



The images show ultracold molecules created from an atomic Bose-Einstein condensate. A magnetic-field gradient is used to separate the atomic BEC (visible in the first four frames) from the molecules, which oscillate around a position in space where their magnetic-field-dependent internal states have an energy minimum. See article 020406.



PHYSICAL REVIEW LETTERS

Contents

Articles published 10 January–16 January 2004

VOLUME 92, NUMBER 2

16 JANUARY 2004

General Physics

Classical Analog to Topological Nonlocal Quantum Interference Effects	020401
Yakir Aharonov, Sandu Popescu, Benni Reznik, and Ady Stern	
Spin-1/2 Geometric Phase Driven by Decohering Quantum Fields	020402
A. Carollo, I. Fuentes-Guridi, M. França Santos, and V. Vedral	
Vortex Lattice Formation in Bose-Einstein Condensates	020403
Carlos Lobo, Alice Sinatra, and Yvan Castin	
Quantum Vacuum Contribution to the Momentum of Dielectric Media	020404
A. Feigel	
Quantum Marking and Quantum Erasure for Neutral Kaons	020405
A. Bramon, G. Garbarino, and B.C. Hiesmayr	
Observation of Molecules Produced from a Bose-Einstein Condensate	020406
Stephan Dürr, Thomas Volz, Andreas Marte, and Gerhard Rempe	
Dynamic Importance Sampling for the Escape Problem in Nonequilibrium Systems: Observation of Shifts in Optimal Paths	020601
S. Beri, R. Mannella, and P.V.E. McClintock	

Gravitation and Astrophysics

Dense Plasma Effects on Nuclear Reaction Rates	021101
E.L. Pollock and B. Militzer	
Dynamical Simulation of Gravothermal Catastrophe	021102
Peter Klinko and Bruce N. Miller	

Elementary Particles and Fields

Mass Spectrum of the Two-Dimensional O(3) Sigma Model with a θ Term	021601
D. Controzzi and G. Mussardo	
High-Precision Lattice QCD Confronts Experiment	022001
C.T.H. Davies, E. Follana, A. Gray, G.P. Lepage, Q. Mason, M. Nobes, J. Shigemitsu, H.D. Trottier, M. Wingate, C. Aubin, C. Bernard, T. Burch, C. DeTar, Steven Gottlieb, E.B. Gregory, U.M. Heller, J.E. Hetrick, J. Osborn, R. Sugar, D. Toussaint, M. Di Pierro, A. El-Khadra, A.S. Kronfeld, P.B. Mackenzie, D. Menscher, and J. Simone (HPQCD and Fermilab Lattice Collaborations)	

Nuclear Physics

Q^2 Evolution of the Neutron Spin Structure Moments using a ^3He Target	022301
M. Amarian <i>et al.</i> (Jefferson Lab E94010 Collaboration)	
Search for Anomalously Heavy Isotopes of Helium in the Earth's Atmosphere	022501
P. Mueller, L.-B. Wang, R.J. Holt, Z.-T. Lu, T.P. O'Connor, and J.P. Schiffer	

(Continued on Third Cover)



Contents (Continued)

Atomic, Molecular, and Optical Physics

Absolute Frequency Measurements of the $2^3S_1 \rightarrow 2^3P_{0,1,2}$ Atomic Helium Transitions around 1083 nm	023001
P. Cancio Pastor, G. Giusfredi, P. De Natale, G. Hagel, C. de Mauro, and M. Inguscio	
Collision-Induced Absorption of Hydrogen Deuteride Dissolved in Liquid Neon	023002
W. Herrebout, B. Van der Veken, A.P. Kouzov, and M.O. Bulanin	
Strong Field Quantum Path Control Using Attosecond Pulse Trains	023003
Kenneth J. Schafer, Mette B. Gaarde, Arne Heinrich, Jens Biegert, and Ursula Keller	

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Filtered Optical Feedback Induced Frequency Dynamics in Semiconductor Lasers	023901
Alexis P.A. Fischer, Mirvais Yousefi, Daan Lenstra, Michael W. Carter, and Gautam Vemuri	
Time-Reversal Analysis for Scatterer Characterization	023902
David H. Chambers and James G. Berryman	
Large Deformations during the Coalescence of Fluid Interfaces	024501
Nianhuan Chen, Tonya Kuhl, Rafael Tadmor, Qi Lin, and Jacob Israelachvili	

Plasma and Beam Physics

Electron Thermal Diffusivity due to the Electron Temperature Gradient Mode	025001
A. Hirose	
Effect of Collisional Zonal-Flow Damping on Flux-Driven Turbulent Transport	025002
G.L. Falchetto and M. Ottaviani	

Condensed Matter: Structure, etc.

Gapless Spin Liquid Behavior in Two-Dimensional Solid ^3He	025301
Ryuichi Masutomi, Yoshitomo Karaki, and Hidehiko Ishimoto	
Entropy-Stabilized Smectic C Phase in a System of Zigzag-Shaped Molecules	025501
Prabal K. Maiti, Yves Lansac, Matthew A. Glaser, and Noel A. Clark	
Local Strain-Mediated Chemical Potential Control of Quantum Dot Self-Organization in Heteroepitaxy	025502
Bin Yang, Feng Liu, and M.G. Lagally	
High Frequency Dynamics in a Monatomic Glass	025503
T. Scopigno, R. Di Leonardo, G. Ruocco, A.Q.R. Baron, S. Tsutsui, F. Bossard, and S.N. Yannopoulos	
Liquid-Liquid Transition in the Molecular Liquid Triphenyl Phosphite	025701
Hajime Tanaka, Rei Kurita, and Hiroshi Mataka	
Onset of Collective and Cohesive Motion	025702
Guillaume Grégoire and Hugues Chaté	
Direct Observation of Charge Transfer at a MgO(111) Surface	026101
A. Subramanian, L.D. Marks, O. Warschkow, and D.E. Ellis	

Condensed Matter: Electronic Properties, etc.

