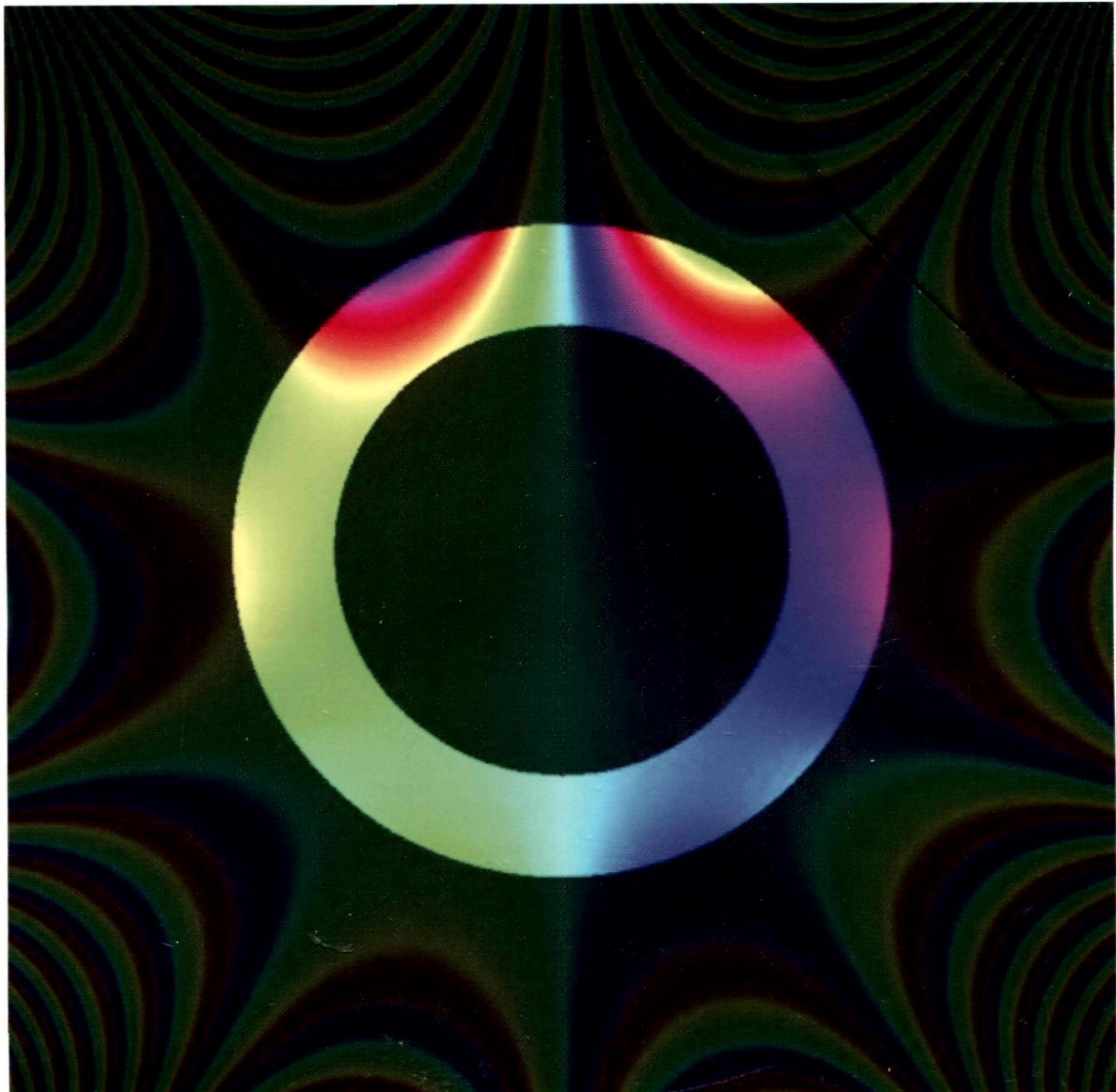


PHYSICAL REVIEW LETTERS™

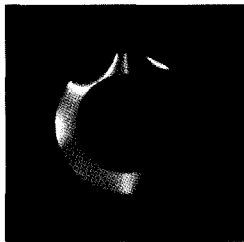
Articles published week ending 9 AUGUST 2013



