



Calculated pattern of ultrasonic waves from a point source (off the figure to the left) being focused by a "phononic crystal" along the left edge. The narrow focusing is a result of negative refraction by the crystal; in an experiment with an actual phononic crystal made up of tungsten carbide beads immersed in water, the same sharp focusing is seen. See article 024301; also, the *Physical Review Focus* story at <http://focus.aps.org>.



PHYSICAL REVIEW LETTERS

Contents

Articles published 3 July–9 July 2004

VOLUME 93, NUMBER 2

9 July 2004

General Physics: Statistical and Quantum Mechanics, Quantum Information, etc.

Proposed Test of Quantum Nonlocality for Continuous Variables	020401
Hyunchul Nha and H.J. Carmichael	
Particle Beams Guided by Electromagnetic Vortices: New Solutions of the Lorentz, Schrödinger, Klein-Gordon, and Dirac Equations	020402
Iwo Bialynicki-Birula	
Simultaneous Arrival of Information in Absorbing Waveguides	020403
A. Ruschhaupt and J.G. Muga	
Umklapp Collisions and Center-of-Mass Oscillations of a Trapped Fermi Gas	020404
G. Orso, L.P. Pitaevskii, and S. Stringari	
Quantum Phase Transition in an Atomic Bose Gas with a Feshbach Resonance	020405
M.W.J. Romans, R.A. Duine, Subir Sachdev, and H.T.C. Stoof	
Microstructured Switchable Mirror for Polar Molecules	020406
Stephan A. Schulz, Hendrick L. Bethlem, Jacqueline van Veldhoven, Jochen Küpper, Horst Conrad, and Gerard Meijer	
Charge Detection Enables Free-Electron Quantum Computation	020501
C.W.J. Beenakker, D.P. DiVincenzo, C. Emary, and M. Kindermann	
Minimum Construction of Two-Qubit Quantum Operations	020502
Jun Zhang, Jiri Vala, Shankar Sastry, and K. Birgitta Whaley	
Nonadditivity of Quantum Capacity for Multiparty Communication Channels	020503
W. Dür, J.I. Cirac, and P. Horodecki	
Realization of a Photonic Controlled-NOT Gate Sufficient for Quantum Computation	020504
Sara Gasparoni, Jian-Wei Pan, Philip Walther, Terry Rudolph, and Anton Zeilinger	
Ensemble Averages and Nonextensivity at the Edge of Chaos of One-Dimensional Maps	020601
Garin F.J. Añãños and Constantino Tsallis	
Exactly Solvable Model of Monomer-Monomer Reactions on a Two-Dimensional Random Catalytic Substrate	020602
G. Oshanin, M.N. Popescu, and S. Dietrich	

Gravitation and Astrophysics

New Limits on Planck Scale Lorentz Violation in QED	021101
T. Jacobson, S. Liberati, D. Mattingly, and F.W. Stecker	
Black Hole Mass Decreasing due to Phantom Energy Accretion	021102
E. Babichev, V. Dokuchaev, and Yu. Eroshenko	
Growth and Form of Planetary Seedlings: Results from a Sounding Rocket Microgravity Aggregation Experiment	021103
Maya Krause and Jürgen Blum	

(Continued on Third Cover)



Contents (Continued)

