

**20 February 2015**

### HIGHLIGHTED ARTICLES

#### **Featured in Physics** **Editors' Suggestion**

#### *Constraint on a Varying Proton-Electron Mass Ratio 1.5 Billion Years after the Big Bang*

J. Bagdonaitė, W. Ubachs, M.T. Murphy, and J.B. Whitmore

Phys. Rev. Lett. **114**, 071301 (2015) – Published 19 February 2015

The spectrum of a distant quasar reveals no sign of changes in the mass ratio of the proton and the electron over 12 billion years, constraining dark energy theories.

#### **Featured in Physics** **Editors' Suggestion**

#### *Kinesin-8 Motors Improve Nuclear Centering by Promoting Microtubule Catastrophe*

Matko Glunčić, Nicola Maghelli, Alexander Krull, Vladimir Krstić, Damien Ramunno-Johnson, Nenad Pavin, and Iva M. Tolić

Phys. Rev. Lett. **114**, 078103 (2015) – Published 18 February 2015

A motor protein called kinesin-8 helps keep a cell's nucleus centered by controlling the length of the tubular structures that connect it with the cell wall.

#### **Featured in Physics**

#### *Directional Antineutrino Detection*

Benjamin R. Safdi and Burkhard Suerfu

Phys. Rev. Lett. **114**, 071802 (2015) – Published 20 February 2015

A proposed detector for low-energy antineutrinos would reveal the particles' trajectories, potentially allowing more detailed studies of Earth's radioactivity and of nuclear reactors.

#### **Featured in Physics**

#### *Measurement of Critical Currents of Superconducting Aluminum Nanowires in External Magnetic Fields: Evidence for a Weber Blockade*

Tyler Morgan-Wall, Benjamin Leith, Nikolaus Hartman, Atikur Rahman, and Nina Marković

Phys. Rev. Lett. **114**, 077002 (2015) – Published 18 February 2015

An applied field can control the entry and exit of single quanta of magnetic flux (vortices) in superconducting nanowires.

## LETTERS

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

### *Spin-Orbit-Coupled Bose-Einstein Condensates in a One-Dimensional Optical Lattice*

C. Hamner, Yongping Zhang, M.A. Khamehchi, Matthew J. Davis, and P. Engels

Phys. Rev. Lett. **114**, 070401 (2015) – Published 17 February 2015

### *Direct Tests of Measurement Uncertainty Relations: What It Takes*

Paul Busch and Neil Stevens

Phys. Rev. Lett. **114**, 070402 (2015) – Published 19 February 2015

### *Compressibility of a Fermionic Mott Insulator of Ultracold Atoms*

Pedro M. Duarte, Russell A. Hart, Tsung-Lin Yang, Xinxing Liu, Thereza Paiva, Ehsan Khatami, Richard T. Scalettar, Nandini Trivedi, and Randall G. Hulet

Phys. Rev. Lett. **114**, 070403 (2015) – Published 20 February 2015

### *Composable Security Proof for Continuous-Variable Quantum Key Distribution with Coherent States*

Anthony Leverrier

Phys. Rev. Lett. **114**, 070501 (2015) – Published 19 February 2015

### *Fermion-Fermion Scattering in Quantum Field Theory with Superconducting Circuits*

L. García-Álvarez, J. Casanova, A. Mezzacapo, I.L. Egusquiza, L. Lamata, G. Romero, and E. Solano

Phys. Rev. Lett. **114**, 070502 (2015) – Published 19 February 2015

## Gravitation and Astrophysics

### *Constraining the 6.05 MeV $0_+$ and 6.13 MeV $3_-$ Cascade Transitions in the $C_{12}(\alpha, \gamma)O_{16}$ Reaction Using the Asymptotic Normalization Coefficients*

M.L. Avila, G.V. Rogachev, E. Koshchiy, L.T. Baby, J. Belarge, K.W. Kemper, A.N. Kuchera, A.M. Mukhamedzhanov, D. Santiago-Gonzalez, and E. Uberseder

Phys. Rev. Lett. **114**, 071101 (2015) – Published 18 February 2015

### *Stability of Anti-de Sitter Space in Einstein-Gauss-Bonnet Gravity*

Nils Deppe, Allison Kolly, Andrew Frey, and Gabor Kunstatter

Phys. Rev. Lett. **114**, 071102 (2015) – Published 20 February 2015

*Gravitational Redshift of Galaxies in Clusters from the Sloan Digital Sky Survey and the Baryon Oscillation Spectroscopic Survey*

Iftach Sadeh, Low Lerh Feng, and Ofer Lahav

Phys. Rev. Lett. **114**, 071103 (2015) – Published 20 February 2015

*Accelerated Gravitational Wave Parameter Estimation with Reduced Order Modeling*

Priscilla Canizares, Scott E. Field, Jonathan Gair, Vivien Raymond, Rory Smith, and Manuel Tiglio

Phys. Rev. Lett. **114**, 071104 (2015) – Published 20 February 2015

**Featured in Physics Editors' Suggestion**

*Constraint on a Varying Proton-Electron Mass Ratio 1.5 Billion Years after the Big Bang*

J. Bagdonaitė, W. Ubachs, M. T. Murphy, and J. B. Whitmore

Phys. Rev. Lett. **114**, 071301 (2015) – Published 19 February 2015

The spectrum of a distant quasar reveals no sign of changes in the mass ratio of the proton and the electron over 12 billion years, constraining dark energy theories.

