

Fracture surfaces in a brittle hydrogel reveal step lines, a signature of heterogeneity. [W. Steinhardt and S. M. Rubinstein, Phys. Rev. Lett. **129**, 128001 (2022)]

NEWSPAPER

PHYSICAL REVIEW LETTERS

Contents

Articles published 10 September–16 September 2022

VOLUME 129, NUMBER 12 16 September 2022

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

Criticality and Phase Classification for Quadratic Open Quantum Many-Body Systems 120401
Yikang Zhang and Thomas Barthel
Quantum Nondemolition Measurements of Moving Target States 120402
Anton L. Andersen and Klaus Mølmer
Uniqueness of Noncontextual Models for Stabilizer Subtheories 120403
David Schmid, Haoxing Du, John H. Selby, and Matthew F. Pusey
Coherent and Dephasing Spectroscopy for Single-Impurity Probing of an Ultracold Bath 120404
Daniel Adam, Quentin Bouton, Jens Nettersheim, Sabrina Burgardt, and Artur Widera
Hidden Phase of the Spin-Boson Model 120406
Florian Otterpohl, Peter Nalbach, and Michael Thorwart
Coherence as a Resource for Shor's Algorithm 120501
Felix Ahnefeld, Thomas Theurer, Dario Egloff, Juan Mauricio Matera, and Martin B. Plenio
Superradiance-Mediated Photon Storage for Broadband Quantum Memory 120502
Anindya Rastogi, Erhan Saglamyurek, Taras Hrushevskyi, and Lindsay J. LeBlanc
Sequential Measurements for Quantum-Enhanced Magnetometry in Spin Chain Probes 120503
Victor Montenegro, Gareth Siôn Jones, Sougato Bose, and Abolfazl Bayat
Adaptive Advantage in Entanglement-Assisted Communications 120504
Jef Pauwels, Stefano Pironio, Emmanuel Zambrini Cruzeiro, and Armin Tavakoli
Perturbative Quantum Simulation 120505
Jinzhao Sun, Suguru Endo, Huiping Lin, Patrick Hayden, Vlatko Vedral, and Xiao Yuan
Fundamental Limits on Correlated Catalytic State Transformations 120506
Roberto Rubboli and Marco Tomamichel
Entanglement of Nambu Spinors and Bell Inequality Test without Beam Splitters 120507
Wei Luo, Hao Geng, D. Y. Xing, G. Blatter, and Wei Chen
Localization and Melting of Interfaces in the Two-Dimensional Quantum Ising Model 120601
Federico Balducci, Andrea Gambassi, Alessio Lerose, Antonello Scardicchio, and Carlo Vanoni
Maxwell Demon that Can Work at Macroscopic Scales 120602
Nahuel Freitas and Massimiliano Esposito
Speed Limit for a Highly Irreversible Process and Tight Finite-Time Landauer's Bound 120603
Jae Sung Lee, Sangyun Lee, Hyukjoon Kwon, and Hyunggyu Park
Field Theory of Charge Sharpening in Symmetric Monitored Quantum Circuits 120604
Fergus Barratt, Utkarsh Agrawal, Sarang Gopalakrishnan, David A. Huse, Romain Vasseur, and Andrew C. Potter
Suppression of Interband Heating for Random Driving 120605
Hongzheng Zhao, Johannes Knolle, Roderich Moessner, and Florian Mintert

(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 2022 American Physical Society

0031-9007(20220916)129:12;1-Q

Human-Scale Brownian Ratchet: A Historical Thought Experiment 120606
M. Lagoin, C. Crauste-Thibierge, and A. Naert

Gravitation and Astrophysics

Gravitational Bremsstrahlung with Tidal Effects in the Post-Minkowskian Expansion 121101
Stavros Mougiakakos, Massimiliano Maria Riva, and Filippo Vernizzi

MICROSCOPE Mission: Final Results of the Test of the Equivalence Principle 121102
Pierre Touboul *et al.*

Squeezed States of Light for Future Gravitational Wave Detectors at a Wavelength of 1550 nm 121103
Fabian Meylahn, Benno Willke, and Henning Vahlbruch

Gravitational Waves from Accretion-Induced Descalarization in Massive Scalar-Tensor Theory 121104
Hao-Jui Kuan, Arthur G. Suvorov, Daniela D. Doneva, and Stoytcho S. Yazadjiev

Elementary Particles and Fields

Radiated Angular Momentum and Dissipative Effects in Classical Scattering 121601
Aneesh V. Manohar, Alexander K. Ridgway, and Chia-Hsien Shen

Unitarity and Low Energy Expansion of the Coon Amplitude 121602
Felipe Figueroa and Piotr Tourkine

