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HIGHLIGHTED ARTICLES

EDITORS' SUGGESTION

Distinguishing types of correlated errors in superconducting qubits

H. P. Binney, H. D. Pinckney, K. Azar, P. M. Harrington, S. Jha, M. Li, J. Yang, F. Contipelli, R. DePencier Piñero, M. Gingras, B. M. Niedzielski, H. Stickler, M. E. Schwartz, J. A. Grover, M. Hays, K. Serniak, J. A. Formaggio, and W. D. Oliver

Phys. Rev. Applied **26**, 024025 (2026) - Published 11 August, 2026

Superconducting qubits are promising for quantum computing, but their performance is hindered by correlated errors from environmental factors like ionizing radiation and cryocooler vibrations. The authors distinguish these error types in the same device by their distinct features, and use accelerometers to directly link specific errors to pulse tube vibrations. This study also reveals that qubits engineered to resist radiation are protected against these vibration-induced errors as well. Identifying the sources of correlated errors will inform future mitigation strategies for building more robust quantum computers.

EDITORS' SUGGESTION

Establishing the magnetoelastic origin of spin-wave routing through focused-ion-beam patterning

Felix Naunheimer, Johannes Greil, Valentin Ahrens, Levente Maucha, Ádám Papp, György Csaba, and Markus Becherer

Phys. Rev. Applied **26**, 024028 (2026) - Published 12 August, 2026

Spin waves hold promise for compact analog computing, but routing them via focused-ion-beam irradiation in yttrium iron garnet is hindered by a nonmonotonic wavelength response to ion dose. By combining atomic force microscopy and time-resolved magneto-optical Kerr effect microscopy with analytical, ion-damage, and micromagnetic modeling, this study links this response to the progression from elastic and plastic deformation to partial amorphization and the resulting magnetoelastic fields. This physical understanding will enable predictably engineered irradiation-defined spin-wave landscapes and future graded-index magnetoelastic magnonic devices.

EDITORS' SUGGESTION

Semiconductor-quality pyrite $\mathrm{FeS_2}$ from iron ore

Yeon Lee, Jennifer T. Mitchell, Caitlyn Komar, Matt Mlinar, Jestos Taguta, George Hudak, and Chris Leighton

Phys. Rev. Applied **26**, 024033 (2026) - Published 13 August, 2026

Pyrite FeS_2 is an earth-abundant, low-cost semiconductor with application potential, particularly if it can be synthesized at high quality from natural resources. This study demonstrates that common iron ores can be converted directly to semiconductor-quality FeS without additional purification, because unexpected purification occurs during processing and few elements effectively dope the material. The resulting single crystals boast carrier densities down to 10 cm and mobilities up to 100 cmVs, similar to those grown from high-purity precursors. This could unlock an attractive new revenue stream for an abundant natural resource.

EDITORS' SUGGESTION

Fast and sensitive readout of a semiconductor quantum dot using an *in situ* microwave resonator with enhanced gate lever arm

Tim J. Wilson and Hong-Wen Jiang

Phys. Rev. Applied **26**, 024040 (2026) - Published 14 August, 2026

Quantum dot–based spin qubits require ultrafast, high-fidelity charge readout for quantum error correction and real-time feedback. Improving readout sensitivity has often required complex high-impedance resonators or specialized circuits. This work shows that optimizing a gate lever arm directly coupled to an *in situ* superconducting microwave resonator dramatically enhances readout sensitivity, achieving integration times at the tens of nanoseconds scale without the use of high-impedance devices, and revealing how readout noise evolves across distinct physical regimes. These results show a practical route toward faster, more scalable architectures for fault-tolerant quantum computing.

EDITORS' SUGGESTION

Volatile resistive-switched state in a bulk organic conductor with a sharp metal-insulator transition

Riku Ishii, Ryo Motohashi, Keitaro Tada, Yusuke Suzuki, Takayoshi Kouchi, Hiroshi Oike, Fumitaka Kagawa, Reizo Kato, and Tetsuaki Itou

Phys. Rev. Applied **26**, 024041 (2026) - Published 17 August, 2026

Volatile resistive switching in correlated-electron systems is promising for electronics applications, but the underlying physics remains obscured. Most studies have focused on inorganic thin films on substrates with strong thermal coupling to their surroundings, but here the authors investigate in a bulk organic single crystal with an exceptionally sharp metal-insulator transition. Bulk-sensitive microscopic NMR reveals the coexistence of metallic and insulating regions in the resistive-switched state, while weak thermal coupling to the surroundings allows temperature locking near the transition temperature and an "inverse Ohm's law", with voltage inversely proportional to current.

EDITORS' SUGGESTION

Scalable simulation of quantum many-body dynamics with OR-represented quantum algebra

Lukas Broers, Rong-Yang Sun, and Seiji Yunoki

Phys. Rev. Applied **26**, 024046 (2026) - Published 18 August, 2026

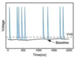
Powerful and efficient numerical techniques have been central to theoretical research on quantum mechanical systems for decades. In the era of quantum advantage demonstrations, it is paramount to develop strong benchmarks that truly represent the classical frontier. This study presents a high-performance parallel implementation and large-scale demonstration of quantum dynamics simulated with OR-represented quantum algebra at a huge scale, retaining over a trillion Pauli strings while maintaining strong scaling behavior, using the supercomputer Fugaku. This algorithm enriches the body of classical high-performance methods and challenges current quantum advantage efforts.