Published by
American Physical Society™

APS
physics™

Volume 111, Number 6



Simulation of an annular objective aperture placed over a wave front distorted by an aberration corrector in a TEM. Manipulation of the electron phase front to form a helical structure creates an electron-vortex beam. Selected for a Synopsis in *Physics* and an Editors' Suggestion. [L. Clark *et al.*, Phys. Rev. Lett. 111, 064801 (2013)]

PHYSICAL REVIEW LETTERS™

Contents

Articles published 3 August–9 August 2013

VOLUME 111, NUMBER 6

9 August 2013

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

- Electromagnetic Duality Symmetry and Helicity Conservation for the Macroscopic Maxwell's Equations 060401
 Ivan Fernandez-Corbaton, Xavier Zambrana-Puyalto, Nora Tischler, Xavier Vidal, Mathieu L. Juan, and Gabriel Molina-Terriza
- Gap Solitons in a Spin-Orbit-Coupled Bose-Einstein Condensate 060402
 Yaroslav V. Kartashov, Vladimir V. Konotop, and Fatkhulla Kh. Abdullaev
- Field Fluctuations in a One-Dimensional Cavity with a Mobile Wall 060403
 Salvatore Butera and Roberto Passante
- Probing Nonperturbative QED with Optimally Focused Laser Pulses 060404
 A. Gonoskov, I. Gonoskov, C. Harvey, A. Ilderton, A. Kim, M. Marklund, G. Mourou, and A. Sergeev
- Coupling Spin Qubits via Superconductors 060501
 Martin Leijnse and Karsten Flensberg
- Classification of Multipartite Entanglement of All Finite Dimensionality 060502
 Gilad Gour and Nolan R. Wallach
- Monte Carlo Adaptive Resolution Simulation of Multicomponent Molecular Liquids 060601
 Raffaello Potestio, Pep Español, Rafael Delgado-Buscalioni, Ralf Everaers, Kurt Kremer, and Davide Donadio
- New Limits on Variation of the Fine-Structure Constant Using Atomic Dysprosium 060801
 N. Leefer, C.T. Weber, A. Cingöz, J.R. Torgerson, and D. Budker
- Adiabatic Quantum Motors 060802
 Raúl Bustos-Marún, Gil Refael, and Felix von Oppen
- Determination of the Boltzmann Constant by Means of Precision Measurements of H₂¹⁸O Line Shapes at 1.39 μm 060803
 L. Moretti, A. Castrillo, E. Fasci, M.D. De Vizia, G. Casa, G. Galzerano, A. Merlone, P. Laporta, and L. Gianfrani

Gravitation and Astrophysics

- Establishing a Relation between the Mass and the Spin of Stellar-Mass Black Holes 061101
 Indrani Banerjee and Banibrata Mukhopadhyay
- First Results from the CARIBU Facility: Mass Measurements on the *r*-Process Path 061102
 J. Van Schelt, D. Lascar, G. Savard, J. A. Clark, P. F. Bertone, S. Caldwell, A. Chaudhuri, A. F. Levand, G. Li, G. E. Morgan, R. Orford, R. E. Segel, K. S. Sharma, and M. G. Sternberg
- Extending the Range of the Inductionless Magnetorotational Instability 061103
 Oleg N. Kirillov and Frank Stefani
- Solution of the α-Potential Mystery in the γ Process and Its Impact on the Nd/Sm Ratio in Meteorites 061104
 Thomas Rauscher
- Electromagnetic and Gravitational Outputs from Binary-Neutron-Star Coalescence 061105
 Carlos Palenzuela, Luis Lehner, Marcelo Ponce, Steven L. Liebling, Matthew Anderson, David Neilsen, and Patrick Motl

(Continued Inside)



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).