Are Halos of Collisionless Cold Dark Matter Collisionless?	021301
Chung-Pei Ma and Michael Boylan-Kolchin	
Elementary Particles and Fields	
Observation of Large CP Violation and Evidence for Direct CP Violation in $B^0 \rightarrow \pi^+ \pi^-$ Decays	021601
K. Abe <i>et al.</i> (Belle Collaboration)	
Model Independent Bound on the Unitarity Triangle from CP Violation in $B \rightarrow \pi^+ \pi^-$ and $B \rightarrow \psi K_S$	021801
Gerhard Buchalla and A. Salim Safir	
Limits on the Neutrino Magnetic Moment using 1496 Days of Super-Kamiokande-I Solar Neutrino Data	021802
D.W. Liu <i>et al.</i> (Super-Kamiokande Collaboration)	
Testing the Maximal Nature of Muon Neutrino Flavor Mixing	021803
Sandhya Choubey and Probir Roy	
Measurement of the Direct CP Asymmetry in $b \rightarrow s\gamma$ Decays	021804
B. Aubert <i>et al.</i> (BABAR Collaboration)	
Search for the Rare Decay $K_L \rightarrow \pi^0 e^+ e^-$	021805
A. Alavi-Harati <i>et al.</i>	
Baryon Exotics in the Quark Model, the Skyrme Model, and QCD	022001
Elizabeth Jenkins and Aneesh V. Manohar	
Measurement of Strange-Quark Contributions to the Nucleon's Form Factors at $Q^2 = 0.230 \text{ (GeV}/c)^2$	022002
F.E. Maas, P. Achenbach, K. Aulenbacher, S. Baunack, L. Capozza, J. Diefenbach, K. Grimm, Y. Imai, T. Hammel, D. von Harrach, E.-M. Kabuß, R. Kothe, J.H. Lee, A. Lorente, A. Lopes Ginja, L. Nungesser, E. Schilling, G. Stephan, C. Weinrich, I. Altarev, J. Arvieux, B. Collin, R. Frascaria, M. Guidal, R. Kunne, D. Marchand, M. Morlet, S. Ong, J. van de Wiele, S. Kowalski, B. Plaster, R. Suleiman, and S. Taylor	
Nuclear Physics	
Interferometry of Direct Photons in Central $^{208}\text{Pb} + ^{208}\text{Pb}$ Collisions at 158A GeV	022301
M.M. Aggarwal <i>et al.</i> (WA98 Collaboration)	
Λ and $\bar{\Lambda}$ Production in Central Pb-Pb Collisions at 40, 80, and 158A GeV	022302
T. Anticic <i>et al.</i> (The NA49 Collaboration)	
Compound and Rotational Damping in Warm Deformed Rare-Earth Nuclei	022501
S. Leoni, M. Matsuo, A. Bracco, G. Benzoni, N. Blasi, F. Camera, C. Grassi, B. Million, A. Paleni, M. Pignanelli, E. Vigezzi, O. Wieland, T. Døssing, B. Herskind, G.B. Hagemann, J. Wilson, A. Maj, M. Kmiecik, G. Lo Bianco, C.M. Petrache, M. Castoldi, A. Zucchiati, G. De Angelis, D. Napoli, P. Bednarczyk, and D. Curien	
Atomic, Molecular, and Optical Physics	
Ionization of Atoms by the Spatial Gradient of the Pondermotive Potential in a Focused Laser Beam	023001
E. Wells, I. Ben-Itzhak, and R.R. Jones	
Interplay of Intra-atomic and Interatomic Effects: An Investigation of the $2p$ Core Level Spectra of Atomic Fe and Molecular FeCl_2	023002
T. Richter, K. Godehusen, M. Martins, T. Wolff, and P. Zimmermann	
Unexpected Behavior of the Near-Threshold Double-Photoionization Cross Section of Beryllium	023003
D. Lukić, J.B. Bluett, and R. Wehlitz	
Ion Solvation Dynamics in Supercritical Fluids	023004
S.A. Egorov	
Two Photon Absorption and Coherent Control with Broadband Down-Converted Light	023005
Barak Dayan, Avi Pe'er, Asher A. Friesem, and Yaron Silberberg	
Structure Determination of Isolated Metal Clusters via Far-Infrared Spectroscopy	023401
André Fielicke, Andrei Kirilyuk, Christian Ratsch, Jörg Behler, Matthias Scheffler, Gert von Helden, and Gerard Meijer	
Formation Times of RbHe Exciplexes on the Surface of Superfluid versus Normal Fluid Helium Nanodroplets	023402
G. Droppelmann, O. Bünermann, C.P. Schulz, and F. Stienkemeier	
Observation of Light Dragging in a Rubidium Vapor Cell	023601
Dmitry Strekalov, Andrey B. Matsko, Nan Yu, and Lute Maleki	

(Continued on Preceding Page)

Contents (Continued)

