

Scanning electron microscope images of semiconductor quantum dots. Inelastic light scattering is used to uncover the spin behavior in dots with few electrons. See article 266806.

PHYSICAL REVIEW LETTERS

Contents

Articles published 17 December–31 December 2005

VOLUME 95, NUMBER 26 31 December 2005

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

Cold Atom Dynamics in a Quantum Optical Lattice Potential 260401
Christoph Maschler and Helmut Ritsch
Superfluid Fermi Gas in a 1D Optical Lattice 260402
G. Orso and G. V. Shlyapnikov
Direct Observation of Sub-Poissonian Number Statistics in a Degenerate Bose Gas 260403
C.-S. Chuu, F. Schreck, T. P. Meyrath, J. L. Hanssen, G. N. Price, and M. G. Raizen
Superfluid-Insulator Transition in a Periodically Driven Optical Lattice 260404
André Eckardt, Christoph Weiss, and Martin Holthaus
Thermodynamics of Interacting Fermions in Atomic Traps 260405
Qijin Chen, Jelena Stajic, and K. Levin
Population of Closed-Channel Molecules in Trapped Fermi Gases with Broad Feshbach Resonances 260406
Qijin Chen and K. Levin
Dressed Feshbach Molecules in the BEC-BCS Crossover 260407
M. W. Romans and H. T. Stoof
Generation of Hyperentangled Photon Pairs 260501
Julio T. Barreiro, Nathan K. Langford, Nicholas A. Peters, and Paul G. Kwiat
Concurrence of Mixed Multipartite Quantum States 260502
Florian Mintert, Marek Kuś, and Andreas Buchleitner
Capacities of Quantum Channels for Massive Bosons and Fermions 260503
Aditi Sen(De), Ujjwal Sen, Bartosz Gromek, Dagmar Bruß, and Maciej Lewenstein
First-Passage Times for Random Walks in Bounded Domains 260601
S. Condamin, O. Bénichou, and M. Moreau
Logarithmic Conformal Field Theory and Boundary Effects in the Dimer Model 260602
N. Sh. Izmailian, V. B. Priezzhev, Philippe Ruelle, and Chin-Kun Hu
Optimal Target Search on a Fast-Folding Polymer Chain with Volume Exchange 260603
Michael A. Lomholt, Tobias Ambjörnsson, and Ralf Metzler
Entanglement and Criticality in Translationally Invariant Harmonic Lattice Systems with Finite-Range Interactions 260604
R. G. Unanyan and M. Fleischhauer
Consistent Lattice Boltzmann Method 260605
Santosh Ansumali and Iliya V. Karlin

Gravitation and Astrophysics

Radio-Quiet Neutron Star 1E 1207.4-5209: A Possible Strong Gravitational-Wave Source 261101
Biping Gong
The Gravity Lagrangian According to Solar System Experiments 261102
Gonzalo J. Olmo

(Continued on Third Cover)

Copyright 2005 by The American Physical Society

0031-9007(20051231)95:26*1;1-0

Constraints on Changes in Fundamental Constants from a Cosmologically Distant OH Absorber or Emitter 261301
N. Kanekar, C. L. Carilli, G. I. Langston, G. Rocha, F. Combes, R. Subrahmanyan, J. T. Stocke, K. M. Menten, F. H. Briggs, and T. Wiklind
511 keV Photons from Superconducting Cosmic Strings 261302
Francesc Ferrer and Tanmay Vachaspati
Measuring the Geometry of the Universe in the Presence of Isocurvature Modes 261303
J. Dunkley, M. Bucher, P. G. Ferreira, K. Moodley, and C. Skordis

