



Transport networks in biology developed though local adaptation and growth. Selected for a Synopsis in *Physics* and an Editors' Suggestion. [Henrik Ronellenfitch and Eleni Katifori, *Phys. Rev. Lett.* **117**, 138301 (2016)]

NEWSPAPER

PHYSICAL REVIEW LETTERS

Contents

Articles published 17 September–23 September 2016

VOLUME 117, NUMBER 13

23 September 2016

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

Quantum Correlations, Separability, and Quantum Coherence Length in Equilibrium Many-Body Systems	130401
Daniele Malpetti and Tommaso Roscilde	
Determination of the Nonequilibrium Steady State Emerging from a Defect	130402
Bruno Bertini and Maurizio Fagotti	
Quantum-Enhanced Machine Learning	130501
Vedran Dunjko, Jacob M. Taylor, and Hans J. Briegel	
Noise-Resilient Quantum Computing with a Nitrogen-Vacancy Center and Nuclear Spins	130502
J. Casanova, Z.-Y. Wang, and M. B. Plenio	
Improved Error Thresholds for Measurement-Free Error Correction	130503
Daniel Crow, Robert Joynt, and M. Saffman	

Gravitation and Astrophysics

Shocks in the Early Universe	131301
Ue-Li Pen and Neil Turok	
How Isotropic is the Universe?	131302
Daniela Saadeh, Stephen M. Feeney, Andrew Pontzen, Hiranya V. Peiris, and Jason D. McEwen	
Thermodynamics of Accelerating Black Holes	131303
Michael Appels, Ruth Gregory, and David Kubizňák	

Elementary Particles and Fields

Necessary Condition for Emergent Symmetry from the Conformal Bootstrap	131601
Yu Nakayama and Tomoki Ohtsuki	
Entanglement of Distillation for Lattice Gauge Theories	131602
Karel Van Acoleyen, Nick Bultinck, Jutho Haegeman, Michael Marien, Volkher B. Scholz, and Frank Verstraete	

Nuclear Physics

Nuclear Binding Near a Quantum Phase Transition	132501
Serdar Elhatisari, Ning Li, Alexander Rokash, Jose Manuel Alarcón, Dechuan Du, Nico Klein, Bing-nan Lu, Ulf-G. Meißner, Evgeny Epelbaum, Hermann Krebs, Timo A. Lähde, Dean Lee, and Gautam Rupak	
Insight into the Narrow Structure in η Photoproduction on the Neutron from Helicity-Dependent Cross Sections	132502
L. Witthauer <i>et al.</i> (A2 Collaboration at MAMI)	

(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 2016 American Physical Society



Atomic, Molecular, and Optical Physics

Double-Core-Hole States in Neon: Lifetime, Post-Collision Interaction, and Spectral Assignment	133001
G. Goldsztejn, T. Marchenko, R. Püttner, L. Journel, R. Guillemin, S. Carniato, P. Selles, O. Travnikova, D. Céolin, A. F. Lago, R. Feifel, P. Lablanquie, M. N. Piancastelli, F. Penent, and M. Simon	
Towards Efficient Orbital-Dependent Density Functionals for Weak and Strong Correlation	133002
Igor Ying Zhang, Patrick Rinke, John P. Perdew, and Matthias Scheffler	
Signatures of Quantum Coherences in Rydberg Excitons	133003
P. Grünwald, M. Abmann, J. Heckötter, D. Fröhlich, M. Bayer, H. Stolz, and S. Scheel	
Detection of Recurrent Fluorescence Photons	133004
Yuta Ebara, Takeshi Furukawa, Jun Matsumoto, Hajime Tanuma, Toshiyuki Azuma, Haruo Shiromaru, and Klavs Hansen	
Controlling Nonsequential Double Ionization in Two-Color Circularly Polarized Femtosecond Laser Fields	133201
Christopher A. Mancuso, Kevin M. Dorney, Daniel D. Hickstein, Jan L. Chaloupka, Jennifer L. Ellis, Franklin J. Dollar, Ronny Knut, Patrik Grychtol, Dmitriy Zusin, Christian Gentry, Maithreyi Gopalakrishnan, Henry C. Kapteyn, and Margaret M. Murnane	
Nonsequential Double Ionization by Counterrotating Circularly Polarized Two-Color Laser Fields	133202
S. Eckart, M. Richter, M. Kunitski, A. Hartung, J. Rist, K. Henrichs, N. Schlott, H. Kang, T. Bauer, H. Sann, L. Ph. H. Schmidt, M. Schöffler, T. Jahnke, and R. Dörner	
 Continuous Quantum Nondemolition Measurement of the Transverse Component of a Qubit	133601
U. Vool, S. Shankar, S. O. Mundhada, N. Ofek, A. Narla, K. Sliwa, E. Zalts-Geller, Y. Liu, L. Frunzio, R. J. Schoelkopf, S. M. Girvin, and M. H. Devoret	
Triple-Resonant Brillouin Light Scattering in Magneto-Optical Cavities	133602
J. A. Haigh, A. Nunnenkamp, A. J. Ramsay, and A. J. Ferguson	
Large Bragg Reflection from One-Dimensional Chains of Trapped Atoms Near a Nanoscale Waveguide	133603
Neil V. Corzo, Baptiste Gouraud, Aweek Chandra, Akihisa Goban, Alexandra S. Sheremet, Dmitriy V. Kupriyanov, and Julien Laurat	
Coherent Backscattering of Light Off One-Dimensional Atomic Strings	133604
H. L. Sørensen, J.-B. Béguin, K. W. Kluge, I. Iakoupov, A. S. Sørensen, J. H. Müller, E. S. Polzik, and J. Appel	