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Interaction of Femtosecond Light Filaments with Obscurants in Aerosols	023901
S. Skupin, L. Bergé, U. Peschel, and F. Lederer	
Surface Modes and Multipower-Law Structure in the Early-Time Electromagnetic Response of Magnetic Targets ...	023902
Peter B. Weichman	
Movable Aperture Lensless Transmission Microscopy: A Novel Phase Retrieval Algorithm	023903
H.M.L. Faulkner and J.M. Rodenburg	
Homogenization of Magnetodielectric Photonic Crystals	023904
A.A. Krokhin and E. Reyes	
Focusing of Sound in a 3D Phononic Crystal	024301
Suxia Yang, J.H. Page, Zhengyou Liu, M.L. Cowan, C.T. Chan, and Ping Sheng	
CO ₂ Molecule as a Quantum Realization of the 1:1:2 Resonant Swing-Spring with Monodromy	024302
R.H. Cushman, H.R. Dullin, A. Giacobbe, D.D. Holm, M. Joyeux, P. Lynch, D.A. Sadovskii, and B.I. Zhilinskiĭ	
Varieties of Dynamic Multiscaling in Fluid Turbulence	024501
Dhrubaditya Mitra and Rahul Pandit	

Plasma and Beam Physics

Pole Dynamics for the Flierl-Petviashvili Equation and Zonal Flow	025001
F. Spineanu, M. Vlad, K. Itoh, H. Sanuki, and S.-I. Itoh	

Condensed Matter: Structure, etc.

Clarification of the Bootstrap Percolation Paradox	025501
Paolo De Gregorio, Aonghus Lawlor, Phil Bradley, and Kenneth A. Dawson	
Monocrystal Elastic Constants of the Negative-Thermal-Expansion Compound Zirconium Tungstate (ZrW ₂ O ₈)	025502
F.R. Drymiotis, H. Ledbetter, J.B. Betts, T. Kimura, J.C. Lashley, A. Migliori, A. Ramirez, G. Kowach, and J. Van Duijn	
Atomistic Study of Dislocation Loop Emission from a Crack Tip	025503
Ting Zhu, Ju Li, and Sidney Yip	
Quantum Signatures of Breather-Breather Interactions	025504
J. Dorignac, J.C. Eilbeck, M. Salerno, and A.C. Scott	
High-Density Liquidlike Component Facilitates Plastic Flow in a Model Amorphous Silicon System	025505
M.J. Demkowicz and A.S. Argon	
Aging and Equilibrium Fluctuations for domain Growth in Ternary Mixtures	025701
Sanjay Puri and Deepak Kumar	
Proton Transfer in Heterocycle Crystals	025901
M. Iannuzzi and M. Parrinello	
Single-File Diffusion of Colloids in One-Dimensional Channels	026001
Christoph Lutz, Markus Kollmann, and Clemens Bechinger	
Interactions in Self-Organized Nanoporous Organic Crystals	026101
Lydie Bourgeois, Bertrand Toudic, Claude Ecolivet, Jean-Claude Ameline, Philippe Bourges, François Guillaume, and Tomasz Breczewski	

Condensed Matter: Electronic Properties, etc.

Thermoelectric Power of HoBaCo ₂ O _{5.5} : Possible Evidence of the Spin Blockade in Cobaltites	026401
A. Maignan, V. Caignaert, B. Raveau, D. Khomskii, and G. Sawatzky	
Orbital Magnetism: Pros and Cons for Enhancing the Cluster Magnetism	026402
Antonis N. Andriotis and Madhu Menon	
Current-Driven Switching in a Single Exchange-Biased Ferromagnetic Layer	026601
T.Y. Chen, Y. Ji, C.L. Chien, and M.D. Stiles	
Phonon Excitations of Composite-Fermion Landau Levels	026801
F. Schulze-Wischeler, F. Hohls, U. Zeitler, D. Reuter, A.D. Wieck, and R.J. Haug	
Thermal Stability and Electronic Structure of Atomically Uniform Pb Films on Si(111)	026802
M.H. Upton, C.M. Wei, M.Y. Chou, T. Miller, and T.-C. Chiang	

(Continued on Preceding Page)

Contents (Continued)