Elementary Particles and Fields
Randall-Sundrum Brane Model with 7D Anti–de Sitter Space 261601
Ruoyu Bao and Joseph Lykken
QCD and a Holographic Model of Hadrons 261602
Joshua Erlich, Emanuel Katz, Dam T. Son, and Mikhail A. Stephanov
Black Holes in Many Dimensions at the CERN Large Hadron Collider: Testing Critical String Theory 261603
JoAnne L. Hewett, Ben Lillie, and Thomas G. Rizzo
Evidence for $B_s^{(*)}\overline{B}_s^{(*)}$ Production at the $\Upsilon(5S)$ Resonance 261801
M. Artuso *et al.* (CLEO Collaboration)
QCD Corrections to Static Heavy-Quark Form Factors 261802
W. Bernreuther, R. Bonciani, T. Gehrmann, R. Heinesch, T. Leineweber, P. Mastrolia, and E. Remiddi
Precision Measurements of the Timelike Electromagnetic Form Factors of Pion, Kaon, and Proton 261803
T. K. Pedlar *et al.* (CLEO Collaboration)
Radiative Seesaw Mechanism and Degenerate Neutrinos 261804
Borut Bajc and Goran Senjanović
Rare Decay $K^+ \to \pi^+ \nu\overline{\nu}$ at the Next-to-Next-to-Leading Order in QCD 261805
Andrzej J. Buras, Martin Gorbahn, Ulrich Haisch, and Ulrich Nierste
Observation of a Resonance $X(1835)$ in $J/\psi \to \gamma\pi^+\pi^-\eta'$ 262001
M. Ablikim *et al.* (BES Collaboration)

Nuclear Physics
Variational Approach to Configuration Interaction 262501
R. R. Chasman

Atomic, Molecular, and Optical Physics
Localized Excitations at the Mott Insulator-Superfluid Interfaces for Confined Bose-Einstein Condensates 263001
Eros Mariani and Ady Stern
Experimental Study of Photodetachment in a Strong Laser Field of Circular Polarization 263002
Boris Bergues, Yongfeng Ni, Hanspeter Helm, and Igor Yu. Kiyan
High-Resolution Dissociative Recombination of Cold H_3^+ and First Evidence for Nuclear Spin Effects 263201
H. Kreckel, M. Motsch, J. Mikosch, J. Glosík, R. Plašil, S. Altevogt, V. Andrianarijaona, H. Buhr, J. Hoffmann, L. Lammich, M. Lestinsky, I. Nevo, S. Novotny, D. A. Orlov, H. B. Pedersen, F. Sprenger, A. S. Terekhov, J. Toker, R. Wester, D. Gerlich, D. Schwalm, A. Wolf, and D. Zajfman
Simple Three-Parameter Model Potential for Diatomic Systems: From Weakly and Strongly Bound Molecules to Metastable Molecular Ions 263202
Rui-Hua Xie and Jiangbin Gong
Extreme Sensitivity of Differential Momentum Transfer Cross Sections to Target Atom Initial Conditions 263203
R. E. Olson and J. Fiol
Strong Oscillations in Molecular Valence Photoemission Intensities 263401
Piero Decleva, Giovanna Fronzoni, Mauro Stener, Monica de Simone, Marcello Coreno, Jennifer C. Green, Nilay Hazari, and Oksana Plekan
Ericson Fluctuations in an Open Deterministic Quantum System: Theory Meets Experiment 263601
Javier Madroñero and Andreas Buchleitner

(Continued on Preceding Page)

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Condensation of Classical Nonlinear Waves 263901
Colm Connaughton, Christophe Josserand, Antonio Picozzi, Yves Pomeau, and Sergio Rica

Theory of Surface Plasmon Generation at Nanoslit Apertures 263902
P. Lalanne, J. P. Hugonin, and J. C. Rodier

Controlled Switching of Intrinsic Localized Modes in a One-Dimensional Antiferromagnet 264101
J. P. Wrubel, M. Sato, and A. J. Sievers

Electron Climbing a ''Devil's Staircase'' in Wave-Particle Interaction 264102
Alessandro Macor, Fabrice Doveil, and Yves Elskens

A Generic Mechanism of Sliding Friction between Charged Soft Surfaces 264301
S. Herminghaus

Renormalized Waves and Discrete Breathers in β-Fermi-Pasta-Ulam Chains 264302
Boris Gershgorin, Yuri V. Lvov, and David Cai

Regimes of Terminal Motion of Sliding Spinning Disks 264303
P. D. Weidman and C. P. Malhotra

Chemical Transients in Closed Chaotic Flows: The Role of Effective Dimensions 264501
György Károlyi and Tamás Tél

Effective Dissipation and Turbulence in Spectrally Truncated Euler Flows 264502
Cyril Cichowlas, Pauline Bonaïti, Fabrice Debbasch, and Marc Brachet

Imprint of Large-Scale Flows on Turbulence 264503
A. Alexakis, P. D. Mininni, and A. Pouquet

Preventing Transition to Turbulence: A Viscosity Stratification Does Not Always Help 264504
Vijayakumar Chikkadi, A. Sameen, and Rama Govindarajan

