

13 February 2015

HIGHLIGHTED ARTICLES

Featured in Physics Editors' Suggestion

Bending of Light in Quantum Gravity

N.E.J. Bjerrum-Bohr, John F. Donoghue, Barry R. Holstein, Ludovic Planté, and Pierre Vanhove

Phys. Rev. Lett. **114**, 061301 (2015) – Published 12 February 2015

Theorists calculate how quantum gravity effects could alter the bending of light induced by massive objects.

Featured in Physics Editors' Suggestion

Postinflationary Higgs Relaxation and the Origin of Matter-Antimatter Asymmetry

Alexander Kusenko, Lauren Pearce, and Louis Yang

Phys. Rev. Lett. **114**, 061302 (2015) – Published 11 February 2015

A new explanation for why matter dominates in our Universe rests on the idea that the Higgs field hasn't been constant in time.

Featured in Physics Editors' Suggestion

Observation of Two New Ξ_{cb} Baryon Resonances

R. Aaij et al. (LHCb Collaboration)

Phys. Rev. Lett. **114**, 062004 (2015) – Published 10 February 2015

Researchers report the detection of two new subatomic particles made of three quarks from each of the possible quark families.

Featured in Physics Editors' Suggestion

Composite-Light-Pulse Technique for High-Precision Atom Interferometry

P. Berg, S. Abend, G. Tackmann, C. Schubert, E. Giese, W.P. Schleich, F.A. Narducci, W. Ertmer, and E.M. Rasel

Phys. Rev. Lett. **114**, 063002 (2015) – Published 9 February 2015

By keeping its atomic components in the same state, a team was able to reduce one typical source of noise in a rotation-measuring device.

Featured in Physics Editors' Suggestion

Laser Filamentation as a New Phase Transition Universality Class

W. Ettoumi, J. Kasparian, and J.-P. Wolf

Phys. Rev. Lett. **114**, 063903 (2015) – Published 13 February 2015

A powerful laser beam separates into many smaller filaments that undergo a phase transition similar to fluid percolating through a porous material.

Featured in Physics Editors' Suggestion

Synthesis of Programmable Reaction-Diffusion Fronts Using DNA Catalyzers

Anton S. Zadorin, Yannick Rondelez, Jean-Christophe Galas, and André Estevez-Torres

Phys. Rev. Lett. **114**, 068301 (2015) – Published 9 February 2015

Strands of DNA can be used to generate waves of chemical reactions with programmable shape and velocity.

Editors' Suggestion

Universality Far from Equilibrium: From Superfluid Bose Gases to Heavy-Ion Collisions

J. Berges, K. Boguslavski, S. Schlichting, and R. Venugopalan

Phys. Rev. Lett. **114**, 061601 (2015) – Published 10 February 2015

A new universality class for many-body systems far from equilibrium is conjectured, providing a link between disparate physical systems ranging from hot plasmas to cold gases.

Editors' Suggestion

Neutral Naturalness from Orbifold Higgs Models

Nathaniel Craig, Simon Knapen, and Pietro Longhi

Phys. Rev. Lett. **114**, 061803 (2015) – Published 13 February 2015

A new class of models, rooted in ideas of extra dimensions of space, is proposed that protect the Higgs mass from large loop corrections.

Editors' Suggestion

Measuring the Transverse Spin Density of Light

Martin Neugebauer, Thomas Bauer, Andrea Aiello, and Peter Banzer

Phys. Rev. Lett. **114**, 063901 (2015) – Published 9 February 2015

Under certain conditions the spin of photons can acquire an unusual transverse component. Using intensity differences in the far-field, the transverse spin density is experimentally measured.

Editors' Suggestion

Classical-to-Quantum Transition with Broadband Four-Wave Mixing

Rafi Z. Vered, Yaakov Shaked, Yelena Ben-Or, Michael Rosenbluh, and Avi Pe'er

Phys. Rev. Lett. **114**, 063902 (2015) – Published 10 February 2015

Experimentalists watch a classical to quantum phase transition by ramping up the number of photons in an optical fiber.

