

Image of Vero cells using a new technique, nonlinear focal modulation microscopy, which has a spatial resolution of ~60 nm. [G. Zhao *et al.*, Phys. Rev. Lett. **120**, 193901 (2018)]

NEWSPAPER

PHYSICAL REVIEW LETTERS

Contents

Articles published 5 May–11 May 2018

VOLUME 120, NUMBER 19 11 May 2018

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

Causal Modeling the Delayed-Choice Experiment 190401
Rafael Chaves, Gabriela Barreto Lemos, and Jacques Pienaar

Integrable Time-Dependent Quantum Hamiltonians 190402
Nikolai A. Sinitsyn, Emil A. Yuzbashyan, Vladimir Y. Chernyak, Aniket Patra, and Chen Sun

Fidelity Witnesses for Fermionic Quantum Simulations 190501
M. Gluza, M. Kliesch, J. Eisert, and L. Aolita

Exact Local Correlations and Full Counting Statistics for Arbitrary States of the One-Dimensional Interacting Bose Gas 190601
Alvise Bastianello, Lorenzo Piroli, and Pasquale Calabrese

Universal Trade-Off between Power, Efficiency, and Constancy in Steady-State Heat Engines 190602
Patrick Pietzonka and Udo Seifert

Gravitation and Astrophysics

New General Relativistic Contribution to Mercury's Perihelion Advance 191101
Clifford M. Will

Constraints on the Primordial Black Hole Abundance from the First Advanced LIGO Observation Run Using the Stochastic Gravitational-Wave Background 191102
Sai Wang, Yi-Fan Wang, Qing-Guo Huang, and Tjonnie G. F. Li

LISA Sources in Milky Way Globular Clusters 191103
Kyle Kremer, Sourav Chatterjee, Katelyn Breivik, Carl L. Rodriguez, Shane L. Larson, and Frederic A. Rasio

Observable Windows for the QCD Axion Through the Number of Relativistic Species 191301
Ricardo Z. Ferreira and Alessio Notari

Elementary Particles and Fields

Dark Matter Interpretation of the Neutron Decay Anomaly 191801
Bartosz Fornal and Benjamín Grinstein

First Extraction of Transversity from a Global Analysis of Electron-Proton and Proton-Proton Data 192001
Marco Radici and Alessandro Bacchetta

Nuclear Physics

Large Directed Flow of Open Charm Mesons Probes the Three-Dimensional Distribution of Matter in Heavy-Ion Collisions 192301
Sandeep Chatterjee and Piotr Bożek

(Continued Inside)

This paper was highlighted in the APS publication *Physics* (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 2018 American Physical Society

0031-9007(20180511)120:19;1-J

Atomic, Molecular, and Optical Physics

Ionic Impurity in a Bose-Einstein Condensate at Submicrokelvin Temperatures 193401
K. S. Kleinbach, F. Engel, T. Dieterle, R. Löw, T. Pfau, and F. Meinert

Three-Body Recombination near a Narrow Feshbach Resonance in ^{6}Li 193402
Jiaming Li, Ji Liu, Le Luo, and Bo Gao

Experimental Observation of One-Dimensional Superradiance Lattices in Ultracold Atoms 193601
Liangchao Chen, Pengjun Wang, Zengming Meng, Lianghui Huang, Han Cai, Da-Wei Wang, Shi-Yao Zhu, and Jing Zhang

Measurement-Based Entanglement of Noninteracting Bosonic Atoms 193602
Brian J. Lester, Yiheng Lin, Mark O. Brown, Adam M. Kaufman, Randall J. Ball, Emanuel Knill, Ana M. Rey, and Cindy A. Regal

Interference of Single Photons Emitted by Entangled Atoms in Free Space 193603
G. Araneda, D. B. Higginbottom, L. Slodička, Y. Colombe, and R. Blatt

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Nonlinear Focal Modulation Microscopy 193901
Guangyuan Zhao, Cheng Zheng, Cuifang Kuang, Renjie Zhou, Mohammad M. Kabir, Kimani C. Toussaint, Wensheng Wang, Liang Xu, Haifeng Li, Peng Xiu, and Xu Liu