Plasma and Beam Physics

Observation of Self-Similar Behavior of the 3D, Nonlinear Rayleigh-Taylor Instability 265001
O. Sadot, V. A. Smalyuk, J. A. Delettrez, D. D. Meyerhofer, T. C. Sangster, R. Betti, V. N. Goncharov, and D. Shvarts

Self-Sustained Oscillations in a Plasma-Wall System with Strongly Inhomogeneous Diffusion of Charged Particles 265002
M. Z. Tokar

Double-Gap Alfvén Eigenmodes: Revisiting Eigenmode Interaction with the Alfvén Continuum 265003
N. N. Gorelenkov

Weak Compressible Magnetohydrodynamic Turbulence in the Solar Corona 265004
Benjamin D. Chandran

Condensed Matter: Structure, etc.

Observation of a New Type of Electron Bubble in Superfluid Helium 265301
Ambarish Ghosh and Humphrey J. Maris

Crystalline Ground States for Classical Particles 265501
András Sütő

Structure, Stability, and Quantum Conductivity of Small Diameter Silicon Nanowires 265502
Inna Ponomareva, Madhu Menon, Deepak Srivastava, and Antonis N. Andriotis

Dynamical Heterogeneity Close to the Jamming Transition in a Sheared Granular Material 265701
O. Dauchot, G. Marty, and G. Biroli

Controlling the Thermal Stability of Thin Films by Interfacial Engineering 266101
D. A. Ricci, T. Miller, and T.-C. Chiang

Stabilizing CO on Au with NO_2: Electronegative Species as Promoters on Coinage Metals? 266102
Tianfu Zhang, Zhi-Pan Liu, S. M. Driver, S. J. Pratt, S. J. Jenkins, and D. A. King

Stress Relaxation in a Perfect Nanocrystal by Coherent Ejection of Lattice Layers 266103
Abhishek Chaudhuri, Surajit Sengupta, and Madan Rao

Hydrogen Induced Metallicity on the ZnO$(10\bar{1}0)$ Surface 266104
Y. Wang, B. Meyer, X. Yin, M. Kunat, D. Langenberg, F. Traeger, A. Birkner, and Ch. Wöll

(Continued on Preceding Page)

Surface and Interface Studies of GaN Epitaxy on Si(111) via ZrB_2 Buffer Layers 266105
Yukiko Yamada-Takamura, Z. T. Wang, Y. Fujikawa, T. Sakurai, Q. K. Xue, J. Tolle, P.-L. Liu, A. V. Chizmeshya, J. Kouvetakis, and I. S. Tsong

Condensed Matter: Electronic Properties, etc.