LETTERS

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

Geometry of Quantum Observables and Thermodynamics of Small Systems

Maxim Olshanii

Phys. Rev. Lett. **114**, 060401 (2015) – Published 11 February 2015

Classifying Directional Gaussian Entanglement, Einstein-Podolsky-Rosen Steering, and Discord

Q. Y. He, Q. H. Gong, and M. D. Reid

Phys. Rev. Lett. **114**, 060402 (2015) – Published 12 February 2015

Quantification of Gaussian Quantum Steering

Ioannis Kogias, Antony R. Lee, Sammy Ragy, and Gerardo Adesso

Phys. Rev. Lett. **114**, 060403 (2015) – Published 12 February 2015

Necessary and Sufficient Quantum Information Characterization of Einstein-Podolsky-Rosen Steering

Marco Piani and John Watrous

Phys. Rev. Lett. **114**, 060404 (2015) – Published 12 February 2015

Determinism, Independence, and Objectivity are Incompatible

Radu Ionicioiu, Robert B. Mann, and Daniel R. Terno

Phys. Rev. Lett. **114**, 060405 (2015) – Published 13 February 2015

What Can Quantum Optics Say about Computational Complexity Theory?

Saleh Rahimi-Keshari, Austin P. Lund, and Timothy C. Ralph

Phys. Rev. Lett. **114**, 060501 (2015) – Published 11 February 2015

Hyperuniformity and Phase Separation in Biased Ensembles of Trajectories for Diffusive Systems

Robert L. Jack, Ian R. Thompson, and Peter Sollich

Phys. Rev. Lett. **114**, 060601 (2015) – Published 9 February 2015

Nonequilibrium Quantum Landauer Principle

John Goold, Mauro Paternostro, and Kavan Modi

Phys. Rev. Lett. **114**, 060602 (2015) – Published 9 February 2015

Nonequilibrium Fluctuations for a Single-Particle Analog of Gas in a Soft Wall

Dong Yun Lee, Chulan Kwon, and Hyuk Kyu Pak

Phys. Rev. Lett. **114**, 060603 (2015) – Published 11 February 2015

Gravitation and Astrophysics

Angular Momentum Transport and Particle Acceleration During Magnetorotational Instability in a Kinetic Accretion Disk

Masahiro Hoshino

Phys. Rev. Lett. **114**, 061101 (2015) – Published 12 February 2015

Featured in Physics Editors' Suggestion

Bending of Light in Quantum Gravity

N.E.J. Bjerrum-Bohr, John F. Donoghue, Barry R. Holstein, Ludovic Planté, and Pierre Vanhove

Phys. Rev. Lett. **114**, 061301 (2015) – Published 12 February 2015

Theorists calculate how quantum gravity effects could alter the bending of light induced by massive objects.

Featured in Physics Editors' Suggestion

Postinflationary Higgs Relaxation and the Origin of Matter-Antimatter Asymmetry

Alexander Kusenko, Lauren Pearce, and Louis Yang

Phys. Rev. Lett. **114**, 061302 (2015) – Published 11 February 2015

A new explanation for why matter dominates in our Universe rests on the idea that the Higgs field hasn't been constant in time.

Elementary Particles and Fields

Editors' Suggestion

Universality Far from Equilibrium: From Superfluid Bose Gases to Heavy-Ion Collisions

J. Berges, K. Boguslavski, S. Schlichting, and R. Venugopalan

Phys. Rev. Lett. **114**, 061601 (2015) – Published 10 February 2015

A new universality class for many-body systems far from equilibrium is conjectured, providing a link between disparate physical systems ranging from hot plasmas to cold gases.

Search for Displaced Supersymmetry in Events with an Electron and a Muon with Large Impact Parameters

V. Khachatryan et al. (CMS Collaboration)

Phys. Rev. Lett. **114**, 061801 (2015) – Published 13 February 2015

Precision Determination of the Cabibbo-Kobayashi-Maskawa Element V_{cb}

Andrea Alberti, Paolo Gambino, Kristopher J. Healey, and Soumitra Nandi

Phys. Rev. Lett. **114**, 061802 (2015) – Published 11 February 2015

Editors' Suggestion

Neutral Naturalness from Orbifold Higgs Models

Nathaniel Craig, Simon Knapen, and Pietro Longhi

Phys. Rev. Lett. **114**, 061803 (2015) – Published 13 February 2015

A new class of models, rooted in ideas of extra dimensions of space, is proposed that protect the Higgs mass from large loop corrections.