EDITORS' SUGGESTION

Timing jitter induced by stochastic baseline fluctuations in high-count-rate superconducting nanowire single-photon detectors

Dianpeng Wang, You Xiao, Jiamin Xiong, Chenrui Wang, Zhen Wan, Hongxin Xu, Chaomeng Ding, Jia Huang, Lixing You, and Hao Li

Phys. Rev. Applied **26**, 024049 (2026) - Published 18 August, 2026



Superconducting nanowire single-photon detectors with high count rates are important for quantum information processing, optical communication, and photon-starved imaging. Their timing performance is limited by excess jitter, though, and the underlying physics is not fully understood. This study identifies stochastic baseline fluctuations caused by the finite memory of ac-coupled readout circuits as an important source of timing jitter at high count rates, and establishes a quantitative framework to predict their impact. Also, under pulsed illumination the timing jitter is found to reach a maximum at about half of the laser's repetition rate.

EDITORS' SUGGESTION

Electromechanical coupling at tunable band extrema in flexoelectric metamaterials

Kshiteej J. Deshmukh, Ihina Mahajan, Alper Erturk, and Pradeep Sharma

Phys. Rev. Applied **26**, 024063 (2026) - Published 24 August, 2026

Stopping and localizing elastic waves can concentrate energy for high-sensitivity sensing and harvesting, but this often requires intricately tuned lattices or symmetry-restricted piezoelectric transducers. This study finds that flexoelectricity—the universal coupling between strain gradients and electric polarization—could be combined with higher-order elasticity to create stable, tunable zero-group-velocity extrema and stationary-inflection modes. Introducing a defect cavity for tighter localization increases both open-circuit voltage and mass responsivity. The resulting self-sensing, electrically reconfigurable resonators could enable compact devices for diverse applications.

EDITORS' SUGGESTION

Battery-free wireless quartz-crystal-microbalance sensor operating at a range of 50 m

Motoyuki Hamana, Ambuj Kumar Gautam, Motoharu Haga, Riki Nishihara, Wenlou Yuan, Fumihito Kato, Nobutomo Nakamura, Hiroki Okita, and Hirotsugu Ogi

Phys. Rev. Applied **26**, 024067 (2026) - Published 24 August, 2026

Starting from a quartz-crystal microbalance, the authors develop a battery-free wireless sensing technology that enables remote measurements of structural strain and gas concentration over distances exceeding 50 m. The system enhances the electromechanical coupling between an AT-cut quartz resonator (packaged in a slightly pre-bent state) and electromagnetic waves, enabling long-range sensing without onboard power sources or electrical connections. The ability to perform battery-free long-range sensing is promising for smart infrastructure monitoring, with applications in bridges, pipelines, nuclear facilities, and industrial plants.

LETTERS

LETTER

Interlayer chiral coupling between an insulating ferrimagnet and a conducting ferromagnet with orthogonal magnetizations

Weronika Janus, Takayuki Shiino, and Can Onur Avci

Phys. Rev. Applied **26**, L021001 (2026) - Published 5 August, 2026

Chiral interlayer coupling is promising for field-free spintronic memory and logic, but has remained largely unexplored in simple bilayers combining a ferrimagnetic insulator and a conducting ferromagnet. The authors study the TbFeO/CoFeB system and reveal a tunable chiral exchange bias acting on both magnetic layers. Temperature-controlled and current-induced Joule heating drive the system from a disfavored to a favored chiral configuration, enabling deterministic perpendicular magnetization reversal of TbFeO. These results establish insulating-ferrimagnetic-garnet/ferromagnet bilayers as a promising platform for chiral spintronic devices.

LETTER

Reflection and refraction properties of a laser-driven two-dimensional quantum well: Analogy to a photonic time crystal

Igor V. Smetanin and Alexander V. Uskov

Phys. Rev. Applied **26**, L021002 (2026) - Published 6 August, 2026

This Letter presents an innovative type of metamaterial that exhibits photonic-crystal-like Floquet scattering when exposed to an obliquely incident, weak electromagnetic probe wave. A laser-driven two-dimensional quantum well modulates the photoexcited electron density at the beat frequency of the laser radiation, behaving as a polychromatic source of radiation. Backward-propagating and surface-bound down-shifted satellites, including TE surface modes, are predicted. The proposed scheme provides a roadmap for extending photonic time crystals to the terahertz and near-infrared frequency domains.

LETTER

Robust Bayesian spin-squeezing-enhanced quantum sensing under noise

Jinye Wei, Jungeng Zhou, Yi Shen, Jiahao Huang, and Chaohong Lee

Phys. Rev. Applied **26**, L021003 (2026) - Published 6 August, 2026

Spin-squeezed states can surpass the standard quantum limit, yet their advantage is confined to a narrow phase range, complicating their use in noisy sensors. The authors present an adaptive Bayesian quantum estimation protocol that locks interferometry to its optimal operating point and incorporates phase noise into a reshaped likelihood function. Applied to quantum gravimeters and atomic clocks, this approach substantially enhances precision and outperforms conventional fringe-fitting protocols under noise. This framework establishes a noise-resilient pathway for entanglement-enhanced sensing, advancing high-precision measurements in geophysics, navigation, and timekeeping.