Nonlinear Dynamics, Fluid Dynamics, Classical Optics, etc.

Extended Propagation of Powerful Laser Pulses in Focusing Kerr Media	133901
V. M. Malkin and N. J. Fisch	
Illuminating Molecular Symmetries with Bicircular High-Order-Harmonic Generation	133902
Daniel M. Reich and Lars Bojer Madsen	
Universal Scaling of Robust Thermal Hot Spot and Ionic Current Enhancement by Focused Ohmic Heating in a Conic Nanopore	134301
Zehao Pan, Ceming Wang, Meng Li, and Hsueh-Chia Chang	
Spatiotemporal Wave Front Shaping in a Microwave Cavity	134302
Philipp del Hougne, Fabrice Lemoult, Mathias Fink, and Geoffroy Lerosey	
Persistent Directional Current at Equilibrium in Nonreciprocal Many-Body Near Field Electromagnetic Heat Transfer	134303
Linxiao Zhu and Shanhui Fan	
Universal Scaling Laws for Dense Particle Suspensions in Turbulent Wall-Bounded Flows	134501
Pedro Costa, Francesco Picano, Luca Brandt, and Wim-Paul Breugem	

Plasma and Beam Physics

Evidence of Toroidally Localized Turbulence with Applied 3D Fields in the DIII-D Tokamak	135001
R. S. Wilcox, M. W. Shafer, N. M. Ferraro, G. R. McKee, L. Zeng, T. L. Rhodes, J. M. Canik, C. Paz-Soldan, R. Nazikian, and E. A. Unterberg	

(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)

Condensed Matter: Structure, etc.

Thermodynamics versus Local Density Fluctuations in the Metal–Mott-Insulator Crossover	135301
J. H. Drewes, E. Cocchi, L. A. Miller, C. F. Chan, D. Pertot, F. Brennecke, and M. Köhl	
Spin-Orbit-Coupled Correlated Metal Phase in Kondo Lattices: An Implementation with Alkaline-Earth Atoms	135302
L. Isaev, J. Schachenmayer, and A. M. Rey	
Initial Atomic Motion Immediately Following Femtosecond-Laser Excitation in Phase-Change Materials	135501
E. Matsubara, S. Okada, T. Ichitsubo, T. Kawaguchi, A. Hirata, P. F. Guan, K. Tokuda, K. Tanimura, T. Matsunaga, M. W. Chen, and N. Yamada	
Machine Learning Energies of 2 Million Elpasolite (ABC_2D_6) Crystals	135502
Felix A. Faber, Alexander Lindmaa, O. Anatole von Lilienfeld, and Rickard Armiento	
Superionic-Superionic Phase Transitions in Body-Centered Cubic H_2O Ice	135503
Jean-Alexis Hernandez and Razvan Caracas	
Deformation Behavior across the Zircon-Scheelite Phase Transition	135701
Binbin Yue, Fang Hong, Sébastien Merkel, Dayong Tan, Jinyuan Yan, Bin Chen, and Ho-Kwang Mao	
Interfacial Free Energy as the Key to the Pressure-Induced Deceleration of Ice Nucleation	135702
Jorge R. Espinosa, Alberto Zaragoza, Pablo Rosales-Pelaez, Caridad Navarro, Chantal Valeriani, Carlos Vega, and Eduardo Sanz	

Condensed Matter: Electronic Properties, etc.