Measurement of the B_{0s} Lifetime in the Flavor-Specific Decay Channel $B_{0s} \rightarrow D_{-s} \mu + \nu X$

V.M. Abazov et al. (D0 Collaboration)

Phys. Rev. Lett. **114**, 062001 (2015) – Published 9 February 2015

Measurement of the Charged-Pion Polarizability

C. Adolph et al. (COMPASS Collaboration)

Phys. Rev. Lett. **114**, 062002 (2015) – Published 10 February 2015

Towards a Resolution of the Proton Form Factor Problem: New Electron and Positron Scattering Data

D. Adikaram et al. (CLAS Collaboration)

Phys. Rev. Lett. **114**, 062003 (2015) – Published 10 February 2015

Featured in Physics Editors' Suggestion

Observation of Two New Ξ_{cb} Baryon Resonances

R. Aaij et al. (LHCb Collaboration)

Phys. Rev. Lett. **114**, 062004 (2015) – Published 10 February 2015

Researchers report the detection of two new subatomic particles made of three quarks from each of the possible quark families.

Measurement of the Two-Photon Exchange Contribution to the Elastic e^+p Scattering Cross Sections at the VEPP-3 Storage Ring

I.A. Rachek, J. Arrington, V.F. Dmitriev, V.V. Gauzshtein, R.E. Gerasimov, A.V. Gramolin, R.J. Holt, V.V. Kaminskiy, B.A. Lazarenko, S.I. Mishnev, N.Yu. Muchnoi, V.V. Neufeld, D.M. Nikolenko, R.Sh. Sadykov, Yu.V. Shestakov, V.N. Stibunov, D.K. Toporkov, H. de Vries, S.A. Zevakov, and V.N. Zhilich

Phys. Rev. Lett. **114**, 062005 (2015) – Published 12 February 2015

Three Loop Cusp Anomalous Dimension in QCD

Andrey Grozin, Johannes M. Henn, Gregory P. Korchemsky, and Peter Marquard

Phys. Rev. Lett. **114**, 062006 (2015) – Published 13 February 2015

Nuclear Physics

Parity-Violating Nucleon-Nucleon Force in the $1/N_c$ Expansion

Daniel R. Phillips, Daris Samart, and Carlos Schat

Phys. Rev. Lett. **114**, 062301 (2015) – Published 10 February 2015

Magnetism of an Excited Self-Conjugate Nucleus: Precise Measurement of the g Factor of the 2_{+1} State in Mg^{24}

A. Kusoglu, A.E. Stuchbery, G. Georgiev, B.A. Brown, A. Goasduff, L. Atanasova, D.L. Balabanski, M. Bostan, M. Danchev, P. Detistov, K.A. Gladnishki, J. Ljungvall, I. Matea, D. Radeck, C. Sotty, I. Stefan, D. Verney, and D.T. Yordanov

Phys. Rev. Lett. **114**, 062501 (2015) – Published 12 February 2015

Atomic, Molecular, and Optical Physics

Carrier Plasmon Induced Nonlinear Band Gap Renormalization in Two-Dimensional Semiconductors

Yufeng Liang and Li Yang

Phys. Rev. Lett. **114**, 063001 (2015) – Published 10 February 2015

Featured in Physics Editors' Suggestion

Composite-Light-Pulse Technique for High-Precision Atom Interferometry

P. Berg, S. Abend, G. Tackmann, C. Schubert, E. Giese, W.P. Schleich, F.A. Narducci, W. Ertmer, and E.M. Rasel

Phys. Rev. Lett. **114**, 063002 (2015) – Published 9 February 2015

By keeping its atomic components in the same state, a team was able to reduce one typical source of noise in a rotation-measuring device.