Contents (Continued)

Highly Eccentric Kozai Mechanism and Gravitational-Wave Observation for Neutron-Star Binaries	061106
Naoki Seto	
Massive Gravity Coupled to Galileons is Ghost-Free	061107
Melinda Andrews, Garrett Goon, Kurt Hinterbichler, James Stokes, and Mark Trodden	
Origin of Cosmic Magnetic Fields	061301
Leonardo Campanelli	
Elementary Particles and Fields	
Spontaneous Breaking of Flavor Symmetry Avoids the Strong <i>CP</i> Problem	061601
Chee Sheng Fong and Enrico Nardi	
Probing Dark Matter at the LHC Using Vector Boson Fusion Processes	061801
Andres G. Delannoy, Bhaskar Dutta, Alfredo Gurrola, Will Johns, Teruki Kamon, Eduardo Luiggi, Andrew Melo, Paul Sheldon, Kuver Sinha, Kechen Wang, and Sean Wu	
Higgs Seesaw Mechanism as a Source for Dark Energy	061802
Lawrence M. Krauss and James B. Dent	
Physics Performance of a Low-Luminosity Low Energy Neutrino Factory	061803
E. Christensen, P. Coloma, and P. Huber	
Use of $B \rightarrow J/\psi f_0$ Decays to Discern the $q\bar{q}$ or Tetraquark Nature of Scalar Mesons	062001
Sheldon Stone and Liming Zhang	
Precision Measurement of Charged Pion and Kaon Differential Cross Sections in e^+e^- Annihilation at $\sqrt{s} = 10.52$ GeV	062002
M. Leitgab <i>et al.</i> (Belle Collaboration)	
Bottom-Quark Forward-Backward Asymmetry in the Standard Model and Beyond	062003
Benjamín Grinstein and Christopher W. Murphy	
Accurate Test of Chiral Dynamics in the $\bar{\gamma}p \rightarrow \pi^0 p$ Reaction	062004
D. Hornidge <i>et al.</i> (A2 and CB-TAPS Collaborations)	
Freeze-Out Parameters: Lattice Meets Experiment	062005
S. Borsányi, Z. Fodor, S.D. Katz, S. Krieg, C. Ratti, and K.K. Szabó	
Evidence from Lattice Data for a New Particle on the Worldsheet of the QCD Flux Tube	062006
Sergei Dubovsky, Raphael Flauger, and Victor Gorbenko	
Nuclear Physics	
Medium Modification of γ Jets in High-Energy Heavy-Ion Collisions	062301
Xin-Nian Wang and Yan Zhu	
Isotopic Chains Around Oxygen from Evolved Chiral Two- and Three-Nucleon Interactions	062501
A. Cipollone, C. Barbieri, and P. Navrátil	
Electromagnetic Transition from the 4^+ to 2^+ Resonance in ^8Be Measured via the Radiative Capture in $^4\text{He} + ^4\text{He}$	062502
V.M. Datar, D.R. Chakrabarty, Suresh Kumar, V. Nanal, S. Pastore, R.B. Wiringa, S.P. Behera, A. Chatterjee, D. Jenkins, C.J. Lister, E.T. Mirgule, A. Mitra, R.G. Pillay, K. Ramachandran, O.J. Roberts, P.C. Rout, A. Shrivastava, and P. Sugathan	
Atomic, Molecular, and Optical Physics	
Atom-Based Vector Microwave Electrometry Using Rubidium Rydberg Atoms in a Vapor Cell	063001
J.A. Sedlacek, A. Schwettmann, H. Kübler, and J.P. Shaffer	
Slow Thermalization between a Lattice and Free Bose Gas	063002
David C. McKay, Carolyn Meldgin, David Chen, and Brian DeMarco	
Quantum Superposition of Target and Product States in Reactive Electron Scattering from CF_4 Revealed through Velocity Slice Imaging	063201
Frímarr H. Ómarsson, Ewelina Szymanska, Nigel J. Mason, E. Krishnakumar, and Oddur Ingólfsson	
Single-Photon Transistor in Circuit Quantum Electrodynamics	063601
Lukas Neumeier, Martin Leib, and Michael J. Hartmann	

