stauber, J.C. Price, C.T. Rogers, and D. Galt, 1997 Fall Meeting of the Materials Research Society, Boston, Dec. 1–5, 1997.

"The microwave dielectric response of strontium titanate thin films measured via hybrid 'flip-chip' resonator structures," M. Dalberth, R. Stauber, J. Price, C. Rogers, C. Carlson, P. Parilla, D. Ginley, D. Galt, DARPA Workshop on Frequency Agile Materials for Electronics, Herndon VA, May 15–16, 1997.

"Dielectric Response of Epitaxial Strontium Titanate Films," Charles Rogers, John C. Price, David Galt, Mark Dalberth, Renaud Stauber, DARPA Tuned Superconducting Circuits RF Workshop, Alexandria, VA, October 30–31, 1996.

"Characterization of Thin Film SrTiO<sub>3</sub> for Microwave Devices," David Galt and John C. Price, National Radio Science Meeting, International Union of Radio Science, Boulder, January 9-13, 1996.

"Mesoscopics and Quantum Transport in Metals," John C. Price, Colorado School of Mines, Physics Department Colloquium, October 16, 1995.

"Epitaxial Strontium Titanate for Microwave Devices," John C. Price, Annual Meeting of the Packard Fellows, Monterey, September 6-9, 1995.

"Tunable microstrip resonators: A method for microwave frequency characterization of ferroelectric thin films," 7th International Symposium on Integrated Ferroelectrics, Colorado Springs, April 1995.

"Quantum Motions of Electrons in Metals," John C. Price, Columbia University, Physics Department Colloquium, March 13, 1995.

"Quantum Motions of Electrons in Metals," John C. Price, University of Minnesota, Condensed Matter Seminar, Feb. 9, 1995.

"Quantum Motions of Electrons in Metals," John C. Price, University of Colorado, Physics Department Colloquium, October 26, 1994.

"Quantum Motions of Electrons in Metals," John C. Price, Colorado State University, Physics Department Colloquium, October 24, 1994.

"Quantum Motions of Electrons in Metals," John C. Price, Penn State, Physics Department Colloquium, October 13, 1994.

"Mesoscopic Conductance Oscillations at 1 GHz," John C. Price, March meeting of the American Physical Society, Pittsburgh, March 21–25, 1994.

"Tunable Antennas Using Thin-Film Ferroelectrics and High Temperature Superconductors," John C. Price and David Rudman, ARPA Ferroelectrics Program Review, Albuqueque, January 27–28, 1994.

"Electrically Tunable HTS Antenna using Ferroelectric Trilayer Capacitors," A.M. Martin, D.R. Bowling, D. Galt, J.C. Price, J.A. Beall, R.H. Ono, Progress in Electromagnetic Research Symposium, Pasadena, July 15, 1993.

"Voltage Tunable Ferroelectric/Superconductor Structures," John C. Price, 5th International Symposium on Integrated Ferroelectrics, Colorado Springs, April 21, 1993.

"Frequency dependence of weak localization," John C. Price, Los Alamos National Laboratory, May 24, 1991.

"Quantum corrections to conductivity at microwave frequencies," John C. Price, Annual Meeting of the Packard Fellows, Monterey, September 5, 1991.

"Stochastic Cooling of Solids," John C. Price, Harvard University, Atomic and Molecular and Optical Physics Colloquium, February 24, 1989.

"Stochastic Cooling of Solids," John C. Price, CalTech, EE Department Colloquium, March 6, 1989.

"Stochastic Cooling of Solids," John C. Price, MIT, EE Department Colloquium, March 20, 1989.

"Stochastic Cooling of Solids," John C. Price, University of Colorado, Physics Department Colloquium, March 16, 1989.

"Stochastic Cooling of Solids," John C. Price, Columbia University, Physics Department Colloquium, March 22, 1989.

"Stochastic Cooling of Solids," John C. Price, University of Southern California, Condensed Matter Seminar, April 11, 1989.

"Stochastic Cooling of Solids," John C. Price, University of California, Berkeley, Condensed Matter Seminar, May 2, 1989.