Bohmian Photonics for Independent Control of the Phase and Amplitude of Waves 193902
Sunkyu Yu, Xianji Piao, and Namkyoo Park

Broadband Control of Topological Nodes in Electromagnetic Fields 193903
Alex Y. Song, Peter B. Catrysse, and Shanhui Fan

Spiral Transformation for High-Resolution and Efficient Sorting of Optical Vortex Modes 193904
Yuanhui Wen, Ioannis Chremmos, Yujie Chen, Jiangbo Zhu, Yanfeng Zhang, and Siyuan Yu

Demonstration of Dispersive Rarefaction Shocks in Hollow Elliptical Cylinder Chains 194101
H. Kim, E. Kim, C. Chong, P. G. Kevrekidis, and J. Yang

Pearling Instabilities of a Viscoelastic Thread 194501
A. Deblais, K. P. Velikov, and D. Bonn

Plasma and Beam Physics

Experimental Evidence of Kinetic Effects in Indirect-Drive Inertial Confinement Fusion Hohlraums 195001
L. Q. Shan, H. B. Cai, W. S. Zhang, Q. Tang, F. Zhang, Z. F. Song, B. Bi, F. J. Ge, J. B. Chen, D. X. Liu, W. W. Wang, Z. H. Yang, W. Qi, C. Tian, Z. Q. Yuan, B. Zhang, L. Yang, J. L. Jiao, B. Cui, W. M. Zhou, L. F. Cao, C. T. Zhou, Y. Q. Gu, B. H. Zhang, S. P. Zhu, and X. T. He

Electrostatic Steepening of Whistler Waves 195101
I. Y. Vasko, O. V. Agapitov, F. S. Mozer, J. W. Bonnell, A. V. Artemyev, V. V. Krasnoselskikh, and Y. Tong

Condensed Matter: Structure, etc.

Fracton-Elasticity Duality 195301
Michael Pretko and Leo Radzihovsky

Fast Rotational Diffusion of Water Molecules in a 2D Hydrogen Bond Network at Cryogenic Temperatures 196001
T. R. Prisk, C. Hoffmann, A. I. Kolesnikov, E. Mamontov, A. A. Podlesnyak, X. Wang, P. R. C. Kent, and L. M. Anovitz

Uncovering the Connection Between Low-Frequency Dynamics and Phase Transformation Phenomena in Molecular Solids 196002
Michael T. Ruggiero, Wei Zhang, Andrew D. Bond, Daniel M. Mittleman, and J. Axel Zeitler

Condensed Matter: Electronic Properties, etc.

Possibility of Flat-Band Ferromagnetism in Hole-Doped Pyrochlore Oxides $Sn_2Nb_2O_7$ and $Sn_2Ta_2O_7$ 196401
I. Hase, T. Yanagisawa, Y. Aiura, and K. Kawashima

(Continued on Preceding Page)

This paper was highlighted in the APS publication *Physics* (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)

Chiral Spin Texture in the Charge-Density-Wave Phase of the Correlated Metallic Pb/Si(111) Monolayer 196402
C. Tresca, C. Brun, T. Bilgeri, G. Menard, V. Cherkez, R. Federicci, D. Longo, F. Debontridder, M. D'angelo, D. Roditchev, G. Profeta, M. Calandra, and T. Cren

Out-of-Bounds Hydrodynamics in Anisotropic Dirac Fluids 196801
Julia M. Link, Boris N. Narozhny, Egor I. Kiselev, and Jörg Schmalian

Quantitative Characterization of the Nanoscale Local Lattice Strain Induced by Sr Dopants in $La_{1.92}Sr_{0.08}CuO_4$ 197001
J. Q. Lin, X. Liu, E. Blackburn, S. Wakimoto, H. Ding, Z. Islam, and S. K. Sinha

Ferromagnetism and Charge Order from a Frozen Electron Configuration in Strained Epitaxial $LaCoO_3$ 197201
G. E. Sterbinsky, R. Nanguneri, J. X. Ma, J. Shi, E. Karapetrova, J. C. Woicik, H. Park, J.-W. Kim, and P. J. Ryan