Coherent Control and Polarization Readout of Individual Excitonic States 266401
B. Patton, U. Woggon, and W. Langbein
Observation of Charge Density Wave Solitons in Overlapping Tunnel Junctions 266402
Yu. I. Latyshev, P. Monceau, S. Brazovskii, A. P. Orlov, and T. Fournier
Interfaces of Correlated Electron Systems: Proposed Mechanism for Colossal Electroresistance 266403
Takashi Oka and Naoto Nagaosa
Competing Orders in One-Dimensional Spin-3/2 Fermionic Systems 266404
Congjun Wu
Incompressible Quantum Liquids and New Conservation Laws 266405
Alexander Seidel, Henry Fu, Dung-Hai Lee, Jon Magne Leinaas, and Joel Moore
Anderson Localization in Carbon Nanotubes: Defect Density and Temperature Effects 266801
Blanca Biel, F. J. García-Vidal, Angel Rubio, and Fernando Flores
Helicity and Electron-Correlation Effects on Transport Properties of Double-Walled Carbon Nanotubes 266802
Shidong Wang and Milena Grifoni
Nonlinear Transport and Heat Dissipation in Metallic Carbon Nanotubes 266803
Marcelo A. Kuroda, Andreas Cangellaris, and Jean-Pierre Leburton
Interlayer Transport in Bilayer Quantum Hall Systems 266804
Enrico Rossi, Alvaro S. Núñez, and A. H. MacDonald
Experimental Test of the Numerical Renormalization-Group Theory for Inelastic Scattering from Magnetic Impurities 266805
Christopher Bäuerle, François Mallet, Félicien Schopfer, Dominique Mailly, Georg Eska, and Laurent Saminadayar
Evidence of Correlation in Spin Excitations of Few-Electron Quantum Dots 266806
César Pascual García, Vittorio Pellegrini, Aron Pinczuk, Massimo Rontani, Guido Goldoni, Elisa Molinari, Brian S. Dennis, Loren N. Pfeiffer, and Ken W. West
How Do Electronic Carriers Cross Si-Bound Alkyl Monolayers? 266807
Adi Salomon, Till Boecking, Calvin K. Chan, Fabrice Amy, Olga Girshevitz, David Cahen, and Antoine Kahn
Nonlinear Quantum Critical Transport and the Schwinger Mechanism for a Superfluid-Mott-Insulator Transition of Bosons 267001
A. G. Green and S. L. Sondhi
Inversion of Two-Band Superconductivity at the Critical Electron Doping of $(Mg, Al)B_2$ 267002
L. D. Cooley, A. J. Zambano, A. R. Moodenbaugh, R. F. Klie, Jin-Cheng Zheng, and Yimei Zhu
Quantum Statistics of Interacting Dimer Spin Systems 267201
Ch. Rüegg, B. Normand, M. Matsumoto, Ch. Niedermayer, A. Furrer, K. W. Krämer, H.-U. Güdel, Ph. Bourges, Y. Sidis, and H. Mutka
Self-Contained Kondo Effect in Single Molecules 267202
C. H. Booth, M. D. Walter, M. Daniel, W. W. Lukens, and R. A. Andersen
Temperature Chaos and Bond Chaos in Edwards-Anderson Ising Spin Glasses: Domain-Wall Free-Energy Measurements 267203
M. Sasaki, K. Hukushima, H. Yoshino, and H. Takayama
Randomly Diluted e_g Orbital-Ordered Systems 267204
T. Tanaka, M. Matsumoto, and S. Ishihara
Orbital Polarization in Itinerant Magnets 267205
I. V. Solovyev
Theory of Magnetodynamics Induced by Spin Torque in Perpendicularly Magnetized Thin Films 267206
M. A. Hoefer, M. J. Ablowitz, B. Ilan, M. R. Pufall, and T. J. Silva
Unifying Ultrafast Magnetization Dynamics 267207
B. Koopmans, J. J. Ruigrok, F. Dalla Longa, and W. J. de Jonge

(Continued on Preceding Page)

Significance of the Hyperfine Interactions in the Phase Diagram of $LiHo_xY_{1-x}F_4$ 267208
M. Schechter and P. C. Stamp
Direct Observation of Condon Domains in Silver by Hall Probes 267209
R. B. Kramer, V. S. Egorov, V. A. Gasparov, A. G. Jansen, and W. Joss
Phase Separation in Jahn-Teller Systems with Localized and Itinerant Electrons 267210
K. I. Kugel, A. L. Rakhmanov, and A. O. Sboychakov
Coherent Light Generation from a Nd:SBN Nonlinear Laser Crystal through its Ferroelectric Phase Transition 267401
M. O. Ramírez, D. Jaque, L. E. Bausá, J. García Solé, and A. A. Kaminskii
Femtosecond Dynamics in Ferromagnetic Metals Investigated with Soft X-Ray Resonant Emission 267402
L. Braicovich, G. Ghiringhelli, A. Tagliaferri, G. van der Laan, E. Annese, and N. B. Brookes
Structural Aspects of Metamagnetism in $Ca_{2-x}Sr_xRuO_4$: Evidence for Field Tuning of Orbital Occupation 267403
M. Kriener, P. Steffens, J. Baier, O. Schumann, T. Zabel, T. Lorenz, O. Friedt, R. Müller, A. Gukasov, P. G. Radaelli, P. Reutler, A. Revcolevschi, S. Nakatsuji, Y. Maeno, and M. Braden
Coupled Charge-Spin Dynamics of the Magnetoresistive Pyrochlore $Tl_2Mn_2O_7$ Probed Using Ultrafast Midinfrared Spectroscopy 267404
R. P. Prasankumar, H. Okamura, H. Imai, Y. Shimakawa, Y. Kubo, S. A. Trugman, A. J. Taylor, and R. D. Averitt
Surface Plasmon Characteristics of Tunable Photoluminescence in Single Gold Nanorods 267405
A. Bouhelier, R. Bachelot, G. Lerondel, S. Kostcheev, P. Royer, and G. P. Wiederrecht
Detection of Acoustic Oscillations of Single Gold Nanospheres by Time-Resolved Interferometry 267406
Meindert A. van Dijk, Markus Lippitz, and Michel Orrit
Subwavelength Optical Imaging through a Metallic Nanorod Array 267407
Atsushi Ono, Jun-ichi Kato, and Satoshi Kawata