Plasma Luminescence from Femtosecond Filaments in Air: Evidence for Impact Excitation with Circularly Polarized Light Pulses

Sergey Mitryukovskiy, Yi Liu, Pengji Ding, Aurélien Houard, Arnaud Couairon, and André Mysyrowicz

Phys. Rev. Lett. **114**, 063003 (2015) – Published 13 February 2015

Efficient Real-Time Time-Dependent Density Functional Theory Method and its Application to a Collision of an Ion with a 2D Material

Zhi Wang, Shu-Shen Li, and Lin-Wang Wang

Phys. Rev. Lett. **114**, 063004 (2015) – Published 13 February 2015

Revealing the Mechanism of the Low-Energy Electron Yield Enhancement from Sensitizing Nanoparticles

Alexey V. Verkhovtsev, Andrei V. Korol, and Andrey V. Solov'yov

Phys. Rev. Lett. **114**, 063401 (2015) – Published 9 February 2015

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Editors' Suggestion

Measuring the Transverse Spin Density of Light

Martin Neugebauer, Thomas Bauer, Andrea Aiello, and Peter Banzer

Phys. Rev. Lett. **114**, 063901 (2015) – Published 9 February 2015

Under certain conditions the spin of photons can acquire an unusual transverse component. Using intensity differences in the far-field, the transverse spin density is experimentally measured.

Editors' Suggestion

Classical-to-Quantum Transition with Broadband Four-Wave Mixing

Rafi Z. Vered, Yaakov Shaked, Yelena Ben-Or, Michael Rosenbluh, and Avi Pe'er

Phys. Rev. Lett. **114**, 063902 (2015) – Published 10 February 2015

Experimentalists watch a classical to quantum phase transition by ramping up the number of photons in an optical fiber.

Featured in Physics Editors' Suggestion

Laser Filamentation as a New Phase Transition Universality Class

W. Ettoumi, J. Kasparian, and J.-P. Wolf

Phys. Rev. Lett. **114**, 063903 (2015) – Published 13 February 2015

A powerful laser beam separates into many smaller filaments that undergo a phase transition similar to fluid percolating through a porous material.

Shock Wave Formation in the Collapse of a Vapor Nanobubble

F. Magaletti, L. Marino, and C.M. Casciola

Phys. Rev. Lett. **114**, 064501 (2015) – Published 12 February 2015

Plasma and Beam Physics

Excitation of Flow-Stabilized Resistive Wall Mode by Coupling with Stable Eigenmodes in Tokamaks

Nobuyuki Aiba and Makoto Hirota

Phys. Rev. Lett. **114**, 065001 (2015) – Published 9 February 2015

Temporal Intermittency of Energy Dissipation in Magnetohydrodynamic Turbulence

Vladimir Zhdankin, Dmitri A. Uzdensky, and Stanislav Boldyrev

Phys. Rev. Lett. **114**, 065002 (2015) – Published 9 February 2015

Condensed Matter: Structure, etc.

Quantum Mechanical Rippling of a MoS₂ Monolayer Controlled by Interlayer Bilayer Coupling

Yi Zheng, Jianyi Chen, M.-F. Ng, Hai Xu, Yan Peng Liu, Ang Li, Sean J. O'Shea, T. Dumitrică, and Kian Ping Loh

Phys. Rev. Lett. **114**, 065501 (2015) – Published 10 February 2015

Grain-Size-Independent Plastic Flow at Ultrahigh Pressures and Strain Rates

H.-S. Park, R.E. Rudd, R.M. Cavallo, N.R. Barton, A. Arsenlis, J.L. Belof, K.J.M. Blobaum, B.S. El-dasher, J.N. Florando, C.M. Huntington, B.R. Maddox, M.J. May, C. Plechaty, S.T. Prisbrey, B.A. Remington, R.J. Wallace, C.E. Wehrenberg, M.J. Wilson, A.J. Comley, E. Giraldez, A. Nikroo, M. Farrell, G. Randall, and G.T. Gray, III

Phys. Rev. Lett. **114**, 065502 (2015) – Published 12 February 2015

Nonlinear Acoustics at GHz Frequencies in a Viscoelastic Fragile Glass Former

Christoph Klieber, Vitalyi E. Gusev, Thomas Pezeril, and Keith A. Nelson

Phys. Rev. Lett. **114**, 065701 (2015) – Published 9 February 2015

Heat and Mass Transfer across Interfaces in Complex Nanogeometries

Øivind Wilhelmsen, Thuat T. Trinh, Signe Kjelstrup, Titus S. van Erp, and Dick Bedeaux