LETTER

Micromagnetic modeling of surface acoustic wave—driven dynamics: Interplay of strain, magnetorotation, and magnetic anisotropy

Florian Millo, Pauline Rovillain, Massimiliano Marangolo, and Daniel Stoeffler

Phys. Rev. Applied **26**, L021004 (2026) - Published 14 August, 2026

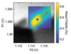
This Letter investigates the coupling mechanism of surface acoustic waves (SAWs) with spin waves (SWs) via micromagnetic analysis. The SAW magnetoacoustic excitation field is fully implemented (all strain and lattice-rotation terms included) in a realistic Co-Fe-B film with weak in-plane uniaxial anisotropy. Resonance alone does not guarantee efficient coupling; weak in-plane anisotropy can reshape the SAW-SW coupling, while lattice rotation can enhance and restructure the absorption features. Particular emphasis is put on the case where a SAW propagates parallel to the external magnetic field, a configuration of special interest for magnonics.

LETTER

Fast, high-fidelity baseband reset of a latched state for readout of a quantum dot qubit

Piotr Marciniec, M. A. Wolfe, Tyler Kovach, J. Reily, Sanghyeok Park, Jared Benson, Mark Friesen, Benjamin D. Woods, Matthew J. Curry, Nathaniel C. Bishop, J. Corrigan, and M. A. Eriksson

Phys. Rev. Applied **26**, L021005 (2026) - Published 21 August, 2026



Fast, high-fidelity qubit measurement and initialization are important for minimizing errors in quantum algorithms. *Latched readout* is a powerful technique for high-fidelity measurement of a spin qubit, but with it come inherently long initialization times. This Letter presents a fresh initialization technique that takes advantage of a fast, two-step decay process to achieve better than 50-fold speedup over passive initialization of latched readout states. This multistep technique uses a low-amplitude pulsing scheme to achieve fast qubit initialization, comparable to simpler single-step techniques, while relieving technical complications that can arise.

ARTICLES

Reconfigurable unit cell with broad impedance tunability for synthesis of anisotropic and bianisotropic Huygens metasurfaces

Pablo Camacho, Elham Baladi, and Mohammad S. Sharawi

Phys. Rev. Applied **26**, 024001 (2026) - Published 4 August, 2026

Temporal interface in wire media controlled by switches

Constantin Simovski and Mikhail Sidorenko

Phys. Rev. Applied **26**, 024002 (2026) - Published 19 August, 2026

Gate-based microwave quantum repeater via grid-state encoding

Hany Khalifa and Matti Silveri

Phys. Rev. Applied **26**, 024003 (2026) - Published 5 August, 2026

Nonlinear enhancement of measurement precision via a hybrid quantum switch

Lei Chen, Yuxiang Yang, Gong-Chu Li, Xu-Song Hong, Si-Qi Zhang, Hua-Qing Xu, Yuan-Cheng Liu, Giulio Chiribella, Zhibo Hou, Geng Chen, Chuan-Feng Li, and Guang-Can Guo

Phys. Rev. Applied **26**, 024004 (2026) - Published 5 August, 2026

Fault-tolerant modular quantum computing with surface codes using single-shot emission-based hardware

Siddhant Singh, Rikiya Kashiwagi, Kazufumi Tanji, Wojciech Roga, Daniel Bhatti, Masahiro Takeoka, and David Elkouss

Phys. Rev. Applied **26**, 024005 (2026) - Published 5 August, 2026

Resource-efficient linear-optical generation of GHZ-like states

Suren A. Fldzhyan, Stanislav S. Straupe, and Mikhail Yu. Saygin

Phys. Rev. Applied **26**, 024006 (2026) - Published 5 August, 2026

Sparse-graph optimization using weighted quantum wires in Rydberg-atom arrays

A. G. de Oliveira, J. Kombe, G. Pelegrí, P. Schroff, M. T. Wells-Pestell, D. M. Walker, A. J. Daley, and J. D. Pritchard

Phys. Rev. Applied **26**, 024007 (2026) - Published 5 August, 2026

Super-Heisenberg-limited sensing via collective subradiance in waveguide quantum electrodynamics

Xin Wang and Zeyang Liao

Phys. Rev. Applied **26**, 024008 (2026) - Published 5 August, 2026

High-fidelity two-qubit gates with transmon qubits using bipolar flux pulses and tunable couplers

Nikita S. Smirnov, Aleksei R. Matanin, Anton I. Ivanov, Vladimir V. Echeistov, Nikita D. Korshakov, Elizaveta I. Malevannaya, Viktor I. Polozov, Bogdan K. Getmanov, Anastasia A. Solovieva, Daria A. Moskaleva, Elizaveta A. Krivko, Dmitry O. Moskalev, Dmitry A. Mikhalin, Igor S. Korobenko, Denis E. Shirokov, Ilya A. Ryzhikov, Alexander V. Andriyash, and Ilya A. Rodionov

Phys. Rev. Applied **26**, 024009 (2026) - Published 6 August, 2026

Sensitive detection of the Rydberg transition in trapped electrons on liquid helium using radio-frequency reflectometry

Jui-Yin Lin, Tomoyuki Tani, Mikhail Belianchikov, and Denis Konstantinov

Phys. Rev. Applied **26**, 024010 (2026) - Published 6 August, 2026

Quantitative evaluation of gas-damping effects in high-precision gravitational reference sensors based on Monte Carlo numerical simulation