Field-Induced Antiferromagnetism in the Kondo Insulator	026401
K.S.D. Beach, Patrick A. Lee, and P. Monthoux	
Phonon-Mediated Electron-Spin Phase Diffusion in a Quantum Dot	026601
Y.G. Semenov and K.W. Kim	
Current-Induced Transverse Spin-Wave Instability in a Thin Nanomagnet	026602
M.L. Polianski and P.W. Brouwer	
Electron Transport in Granular Metals	026801
Alexander Altland, Leonid I. Glazman, and Alex Kamenev	
Scanning Tunneling Microscopy Chemical Signature of Point Defects on the MoS ₂ (0001) Surface	026802
Javier D. Fuhr, Andrés Saúl, and Jorge O. Sofo	
Hydrodynamic Effects in Interacting Fermi Electron Jets	026803
Alexander O. Govorov and Jean J. Heremans	
Geometrical Dependence of High-Bias Current in Multiwalled Carbon Nanotubes	026804
B. Bourslon, D.C. Glattli, B. Plaçais, J.M. Berroir, C. Miko, L. Forró, and A. Bachtold	

(Continued on Preceding Page)

Contents (Continued)

Two-Particle Aharonov-Bohm Effect and Entanglement in the Electronic Hanbury Brown–Twiss Setup	026805
P. Samuelsson, E. V. Sukhorukov, and M. Büttiker	
Metastable Resistance-Anisotropy Orientation of Two-Dimensional Electrons in High Landau Levels	026806
K. B. Cooper, J. P. Eisenstein, L. N. Pfeiffer, and K. W. West	
Bosonization for Disordered and Chaotic Systems	026807
K. B. Efetov, G. Schwiete, and K. Takahashi	
Effect of Quantum Confinement on the Dielectric Function of PbSe	026808
Z. Hens, D. Vanmaekelbergh, E. S. Kooij, H. Wormeester, G. Allan, and C. Delerue	
Transport in Ultraclean YBa ₂ Cu ₃ O ₇ : Neither Unitary nor Born Impurity Scattering	027001
R. W. Hill, Christian Lupien, M. Sutherland, Etienne Boaknin, D. G. Hawthorn, Cyril Proust, F. Ronning, Louis Taillefer, Ruixing Liang, D. A. Bonn, and W. N. Hardy	
Scaling of the Magnetic Response in Doped Antiferromagnets	027002
P. Prelovšek, I. Sega, and J. Bonča	
Heavy Fermion Superconductivity and Magnetic Order in Noncentrosymmetric CePt ₃ Si	027003
E. Bauer, G. Hilscher, H. Michor, Ch. Paul, E. W. Scheidt, A. Griбанov, Yu. Seropegin, H. Noël, M. Sigrist, and P. Rogl	
Vortex State in Na _x CoO ₂ · yH ₂ O: $p_x \pm ip_y$ -Wave Versus $d_{x^2-y^2} \pm id_{xy}$ -Wave Pairing	027004
Qiang Han, Z. D. Wang, Qiang-Hua Wang, and Tianlong Xia	
Kinetic Energy Driven Pairing in Cuprate Superconductors	027005
Th. A. Maier, M. Jarrell, A. Macridin, and C. Slezak	
Direct-Current Induced Dynamics in Co ₉₀ Fe ₁₀ /Ni ₈₀ Fe ₂₀ Point Contacts	027201
W. H. Rippard, M. R. Pufall, S. Kaka, S. E. Russek, and T. J. Silva	
Optical-Spectroscopic Detection of Spin-Exchange Interaction Pyrochlore Molybdates	027202
M. W. Kim, Y. S. Lee, T. W. Noh, Jaeyun Yu, and Y. Moritomo	
Anomalous Fluctuations in Phases with a Broken Continuous Symmetry	027203
W. Zwerger	
Dynamic Structure Factor of the Two-Dimensional Shastry-Sutherland Model	027204
Christian Knetter and Götz S. Uhrig	
Interdisciplinary Physics: Biological Physics, Quantum Information, etc.	
Entanglement versus Correlations in Spin Systems	027901
F. Verstraete, M. Popp, and J. I. Cirac	
Classical Capacity of the Lossy Bosonic Channel: The Exact Solution	027902
V. Giovannetti, S. Guha, S. Lloyd, L. Maccone, J. H. Shapiro, and H. P. Yuen	
Transitions to Synchrony in Coupled Bursting Neurons	028101
Mukeshwar Dhamala, Viktor K. Jirsa, and Mingzhou Ding	
Role of Synaptic Filtering on the Firing Response of Simple Model Neurons	028102
Rubén Moreno-Bote and Néstor Parga	
Fluctuations in Network Dynamics	028701
M. Argollo de Menezes and A.-L. Barabási	
Comments	
Comment on “Dynamic Behavior of Anisotropic Nonequilibrium Driving Lattice Gases”	029601
Sergio Caracciolo, Andrea Gambassi, Massimiliano Gubinelli, and Andrea Pelissetto	
Albano and Saracco Reply	029602
E. V. Albano and G. Saracco	
Errata	
Erratum: Precision Measurement of the ⁷ Be(<i>p</i> , γ) ⁸ B Cross Section with an Implanted ⁷ Be Target [Phys. Rev. Lett. 90 , 022501 (2003)]	029901
L. T. Baby, C. Bordeanu, G. Goldring, M. Hass, L. Weissman, V. N. Fedoseyev, U. Köster, Y. Nir-El, G. Haquin, H. W. Gäggeler, and R. Weinreich (the ISOLDE Collaboration)	