(Continued on Preceding Page)



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Contents (Continued)

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

	Filtering Random Matrices: The Effect of Incomplete Channel Control in Multiple Scattering	063901
	A. Goetschy and A.D. Stone	
☞	Nonequilibrium Chaos of Disordered Nonlinear Waves	064101
	Ch. Skokos, I. Gkolias, and S. Flach	
	Flow-Induced Draping	064301
	Lionel Schouveiler and Christophe Eloy	
	Spatial Fluctuations of Fluid Velocities in Flow through a Three-Dimensional Porous Medium	064501
	Sujit S. Datta, H. Chiang, T.S. Ramakrishnan, and David A. Weitz	

Plasma and Beam Physics

☞	Exploiting Lens Aberrations to Create Electron-Vortex Beams	064801
	L. Clark, A. Béché, G. Guzzinati, A. Lubk, M. Mazilu, R. Van Boxem, and J. Verbeeck	
☞	Magnetic Field Blocks Two-Dimensional Crystallization in Strongly Coupled Plasmas	065001
	T. Ott, H. Löwen, and M. Bonitz	
	Generating “Superponderomotive” Electrons due to a Non-Wake-Field Interaction between a Laser Pulse and a Longitudinal Electric Field	065002
	A.P. Robinson, A.V. Arefiev, and D. Neely	
	Measurement of High-Pressure Shock Waves in Cryogenic Deuterium-Tritium Ice Layered Capsule Implosions on NIF	065003
	H.F. Robey, J.D. Moody, P.M. Celliers, J.S. Ross, J. Ralph, S. Le Pape, L. Berzak Hopkins, T. Parham, J. Sater, E. R. Mapoles, D.M. Holunga, C.F. Walters, B.J. Haid, B.J. Koziowski, R.J. Dylla-Spears, K.G. Krauter, G. Frieders, G. Ross, M.W. Bowers, D.J. Strozzi, B.E. Yoxall, A.V. Hamza, B. Dzenitis, S.D. Bhandarkar, B. Young, B.M. Van Wenterghem, L.J. Atherton, O.L. Landen, M.J. Edwards, and T.R. Boehly	

Condensed Matter: Structure, etc.

	Solid Iron Compressed Up to 560 GPa	065501
	Y. Ping, F. Coppari, D.G. Hicks, B. Yaakobi, D.E. Fratanduono, S. Hamel, J.H. Eggert, J.R. Rygg, R.F. Smith, D.C. Swift, D.G. Braun, T.R. Boehly, and G.W. Collins	
	Thermodynamic Equilibrium Conditions of Graphene Films on SiC	065502
	Lydia Nemeč, Volker Blum, Patrick Rinke, and Matthias Scheffler	
	Counting Dislocations in Microcrystals by Coherent X-Ray Diffraction	065503
	V.L. Jacques, D. Carbone, R. Ghisleni, and L. Thilly	
	Enhanced Sputtering Yields from Single-Ion Impacts on Gold Nanorods	065504
	G. Greaves, J.A. Hinks, P. Busby, N.J. Mellors, A. Ilinov, A. Kuronen, K. Nordlund, and S.E. Donnelly	
	Hydrogenation and Disorder in Engineered Black TiO ₂	065505
	Lei Liu, Peter Y. Yu, Xiaobo Chen, Samuel S. Mao, and D.Z. Shen	
	Direct Detection of Electron Backscatter Diffraction Patterns	065506
	Angus J. Wilkinson, Grigore Moldovan, T. Benjamin Britton, Angus Bewick, Robert Clough, and Angus I. Kirkland	
	Estimate of the Maximum Strength of Metallic Glasses from Finite Deformation Theory	065507
	Hao Wang and Mo Li	
	Bulk and Surface Tunneling Hydrogen Defects in Alumina	065901
	Aaron M. Holder, Kevin D. Osborn, C.J. Lobb, and Charles B. Musgrave	
	Elastic Signature of Flow Events in Supercooled Liquids Under Shear	066001
	Joyjit Chattoraj and Anaël Lemaître	
	Stick-Slip Sliding of Water Drops on Chemically Heterogeneous Surfaces	066101
	S. Varagnolo, D. Ferraro, P. Fantinel, M. Pierno, G. Mistura, G. Amati, L. Biferale, and M. Sbragaglia	
	Finite-Temperature Hydrogen Adsorption and Desorption Thermodynamics Driven by Soft Vibration Modes	066102
	Sung-Jae Woo, Eui-Sup Lee, Mina Yoon, and Yong-Hyun Kim	
	Bonding and Structure of Ceramic-Ceramic Interfaces	066103
	Kohei Shimamura, Fuyuki Shimojo, Rajiv K. Kalia, Aiichiro Nakano, and Priya Vashishta	