Ying-Nan Zhu, Jin-Song Yang, Peng Wang, Yan-Chong Liu, Ji Fan, Yan-Zheng Bai, and Ze-Bing Zhou

Phys. Rev. Applied **26**, 024011 (2026) - Published 6 August, 2026

Optimizing QAOA circuit transpilation with parity twine and SWAP network encodings

J. A. Montañez-Barrera, Yanjun Ji, Michael R. von Spakovsky, David E. Bernal Neira, and Kristel Michielsen

Phys. Rev. Applied **26**, 024012 (2026) - Published 7 August, 2026

Predicting charge stability in donor spin-qubit arrays in silicon

Songqi Jia, Pericles Philippopoulos, Félix Beaudoin, and Hong Guo

Phys. Rev. Applied **26**, 024013 (2026) - Published 7 August, 2026

Magnetic properties and subkelvin magnetocaloric effect of the low-density triangular-lattice series (, Nd, Gd–Yb)

Malik Ashtar, Zhaotong Zhuang, Xinyang Liu, Jitong Song, Zixuan Leng, Wenke Ma, He Sun, Junsen Xiang, Zhaoming Tian, and Peijie Sun

Phys. Rev. Applied **26**, 024014 (2026) - Published 7 August, 2026

Tuning high-mobility transport and degeneracy in single crystals for high-performance infrared detectors

Li Chen, Nan Zhou, Yu Zhao, Yongqiang Pan, Xiaoguang Zhu, Ranran Zhang, Wenhai Song, Zhigao Sheng, Xuan Luo, and Yuping Sun

Phys. Rev. Applied **26**, 024015 (2026) - Published 7 August, 2026

Simulation-free fidelity estimation of universal quantum processors via output order statistics of chaotic circuits

Tobias Micklitz

Phys. Rev. Applied **26**, 024016 (2026) - Published 7 August, 2026

Estimating resolution from images of wavelength-scale objects: Issues and reliability

A. V. Maslov

Phys. Rev. Applied **26**, 024017 (2026) - Published 10 August, 2026

Robust gigahertz-range ac magnetometry with an ensemble of centers in diamond using concatenated continuous dynamical decoupling

Takuya Kitamura, Genko Genov, Alon Salhov, Yutaka Kobayashi, Shinobu Onoda, Junichi Isoya, Alex Retzker, and Fedor Jelezko

Phys. Rev. Applied **26**, 024018 (2026) - Published 10 August, 2026

Enhancing angular sensitivity of segmented antineutrino detectors for reactor monitoring

Brian C. Crow, Max A. A. Dornfest, John G. Learned, Jackson D. Seligman, Nathan S. Sibert, Jeffrey G. Yepez, and Viacheslav A. Li

Phys. Rev. Applied **26**, 024019 (2026) - Published 10 August, 2026

Leveraging the critical mode of flexural vibration for enhanced performance of nanomechanical systems

Jay Krishna Anand, Durgesh Banswar, Sonika Singh, and Ankur Goswami

Phys. Rev. Applied **26**, 024020 (2026) - Published 10 August, 2026

Lemniscate phase trajectories for high-fidelity preparation of GHZ states in trapped-ion chains

Evgeny V. Anikin, Andrey Chuchalin, Dimitrii Donchenko, Olga Lakhmanskaya, and Kirill Lakhmanskiy

Phys. Rev. Applied **26**, 024021 (2026) - Published 10 August, 2026

Analysis of fluorescence-fluctuation spectroscopy combining autocorrelation and time-integrated cumulants in confocal microscopy

Pierre Leclerc, Henri Truong, Gérard Colas des Francs, Laurent Hériot, and Aymeric Leray

Phys. Rev. Applied **26**, 024022 (2026) - Published 10 August, 2026

Linear optical FAN-OUT gates using fewer ancillary single photons with enhanced success probability

Wen-Qiang Liu and Hai-Rui Wei

Phys. Rev. Applied **26**, 024023 (2026) - Published 11 August, 2026

Dynamic imaging of periodic structures using extreme-ultraviolet scatterometry

Brendan McBennett, Michael Tanksalvala, Emma E. Nelson, Theodore H. Culman, Yunhao Li, Jiayi Liu, Ethan Berk, Albert Beardo, James Harford, Justin M. Shaw, Henry C. Kapteyn, Margaret M. Murnane, and Joshua L. Knobloch

Phys. Rev. Applied **26**, 024024 (2026) - Published 11 August, 2026

EDITORS' SUGGESTION

Distinguishing types of correlated errors in superconducting qubits

H. P. Binney, H. D. Pinckney, K. Azar, P. M. Harrington, S. Jha, M. Li, J. Yang, F. Contipelli, R. DePencier Piñero, M. Gingras, B. M. Niedzielski, H. Stickler, M. E. Schwartz, J. A. Grover, M. Hays, K. Serniak, J. A. Formaggio, and W. D. Oliver

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High-efficiency thermophotovoltaic selective emitter enabled by a one-dimensional highly doped silicon grating and a photonic crystal stack

Maha Ben Rhouma and Brahim Guizal

Phys. Rev. Applied **26**, 024026 (2026) - Published 12 August, 2026

Integral variable-range hopping for modeling electrical transport in disordered systems

