

A localized "trilobite" state of a Rydberg excitation in a dense gas. Blue is a contour surface of the electron density, green is the Rydberg core, red spheres are other atoms, yellow spheres mark a cluster of atoms. [Perttu J.J. Luukko and Jan-Michael Rost, Phys. Rev. Lett. **119**, 203001 (2017)]

NEWSPAPER

PHYSICAL REVIEW LETTERS

Contents

Articles published 11 November–17 November 2017

VOLUME 119, NUMBER 20 17 November 2017

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

Time Scale for Adiabaticity Breakdown in Driven Many-Body Systems and Orthogonality Catastrophe 200401
Oleg Lychkovskiy, Oleksandr Gamayun, and Vadim Cheianov

Interaction Dependent Heating and Atom Loss in a Periodically Driven Optical Lattice 200402
Martin Reitter, Jakob Näger, Karen Wintersperger, Christoph Sträter, Immanuel Bloch, André Eckardt, and Ulrich Schneider

Satellite-to-Ground Entanglement-Based Quantum Key Distribution 200501
Juan Yin, Yuan Cao, Yu-Huai Li, Ji-Gang Ren, Sheng-Kai Liao, Liang Zhang, Wen-Qi Cai, Wei-Yue Liu, Bo Li, Hui Dai, Ming Li, Yong-Mei Huang, Lei Deng, Li Li, Qiang Zhang, Nai-Le Liu, Yu-Ao Chen, Chao-Yang Lu, Rong Shu, Cheng-Zhi Peng, Jian-Yu Wang, and Jian-Wei Pan

Digital Quantum Estimation 200502
Majid Hassani, Chiara Macchiavello, and Lorenzo Maccone

Gravitation and Astrophysics

Superconducting-Gravimeter Tests of Local Lorentz Invariance 201101
Natasha A. Flowers, Casey Goodge, and Jay D. Tasson

Lorentz Symmetry Violations from Matter-Gravity Couplings with Lunar Laser Ranging 201102
A. Bourgoin, C. Le Poncin-Lafitte, A. Hees, S. Bouquillon, G. Francou, and M.-C. Angonin

Long-Lived Inverse Chirp Signals from Core-Collapse in Massive Scalar-Tensor Gravity 201103
Ulrich Sperhake, Christopher J. Moore, Roxana Rosca, Michalis Agathos, Davide Gerosa, and Christian D. Ott

Elementary Particles and Fields

Four-Loop Nonplanar Cusp Anomalous Dimension in $\mathcal{N} = 4$ Supersymmetric Yang-Mills Theory 201601
Rutger H. Boels, Tobias Huber, and Gang Yang

Imaging Galactic Dark Matter with High-Energy Cosmic Neutrinos 201801
Carlos A. Argüelles, Ali Kheirandish, and Aaron C. Vincent

Direct CP Violation in $K \to \mu^+\mu^-$ 201802
Giancarlo D'Ambrosio and Teppei Kitahara

Probing Seesaw with Parity Restoration 201803
Goran Senjanović and Vladimir Tello

Double-Cascade Events from New Physics in Icecube 201804
Pilar Coloma, Pedro A. N. Machado, Ivan Martinez-Soler, and Ian M. Shoemaker

Discovery of the Doubly Charmed Ξ_{cc} Baryon Implies a Stable $bb\bar{u}\,\bar{d}$ Tetraquark 202001
Marek Karliner and Jonathan L. Rosner

Heavy-Quark Symmetry Implies Stable Heavy Tetraquark Mesons $Q_iQ_j\bar{q}_k\bar{q}_l$ 202002
Estia J. Eichten and Chris Quigg

(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).

Copyright 2017 American Physical Society

0031-9007(20171117)119:20;1-W

Measurement of the $D^*(2010)^+$-D^+ Mass Difference 202003
J. P. Lees *et al.* (*BABAR* Collaboration)
First Exclusive Measurement of Deeply Virtual Compton Scattering off ^{4}He: Toward the 3D Tomography of Nuclei 202004
M. Hattawy *et al.* (CLAS Collaboration)

Nuclear Physics

Geiger-Nuttall Law for Nuclei in Strong Electromagnetic Fields 202501
D. S. Delion and S. A. Ghinescu