(Continued on Preceding Page)



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Condensed Matter: Electronic Properties, etc.	
Dimersized Solids and Resonating Plaquette Order in $SU(N)$ -Dirac Fermions	066401
Thomas C. Lang, Zi Yang Meng, Alejandro Muramatsu, Stefan Wessel, and Fakher F. Assaad	
Angular-Momentum-Dependent Orbital-Free Density Functional Theory	066402
Youqi Ke, Florian Libisch, Junchao Xia, Lin-Wang Wang, and Emily A. Carter	
Multifractality at Anderson Transitions with Coulomb Interaction	066601
I. S. Burmistrov, I. V. Gornyi, and A. D. Mirlin	
 Inverse Spin Hall Effect in a Ferromagnetic Metal	066602
B. F. Miao, S. Y. Huang, D. Qu, and C. L. Chien	
Spin-Orbital Texture in Topological Insulators	066801
Haijun Zhang, Chao-Xing Liu, and Shou-Cheng Zhang	
Pauli Spin Blockade and the Ultrasmall Magnetic Field Effect	066802
Jeroen Danon, Xuhui Wang, and Aurélien Manchon	
Chiral Tunneling in a Twisted Graphene Bilayer	066803
Wen-Yu He, Zhao-Dong Chu, and Lin He	
$d + id'$ Chiral Superconductivity in Bilayer Silicene	066804
Feng Liu, Cheng-Cheng Liu, Kehui Wu, Fan Yang, and Yugui Yao	
Realization of Artificial Ice Systems for Magnetic Vortices in a Superconducting MoGe Thin Film with Patterned Nanostructures	067001
M. L. Latimer, G. R. Berdiyrov, Z. L. Xiao, F. M. Peeters, and W. K. Kwok	
Waiting Time Distributions for the Transport through a Quantum-Dot Tunnel Coupled to One Normal and One Superconducting Lead	067002
Leila Rajabi, Christina Pörtl, and Michele Governale	
Microwave Spectroscopy Evidence of Superconducting Pairing in the Magnetic-Field-Induced Metallic State of InO_x Films at Zero Temperature	067003
Wei Liu, LiDong Pan, Jiajia Wen, Minsoo Kim, G. Sambandamurthy, and N. P. Armitage	
 Nonequilibrium Spin Noise Spectroscopy	067201
Fuxiang Li, Yuriy V. Pershin, Valeriy A. Slipko, and N. A. Sinitsyn	
Reversal Mechanism of an Individual Ni Nanotube Simultaneously Studied by Torque and SQUID Magnetometry	067202
A. Buchter, J. Nagel, D. Ruffer, F. Xue, D. P. Weber, O. F. Kieler, T. Weimann, J. Kohlmann, A. B. Zorin, E. Russo-Averchi, R. Huber, P. Berberich, A. Fontcuberta i Morral, M. Kemmler, R. Kleiner, D. Koelle, D. Grundler, and M. Poggio	
Dynamics of an Insulating Skyrmion under a Temperature Gradient	067203
Lingyao Kong and Jiadong Zang	
Spin Pseudogap in Ni-Doped SrCuO_2	067204
G. Simutis, S. Gvasaliya, M. Månsson, A. L. Chernyshev, A. Mohan, S. Singh, C. Hess, A. T. Savici, A. I. Kolesnikov, A. Piovano, T. Perring, I. Zaliznyak, B. Büchner, and A. Zheludev	
 Terahertz-Induced Optical Emission of Photoexcited Undoped GaAs Quantum Wells	067401
K. Shinokita, H. Hirori, K. Tanaka, T. Mochizuki, C. Kim, H. Akiyama, L. N. Pfeiffer, and K. W. West	
Dependence of the Minority-Carrier Lifetime on the Stoichiometry of CdTe Using Time-Resolved Photoluminescence and First-Principles Calculations	067402
Jie Ma, Darius Kuciauskas, David Albin, Raghu Bhattacharya, Matthew Reese, Teresa Barnes, Jian V. Li, Timothy Gessert, and Su-Huai Wei	
Auger Processes Mediating the Nonresonant Optical Emission from a Semiconductor Quantum Dot Embedded Inside an Optical Cavity	067403
Mikkel Settnes, Per Kaer, Anders Moelbjerg, and Jesper Mork	
Detecting and Polarizing Nuclear Spins with Double Resonance on a Single Electron Spin	067601
P. London, J. Scheuer, J.-M. Cai, I. Schwarz, A. Retzker, M. B. Plenio, M. Katagiri, T. Teraji, S. Koizumi, J. Isoya, R. Fischer, L. P. McGuinness, B. Naydenov, and F. Jelezko	
Nanoscale Photoelectron Mapping and Spectroscopy with an Atomic Force Microscope	067602
Ping Yu and Jürgen Kirschner	