Chenxin Qin, Chenyan Wang, Mouyang Cheng, and Ji Chen

Phys. Rev. Applied **26**, 024027 (2026) - Published 12 August, 2026

EDITORS' SUGGESTION

Establishing the magnetoelastic origin of spin-wave routing through focused-ion-beam patterning

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Few-MHz bandwidth tunable optical filter based on a fiber-ring resonator

Gabriele Maron, Anton Bölian, Xin-Xin Hu, Luke Masters, Arno Rauschenbeutel, and Jürgen Volz

Phys. Rev. Applied **26**, 024029 (2026) - Published 12 August, 2026

Multimodal direct-ray transmission for enhanced point-to-point wireless-channel capacity

Felipe Vico, Jose I. Herranz-Herruzo, Miguel Ferrando-Rocher, and Eva Antonino-Daviu

Phys. Rev. Applied **26**, 024030 (2026) - Published 12 August, 2026

Size-dependent particle patterning in the Fresnel region of standing surface acoustic wave tweezers

Liang Shen, Andrew Moomaw, and Zhenhua Tian

Phys. Rev. Applied **26**, 024031 (2026) - Published 12 August, 2026

Mixed-state surface impedance of Nb-Ti: Flux flow, pinning, and creep

Nicola Pompeo, Andrea Alimenti, Davide Ford, Gianluca Ghigo, Alessandro Magalotti, Giovanni Marconato, Cristian Pira, Kostiantyn Torokhtii, Pablo Vidal García, and Enrico Silva

Phys. Rev. Applied **26**, 024032 (2026) - Published 13 August, 2026

EDITORS' SUGGESTION

Semiconductor-quality pyrite from iron ore

Yeon Lee, Jennifer T. Mitchell, Caitlyn Komar, Matt Mlinar, Jestos Taguta, George Hudak, and Chris Leighton

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Most informative Cramér-Rao bound for quantum two-parameter estimation with pure-state probes

Simon K. Yung, C. M. Yung, Lorcán O. Conlon, and Syed M. Assad

Phys. Rev. Applied **26**, 024034 (2026) - Published 13 August, 2026

Thermoelasticity-induced interferometer-displacement noise from the test mass in spaceborne gravitational-wave detectors

Xingyu Yan, Fulong Wei, Shen Zhan, and Zebing Zhou

Phys. Rev. Applied **26**, 024035 (2026) - Published 13 August, 2026

Persistent-current-biased and current-actuated switch for superconducting circuits

Ziyi Zhao, Eva Gurra, Michael R. Vissers, and K. W. Lehnert

Phys. Rev. Applied **26**, 024036 (2026) - Published 14 August, 2026

Efficient single-atom transfer from an optical conveyor belt to a tightly confined optical tweezer

Lei Xu, Ling-Xiao Wang, Guang-Jie Chen, Zhu-Bo Wang, Xin-Biao Xu, Guang-Can Guo, Chang-Ling Zou, and Guo-Yong Xiang

Phys. Rev. Applied **26**, 024037 (2026) - Published 14 August, 2026

ARTICLES

Research Articles

Coupling quantum dots to elastic waves in a phononic crystal waveguide

Jakub Rosiński, Michał Gawełczyk, Matthias Weiß, Hubert J. Krenner, and Paweł Machnikowski

Phys. Rev. Applied **26**, 024038 (2026) - Published 17 August, 2026

ARTICLES

Grazing-incidence resonant elastic x-ray scattering of skyrmion lattices in bulk MnSi

Jingyi Chen, Andreas Bauer, Christian Pfleiderer, Gerrit van der Laan, Thorsten Hesjedal, and Shilei Zhang

Phys. Rev. Applied **26**, 024039 (2026) - Published 14 August, 2026

EDITORS' SUGGESTION

Fast and sensitive readout of a semiconductor quantum dot using an *in situ* microwave resonator with enhanced gate lever arm

Tim J. Wilson and Hong-Wen Jiang

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Volatile resistive-switched state in a bulk organic conductor with a sharp metal-insulator transition

Riku Ishii, Ryo Motohashi, Keitaro Tada, Yusuke Suzuki, Takayoshi Kouchi, Hiroshi Oike, Fumitaka Kagawa, Reizo Kato, and Tetsuaki Itou

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Potassium Faraday lasers for atomic magnetometry

Ziqi Lu, Yuefeng Lu, Baichuan Li, Xiaoliang Li, Tiantian Shi, Teng Wu, Anhong Dang, and Jingbiao Chen

Phys. Rev. Applied **26**, 024042 (2026) - Published 17 August, 2026

Periodic defect engineering in microring resonators for high-purity vortex-beam generation

Zezheng Wang, Bohao Chen, Jihong Zhu, Yuanjie Yang, and Zhihong Zhang

Phys. Rev. Applied **26**, 024043 (2026) - Published 17 August, 2026

Steady-state exceptional-point degeneracy and sensitivity of nonlinear saturable coupled oscillators

Benjamin Bradshaw, Amin Hakimi, and Filippo Capolino

Phys. Rev. Applied **26**, 024044 (2026) - Published 25 August, 2026

Modeling integrated frequency shifters and beam splitters

Manuel H. Muñoz-Arias, Kevin J. Randles, Nils T. Otterstrom, Paul S. Davids, Michael Gehl, and Mohan Sarovar