## Elementary Particles and Fields

*Quantum Field Theory of Fluids*

Ben Gripaios and Dave Sutherland

Phys. Rev. Lett. **114**, 071601 (2015) – Published 18 February 2015

*Integrability and Maximally Helicity Violating Diagrams in  $N=4$  Supersymmetric Yang-Mills Theory*

Andreas Brandhuber, Brenda Penante, Gabriele Travaglini, and Donovan Young

Phys. Rev. Lett. **114**, 071602 (2015) – Published 20 February 2015

*Right-Handed Quark Mixing in Left-Right Symmetric Theory*

Goran Senjanović and Vladimir Tello

Phys. Rev. Lett. **114**, 071801 (2015) – Published 19 February 2015

**Featured in Physics**

*Directional Antineutrino Detection*

Benjamin R. Safdi and Burkhard Suerfu

Phys. Rev. Lett. **114**, 071802 (2015) – Published 20 February 2015

A proposed detector for low-energy antineutrinos would reveal the particles' trajectories, potentially allowing more detailed studies of Earth's radioactivity and of nuclear reactors.

## Nuclear Physics

### *Production and Elliptic Flow of Dileptons and Photons in a Matrix Model of the Quark-Gluon Plasma*

Charles Gale, Yoshimasa Hidaka, Sangyong Jeon, Shu Lin, Jean-François Paquet, Robert D. Pisarski, Daisuke Satow, Vladimir V. Skokov, and Gojko Vujanovic

Phys. Rev. Lett. **114**, 072301 (2015) – Published 20 February 2015

### *Measurements of the Nuclear Modification Factor for Jets in $Pb+Pb$ Collisions at $\sqrt{s_{NN}} = 2.76$ TeV with the ATLAS Detector*

G. Aad *et al.* (ATLAS Collaboration)

Phys. Rev. Lett. **114**, 072302 (2015) – Published 20 February 2015

## Atomic, Molecular, and Optical Physics

### *Two-Dimensional Spectroscopy for the Study of Ion Coulomb Crystals*

A. Lemmer, C. Cormick, C. T. Schmiegelow, F. Schmidt-Kaler, and M. B. Plenio

Phys. Rev. Lett. **114**, 073001 (2015) – Published 18 February 2015

### *Dispersion Engineering for Vertical Microcavities Using Subwavelength Gratings*

Zhaorong Wang, Bo Zhang, and Hui Deng

Phys. Rev. Lett. **114**, 073601 (2015) – Published 17 February 2015

## Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

### *Improved Intrapulse Raman Scattering Control via Asymmetric Airy Pulses*

Yi Hu, Amirhossein Tehrani, Stefan Wabnitz, Raman Kashyap, Zhigang Chen, and Roberto Morandotti

Phys. Rev. Lett. **114**, 073901 (2015) – Published 20 February 2015

## Plasma and Beam Physics

### *Observation of Deflection of a Beam of Multi-GeV Electrons by a Thin Crystal*

U. Wienands, T. W. Markiewicz, J. Nelson, R. J. Noble, J. L. Turner, U. I. Uggerhøj, T. N. Wistisen, E. Bagli, L. Bandiera, G. Germogli, V. Guidi, A. Mazzolari, R. Holtzapple, and M. Miller

Phys. Rev. Lett. **114**, 074801 (2015) – Published 19 February 2015

### *Nonhelical Inverse Transfer of a Decaying Turbulent Magnetic Field*

Axel Brandenburg, Tina Kahniashvili, and Alexander G. Tevzadze

Phys. Rev. Lett. **114**, 075001 (2015) – Published 19 February 2015

Condensed Matter: Structure, etc.

*Breakdown of the Fermi Liquid Description for Strongly Interacting Fermions*

Yoav Sagi, Tara E. Drake, Rabin Paudel, Roman Chapurin, and Deborah S. Jin

Phys. Rev. Lett. **114**, 075301 (2015) – Published 19 February 2015

*Nanomechanics of Bidentate Thiolate Ligands on Gold Surfaces*

Martin E. Zoloff Michoff, Jordi Ribas-Arino, and Dominik Marx

Phys. Rev. Lett. **114**, 075501 (2015) – Published 17 February 2015

*Structure and Local Chemical Properties of Boron-Terminated Tetravacancies in Hexagonal Boron Nitride*

Ovidiu Cretu, Yung-Chang Lin, Masanori Koshino, Luiz H. G. Tizei, Zheng Liu, and Kazutomo Suenaga

Phys. Rev. Lett. **114**, 075502 (2015) – Published 19 February 2015

Condensed Matter: Electronic Properties, etc.