Atomic, Molecular, and Optical Physics

Polyatomic Trilobite Rydberg Molecules in a Dense Random Gas 203001
Perttu J. J. Luukko and Jan-Michael Rost
Signatures of Electronic Structure in Bicircular High-Harmonic Spectroscopy 203201
Denitsa Baykusheva, Simon Brennecke, Manfred Lein, and Hans Jakob Wörner
Comparison Study of Strong-Field Ionization of Molecules and Atoms by Bicircular Two-Color Femtosecond Laser Pulses 203202
Kang Lin, Xinyan Jia, Zuqing Yu, Feng He, Junyang Ma, Hui Li, Xiaochun Gong, Qiying Song, Qinying Ji, Wenbin Zhang, Hanxiao Li, Peifen Lu, Heping Zeng, Jing Chen, and Jian Wu
Different Time Scales in the Dissociation Dynamics of Core-Excited CF_4 by Two Internal Clocks 203203
H. Iwayama, C. Léonard, F. Le Quéré, S. Carniato, R. Guillemin, M. Simon, M. N. Piancastelli, and E. Shigemasa
Topological Edge-State Manifestation of Interacting 2D Condensed Boson-Lattice Systems in a Harmonic Trap 203204
Bogdan Galilo, Derek K. K. Lee, and Ryan Barnett
Unexpected Sensitivity of Nitrogen Ions Superradiant Emission on Pump Laser Wavelength and Duration 203205
Yi Liu, Pengji Ding, Neven Ibrakovic, Samuel Bengtsson, Shihua Chen, Rostyslav Danylo, Emma R. Simpson, Esben W. Larsen, Xiang Zhang, Zhengquan Fan, Aurélien Houard, Johan Mauritsson, Anne L'Huillier, Cord L. Arnold, Songlin Zhuang, Vladimir Tikhonchuk, and André Mysyrowicz
Shakeoff Ionization near the Coulomb Barrier Energy 203401
Prashant Sharma and T. Nandi
Observation of Broad *d*-Wave Feshbach Resonances with a Triplet Structure 203402
Yue Cui, Chuyang Shen, Min Deng, Shen Dong, Cheng Chen, Rong Lü, Bo Gao, Meng Khoon Tey, and Li You
Positron Cooling and Annihilation in Noble Gases 203403
D. G. Green
Probing Positron Cooling in Noble Gases via Annihilation γ Spectra 203404
D. G. Green

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Generation of Caustics and Rogue Waves from Nonlinear Instability 203901
Akbar Safari, Robert Fickler, Miles J. Padgett, and Robert W. Boyd
Angular Momentum of Topologically Structured Darkness 203902
Samuel N. Alperin and Mark E. Siemens
Persistence and Lifelong Fidelity of Phase Singularities in Optical Random Waves 203903
L. De Angelis, F. Alpeggiani, A. Di Falco, and L. Kuipers
Sliding Drops: Ensemble Statistics from Single Drop Bifurcations 204501
Markus Wilczek, Walter Tewes, Sebastian Engelnkemper, Svetlana V. Gurevich, and Uwe Thiele
Revision of Bubble Bursting: Universal Scaling Laws of Top Jet Drop Size and Speed 204502
Alfonso M. Gañán-Calvo
Transition to Turbulent Dynamo Saturation 204503
Kannabiran Seshasayanan, Basile Gallet, and Alexandros Alexakis

(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)

Plasma and Beam Physics

Determination of Hydrogen Density by Swift Heavy Ions 204801
Ge Xu, M. D. Barriga-Carrasco, A. Blazevic, B. Borovkov, D. Casas, K. Cistakov, R. Gavrilin, M. Iberler, J. Jacoby, G. Loisch, R. Morales, R. Mäder, S.-X. Qin, T. Rienecker, O. Rosmej, S. Savin, A. Schönlein, K. Weyrich, J. Wiechula, J. Wieser, G. Q. Xiao, and Y. T. Zhao

Generating Carrier-Envelope-Phase Stabilized Few-Cycle Pulses from a Free-Electron Laser Oscillator 204802
Ryoichi Hajima and Ryoji Nagai

Propagation Dynamics Associated with Resonant Magnetic Perturbation Fields in High-Confinement Mode Plasmas inside the KSTAR Tokamak 205001
W. W. Xiao, T. E. Evans, G. R. Tynan, S. W. Yoon, Y. M. Jeon, W. H. Ko, Y. U. Nam, Y. K. Oh, and KSTAR team

Experimental Observation of Convective Cell Formation due to a Fast Wave Antenna in the Large Plasma Device 205002
M. J. Martin, W. Gekelman, B. Van Compernolle, P. Pribyl, and T. Carter

Magnetospheric Multiscale Observation of Plasma Velocity-Space Cascade: Hermite Representation and Theory 205101
S. Servidio, A. Chasapis, W. H. Matthaeus, D. Perrone, F. Valentini, T. N. Parashar, P. Veltri, D. Gershman, C. T. Russell, B. Giles, S. A. Fuselier, T. D. Phan, and J. Burch

Condensed Matter: Structure, etc.

