PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Control of surface roughness by varying the temperature while a thin film is deposited *(14 pages)* 045504
Edwin Edgar Mozo Luis, Thiago A. de Assis, and Fábio D. A. Aarão Reis

COMMENTS

Comment on "Discontinuous codimension-two bifurcation in a Vlasov equation" *(3 pages)* 046201
Tarcísio N. Teles, Renato Pakter, and Yan Levin

Reply to "Comment on "Discontinuous codimension-two bifurcation in a Vlasov equation"" *(3 pages)* 046202
Yoshiyuki Y. Yamaguchi and Julien Barré

ERRATA

Erratum: Carbon ionization from a quantum average-atom model up to gigabar pressures
[Phys. Rev. E **104**, 025209 (2021)] *(1 page)* . . . . . 049901(E)
Gérald Faussurier, Christophe Blancard, and Mandy Bethkenhagen

Erratum: Electron-ion coupling factor for temperature relaxation in dense plasmas
[Phys. Rev. E **101**, 023206 (2020)] *(1 page)* . . . . . 049902(E)
Gérald Faussurier

Erratum: Density effects on electronic configurations in dense plasmas
[Phys. Rev. E **97**, 023206 (2018)] *(1 page)* . . . . . 049903(E)
Gérald Faussurier and Christophe Blancard

Erratum: Numerical investigation of atmospherelike flows in a spherical geometry
[Phys. Rev. E **104**, 065110 (2021)] *(1 page)* . . . . . 049904(E)
Vadim Travnikov and Christoph Egbers

Erratum: Nonequilibrium protection effect and spatial localization of noise-induced fluctuations: Quasi-one-dimensional driven lattice gas with partially penetrable obstacle
[Phys. Rev. E **109**, 054103 (2024)] *(1 page)* . . . . . 049905(E)
S. P. Lukyanets and O. V. Kliushnichenko

Retraction: Multiparticle quantum heat engine: Exploring the impact of criticality on efficiency
[Phys. Rev. E **112**, 044104 (2025)] *(1 page)* . . . . . 049906(E)
Anass Hminat, Abdallah Slaoui, Brahim Amghar, and Rachid Ahl Laamara

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Numerically discovered inherent states are always protocol dependent in jammed packings *(6 pages)* 045408
Eddie Bautista and Eric I. Corwin

Free chiral self-propelled robots compared to active Brownian circle swimmers *(13 pages)* 045409
Thomas Kiechl, Amy Altshuler, Anton Lüders, Yael Roichman, and Thomas Franosch

Flow field induced crystallization of multicomponent colloids *(9 pages)* 045410
Chetteente M. Ragisha, Noah Medina, Nihal M. Habeeb,
Thi Vo, and Subramanyan Namboodiri Varanakkottu

Large temperature-up-jump simulations of a binary Lennard-Jones system *(8 pages)* 045411
Aude Y. Amari, Lorenzo Costigliola, and Jeppe C. Dyre

Analytical solution for diffusiophoretic mobility of soft particles considering finite ion size effect *(14 pages)* 045412
Rahul Kumar Singh, Partha Sarathi Majee, and Hiroyuki Ohshima

Thermodynamic response functions of fluids with repulsive inverse power pair potentials *(16 pages)* 045413
D. M. Heyes and D. Dini

Interpretable liquid crystal phase classification via two-by-two ordinal patterns *(14 pages)* 045414
Leonardo G. J. M. Voltarelli, Natalia Osiecka-Drewniak, Marcin Piwowarczyk, Ewa Juszyńska-Gałązka,
Rafael S. Zola, Matjaž Perc, and Haroldo V. Ribeiro

Influence of turbulence on the triboelectric charging of granular materials carried by an airflow *(10 pages)* 045415
Thomas Gemine, Simon Dehareng, Thomas Andrianne, and Geoffroy Lumay

Reverse Janssen effect with non-spherical grains *(7 pages)* 045416
Adria Meca-Montserrat, Iker Zamorano, Caleb Anderson, Ramon Planet, and Alberto Fernandez-Nieves

Striker impact on granular chains generates solitary waves or shocklike wave depending on ramp time
of incoming pulse *(7 pages)* 045417
Po-Hsun Chiu and Vitali F. Nesterenko

Impact of initial charge distributions on the kinetics of charged particle coagulation *(11 pages)* 045418
Gustavo Castillo and Nicolás Mujica

Only the ambidextrous can flock: Two-dimensional chiral Malthusian flocks, time cholesterics,
and the Kardar-Parisi-Zhang equation *(30 pages)* 045419
Leiming Chen, Chiu Fan Lee, and John Toner