"How to measure Newton's constant at 100 micrometers," John C. Price, MIT, Physics Department Seminar, March 21, 1989.

"Gravitational Wave Astronomy with Resonant-Mass Antennas," John C. Price, University of Southern California, Physics Department Colloquium, April 11, 1989.

"Stochastic Cooling of Solids," Low Temperature Physics Seminar, Stanford University, October 6, 1988.

"Gravitational Wave Astronomy," Physics Department Colloquium, Washington University of Saint Louis, March 16, 1988.

"Gravitational Wave Astronomy with Resonant-Mass Antennas," SLAC Departmental Colloquium, Stanford Linear Accelerator Center, December 7, 1987.

"Superconducting thin-film transducers for gravity wave antennas," Clarke group seminar, University of California at Berkeley, January 25, 1987.

"The Stanford Cryogenic Gravity Wave Antenna," Santa Cruz Institute for Particle Physics, U.C. Santa Cruz, January 15, 1987.

"The Stanford Cryogenic Gravity Wave Antenna," Royal Institute for Technology, Stockholm, Sweden, July 12, 1986.

"Evidence for the electron: progress on the rotor electrometer free quark search," SLAC Colloquium, Stanford Linear Accelerator Center, September 15, 1985.

### **Contributed Talks (Not including talks where text appears above)**

"Linear-response reflection coefficient of the recorder air-jet amplifier," John C. Price, William Johnston, Daniel McKinnon, Fall Meeting of the Acoustical Society of America, Indianapolis, October 29, 2014.

"picoSpin: Miniature NMR spectrometers for fun and profit," Meeting of the Packard Fellows, Denver, Colorado, September 11-14, 2013 (poster).

"Rotational dynamics of molecular dipoles on a MOF-5 crystal lattice," John C. Price, First International Conference on Metal Organic Frameworks and Open Framework Compounds, Augsburg, Germany, October 10, 2008.

"Molecular Rotor Crystals from Metal-Organic Frameworks," 20 Year Anniversary Meeting of the Packard Fellows, Park City, Utah, September 3-5, 2008 (poster).

"Dynamical Properties of Surface-Mounted Dipolar Molecular Rotors," Jason Underwood, John Price, Douglas Caskey, Josef Michl, March Meeting of the American Physical Society, Denver, March 5-9, 2007.

"Dynamics of polar guest molecules contained in cryptophane molecular crystals," Erick B. Winston, Robert D. Horansky, Matthew S. Myers, Jaroslav Vacek, and John C. Price, March Meeting of the American Physical Society, Baltimore, March 13-17, 2006.

"Dynamics of Polar Molecular Rotors in Metal-Organic Frameworks," Erick B. Winston, John C. Price, Josef Michl, CU/NREL Symposium, October 1, 2006 (poster).

"Rotor-rotor interactions in a three dimensional lattice of dipolar molecular rotors," Robert D. Horansky, Laura I. Clarke, Erick Winston, Jose Nunez, Miguel A. Garcia-

Garibay, and John C. Price, March Meeting of the American Physical Society, Los Angeles, March 21-25, 2005.

"Roto-electrics: Arrays of interacting polar molecular rotors," John C. Price, Robert Horansky, Erick Winston, Jason Underwood, and Matthew Myers, CU/NIST Symposium, November 14, 2005 (poster).

"Parametric Amplifier for Biological Mass Spectrometry," John C. Price, Butcher Symposium on Genomics and Biotechnology, University of Colorado, November 11, 2004 (poster).

"Dielectric Spectroscopy of Altitudinal Dipolar Molecular Rotors," Laura I. Clarke, Mary Beth Mulcahy, Robert Horansky, Dominik Horinek, Xaiolai Zheng, Thomas Magnera, Josef Michl, and John Price, March Meeting of the American Physical Society, Quebec, March 24, 2004.

"Roto-electrics: Three dimensional dipolar molecular rotor lattices," Robert D. Horansky, Laura I. Clarke, John C. Price, Jose Nunez, Tinh-A.V. Kuong, Miguel A. Garcia-Garibay, March Meeting of the American Physical Society, Quebec, March 24, 2004.