Absence of Marginal Stability in a Structural Glass 205501
Camille Scalliet, Ludovic Berthier, and Francesco Zamponi

Block Analysis for the Calculation of Dynamic and Static Length Scales in Glass-Forming Liquids 205502
Saurish Chakrabarty, Indrajit Tah, Smarajit Karmakar, and Chandan Dasgupta

Ultrafast Generation of Unconventional {001} Loops in Si 205503
Luis A. Marqués, María Aboy, Iván Santos, Pedro López, Fuccio Cristiano, Antonino La Magna, Karim Huet, Toshiyuki Tabata, and Lourdes Pelaz

Stacking Characteristics of Close Packed Materials 205701
Christian H. Loach and Graeme J. Ackland

Condensed Matter: Electronic Properties, etc.

Unconventional Chiral Fermions and Large Topological Fermi Arcs in RhSi 206401
Guoqing Chang, Su-Yang Xu, Benjamin J. Wieder, Daniel S. Sanchez, Shin-Ming Huang, Ilya Belopolski, Tay-Rong Chang, Songtian Zhang, Arun Bansil, Hsin Lin, and M. Zahid Hasan

Multiple Types of Topological Fermions in Transition Metal Silicides 206402
Peizhe Tang, Quan Zhou, and Shou-Cheng Zhang

Giant Spin Lifetime Anisotropy in Graphene Induced by Proximity Effects 206601
Aron W. Cummings, Jose H. Garcia, Jaroslav Fabian, and Stephan Roche

Solvable Sachdev-Ye-Kitaev Models in Higher Dimensions: From Diffusion to Many-Body Localization 206602
Shao-Kai Jian and Hong Yao

Superconductivity at the Polar-Nonpolar Phase Boundary of SnP with an Unusual Valence State 207001
M. Kamitani, M. S. Bahramy, T. Nakajima, C. Terakura, D. Hashizume, T. Arima, and Y. Tokura

Bound States of Skyrmions and Merons near the Lifshitz Point 207201
Y. A. Kharkov, O. P. Sushkov, and M. Mostovoy

Double-Exchange Interaction in Optically Induced Nonequilibrium State: A Conversion from Ferromagnetic to Antiferromagnetic Structure 207202
Atsushi Ono and Sumio Ishihara

Origin of Negative Longitudinal Piezoelectric Effect 207601
Shi Liu and R. E. Cohen

Visualization of Room-Temperature Ferroelectricity and Polarization Rotation in the Thin Film of Quinuclidinium Perrhenate 207602
Yuan-Yuan Tang, Peng-Fei Li, Ping-Ping Shi, Wan-Ying Zhang, Zhong-Xia Wang, Yu-Meng You, Heng-Yun Ye, Takayoshi Nakamura, and Ren-Gen Xiong

(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)

Competition between Chaotic and Nonchaotic Phases in a Quadratically Coupled Sachdev-Ye-Kitaev Model 207603
Xin Chen, Ruihua Fan, Yiming Chen, Hui Zhai, and Pengfei Zhang
Favorable Concurrence of Static and Dynamic Phenomena at the Morphotropic Phase Boundary of $x\mathrm{BiNi_{0.5}Zr_{0.5}O_3}$-$(1\text{-}x)\mathrm{PbTiO_3}$ 207604
K. Datta, R. B. Neder, J. Chen, J. C. Neuefeind, and B. Mihailova
Band Structure and Contact Resistance of Carbon Nanotubes Deformed by a Metal Contact 207701
Roohollah Hafizi, Jerry Tersoff, and Vasili Perebeinos

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

Optimizing Hyperuniformity in Self-Assembled Bidisperse Emulsions 208001
Joshua Ricouvier, Romain Pierrat, Rémi Carminati, Patrick Tabeling, and Pavel Yazhgur
Flow of Deformable Droplets: Discontinuous Shear Thinning and Velocity Oscillations 208002
M. Foglino, A. N. Morozov, O. Henrich, and D. Marenduzzo
Lattice Model to Derive the Fluctuating Hydrodynamics of Active Particles with Inertia 208003
A. Manacorda and A. Puglisi
Wall Slip of Soft-Jammed Systems: A Generic Simple Shear Process 208004
X. Zhang, E. Lorenceau, P. Basset, T. Bourouina, F. Rouyer, J. Goyon, and P. Coussot
Forced Imbibition in Porous Media: A Fourfold Scenario 208005
Céleste Odier, Bertrand Levaché, Enric Santanach-Carreras, and Denis Bartolo
Optimal Design of Experiments by Combining Coarse and Fine Measurements 208101
Alpha A. Lee, Michael P. Brenner, and Lucy J. Colwell
Complete Mean-Field Theory for Dynamics of Binary Recurrent Networks 208301
Farzad Farkhooi and Wilhelm Stannat

Errata

Publisher's Note: JLab Measurements of the ^{3}He Form Factors at Large Momentum Transfers [Phys. Rev. Lett. **119**, 162501 (2017)] 209901
A. Camsonne *et al.* (Jefferson Lab Hall A Collaboration)

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.