Phys. Rev. Applied **26**, 024045 (2026) - Published 17 August, 2026

EDITORS' SUGGESTION

Scalable simulation of quantum many-body dynamics with OR-represented quantum algebra

Lukas Broers, Rong-Yang Sun, and Seiji Yunoki

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Highly linear flux-to-voltage transducer based on superconducting quantum interference proximity transistors

Angelo Greco, Giorgio De Simoni, and Francesco Giazotto

Phys. Rev. Applied **26**, 024047 (2026) - Published 18 August, 2026

Optical modeling and numerical optimization of antireflective coatings for back-contact perovskite solar cells

Erik O. Shalenov, Yersain K. Nurmagambetov, Kuanysh O. Tlekova, Madina M. Seisembayeva, Karlygash N. Dzhumagulova, Bauyrzhan N. Idreisov, Annie Ng, and Askhat N. Jumabekov

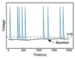
Phys. Rev. Applied **26**, 024048 (2026) - Published 18 August, 2026

EDITORS' SUGGESTION

Timing jitter induced by stochastic baseline fluctuations in high-count-rate superconducting nanowire single-photon detectors

Dianpeng Wang, You Xiao, Jiamin Xiong, Chenrui Wang, Zhen Wan, Hongxin Xu, Chaomeng Ding, Jia Huang, Lixing You, and Hao Li

Phys. Rev. Applied **26**, 024049 (2026) - Published 18 August, 2026



Superconducting nanowire single-photon detectors with high count rates are important for quantum information processing, optical communication, and photon-starved imaging. Their timing performance is limited by excess jitter, though, and the underlying physics is not fully understood. This study identifies stochastic baseline fluctuations caused by the finite memory of ac-coupled readout circuits as an important source of timing jitter at high count rates, and establishes a quantitative framework to predict their impact. Also, under pulsed illumination the timing jitter is found to reach a maximum at about half of the laser's repetition rate.

Electromagnetic modes in spherical cavities: Angular spectra, dispersion relations, and self-adjoint extensions

Mustafa Bakr, Tongyu Zhang, and Smain Amari

Phys. Rev. Applied **26**, 024050 (2026) - Published 19 August, 2026

Reservoir computing as a language model

Felix Köster and Atsushi Uchida

Phys. Rev. Applied **26**, 024051 (2026) - Published 19 August, 2026

-based energy-efficient artificial spiking sensor emulating human-skin-like high-precision temperature perception

Xi Zeng, Thomas Ratier, Rafael Puyol, Léopold Van Brandt, and Denis Flandre

Phys. Rev. Applied **26**, 024052 (2026) - Published 19 August, 2026

Exceptional topological entanglement in open quantum systems

Shahab Ramezanpour and Amr S. Helmy

Phys. Rev. Applied **26**, 024053 (2026) - Published 19 August, 2026

Nonreciprocal spin transport across a Pt/Ti bilayer

Feng Li, Qian Zhao, Ping Tang, Zimu Li, Quwen Wang, Yixin Fan, Tengfei Zhang, Jianbo Wang, Qingfang Liu, Guoqiang Yu, and Jinwu Wei

Phys. Rev. Applied **26**, 024054 (2026) - Published 19 August, 2026

Nucleation suppression by charge screening on grain boundaries: A kinetic model for bulk imprint in polycrystalline ferroelectric thin films

Huanhuan Tian, Jianguo Yang, and Ming Liu

Phys. Rev. Applied **26**, 024055 (2026) - Published 20 August, 2026

Machine-learning-assisted material and geometry characterization from Casimir force measurement

Hideo Iizuka and Shanhui Fan

Phys. Rev. Applied **26**, 024056 (2026) - Published 20 August, 2026

Passive cryogenic vacuum metrology from translational damping of a Meissner-levitated magnetic sphere

Kun Wang, Fang Xiong, Tong Wu, Xu-Ran Tao, Kai Ma, Yi-Chong Ren, Feng Xu, Xiao-Jing Chen, and Fei Xue

Phys. Rev. Applied **26**, 024057 (2026) - Published 20 August, 2026

Raman detuning compensation in atom gravimeters for surveys of marine gravity

Su-Peng Li, Xi Chen, Bei-Bei Liu, Ming-Qi Huang, Yu-Heng Zhao, Yu Luo, Sheng-Hua Li, Chang-Chun Wang, Jian-Wei Pan, Luo-Kan Chen, and Shuai Chen

Phys. Rev. Applied **26**, 024058 (2026) - Published 20 August, 2026

Implementation of a -free iSWAP gate via dual-microwave suppression of coupling

Yuan Li, Yuanhao Fu, Dayu Li, Chen Zha, Sirui Cao, Jianbin Cai, Yisen Hu, Daojin Fan, Zhiyuan Chen, Zihua Chen, Yangsen Ye, Jin Lin, Ming Gong, Shaowei Li, and Yong-Heng Huo

Phys. Rev. Applied **26**, 024059 (2026) - Published 20 August, 2026

Spin splitting torque–induced perpendicular magnetization field-free switching in the heterostructure

Xiaoyu Feng, Xinge Feng, Peng Zhang, Fangjun Guo, Zhirui Wang, Yifei Wang, Zhiqiang Zhang, Wending Liu, Dangwei Guo, Desheng Xue, and Xiaolong Fan