"Dielectric Response of Dipolar Molecular Rotors," L. Clarke, R. Horansky, T. Hinderer, J. Price, J. Nunez, T. Khuong, M. Garcia-Garibay, D. Horinek, G. Kottas, N. Varaska, T. Magnera, J. Michl, March Meeting of the American Physical Society, Austin, March 4, 2003.

"Dielectric Response of Molecular Dipolar Rotors on Insulating Surfaces," Robert D. Horansky, Laura I. Clarke, Jose Nunez, Josef Michl, Miguel Garcia-Garibay, John C. Price, Trends in Nanotechnology Conference, Salamanca, Spain, Sept. 5-9, 2003. This presentation won "Best Poster Award."

"Dielectric Spectroscopy of Altitudinal Dipolar Molecular Rotors," Laura I. Clarke, Mary Beth Mulcahy, Robert Horansky, Dominik Horinek, Xaiolai Zheng, Thomas Magnera, Josef Michl, and John Price, Fall Meeting of the Materials Research Society, Boston, Dec. 2003.

"Dielectric Response of Molecular Dipolar Rotors on Insulating Surfaces," Robert D. Horansky, Laura I. Clarke, Mary Beth Mulcahy, Jose Nunez, Josef Michl, Miguel Garcia-Garibay, John C. Price, NSF-CONICEF Workshop on Molecular Electronics and Quantum Dots, Quilmes, Argentina, May 15-19, 2003.

"Rotoelectrics," John C. Price, 15 Year Anniversary Meeting of the Packard Fellows, Vancouver, British Columbia, September 3-6, 2003 (poster).

"Experimental Search for New Macroscopic Forces Below 1 Millimeter," Joshua C. Long, Eric A. Gulbis, Allison B. Churnside, John C. Price, American Physical Society April Meeting, Albuquerque, April 22, 2002.

"Dielectric response of chloromethylsilyl dipolar rotors," Robert D. Horansky, Laura I. Clarke, Dominik Horinek, Gregg S. Kottas, Natalia Varaksa, Thomas F. Magnera, Tanja P. Hinderer, Josef Michl, and John C. Price, Trends in Nanotechnology 2002, Santiago de Compostella, Spain, Sept. 9–13, 2002 (poster).

"Dielectric relaxation of surface mounted molecular dipolar rotors," Laura I. Clarke, Dominik Horinek, Tanja P. Hinderer, Gregg S. Kottas, Natalia Varaksa, Thomas F. Magnera, Robert D. Horansky, Josef Michl, John Price, Daniel Kitayama, M. Jon Dadras, and Tim Black, Gordon Research Conference on Nanostructure Fabrication, Tilton School, August 2002 (poster).

"Dielectric response of chloromethylsilyl dipolar rotors on fused silica surfaces," Laura I. Clarke, Gregg S. Kottas, Tanja P. Hinderer, Natalia Varaksa, Thomas F. Magnera, Robert D. Horansky, Dominik Horinek, Josef Michl, John Price, 1st International Conference on Nanoscale/Molecular Mechanics, Maui, May 2002 (poster).

"Status of Experimental Search for Gravitational-Strength Forces below One Centimeter," J.C. Long, H.W. Chan, J.C. Price, Centennial Meeting of the American Physical Society, Atlanta, March 20-26, 1999.

"Structural and Dielectric Effects of Annealing on High Quality Laser Ablated BaSrTiO<sub>3</sub> Thin Films on MgO and LaAlO<sub>3</sub> Substrates," C.M. Carlson, J.C. Price, T.V. Rivkin, P.A. Parilla, D.S. Ginley, International Symposium on Integrated Ferroelectrics, March 8, 1999.

"Strontium Titanate Thin-Films for Tunable Microwave Devices," J.C. Price, C.T. Rogers, M. Dalberth, R. Stauber, 1998 ONR Superconductivity Program Review, China Lake, CA, Jan. 25-28, 1998.