Phys. Rev. Lett. **114**, 065901 (2015) – Published 12 February 2015

Surface-Induced Optimal Packing of Two-Dimensional Molecular Networks

Guillaume Copie, Fabrizio Cleri, Younes Makoudi, Christophe Krzeminski, Maxime Berthe, Frédéric Cherioux, Frank Palmino, and Bruno Grandidier

Phys. Rev. Lett. **114**, 066101 (2015) – Published 13 February 2015

Condensed Matter: Electronic Properties, etc.

Spin Andreev-like Reflection in Metal-Mott Insulator Heterostructures

K.A. Al-Hassanieh, Julián Rincón, G. Alvarez, and E. Dagotto

Phys. Rev. Lett. **114**, 066401 (2015) – Published 9 February 2015

One-Dimensional Edge States with Giant Spin Splitting in a Bismuth Thin Film

A. Takayama, T. Sato, S. Souma, T. Oguchi, and T. Takahashi

Phys. Rev. Lett. **114**, 066402 (2015) – Published 9 February 2015

Magnetic Fluctuations and Specific Heat in Na_xCoO_2 Near a Lifshitz Transition

Sergey Slizovskiy, Andrey V. Chubukov, and Joseph J. Betouras

Phys. Rev. Lett. **114**, 066403 (2015) – Published 11 February 2015

Gauge-Invariant Calculation of Static and Dynamical Magnetic Properties from the Current Density

Nathaniel Raimbault, Paul L. de Boeij, Pina Romaniello, and J. A. Berger

Phys. Rev. Lett. **114**, 066404 (2015) – Published 12 February 2015

Nonsinusoidal Current-Phase Relationship in Josephson Junctions from the 3D Topological Insulator HgTe

Ilya Sochnikov, Luis Maier, Christopher A. Watson, John R. Kirtley, Charles Gould, Grigory Tkachov, Ewelina M. Hankiewicz, Christoph Brüne, Hartmut Buhmann, Laurens W. Molenkamp, and Kathryn A. Moler

Phys. Rev. Lett. **114**, 066801 (2015) – Published 9 February 2015

Connection of a Topological Surface State with the Bulk Continuum in $\text{Sb}_2\text{Te}_3(0001)$

Christoph Seibel, Hendrik Bentmann, Jürgen Braun, Jan Minár, Henriette Maaß, Kazuyuki Sakamoto, Masashi Arita, Kenya Shimada, Hubert Ebert, and Friedrich Reinert

Phys. Rev. Lett. **114**, 066802 (2015) – Published 10 February 2015

van der Waals Heterostructure of Phosphorene and Graphene: Tuning the Schottky Barrier and Doping by Electrostatic Gating

J.E. Padilha, A. Fazzio, and Antônio J.R. da Silva

Phys. Rev. Lett. **114**, 066803 (2015) – Published 12 February 2015

Very Large Thermophase in Ferromagnetic Josephson Junctions

F. Giazotto, T.T. Heikkilä, and F.S. Bergeret

Phys. Rev. Lett. **114**, 067001 (2015) – Published 9 February 2015

Pressure-Induced Mott Transition in an Organic Superconductor with a Finite Doping Level

H. Oike, K. Miyagawa, H. Taniguchi, and K. Kanoda

Phys. Rev. Lett. **114**, 067002 (2015) – Published 9 February 2015

Ultrafast Dynamics of Fluctuations in High-Temperature Superconductors Far from Equilibrium

L. Perfetti, B. Sciolla, G. Biroli, C.J. van der Beek, C. Piovera, M. Wolf, and T. Kampfrath

Phys. Rev. Lett. **114**, 067003 (2015) – Published 12 February 2015

Uniaxial-Stress Control of Spin-Driven Ferroelectricity in Multiferroic $Ba_2CoGe_2O_7$

Taro Nakajima, Yusuke Tokunaga, Vilmos Kocsis, Yasujiro Taguchi, Yoshinori Tokura, and Takahisa Arima