Worldsheet Correlators in Black Hole Microstates 121603
Davide Bufalini, Sergio Iguri, Nicolas Kovensky, and David Turton

Line Operators in Chern-Simons–Matter Theories and Bosonization in Three Dimensions 121604
Barak Gabai, Amit Sever, and De-liang Zhong (钟德亮)

Pion-Induced Radiative Corrections to Neutron β Decay 121801
Vincenzo Cirigliano, Jordy de Vries, Leendert Hayen, Emanuele Mereghetti, and André Walker-Loud

Absolute ν Mass Measurement with the DUNE Experiment 121802
Federica Pompa, Francesco Capozzi, Olga Mena, and Michel Sorel

Correlating W-Boson Mass Shift with Muon $g-2$ in the Two Higgs Doublet Model 121803
K. S. Babu, Sudip Jana, and Vishnu P. K.

First Observation of the Direct Production of the χ_{c1} in e^+e^- Annihilation 122001
M. Ablikim *et al.* (BESIII Collaboration)

Nuclear Physics

Structure of ^{36}Ca under the Coulomb Magnifying Glass 122501
L. Lalanne, O. Sorlin, A. Poves, M. Assié, F. Hammache, S. Koyama, D. Suzuki, F. Flavigny, V. Girard-Alcindor, A. Lemasson, A. Matta, T. Roger, D. Beaumel, Y. Blumenfeld, B. A. Brown, F. De Oliveira Santos, F. Delaunay, N. de Séréville, S. Franchoo, J. Gibelin, J. Guillot, O. Kamalou, N. Kitamura, V. Lapoux, B. Mauss, P. Morfouace, M. Niikura, J. Pancin, T. Y. Saito, C. Stodel, and J-C. Thomas

Atomic, Molecular, and Optical Physics

Nanoscale Magnetism Probed in a Matter-Wave Interferometer 123001
Yaakov Y. Fein, Sebastian Pedalino, Armin Shayeghi, Filip Kiałka, Stefan Gerlich, and Markus Arndt

Electronic State Population Dynamics upon Ultrafast Strong Field Ionization and Fragmentation of Molecular Nitrogen 123002
Carlo Kleine, Marc-Oliver Winghart, Zhuang-Yan Zhang, Maria Richter, Maria Ekimova, Sebastian Eckert, Marc J. J. Vrakking, Erik T. J. Nibbering, Arnaud Rouzée, and Edward R. Grant

Two-Dimensional Programmable Tweezer Arrays of Fermions 123201
Zoe Z. Yan, Benjamin M. Spar, Max L. Prichard, Sungjae Chi, Hao-Tian Wei, Eduardo Ibarra-García-Padilla, Kaden R. A. Hazzard, and Waseem S. Bakr

Dynamically Induced Symmetry Breaking and Out-of-Equilibrium Topology in a 1D Quantum System 123202
G. H. Reid, Mingwu Lu, A. R. Fritsch, A. M. Piñeiro, and I. B. Spielman

Resonant Annihilation and Positron Bound States in Benzene 123401
S. Ghosh, J. R. Danielson, and C. M. Surko

(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)

Mechanical Bistability in Kerr-modified Cavity Magnomechanics 123601
Rui-Chang Shen, Jie Li, Zhi-Yuan Fan, Yi-Pu Wang, and J. Q. You

Beating the 3 dB Limit for Intracavity Squeezing and Its Application to Nondemolition Qubit Readout 123602
Wei Qin, Adam Miranowicz, and Franco Nori

Floquet Control of Optomechanical Bistability in Multimode Systems 123603
Karl Pelka, Guilhem Madiot, Rémy Braive, and André Xuereb

Engineering Symmetry-Selective Couplings of a Superconducting Artificial Molecule to Microwave Waveguides 123604
Mohammed Ali Aamir, Claudia Castillo Moreno, Simon Sundelin, Janka Biznárová, Marco Scigliuzzo, Kowshik Erappaji Patel, Amr Osman, D. P. Lozano, Ingrid Strandberg, and Simone Gasparinetti

Electro-Optic Fourier Transform Chronometry of Pulsed Quantum Light 123605
Ali Golestani, Alex O. C. Davis, Filip Sośnicki, Michał Mikołajczyk, Nicolas Treps, and Michał Karpiński

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Anomalous Electromagnetic Tunneling in Bianisotropic ε-μ-Zero Media 123901
Menglin L. N. Chen, Yangang Bi, Hsun-Chi Chan, Zemeng Lin, Shaojie Ma, and Shuang Zhang