Phys. Rev. Applied **26**, 024060 (2026) - Published 21 August, 2026

Magnetophotoelectric effect in graphene via tailored potential landscapes

Joris Josiek, Friedemann Queisser, Stephan Winnerl, and Ralf Schützhold

Phys. Rev. Applied **26**, 024061 (2026) - Published 21 August, 2026

Optimal and efficient inference tools for field tracking with precessing spins

Klaudia Dilcher, Piotr Bania, Diana Méndez-Avalos, Aleksandra Sierant, Morgan W. Mitchell, and Jan Kołodyński

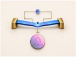
Phys. Rev. Applied **26**, 024062 (2026) - Published 25 August, 2026

EDITORS' SUGGESTION

Electromechanical coupling at tunable band extrema in flexoelectric metamaterials

Kshiteej J. Deshmukh, Ihina Mahajan, Alper Erturk, and Pradeep Sharma

Phys. Rev. Applied **26**, 024063 (2026) - Published 24 August, 2026



Stopping and localizing elastic waves can concentrate energy for high-sensitivity sensing and harvesting, but this often requires intricately tuned lattices or symmetry-restricted piezoelectric transducers. This study finds that flexoelectricity—the universal coupling between strain gradients and electric polarization—could be combined with higher-order elasticity to create stable, tunable zero-group-velocity extrema and stationary-inflection modes. Introducing a defect cavity for tighter localization increases both open-circuit voltage and mass responsivity. The resulting self-sensing, electrically reconfigurable resonators could enable compact devices for diverse applications.

Real-time amplitude and phase estimation of ac magnetic fields with spins in diamond

C. T.-K. Lew, S. A. Wilkinson, N. Gillespie, B. C. Gibson, D. A. Broadway, and J.-P. Tetienne

Phys. Rev. Applied **26**, 024064 (2026) - Published 24 August, 2026

Dispersive Hong-Ou-Mandel interference with finite coincidence windows

T. J. Walstra, A. J. Hasenack, D. J. de Ruiter, P. W. H. Pinkse, T. D. Bradley, and B. Škorić

Phys. Rev. Applied **26**, 024065 (2026) - Published 24 August, 2026

High-fidelity, robust, and programmable quantum logic units via intersubspace dynamical decoupling

Yao Song, Junkai Zeng, Guangchong Hu, Yu He, and Xiu-Hao Deng

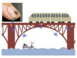
Phys. Rev. Applied **26**, 024066 (2026) - Published 24 August, 2026

EDITORS' SUGGESTION

Battery-free wireless quartz-crystal-microbalance sensor operating at a range of 50 m

Motoyuki Hamana, Ambuj Kumar Gautam, Motoharu Haga, Riki Nishihara, Wenlou Yuan, Fumihito Kato, Nobutomo Nakamura, Hiroki Okita, and Hirotsugu Ogi

Phys. Rev. Applied **26**, 024067 (2026) - Published 24 August, 2026



Starting from a quartz-crystal microbalance, the authors develop a battery-free wireless sensing technology that enables remote measurements of structural strain and gas concentration over distances exceeding 50 m. The system enhances the electromechanical coupling between an AT-cut quartz resonator (packaged in a slightly pre-bent state) and electromagnetic waves, enabling long-range sensing without onboard power sources or electrical connections. The ability to perform battery-free long-range sensing is promising for smart infrastructure monitoring, with applications in bridges, pipelines, nuclear facilities, and industrial plants.

Nonlinear dynamics of hopfions for frequency multiplication

Waleed I. Waseer, Yunshan Cao, and Peng Yan

Phys. Rev. Applied **26**, 024068 (2026) - Published 25 August, 2026

Deterministic photonic controlled--phase gate enabled by passive time-reversal-symmetric photon transport

Zhaohua Tian, Ying Gu, and Xue-Wen Chen

Phys. Rev. Applied **26**, 024069 (2026) - Published 25 August, 2026

Transient dynamics of parametric driving for single-electron image-current detection in a Paul trap

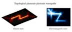
Baiyi Yu, Andris Huang, Isabel Sacksteder, and Hartmut Haeffner

Phys. Rev. Applied **26**, 024070 (2026) - Published 25 August, 2026

Colocalized photonic and phononic topological edge states in silicon membrane structures

Nouh Krai, Gaëtan Lévêque, Bahram Djafari-Rouhani, and Yan Pennec

Phys. Rev. Applied **26**, 024071 (2026) - Published 25 August, 2026



This work introduces a unified platform supporting topological states for both electromagnetic and elastic waves, within the same artificial crystal. While topological photonic and phononic systems typically are investigated independently, the approach here enables direct comparison of their topological properties and transport behaviors in the selfsame geometry. Breaking a specific spatial symmetry in a graphenelike lattice opens valley-polarized topological band gaps in both physical domains, yielding interfacial states between topologically distinct crystals. The authors establish a general, unifying framework for topological photonics and phononics.