Einselection in Action: Decoherence and Pointer States in Open Quantum Dots	026803
D.K. Ferry, R. Akis, and J.P. Bird	
Evidence for Current-Flow Anomalies in the Irradiated 2D Electron System at Small Magnetic Fields	026804
R.L. Willett, L.N. Pfeiffer, and K.W. West	
Cluster Core-Level Binding-Energy Shifts: The Role of Lattice Strain	026805
B. Richter, H. Kuhlbeck, H.-J. Freund, and P.S. Bagus	
Magnetic Order in Lightly Doped $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$	027001
A. Gozar, B.S. Dennis, G. Blumberg, Seiki Komiy, and Yoichi Ando	
Spin Correlations and Magnetic Order in Nonsuperconducting $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_{4\pm\delta}$	027002
P.K. Mang, O.P. Vajk, A. Arvanitaki, J.W. Lynn, and M. Greven	
Evidence for a Novel State of Superconductivity in Noncentrosymmetric CePt_3Si : A ^{195}Pt -NMR Study	027003
M. Yogi, Y. Kitaoka, S. Hashimoto, T. Yasuda, R. Settai, T.D. Matsuda, Y. Haga, Y. Ōnuki, P. Rogl, and E. Bauer	
Nonlinear Transport near a Quantum Phase Transition in Two Dimensions	027004
Denis Dalidovich and Philip Phillips	
Magnon-Hole Scattering and Charge Order in $\text{Sr}_{14-x}\text{Ca}_x\text{Cu}_{24}\text{O}_{41}$	027005
C. Hess, H. ElHaes, B. Büchner, U. Ammerahl, M. Hücker, and A. Revcolevschi	
Excitation Hierarchy of the Quantum Sine-Gordon Spin Chain in a Strong Magnetic Field	027201
S.A. Zvyagin, A.K. Kolezhuk, J. Krzystek, and R. Feyerherm	
Direct Determination of the Magnetic Ground State in the Square Lattice $S = 1/2$ Antiferromagnet $\text{Li}_2\text{VOSiO}_4$	027202
A. Bombardi, J. Rodriguez-Carvajal, S. Di Matteo, F. de Bergevin, L. Paolasini, P. Carretta, P. Millet, and R. Caciuffo	
Giant Magnetic Anisotropy in Tetragonal FeCo Alloys	027203
Till Burkert, Lars Nordström, Olle Eriksson, and Olle Heinonen	
Low Temperature Emission Spectra of Individual Single-Walled Carbon Nanotubes: Multiplicity of Subspecies within Single-Species Nanotube Ensembles	027401
H. Htoon, M.J. O'Connell, P.J. Cox, S.K. Doorn, and V.I. Klimov	
Angle-Resolved Photoemission from Surface States	027601
E.E. Krasovskii and W. Schattke	
Soft Matter, Biological, and Interdisciplinary Physics	
Channel Formation and Intermediate Range Order in Sodium Silicate Melts and Glasses	027801
A. Meyer, J. Horbach, W. Kob, F. Kargl, and H. Schober	
Dynamical Model for Chemically Driven Running Droplets	027802
Uwe Thiele, Karin John, and Markus Bär	
Lipid Corraling and Poloxamer Squeeze-Out in Membranes	028101
Guohui Wu, Jaroslaw Majewski, Canay Ege, Kristian Kjaer, Markus Jan Weygand, and Ka Yee C. Lee	
Oxygen Saturation-Dependent Absorption and Scattering of Blood	028102
Dirk J. Faber, Maurice C.G. Aalders, Egbert G. Mik, Brett A. Hooper, Martin J.C. van Gemert, and Ton G. van Leeuwen	
Direct Determination of Vibrational Density of States Change on Ligand Binding to a Protein	028103
Erika Balog, Torsten Becker, Martin Oetl, Ruep Lechner, Roy Daniel, John Finney, and Jeremy C. Smith	
Onset of Tethered Chain Overcrowding	028301
William Y. Chen, Joseph X. Zheng, Stephen Z.D. Cheng, Christopher Y. Li, Ping Huang, Lei Zhu, Huiming Xiong, Qing Ge, Ya Guo, Rodric P. Quirk, Bernard Lotz, Lingfeng Deng, Chi Wu, and Edwin L. Thomas	
Origin of the Slow Linear Viscoelastic Response of Aqueous Foams	028302
Sylvie Cohen-Addad, Reinhard Höhler, and Yacine Khidas	
Stochastic Gain in Population Dynamics	028701
Arne Traulsen, Torsten Röhl, and Heinz Georg Schuster	

(Continued on Preceding Page)

Contents (Continued)

Errata

Publisher's Note: Fermi-Ulam Accelerator Model under Scaling Analysis[Phys. Rev. Lett. 93 , 014101 (2004)]	029901
Edson D. Leonel, P.V.E. McClintock, and J. Kamphorst Leal da Silva	
Publisher's Note: Molecular Dynamics Simulations of a Fluid near Its Critical Point [Phys. Rev. Lett. 93 , 015701 (2004)]	029902
Kamakshi Jagannathan and Arun Yethiraj	