"Thin-Film Growth and Processing of Metal Oxide Microwave Materials," C.T. Rogers, J.C. Price, M. Dalberth, R. Stauber, B. Andersson, 1998 ONR Superconductivity Program Review, China Lake, CA, Jan. 25-28, 1998.

"Progress toward a measurement of gravitational-strength forces in the sub-centimeter range," J.C. Long, H.W. Chan, J.C. Price, NIST Boulder, Oct. 23, 1998.

"Gravitational strength forces below 1 cm," J.C. Price, NSF REU Seminar, CU Boulder, July 8, 1998.

"Development of an Experiment to Search for New Gravitational-Strength Forces below One Centimeter," John C. Price, Hilton W. Chan, Christian Dembowski, Joshua C. Long, 1998 Spring Meeting of the American Physical Society, Columbus, Ohio, April 17-21, 1998.

"Existing Limits on Gravitational-Strength Forces in the Sub-Centimeter Range," Joshua C. Long, Hilton W. Chan, John C. Price, 1998 Spring Meeting of the American Physical Society, Columbus, Ohio, April 17-21, 1998.

"High-Q Oscillators for a Search for Gravitational-Strength Forces in the Sub-Centimeter Range," Hilton W. Chan, Joshua C. Long, John C. Price, 1998 Spring Meeting of the American Physical Society, Columbus, Ohio, April 17-21, 1998.

"Pulsed Laser Deposition of Superconducting Strontium Titanate Thin-Films," Arnold Leitner, Charles T. Rogers, and John C. Price, David A. Rudman, 1998 March Meeting of the American Physical Society, Los Angeles, March 16-20, 1998.

"Evidence for the Coexistence of magnetism and Superconductivity in Doped Strontium Titanate Thin Films," Arnold Leitner, Charles T. Rogers, and John C. Price, 1998 March Meeting of the American Physical Society, Los Angeles, March 16-20, 1998.

"Frequency and Temperature Dependent Dielectric Properties of Free-standing Strontium Titanate Thin Films," Mark J. Dalberth, Renaud E. Stauber, Britt Anderson, Charles T. Rogers, and John C. Price, 1998 March Meeting of the American Physical Society, Los Angeles, March 16-20, 1998.

"Plused Laser Deposition of Superconducting Strontium Titanate Thin-Films," Arnold Leitner, Christian Strahberger, Charles T. Rogers, and John C. Price, 1997 March Meeting of the American Physical Society, Kansas City, March 17-21, 1997.

"Weak Localization in Quasi-Ballistic Lithium Films," Eric Black and John C. Price, 1997 March Meeting of the American Physical Society, Kansas City, March 17-21, 1997.

"Novel Biaxially Textured Buffer Layers for Superconducting Films," C.M. Carlson, J.C. Price, P.A. Parilla, D.S. Ginley, R.D. Blaugher, A. Goyal, M. Paranthaman, D.M. Kroeger, D.K. Christen, 1997 Fall Meeting of the Materials Research Society, Boston, Dec. 1–5, 1997.

"Who was Jesse Beams?," John C. Price, Low Temperature Bag Lunch, Spring 1996.

"Gravitational Strength Forces below 1 cm," John C. Price, Low Temperature Bag Lunch, Fall 1996.

"Gravitational Strength Forces below 1 cm," John C. Price, Cornell/Weiman group meeting, Fall 1996.

"YBCO/STO Structures for Tunable Microwave Devices," C.H. Mueller, R.E. Treece, T. Rivkin, Z. Zhang, J.B. Thompson, G.A. Koepf, D. Galt, J.C. Price, A.M. Hermann, M. Dalberth, C.T. Rogers, F.A. Miranda, L.A. Knauss, J.S. Horowitz, 8th International Symposium on Integrated Ferroelectrics, Tempe, AZ, March 17–20, 1996.

"Potential Rewards and Real challenges for Integrating High-T<sub>c</sub> Superconducting Thin Films into Microwave Applications," R.E. Treece, C.H. Mueller, J.B. Thompson, M. Heiny, G.A. Koepf, R.M. Yandrofski, L.A. Knauss, J.S. Horowitz, D. Galt, J.C. Price, C.T. Rogers, 1996 Spring Meeting of the Materials Research Society, Pittsburgh, April 8–12, 1996.