Analog circuit-quantum-electrodynamics simulator of quantum spin dynamics through the extended Bose-Hubbard model

Ivan V. Dudinets, Jaehee Kim, Tomás Ramos, Aleksey K. Fedorov, Vladimir I. Man'ko, and Joonsuk Huh

Phys. Rev. Applied **26**, 024072 (2026) - Published 25 August, 2026

Passive synchronization of nonlocal Franson interferometry for fiber-based quantum networks using copropagating classical clock signals

Xiao Xiang, Runai Quan, Yuting Liu, Huibo Hong, Bingke Shi, Zhiguang Xia, Xinghua Li, Tao Liu, Shougang Zhang, and Ruifang Dong

Phys. Rev. Applied **26**, 024073 (2026) - Published 26 August, 2026

Triple-key optical encryption system using ultra-sparse sampling of orbital angular momentum speckles

Junlei Zhou, Yaling Yin, Qi Chu, Chaoxiu Guo, Quanli Gu, and Yong Xia

Phys. Rev. Applied **26**, 024074 (2026) - Published 26 August, 2026

Detuning-insensitive wide-field microwave imaging with diamond sensors

Xiu-Qi Chen, Rui-Zhi Zhang, Gang-Qin Liu, and Huijie Zheng

Phys. Rev. Applied **26**, 024075 (2026) - Published 26 August, 2026

Solution of wave acceleration and non-Hermitian jump in nonreciprocal lattices

Sayan Jana, Bertin Many Manda, Vassos Achilleos, Dimitrios J. Frantzeskakis, and Lea Sirota

Phys. Rev. Applied **26**, 024076 (2026) - Published 26 August, 2026

Efficient growth of preferentially oriented N- ensemble in diamond

Xun Zhu, Chao-Nan Lin, Xian-Qi Dong, Cheng-Liang Yue, Yuan Zhang, Yan Liu, Qing Lou, Chong-Xin Shan, and Ren-Fu Yang

Phys. Rev. Applied **26**, 024077 (2026) - Published 26 August, 2026

Pulsed coherent spectroscopy of a quantum emitter in hexagonal boron nitride

Jake Horder, Hugo Quard, Kenji Watanabe, Takashi Taniguchi, Nathan Coste, and Igor Aharonovich

Phys. Rev. Applied **26**, 024078 (2026) - Published 27 August, 2026

Model-based and data-driven phase compensation for continuous-variable quantum communication

Lei Wang, Geng Chai, Zhengwen Cao, and Yinghua Jiang

Phys. Rev. Applied **26**, 024079 (2026) - Published 27 August, 2026

Geometry-governed dual-frequency terahertz third-harmonic generation in a single-layer graphene metamaterial

Mingjun Xu, Dexian Yan, Xiangjun Li, Le Zhang, Yi Wang, Jining Li, and Jianquan Yao

Phys. Rev. Applied **26**, 024080 (2026) - Published 27 August, 2026

First-principles analysis of hole-induced bond dissociation in silicon dioxide

Dominic Waldhoer, Mark E. Turiansky, Woncheol Lee, Sokrates T. Pantelides, Chris G. Van de Walle, and Tibor Grasser

Phys. Rev. Applied **26**, 024081 (2026) - Published 27 August, 2026

Y-scheme heterojunction photocatalyst: Polarization-driven charge separation beyond interfacial limitations

Zi-Xuan Yang, Lei Li, Tao Huang, Hui Wan, X. S. Wang, Gui-Fang Huang, Wangyu Hu, and Wei-Qing Huang

Phys. Rev. Applied **26**, 024082 (2026) - Published 28 August, 2026

Spatial mode encoding for quantum key distribution: From hundreds to thousands of modes

Lukas Scarfe, Yingwen Zhang, and Ebrahim Karimi

Phys. Rev. Applied **26**, 024083 (2026) - Published 28 August, 2026

Soft-tissue boundary-enhanced proton imaging driven by hollow lasers

Mengjiao Wang, Shuang Dong, Xinyue Sun, Zhiyong Shi, Yi Xu, Zongxin Zhang, Jiayi Qian, Jiacheng Zhu, Xiaoyan Liang, Yuxin Leng, and Wenpeng Wang

Phys. Rev. Applied **26**, 024084 (2026) - Published 31 August, 2026

Microscopic damping and energy dissipation via phonon dynamics in single crystals

Zhiyu Liu, Iskander G. Batyrev, and Peter W. Chung

Phys. Rev. Applied **26**, 024085 (2026) - Published 31 August, 2026

Disorder-driven stochastic dynamics in Mott resistive-switching systems

David J. Alspaugh, Lorenzo Fratino, Nareg Ghazikhanian, Ivan K. Schuller, and Marcelo Rozenberg

Phys. Rev. Applied **26**, 024086 (2026) - Published 31 August, 2026

Focusing surface-acoustic-wave resonators on thin-film lithium niobate with transverse-mode suppression

Ryo Sasaki, Ryusuke Hisatomi, Rekishu Yamazaki, Yuya Yamaguchi, Yasunobu Nakamura, and Atsushi Noguchi

Phys. Rev. Applied **26**, 024087 (2026) - Published 31 August, 2026

Crosstalk in multiqubit fluxonium architectures with transmon couplers

Martijn F. S. Zwanenburg and Christian Kraglund Andersen

Phys. Rev. Applied **26**, 024088 (2026) - Published 31 August, 2026

ERRATA

Erratum: High-performance chiral mirrors by twisted anisotropic photonic crystals [Phys. Rev. Applied 23, 064027 (2025)]

Andrea Alessandrini, Leone di Mauro Villari, Luca Assogna, Matteo Silvestri, Matteo Venturi, Carino Ferrante, Paola Benassi, Davide Tedeschi, and Andrea Marini

Phys. Rev. Applied **26**, 029901 (2026) - Published 11 August, 2026

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