Impact of Surface Charge Depletion on the Free Electron Nonlinear Response of Heavily Doped Semiconductors 123902
Federico De Luca and Cristian Ciracì

Vortex Solitons in Twisted Circular Waveguide Arrays 123903
Liangwei Dong, Yaroslav V. Kartashov, Lluis Torner, and Albert Ferrando

Eulerian vs Lagrangian Irreversibility in an Experimental Turbulent Swirling Flow 124501
Adam Cheminet, Damien Geneste, Antoine Barlet, Yasar Ostovan, Tarek Chaabo, Valentina Valori, Paul Debue, Christophe Cuvier, François Daviaud, Jean-Marc Foucaut, Jean-Philippe Laval, Vincent Padilla, Cécile Wiertel-Gasquet, and Bérengère Dubrulle

Plasma and Beam Physics

Electron Modulational Instability in the Strong Turbulent Regime for an Electron Beam Propagating in a Background Plasma 125001
Haomin Sun, Jian Chen, Igor D. Kaganovich, Alexander Khrabrov, and Dmytro Sydorenko

Condensed Matter: Structure, etc.

Brillouin Spectroscopy of Metastable Superfluid Helium-4 125301
Lionel Djadaojee and Jules Grucker

Duality, Hidden Symmetry, and Dynamic Isomerism in 2D Hinge Structures 125501
Qun-Li Lei, Feng Tang, Ji-Dong Hu, Yu-qiang Ma, and Ran Ni

Observation of Dirac Hierarchy in Three-Dimensional Acoustic Topological Insulators 125502
Linyun Yang, Yin Wang, Yan Meng, Zhenxiao Zhu, Xiang Xi, Bei Yan, Shuxin Lin, Jingming Chen, Bin-jie Shi, Yong Ge, Shou-qi Yuan, Hongsheng Chen, Hong-xiang Sun, Gui-Geng Liu, Yihao Yang, and Zhen Gao

Skyrmion Echo in a System of Interacting Skyrmions 126101
X.-G. Wang, Guang-hua Guo, A. Dyrdał, J. Barnaś, V. K. Dugaev, S. S. P. Parkin, A. Ernst, and L. Chotorlishvili

Condensed Matter: Electronic Properties, etc.

Many-Body Self-Interaction and Polarons 126401
Stefano Falletta and Alfredo Pasquarello

Thermal Evolution of Dirac Magnons in the Honeycomb Ferromagnet $CrBr_3$ 127201
S. E. Nikitin, B. Fåk, K. W. Krämer, T. Fennell, B. Normand, A. M. Läuchli, and Ch. Rüegg

Riemann-Encircling Exceptional Points for Efficient Asymmetric Polarization-Locked Devices 127401
Aodong Li, Weijin Chen, Heng Wei, Guowei Lu, Andrea Alù, Cheng-Wei Qiu, and Lin Chen

Ultrafast Suppression of the Ferroelectric Instability in $KTaO_3$ 127601
Viktor Krapivin, Mingqiang Gu, D. Hickox-Young, S. W. Teitelbaum, Y. Huang, G. de la Peña, D. Zhu, N. Sirica, M.-C. Lee, R. P. Prasankumar, A. A. Maznev, K. A. Nelson, M. Chollet, James M. Rondinelli, D. A. Reis, and M. Trigo

(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)

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

Unexpected Ductility in Semiflexible Polymer Glasses with Entanglement Length Equal to Their Kuhn Length 127801
Joseph D. Dietz, Kai Nan, and Robert S. Hoy

How Material Heterogeneity Creates Rough Fractures 128001
Will Steinhardt and Shmuel M. Rubinstein

Thermodynamic Control of Activity Patterns in Cytoskeletal Networks 128002
Alexandra Lamtyugina, Yuqing Qiu, Étienne Fodor, Aaron R. Dinner, and Suriyanarayanan Vaikuntanathan

Force-Regulated State Transitions of Growing Axons 128101
Huanxin Zhang, Kaixuan Zhang, Min Li, Yue Shao, and Xi-Qiao Feng

Affinity and Valence Impact the Extent and Symmetry of Phase Separation of Multivalent Proteins 128102
Saroj Kumar Nandi, Daniel Österle, Meta Heidenreich, Emmanuel D. Levy, and Samuel A. Safran

Errata

Erratum: Fermi Surface Reconstruction and Electron Dynamics at the Charge-Density-Wave Transition in $TiSe_2$ [Phys. Rev. Lett. **124**, 167602 (2020)] 129901
Patrick Knowles, Bo Yang, Takaki Muramatsu, Owen Moulding, Jonathan Buhot, Charles Sayers, Enrico Da Como, and Sven Friedemann

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.