Kinetic theory of emulsions with matter supply *(19 pages)* 045420
Jacqueline Janssen, Frank Jülicher, and Christoph A. Weber

Mechanics, Interfaces, and Films

Genetically homogeneous sector morphologies emerge from anisotropic colony growth *(12 pages)* 045501
Daniel W. Swartz, Hyunseok Lee, Mehran Kardar, and Kirill S. Korolev

Hydrostatic Newton-Cartan membranes *(18 pages)* 045502
Domingo Gallegos and Carlos Málaga

Quantitative analysis of crack patterns in coatings *(8 pages)* 045503
Tristan Schweiss and Ludovic Pauchard

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Enhanced performance in quasi-isodynamic max-*J* stellarators with a turbulent particle pinch *(6 pages)* 045215
G. G. Plunk, A. G. Goodman, P. Xanthopoulos, P. Costello, H. M. Smith, K. Aleynikova, C. D. Beidler, M. Drevlak, S. Stroteich, and P. Helander

Computational Physics, Machine Learning, and Artificial Intelligence

Extended phase-space symplectic integration for electron dynamics *(15 pages)* 045301
François Mauger and Cristel Chandre

Decomposing the collision operator in the lattice Boltzmann method *(11 pages)* 045302
Julius Weinmiller, Benjamin Kellers, Martin P. Lautenschlaeger, Arnulf Latz, and Timo Danner

Double descent: When do neural quantum states generalize? *(19 pages)* 045303
M. Schuyler Moss, Alev Orfi, Christopher Roth, Anirvan M. Sengupta, Antoine Georges, Dries Sels, Anna Dawid, and Agnes Valenti

Machine-learned quantum molecular dynamics calculations of warm dense equation of state and ionic transport coefficients of deuterated water *(23 pages)* 045304
Margaret L. Berrens, Oleg Schilling, Evan B. Bauer, John E. Pask, Robert E. Rudd, Gavin D. Portwood, Sebastien Hamel, Lucas J. Babati, Scott D. Baalrud, and Nathaniel R. Shaffer

Equilibrium-distribution-function-based mesoscopic finite-difference methods for partial differential equations: Modeling and analysis *(21 pages)* 045305
Baochang Shi, Rui Du, and Zhenhua Chai

Interpolation-supplemented quantum lattice Boltzmann method for incompressible flows with nonuniform mesh and curved boundary *(14 pages)* 045306
Yang Xiao, Liming Yang, Hao Dong, and Yinjie Du

Soft Matter including Polymers, Liquid Crystals, and Granular Materials

Entropic alignment of topologically modified ring polymers in cylindrical confinement *(18 pages)* 045401
Sanjay Bhandarkar, Debarshi Mitra, Jürgen Horbach, and Apratim Chatterji

Dynamic heterogeneity and facilitation in sheared granular materials: Insights from three-dimensional triaxial testing *(10 pages)* 045402
Kwangmin Lee, Brett S. Kuwik, and Ryan C. Hurley

Mean-squared displacements of rough particles in polydisperse granular gases *(8 pages)* 045403
Anna S. Bodrova

Finite-time dehydration as a chemical reaction and its effect on counterion selectivity *(7 pages)* 045404
I. Rubinstein, M. Z. Bazant, N. A. Kononenko, V. V. Nikonenko, and B. Zaltzman

Adhesive loose packing limit of axisymmetric nonspherical particles *(14 pages)* 045405
Zhu Fang, Xuan Ruan, Yiyang Zhang, Longfei Chen, and Shuiqing Li

Effects of crowding and enzyme-driven active fluctuations on particle correlations in colloidal suspensions *(12 pages)* 045406
Arnab Maiti, Syed Shuja Hasan Zaidi, Prabhat K. Jaiswal, and Krishna Kanti Dey

Functional renormalization group for classical liquids without recourse to hard-core reference systems: A study of three-dimensional Lennard-Jones liquids *(13 pages)* 045407
Takeru Yokota, Jun Haruyama, and Osamu Sugino

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Drag force and diffusion of small planar structures: A gas kinetic theory analysis and molecular dynamics study *(12 pages)* 045106
Amitesh S. Jayaraman, Nikolaos Kateris, and Hai Wang

Quadratic Fokker-Planck model of monatomic rarefied gas *(20 pages)* 045107
Henan Zhang, Hao Yang, Ziqi Cui, and Jun Zhang

Plasma Physics

Quantitative analysis of zonal flow influence on turbulent plasmas driven by trapped electrons *(10 pages)* 045201
Jiheon Song, Jeff Candy, Emily Belli, and Jungpyo Lee