Theory of the Interfacial Dzyaloshinskii-Moriya Interaction in Rashba Antiferromagnets 197202
Alireza Qaiumzadeh, Ivan A. Ado, Rembert A. Duine, Mikhail Titov, and Arne Brataas

Interaction of Individual Skyrmions in a Nanostructured Cubic Chiral Magnet 197203
Haifeng Du, Xuebing Zhao, Filipp N. Rybakov, Aleksandr B. Borisov, Shasha Wang, Jin Tang, Chiming Jin, Chao Wang, Wensheng Wei, Nikolai S. Kiselev, Yuheng Zhang, Renchao Che, Stefan Blügel, and Mingliang Tian

Selective Optical Addressing of Nuclear Spins through Superhyperfine Interaction in Rare-Earth Doped Solids 197401
B. Car, L. Veissier, A. Louchet-Chauvet, J.-L. Le Gouët, and T. Chanelière

Do Optomechanical Metasurfaces Run Out of Time? 197402
Sophie Viaene, Vincent Ginis, Jan Danckaert, and Philippe Tassin

Resonant Thermalization of Periodically Driven Strongly Correlated Electrons 197601
Francesco Peronaci, Marco Schiró, and Olivier Parcollet

Cooperative Couplings between Octahedral Rotations and Ferroelectricity in Perovskites and Related Materials 197602
Teng Gu, Timothy Scarbrough, Yurong Yang, Jorge Íñiguez, L. Bellaiche, and H. J. Xiang

Signatures of a Nonthermal Metastable State in Copropagating Quantum Hall Edge Channels 197701
Kosuke Itoh, Ryo Nakazawa, Tomoaki Ota, Masayuki Hashisaka, Koji Muraki, and Toshimasa Fujisawa

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

Elastohydrodynamic Lift at a Soft Wall 198001
Heather S. Davies, Delphine Débarre, Nouha El Amri, Claude Verdier, Ralf P. Richter, and Lionel Bureau

Trap Model for Clogging and Unclogging in Granular Hopper Flows 198002
Alexandre Nicolas, Ángel Garcimartín, and Iker Zuriguel

Kinematic Model of Transient Shape-Induced Anisotropy in Dense Granular Flow 198003
B. Nadler, F. Guillard, and I. Einav

Model of Collective Fish Behavior with Hydrodynamic Interactions 198101
Audrey Filella, François Nadal, Clément Sire, Eva Kanso, and Christophe Eloy

Critical Point in Self-Organized Tissue Growth 198102
Daniel Aguilar-Hidalgo, Steffen Werner, Ortrud Wartlick, Marcos González-Gaitán, Benjamin M. Friedrich, and Frank Jülicher

Optimized Diffusion of Run-and-Tumble Particles in Crowded Environments 198103
Thibault Bertrand, Yongfeng Zhao, Olivier Bénichou, Julien Tailleur, and Raphaël Voituriez

Uncertainty Reduction for Stochastic Processes on Complex Networks 198301
Filippo Radicchi and Claudio Castellano

Errata

Erratum: Dynamical Reduction of the Dimensionality of Exchange Interactions and the "Spin-Liquid" Phase of κ-(BEDT-TTF)$_2X$ [Phys. Rev. Lett. **119**, 087204 (2017)] 199901
B. J. Powell, E. P. Kenny, and J. Merino

(Continued on Preceding Page)

This paper was highlighted in the APS publication *Physics* (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)

Erratum: Macroscopic Polarization from Antiferrodistortive Cycloids in Ferroelastic $SrTiO_3$ [Phys. Rev. Lett. **119**, 137601 (2017)] 199902
Andrea Schiaffino and Massimiliano Stengel
Erratum: Observation of Sequential Υ Suppression in PbPb Collisions [Phys. Rev. Lett. **109**, 222301 (2012)] 199903
S. Chatrchyan *et al.* CMS Collaboration

This paper was highlighted in the APS publication *Physics* (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* (physics.aps.org), provides thought-provoking analysis and spotlights exceptional research.