Xiaxian Zhang and John C. Price, "SQUID Microsusceptometry of Mesoscopic Aluminum Rings," March Meeting of the American Physical Society, St. Louis, March 17–22, 1996.

Eric Black and John C. Price, "Magnetoresistnace of Quench Condensed Lithium Films in Perpendicular and Parallel Fields," March Meeting of the American Physical Society, St. Louis, March 17–22, 1996.

David Galt, John C. Price, Charles T. Rogers, James B. Thompson, "Dielectric Response of Epitaxial Strontium Titanate Films," March Meeting of the American Physical Society, St. Louis, March 17–22, 1996.

"The LST Relation and SrTiO<sub>3</sub> Thin-Films," John C. Price, STO Seminar Series, University of Colorado, August 17, 1995.

"Spin Effects in Weak Localization," John C. Price, Low Temperature Bag Lunch, University of Colorado, October 20, 1994.

"Mesoscopic Conductance Correlation Functions for Non-Interacting Electrons at Finite Frequency," John B. Pieper and John C. Price, Fall meeting of the New England section of the American Physical Society, Providence, October 7–8, 1994.

"Strontium Titanate as a Superconductor," John C. Price, Low Temperature Bag Lunch, University of Colorado, April 21, 1994.

"Oscillations of the Superconductor-Normal Boundary Conductance," David Betz, Maxim Rivkin, and John C. Price, March meeting of the American Physical Society, Pittsburgh, March 21–25, 1994.

"SQUID Microsusceptometry of Isolated Mesoscopic Aluminum Rings," Xiaxian Zhang and John C. Price, March meeting of the American Physical Society, Pittsburgh, March 21–25, 1994.

"Ionization of Charge-Anticharge Pairs in Ultrathin Palladium Films," Y. Liu and John C. Price, March meeting of the American Physical Society, Pittsburgh, March 21–25, 1994.

"Aharonov-Bohm Oscillations in Disordered Mesoscopic Superconductors," Y. Liu, John C. Price, and Xiaxian Zhang, March meeting of the American Physical Society, Pittsburgh, March 21–25, 1994.

"Observation of the Aharonov-Bohm effect at finite frequency in mesoscopic Ag rings," John B. Pieper and John C. Price, Metal-Insulator Transitions, Localization, and Mesoscopic Systems, Eugene, August 12–14, 1993. (Poster paper)

"Ionization of Charge-Anticharge Pairs in Ultrathin Palladium Films," Y. Liu and John C. Price, Metal-Insulator Transitions, Localization, and Mesoscopic Systems, Eugene, August 12–14, 1993. (Poster paper)

"Mesoscopic Density-of-States Fluctuations," John C. Price, Low Temperature Bag Lunch, University of Colorado, April, 1993.

"Mesoscopic Quantum Transport at 1 GHz," John C. Price, Annual Meeting of the Packard Fellows, Monterey, September 10, 1993. (Poster paper)

"Frequency dependence of h/e conductance oscillations in mesoscopic Ag rings," John B. Pieper and John C. Price, March Meeting of the American Physical Society, Seattle, March 22–26, 1993.

"SQUID Microsusceptometry of Isolated Mesoscopic Superconducting Rings," Xiaxian Zhang and John C. Price, March Meeting of the American Physical Society, Seattle, March 22–26, 1993.

"AC Conductivity of Ultrathin Amorphous Pd Films," Y. Liu and John C. Price, March Meeting of the American Physical Society, Seattle, March 22–26, 1993.

"Tunable microwave resonators utilizing thin high-temperature superconducting films and ferroelectrics," A.M. Hermann, John C. Price, J.F. Scott, R.M. Yandrofski, A. Naziripour, David Galt, H.M. Duan, M. Parathaman, R. Tello, March Meeting of the American Physical Society, Seattle, March 22–26, 1993.

"Tunable high temperature superconductor microstrip resonators," David Galt, John C. Price, James A. Beall, and Ronald Ono, March Meeting of the American Physical Society, Seattle, March 22–26, 1993.