*Ground-State Degeneracy of Topological Phases on Open Surfaces*

Ling-Yan Hung and Yidun Wan

Phys. Rev. Lett. **114**, 076401 (2015) – Published 18 February 2015

*Gapped Domain Walls, Gapped Boundaries, and Topological Degeneracy*

Tian Lan, Juven C. Wang, and Xiao-Gang Wen

Phys. Rev. Lett. **114**, 076402 (2015) – Published 18 February 2015

*Spin Polarization of the Split Kondo State*

Kirsten von Bergmann, Markus Ternes, Sebastian Loth, Christopher P. Lutz, and Andreas J. Heinrich

Phys. Rev. Lett. **114**, 076601 (2015) – Published 20 February 2015

*Gap Reversal at Filling Factors  $3 + 1/3$  and  $3 + 1/5$ : Towards Novel Topological Order in the Fractional Quantum Hall Regime*

Ethan Kleinbaum, Ashwani Kumar, L.N. Pfeiffer, K.W. West, and G.A. Csáthy

Phys. Rev. Lett. **114**, 076801 (2015) – Published 19 February 2015

*Aharonov-Bohm Oscillations in Singly Connected Disordered Conductors*

I.L. Aleiner, A.V. Andreev, and V. Vinokur

Phys. Rev. Lett. **114**, 076802 (2015) – Published 20 February 2015

*Universal Increase in the Superconducting Critical Temperature of Two-Dimensional Semiconductors at Low Doping by the Electron-Electron Interaction*

Matteo Calandra, Paolo Zocante, and Francesco Mauri

Phys. Rev. Lett. **114**, 077001 (2015) – Published 18 February 2015

**Featured in Physics**

*Measurement of Critical Currents of Superconducting Aluminum Nanowires in External Magnetic Fields: Evidence for a Weber Blockade*

Tyler Morgan-Wall, Benjamin Leith, Nikolaus Hartman, Atikur Rahman, and Nina Marković

Phys. Rev. Lett. **114**, 077002 (2015) – Published 18 February 2015

An applied field can control the entry and exit of single quanta of magnetic flux (vortices) in superconducting nanowires.

*Constraints on Topological Order in Mott Insulators*

Michael P. Zaletel and Ashvin Vishwanath

Phys. Rev. Lett. **114**, 077201 (2015) – Published 18 February 2015

*Hyperhoneycomb Iridate  $\beta$ -Li<sub>2</sub>IrO<sub>3</sub> as a Platform for Kitaev Magnetism*

T. Takayama, A. Kato, R. Dinnebier, J. Nuss, H. Kono, L.S.I. Veiga, G. Fabbris, D. Haskel, and H. Takagi

Phys. Rev. Lett. **114**, 077202 (2015) – Published 19 February 2015

**Polymer, Soft Matter, Biological, and Interdisciplinary Physics**

*Stochastic Phenotype Transition of a Single Cell in an Intermediate Region of Gene State Switching*

Hao Ge, Hong Qian, and X. Sunney Xie

Phys. Rev. Lett. **114**, 078101 (2015) – Published 17 February 2015

*Universality in the Morphology and Mechanics of Coarsening Amyloid Fibril Networks*

L.G. Rizzi, D.A. Head, and S. Auer

Phys. Rev. Lett. **114**, 078102 (2015) – Published 18 February 2015

**Featured in Physics Editors' Suggestion**

*Kinesin-8 Motors Improve Nuclear Centering by Promoting Microtubule Catastrophe*

Matko Glunčić, Nicola Maghelli, Alexander Krull, Vladimir Krstić, Damien Ramunno-Johnson, Nenad Pavin, and Iva M. Tolić

Phys. Rev. Lett. **114**, 078103 (2015) – Published 18 February 2015

A motor protein called kinesin-8 helps keep a cell's nucleus centered by controlling the length of the tubular structures that connect it with the cell wall.

*Switching Bonds in a DNA Gel: An All-DNA Vitrimer*

Flavio Romano and Francesco Sciortino

Phys. Rev. Lett. **114**, 078104 (2015) – Published 19 February 2015

*Dynamical Criticality in the Collective Activity of a Population of Retinal Neurons*

Thierry Mora, Stéphane Deny, and Olivier Marre

Phys. Rev. Lett. **114**, 078105 (2015) – Published 20 February 2015