(Continued on Preceding Page)





Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Contents (Continued)

Soft Matter, Biological, and Interdisciplinary Physics

	Flexoelectrically Driven Electroclinic Effect in the Twist-Bend Nematic Phase of Achiral Molecules with Bent Shapes	067801
	C. Meyer, G.R. Luckhurst, and I. Dozov	
	Locomotion of Helical Bodies in Viscoelastic Fluids: Enhanced Swimming at Large Helical Amplitudes	068101
	Saverio E. Spagnolie, Bin Liu, and Thomas R. Powers	
	Origin of Rigidity in Dry Granular Solids	068301
	Sumantra Sarkar, Dapeng Bi, Jie Zhang, R.P. Behringer, and Bulbul Chakraborty	
	Strain Hardening in Startup Shear of Long-Chain Branched Polymer Solutions	068302
	Gengxin Liu, Shiwang Cheng, Hyojoon Lee, Hongwei Ma, Hongde Xu, Taihyun Chang, Roderic P. Quirk, and Shi-Qing Wang	
	Anomalous Surface Relaxations of Branched-Polymer Melts	068303
	Shih-fan Wang, Sewoo Yang, Jaesik Lee, Bulent Akgun, David T. Wu, and Mark D. Foster	
	Nature of the Epidemic Threshold for the Susceptible-Infected-Susceptible Dynamics in Networks	068701
	Marian Boguñá, Claudio Castellano, and Romualdo Pastor-Satorras	

Errata

	Publisher's Note: Efficient Atomic-Scale Kinetics through a Complex Heterophase Interface [Phys. Rev. Lett. 111 , 046102 (2013)]	069901
	Laure Bourgeois, Nikhil V. Medhekar, Andrew E. Smith, Matthew Weyland, Jian-Feng Nie, and Christian Dwyer	



Selected for a Viewpoint in *Physics*. Please visit <http://physics.aps.org/>.

By suggesting a few manuscripts each week, we hope to promote reading across fields. Please see our Announcement Phys. Rev. Lett. 98, 010001 (2007).

Physics
spotlighting exceptional research

The American Physical Society's free online publication, *Physics* (<http://physics.aps.org/>), provides thought-provoking analysis and spotlights exceptional research.