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On the Cover

Schematic of an image from an atom-resolved quantum gas microscope used to measure spatial charge and spin correlations in a strongly interacting Fermi gas. Red and blue spheres represent spin-up and spin-down fermions, respectively, while the surrounding wavelike image pattern, believed for a long time to be impossible, is revealed for the first time in experiments.

From the article:

Observing Spatial Charge and Spin Correlations in a Strongly Interacting Fermi Gas

Cyprian Gaul, Maxime Dixmerias, Yuan Yao Ho, Jens Herzog, Bruno Peaudecerf, Shivan Zhang, and Tarik Yefsah

Phys. Rev. Lett. 136, 153401 (2026)

HIGHLIGHTED ARTICLES

GENERAL RELATIVITY | ASTROPHYSICS

Observation of In Ice Askaryan Radiation from High-Energy Cosmic Rays

K. Hoshi et al. (IceCube Collaboration)

Phys. Rev. Lett. 136, 151002 (2026) Published 7 April 2026

A South Pole neutrino experiment has measured radio waves induced by cosmic rays—thus demonstrating that its detection method works.

QUANTUM GASES | QUANTUM SIMULATION

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QUANTUM SIMULATION

Krylov Winding and Emergent Coherence in Operator Growth Dynamics

Mahdi Nezhat, Bruno Nachtergaele, Michael S. Flynn, and Thomas Scaffidi

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Operator growth at finite temperature in quantum chaotic systems relies on coherent spreading in the Krylov basis.

QUANTUM SIMULATION

Effective Delocalization in the One-Dimensional Anderson Model with Stability Disorder

Carlo Vanoni, Jonas Richter, Mikael C. Rechtsman, Boris L. Altshuler, Paul J. Steinhardt, and Salvatore Torquato

Phys. Rev. Lett. 136, 150403 (2026) Published 7 April 2026

The systematic cancellation of leading self-energy terms causes the localization length in the 1D Anderson model to increase far beyond typical system sizes, effectively producing delocalized behavior at a regime where localization is expected.

QUANTUM SIMULATION

Stopping Kekulé Spiral Order in Graphene

Lei Zhang, Pan Chen, Ting Xu, Yuli Zhou, Lili Zhou, Zhaoning Hong, Mengyu Hu, Lyuo Zhang, Yu Zhang, and Yalong Wang

Phys. Rev. Lett. 136, 156401 (2026) Published 13 April 2026

The first experimental evidence that a 1D nanostructure induces Kekulé spiral order in graphene.

QUANTUM SIMULATION

Momentum-Resolved Spectroscopy of Superconductivity with the Quantum Twisting Microscope

Yuval Nevo, Ady Stern, and Yuval Oreg

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QUANTUM SIMULATION

Tensor Network Method for Real-Space Topology in Quasicrystal Chern Mosaics

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Non-Abelian Chern Band in Rhombohedral Graphene Multilayers

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Quantum Information, Science, and Technology

QUANTUM SIMULATION

Proof of a Universal Speed Limit on Fast Scrambling in Quantum Systems

Amit Vikram, Lucas Brito, and Victor Galitski

Phys. Rev. Lett. 136, 150601 (2026) Published 7 April 2026

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Universal Statistics of Charge Exchanges in Non-Abelian Quantum Transport

Yuval Gefen and Yonatan Cohen

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QUANTUM SIMULATION

Tangent Space Excitation Ansatz for Quantum Circuits

Ji-Yao Chen, Bozhen Huang, D. L. Zhou, Rouhan Sohail, Chaofeng Cai, and Wuchao Yang

Phys. Rev. Lett. 136, 150602 (2026) Published 7 April 2026

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Realistic Gottesman-Kitaev-Preskill Stabilizer States Enable Universal Quantum Computation

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Phys. Rev. Lett. 136, 150603 (2026) Published 7 April 2026

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Phys. Rev. Lett. 136, 150604 (2026) Published 7 April 2026

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Phys. Rev. Lett. 136, 150605 (2026) Published 7 April 2026

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Probing Cosmic Ray Composition and Monopole Dark Matter via Muon Bundles

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Phys. Rev. Lett. 136, 151001 (2026) Published 7 April 2026

GRAVITATION

Test of the Gravitational Force Law on Cosmological Scales Using the Kinematic Sunyaev-Zeldovich Effect