Phys. Rev. Lett. **114**, 067201 (2015) – Published 10 February 2015

Optical Spin-Transfer-Torque-Driven Domain-Wall Motion in a Ferromagnetic Semiconductor

A.J. Ramsay, P.E. Roy, J.A. Haigh, R.M. Otxoa, A.C. Irvine, T. Janda, R.P. Campion, B.L. Gallagher, and J. Wunderlich

Phys. Rev. Lett. **114**, 067202 (2015) – Published 11 February 2015

Measuring the Photon Coalescence Time Window in the Continuous-Wave Regime for Resonantly Driven Semiconductor Quantum Dots

Raphaël Proux, Maria Maragkou, Emmanuel Baudin, Christophe Voisin, Philippe Roussignol, and Carole Diederichs

Phys. Rev. Lett. **114**, 067401 (2015) – Published 10 February 2015

Ultrafast Structural Dynamics of the Fe-Prictide Parent Compound BaFe₂As₂

L. Rettig, S.O. Mariager, A. Ferrer, S. Grübel, J.A. Johnson, J. Rittmann, T. Wolf, S.L. Johnson, G. Ingold, P. Beaud, and U. Staub

Phys. Rev. Lett. **114**, 067402 (2015) – Published 13 February 2015

Cooperativity and Heterogeneity in Plastic Crystals Studied by Nonlinear Dielectric Spectroscopy

M. Michl, Th. Bauer, P. Lunkenheimer, and A. Loidl

Phys. Rev. Lett. **114**, 067601 (2015) – Published 12 February 2015

Polymer, Soft Matter, Biological, and Interdisciplinary Physics

From Phase to Microphase Separation in Flocking Models: The Essential Role of Nonequilibrium Fluctuations

Alexandre P. Solon, Hugues Chaté, and Julien Tailleur

Phys. Rev. Lett. **114**, 068101 (2015) – Published 12 February 2015

Featured in Physics Editors' Suggestion

Synthesis of Programmable Reaction-Diffusion Fronts Using DNA Catalyzers

Anton S. Zadorin, Yannick Rondelez, Jean-Christophe Galas, and André Estevez-Torres

Phys. Rev. Lett. **114**, 068301 (2015) – Published 9 February 2015

Strands of DNA can be used to generate waves of chemical reactions with programmable shape and velocity.

Drift of Scroll Waves in Thin Layers Caused by Thickness Features: Asymptotic Theory and Numerical Simulations

I. V. Biktasheva, H. Dierckx, and V. N. Biktashev

Phys. Rev. Lett. **114**, 068302 (2015) – Published 11 February 2015

Effects of Macromolecular Crowding on the Collapse of Biopolymers

Hongsuk Kang, Philip A. Pincus, Changbong Hyeon, and D. Thirumalai

Phys. Rev. Lett. **114**, 068303 (2015) – Published 13 February 2015

COMMENTS

Comment on “Universality of Returning Electron Wave Packet in High-Order Harmonic Generation with Midinfrared Laser Pulses”

M. V. Frolov, N. L. Manakov, Wei-Hao Xiong, Liang-You Peng, J. Burgdörfer, and Anthony F. Starace

Phys. Rev. Lett. **114**, 069301 (2015) – Published 9 February 2015

Comment on “Human Time-Frequency Acuity Beats the Fourier Uncertainty Principle”

G. S. Thekkadath and Michael Spanner

Phys. Rev. Lett. **114**, 069401 (2015) – Published 10 February 2015

ERRATA

*Publisher’s Note: Measurement-Device-Independent Quantum Key Distribution over 200 km [Phys. Rev. Lett. **113**, 190501 (2014)]*

Yan-Lin Tang, Hua-Lei Yin, Si-Jing Chen, Yang Liu, Wei-Jun Zhang, Xiao Jiang, Lu Zhang, Jian Wang, Li-Xing You, Jian-Yu Guan, Dong-Xu Yang, Zhen Wang, Hao Liang, Zhen Zhang, Nan Zhou, Xiongfeng Ma, Teng-Yun Chen, Qiang Zhang, and Jian-Wei Pan

Phys. Rev. Lett. **114**, 069901 (2015) – Published 12 February 2015