Soft Matter, Biological, and Interdisciplinary Physics

Temperature-Induced Density Anomaly in Te-Rich Liquid Germanium Tellurides: p versus sp^3 Bonding? 267801
Christophe Bichara, Mark Johnson, and Jean Yves Raty
Effect of Rare Events on Out-of-Equilibrium Relaxation 268001
Philippe Ribière, Patrick Richard, Renaud Delannay, Daniel Bideau, Masahiro Toiya, and Wolfgang Losert
Compression and Free Expansion of Single DNA Molecules in Nanochannels 268101
Christian Hermann Reccius, John Thomas Mannion, Joshua David Cross, and H. G. Craighead
Active Diffusion of Motor Particles 268102
Stefan Klumpp and Reinhard Lipowsky
Tailoring the Flow of Soft Glasses by Soft Additives 268301
E. Zaccarelli, C. Mayer, A. Asteriadi, C. N. Likos, F. Sciortino, J. Roovers, H. Iatrou, N. Hadjichristidis, P. Tartaglia, H. Löwen, and D. Vlassopoulos
Dilatant Flow of Concentrated Suspensions of Rough Particles 268302
Didier Lootens, Henri van Damme, Yacine Hémar, and Pascal Hébraud
Persistence Length Changes Dramatically as RNA Folds 268303
G. Caliskan, C. Hyeon, U. Perez-Salas, R. M. Briber, S. A. Woodson, and D. Thirumalai
Origin of Self-Reversed Thermoremanent Magnetization 268501
Richard J. Harrison, Takeshi Kasama, Thomas A. White, Edward T. Simpson, and Rafal E. Dunin-Borkowski

Comments

Comment on "Cross-Scale Nonlinear Coupling and Plasma Energization by Alfvén Waves" 269501
P. K. Shukla and L. Stenflo
Voitenko and Goossens Reply 269502
Y. Voitenko and M. Goossens
Comment on "Hard-Sphere-Like Dynamics in a Non-Hard-Sphere Liquid" 269601
F. J. Bermejo, I. Bustinduy, C. Cabrillo, S. J. Levett, and J. W. Taylor
Scopigno *et al.* Reply 269602
T. Scopigno, R. Di Leonardo, L. Comez, A. Q. Baron, D. Fioretto, G. Ruocco, and W. Montfrooij
Comment on "Domain Structure in a Superconducting Ferromagnet" 269701
E. B. Sonin

(Continued on Preceding Page)

Fauré and Buzdin Reply 269702
M. Fauré and A. Buzdin
Comment on "Fluctuation-Driven First-Order Transition in Pauli-Limited d-Wave Superconductors" 269703
Ryusuke Ikeda and Hiroto Adachi
Dalidovich and Yang Reply 269704
D. Dalidovich and Kun Yang

Errata

Erratum: Critical Current of $YBa_2Cu_3O_{7-\delta}$ Low-Angle Grain Boundaries [Phys. Rev. Lett. **90**, 247006 (2003)] 269901
J. H. Durrell, M. J. Hogg, F. Kahlmann, Z. H. Barber, M. G. Blamire, and J. E. Evetts
Publisher's Note: Magnetic Scattering of Spin Polarized Carriers in (In, Mn)Sb Dilute Magnetic Semiconductor [Phys. Rev. Lett. **95**, 227203 (2005)] 269902
M. Csontos, T. Wojtowicz, X. Liu, M. Dobrowolska, B. Jankó, J. K. Furdyna, and G. Mihály
Publisher's Note: Magnetic-Field Asymmetry of Nonlinear Transport in Carbon Nanotubes [Phys. Rev. Lett. **95**, 256601 (2005)] 269903
Jiang Wei, Michael Shimogawa, Zenghui Wang, Iuliana Radu, Robert Dormaier, and David Henry Cobden
Publisher's Note: Skyrmions from Instantons inside Domain Walls [Phys. Rev. Lett. **95**, 252003 (2005)] 269904
Minoru Eto, Muneto Nitta, Keisuke Ohashi, and David Tong

Physical Review Focus

Brief explanations of selected papers from this and other APS journals appear regularly at the *Phys. Rev. Focus* web site (http://focus.aps.org). Readers can also sign up for weekly e-mail summaries of *Focus* stories.