 Magneto-Optical Signature of Massless Kane Electrons in Cd_3As_2	136401
A. Akrap, M. Haki, S. Tchoumakov, I. Crassee, J. Kuba, M. O. Goerbig, C. C. Homes, O. Caha, J. Novák, F. Tepe, W. Desrat, S. Koohpayeh, L. Wu, N. P. Armitage, A. Nateprov, E. Arushanov, Q. D. Gibson, R. J. Cava, D. van der Marel, B. A. Piot, C. Faugeras, G. Martinez, M. Potemski, and M. Orlita	
Fate of Spinons at the Mott Point	136601
Tsung-Han Lee, Serge Florens, and Vladimir Dobrosavljević	
$\mathbb{Z}_2$ and Chiral Anomalies in Topological Dirac Semimetals	136602
Anton A. Burkov and Yong Baek Kim	
Ultrafast Spin Density Wave Transition in Chromium Governed by Thermalized Electron Gas	136801
C. W. Nicholson, C. Monney, R. Carley, B. Frietsch, J. Bowlan, M. Weinelt, and M. Wolf	
Bosonic Analogue of Dirac Composite Fermi Liquid	136802
David F. Mross, Jason Alicea, and Olexei I. Motrunich	
Lateral Electron Confinement with Open Boundaries: Quantum Well States above Nanocavities at Pb(111)	136803
M. Müller, N. Néel, S. Crampin, and J. Kröger	
Correlation-Enhanced Odd-Parity Interorbital Singlet Pairing in the Iron-Pnictide Superconductor $LiFeAs$	137001
R. Nourafkan, G. Kotliar, and A.-M. S. Tremblay	
Self-Induced Glassiness and Pattern Formation in Spin Systems Subject to Long-Range Interactions	137201
Alessandro Principi and Mikhail I. Katsnelson	
Exact Bethe Ansatz Spectrum of a Tight-Binding Chain with Dephasing Noise	137202
Mariya V. Medvedyeva, Fabian H. L. Essler, and Tomaž Prosen	
<i>Ab Initio</i> Theory of Coherent Laser-Induced Magnetization in Metals	137203
Marco Berritta, Ritwik Mondal, Karel Carva, and Peter M. Oppeneer	
Spin-Orbit Twisted Spin Waves: Group Velocity Control	137204
F. Perez, F. Baboux, C. A. Ullrich, I. D'Amico, G. Vignale, G. Karczewski, and T. Wojtowicz	

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

 Stress Singularities in Swelling Soft Solids	138001
Alain Goriely, Johannes Weickenmeier, and Ellen Kuhl	
 Revealing Three-Dimensional Structure of an Individual Colloidal Crystal Grain by Coherent X-Ray Diffractive Imaging	138002
A. G. Shabalin, J.-M. Meijer, R. Dronyak, O. M. Yefanov, A. Singer, R. P. Kurta, U. Lorenz, O. Y. Gorobtsov, D. Dzhigaev, S. Kalbfleisch, J. Gulden, A. V. Zozulya, M. Sprung, A. V. Petukhov, and I. A. Vartanyants	

(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)

Contents (Continued)

Theory of Acoustic Raman Modes in Proteins	138101
Timothy DeWolf and Reuven Gordon	
Pointlike Inclusion Interactions in Tubular Membranes	138102
Afshin Vahid and Timon Idema	
Symmetry and Size of Membrane Protein Polyhedral Nanoparticles	138103
Di Li, Osman Kahraman, and Christoph A. Haselwandter	
Nonadditive Compositional Curvature Energetics of Lipid Bilayers	138104
A. J. Sodt, R. M. Venable, E. Lyman, and R. W. Pastor	
 Global Optimization, Local Adaptation, and the Role of Growth in Distribution Networks	138301
Henrik Ronellenfitsch and Eleni Katifori	
Simultaneous Precision Gravimetry and Magnetic Gradiometry with a Bose-Einstein Condensate: A High Precision, Quantum Sensor	138501
K. S. Hardman, P. J. Everitt, G. D. McDonald, P. Manju, P. B. Wigley, M. A. Sooriyabandara, C. C. N. Kuhn, J. E. Debs, J. D. Close, and N. P. Robins	
Comments	
Comment on “Two-Dimensional Optical Control of Electron Spin Orientation by Linearly Polarized Light in InGaAs”	139701
Michael Oestreich and Jens Hübner	
Schmalbuch <i>et al.</i> Reply	139702
K. Schmalbuch, S. Göbbels, Ph. Schäfers, Ch. Rodenbücher, P. Schlammes, Th. Schäpers, M. Lepsa, G. Güntherodt, and B. Beschoten	
Comment on “Cortical Flow-Driven Shapes of Nonadherent Cells”	139801
L. M. Pismen	
Callan-Jones <i>et al.</i> Reply	139802
A. C. Callan-Jones, V. Ruprecht, S. Wieser, C. P. Heisenberg, and R. Voituriez	
Errata	
Publisher’s Note: Glassy Dynamics in Disordered Electronic Systems Reveal Striking Thermal Memory Effects [Phys. Rev. Lett. 117 , 116601 (2016)]	139901
A. Eisenbach, T. Havdala, J. Delahaye, T. Grenet, A. Amir, and A. Frydman	



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.