"High Temperature Superconductor-Ferroelectric Tunable Microwave Resonators," James A. Beall, David Galt, John C. Price, International Superconducting Electronics Conference, Boulder, August 11–14, 1993.

"Tunable High Temperature Superconductor Microstrip Resonators," James A. Beall, R.H. Ono, David Galt, John C. Price, 1993 Spring Meeting of the Materials Research Society, San Francisco, April 15, 1993.

"The Little-Parks effects and mesoscopics," John C. Price, Low Temperature Bag Lunch, University of Colorado, November, 1992.

"High-frequency magnetoconductance of mesoscopic Ag rings," John B. Pieper and John C. Price, March Meeting of the American Physical Society, Indianapolis, March 20, 1992.

"Electrically-small superconducting antennas," John C. Price, Low Temperature Bag Lunch, University of Colorado, February 27, 1992.

"Microsusceptometry of Mesoscopic Superconducting Rings," John C. Price, Annual Meeting of the Packard Fellows, Monterey, September 11, 1992. (Poster paper)

"500 MHz Tunable Half-loop Antenna," John C. Price, DARPA Superconducting Antenna Workshop, Annapolis, March 12, 1992.

"High T<sub>c</sub> Antennas," John C. Price, Low Temperature Physics Bag Lunch Seminar, CU Physics Department, February 2, 1992.

"Ultralow Temperature Electronics Laboratory," John C. Price, Rocky Mountain Superconductivity Alliance, University of Colorado, January 22, 1992.

"Physics Careers," John C. Price, Society of Physics students meeting, February 19, 1992.

"Weak localization for pedestrians," John C. Price, Condensed Matter Seminar, University of Colorado, March 12, 1991.

"Weak localization at 1 GHz in disordered Ag wires," John B. Pieper and John C. Price, March Meeting of the American Physics Society, Cincinnati, March 20, 1991.

"Spin Precession and Weak Localization," John C. Price, March Meeting of the American Physical Society, Cincinnati, March 20, 1991. (Poster paper)

"Frequency dependence of weak localization in disordered metal nanostructures," John B. Pieper and John C. Price, International Symposium on Nanostructures and Mesoscopic Systems, Santa Fe, May 20, 1991. (Poster paper)

"Spin precession and weak localization," John C. Price, Low Temperature Physics Bag Lunch Seminar, CU Physics Department, November 20, 1991.

"Q measurement of high sound speed materials for use in resonant gravitational antenna," Carl Zhou, Hu Enke, John C. Price, Peter F. Michelson, W. Fairbank, 12<sup>th</sup> International Conference on General Relativity and Gravitation, Boulder, August, 1989.

"Stanford Ultralow Temperature Gravitational Wave Antenna," T. Aldcroft, J. Chiang, D. DeBra, W.M. Fairbank, J. Henderson, Hu Enke, L.D. Mann, F. McLoughlin, P.F. Michelson, J.C. Price, T. Stevenson, B. Vaughan, Z. Zhou., 12<sup>th</sup> International Conference on General Relativity and Gravitation, Boulder, August, 1989.

"Superconducting transducer for gravitational wave antennas," Thomas Stevenson, John Henderson, Katrina Lane, John Price, Conference on High Performance SQUID Systems, Tiburon, August 26, 1988.

"Resonant-Mass Antenna Design," John C Price, International Symposium on Experimental Gravitational Physics, Guangzhou, China, August 7, 1987.

"Ultra-low temperature gravitational wave antenna," R. Elia, W. Fairbank, J. Henderson, K. Lane, P Michelson, J. Price, T. Stevenson, R. Taber, B. Vaughn, International Symposium on Experimental Gravitational Physics, Guangzhou, China, August 7, 1987.

"Optimal Design of Resonant-mass Gravity Wave Detectors," John C. Price, Third Annual West Coast Meeting on General Relativity and Gravitation, U.C. Irvine, March 7, 1987.

"Progress on thin-film transducers," John C. Price, 11th International Conference on General Relativity and Gravitation, Stockholm, Sweden, July 6, 1986.