Yi Zheng

Phys. Rev. Lett. 136, 151002 (2026) Published 10 April 2026

NATURAL SCIENCES | ASTROPHYSICS

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GRAVITATION

Gravitational Collapse in the Vicinity of the Extremal Black Hole Critical Point

Wilfred D. Guo

Phys. Rev. Lett. 136, 151003 (2026) Published 10 April 2026

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Cosmological Constant from Quantum Gravitational $\mathcal{F}$ Vacua and the Gravitational Hall Effect

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Phys. Rev. Lett. 136, 151004 (2026) Published 10 April 2026

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Horizon Edge Partition Functions in $\mathcal{N}=3$ Quantum Gravity

T. J. Beard and Ian Morrison Lloyd

Phys. Rev. Lett. 136, 151601 (2026) Published 7 April 2026

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Universal Time Evolution of Holographic and Quantum Complexity

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Phys. Rev. Lett. 136, 151602 (2026) Published 7 April 2026

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Phys. Rev. Lett. 136, 151603 (2026) Published 10 April 2026

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Phys. Rev. Lett. 136, 151604 (2026) Published 10 April 2026

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Accessing Nucleon Transversity with One-Point Energy Correlators

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Phys. Rev. Lett. 136, 151902 (2026) Published 10 April 2026

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Yuka Mizutani et al. (J-PARC E73 Collaboration)

Phys. Rev. Lett. 136, 152501 (2026) Published 13 April 2026

QUANTUM SIMULATION

Collapse of Nuclear Collectivity along the $N=Z$ Line

M. A. Bentley et al.

Phys. Rev. Lett. 136, 152501 (2026) Published 13 April 2026

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Phys. Rev. Lett. 136, 153201 (2026) Published 14 April 2026

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Photoelectron Holography of a Heteronuclear Molecule

Maximilian Kircher, Max Pyles, Simon Schoßau, and Reinhard Dörner

Phys. Rev. Lett. 136, 153202 (2026) Published 14 April 2026

NATURAL SCIENCES | QUANTUM SIMULATION

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QUANTUM SIMULATION

Experimental Observation of Negative Weak Values for the Time Atoms Spend in the Excited State as a Photon Is Transmitted

Daniela Angulo, Ajay Thennadil, Hamidreza Mirzaei Ahranjani, Howard M. Wiseman, and Kiyoshi W. Steinberg

Phys. Rev. Lett. 136, 153601 (2026) Published 13 April 2026

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Phys. Rev. Lett. 136, 153602 (2026) Published 13 April 2026

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Interlayer Charge-Density-Wave Vector Flows Induced Structural Chirality

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Phys. Rev. Lett. 136, 156101 (2026) Published 14 April 2026

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Heat-Driven Transformation of a Honeycomb Oxide into a Dodecagonal Quasicrystal

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Phys. Rev. Lett. 136, 156201 (2026) Published 13 April 2026

QUANTUM SIMULATION

Imaging Kekulé Spiral Order in Graphene

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False Vacuum Decay in Flat-Band Ferromagnets: Role of Quantum Geometry and Chiral Edge States

Ankur Das, Sudeep Kumar Ghorai, Sthitadhi Roy, and Nirmal Ganguli

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QUANTUM SIMULATION

Algebraic States in Continuum in $\mathcal{N}=2$ Dimensional Non-Hermitian Systems

Yi-Ting Tsai and Ching-Hua Lee

Phys. Rev. Lett. 136, 156503 (2026) Published 13 April 2026

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Selective Ultrafast Optical Excitation of High-Wave-Number Dynamics in a Charge-Density-Wave Material

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Phys. Rev. Lett. 136, 156504 (2026) Published 13 April 2026

Statistical Physics: Classical, Nonlinear, and Complex Systems

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Dana Shlosh, Ze Jiang, and Yaroslav Bromberg

Phys. Rev. Lett. 136, 157101 (2026) Published 13 April 2026

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QUANTUM SIMULATION

Accurate Site Measurement of Individual Fleishmann-Hand Spheres from Blurry Videos

Jiaqi Liu and Yuan Lin

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QUANTUM SIMULATION

Universal Persistent Brownian Motions in Confluent Tissues

Masaki Sasai, Hiroaki Tsukamoto, and Yoshihiro Morishita

Phys. Rev. Lett. 136, 158401 (2026) Published 15 April 2026

QUANTUM SIMULATION

Dynamics of Wound Closure in Living Nematic Epithelia

Yuting Sammy Jiang, Jin Tang, Alexis Hoffman, Karl Kim, Sean C. Ellebracht, Rachel E. Bennett, and Tommaso R. Cuvelier

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