Characterization of time-dependent x-ray drive at the center of a cylindrical hohlraum *(7 pages)* 045202
Xufei Xie *et al.*

Linear stability analysis of radiative effects on compressible Rayleigh-Taylor instability *(12 pages)* 045203
Cunbo Zhang, Zongqiang Ma, Yang Song, Cheng-quan Fu, Zhengfeng Fan, Anmin He, and Pei Wang

Laser-driven autoresonant acceleration of thermal electrons in plasma solenoid *(13 pages)* 045204
Iu. Gagarin and Ph. Korneev

Light drag in nonuniformly moving anisotropic media through the lens of gradient-index optics *(16 pages)* 045205
Julien Langlois and Renaud Gueroult

Modeling partially ionized dense plasma using wavepacket molecular dynamics *(15 pages)* 045206
Daniel Plummer, Pontus Svensson, Wiktor Jasniak, Patrick Hollebon, Sam M. Vinko, and Gianluca Gregori

Beam transverse dynamics in laser-plasma accelerators *(12 pages)* 045207
Laury Batista, Samuel Marini, Nicolas Chauvin, Antoine Chancé, Didier Uriot, and Phu Anh Phi Nghiem

Universal growth of magnetic energy during the nonlinear phase of subsonic and supersonic small-scale dynamos *(9 pages)* 045208
Neco Kriel, Mark R. Krumholz, Patrick J. Armstrong, James R. Beattie, and Jennifer Schober

Theory of beam-driven nonlinear plasma wake and interior waves *(9 pages)* 045209
M. Lamač, P. Valenta, U. Chaulagain, J. Nejdl, D. Čáp, O. Morvai, and S. V. Bulanov

Investigating solid-fluid phase coexistence in dc plasma bilayer crystals: The role of particle pairing and mode coupling *(10 pages)* 045210
Siddhartha Mangamuri, L. Couëdel, and S. Jaiswal

Theoretical study of the electron cyclotron resonance ion plasma accelerator concept *(12 pages)* 045211
Andrea Cernuschi, Thomas Thuillier, and Laurent Garrigues

Implosion of cone-in-shell targets for direct-drive fast ignition *(12 pages)* 045212
A. Mateo, J. J. Honrubia, D. A. Callahan, M. Brönner, W. Theobald, and M. Roth

Anomalous collisionally induced transparency *(8 pages)* 045213
Litong Xu, Guoqian Liao, Xinyao Zhang, Jieya Ruan, Tingting Xi, Xin Lu, and Yutong Li

Formation of inverse electron distribution function in glow discharges with hollow cathode *(14 pages)* 045214
E. A. Bogdanov, A. A. Kudryavtsev, and Chengxun Yuan

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Competitive binding of transcription factors as activator-repressor in stochastic gene expression *(21 pages)* 044406
Amit Kumar Das and Debabrata Biswas

Density of states weighted decoherence probe formalism for charge transport in DNA *(15 pages)* 044407
Hashem Mohammad and M. P. Anantram

Ising models of cooperativity in muscle contraction *(10 pages)* 044408
Elaheh Saadat, Matthieu Caruel, Stefano Gherardini, Ilaria Morotti, Matteo Marcello, Marco Caremani, Marco Linari, Ivan Latella, and Stefano Ruffo

Dynamics of inducible genetic circuits *(55 pages)* 044409
Zitao Yang, Rebecca J. Rousseau, Sara D. Mahdavi, Hernan G. Garcia, and Rob Phillips

Directed swimming of *Chlamydomonas reinhardtii* near complex microstructures *(8 pages)* 044410
Chunhe Li, Hongyi Bian, Zixiang Lin, Yi Man, and Zijie Qu

Dynamical diversity in conductance-based neuron response to kilohertz electrical stimulation *(18 pages)* 044411
J. G. Polli, F. Kolbl, P. Lanusse, and M. G. E. da Luz

The FlEye camera: Sampling the joint distribution of natural scenes and motion *(18 pages)* 044412
Charles J. Edelson, Paul Smith, Sima Setayeshgar, William Bialek, and Rob R. de Ruyter van Steveninck

Self-trapping of microorganisms steering toward their own trail *(7 pages)* 044413
Aymeric Lutier, Jean-Baptiste Fournier, and Frédéric van Wijland

Perfect adaptation in eukaryotic gradient sensing using cooperative allosteric binding *(14 pages)* 044414
Vishnu Srinivasan, Wei Wang (汪巍), and Brian A. Camley

Fitness inference tested by in silico population genetics *(14 pages)* 044415
Hong-Li Zeng, Yu-Han Huang, Erik Aurell, and John Barton

Model reduction, coherence, and information transfer in stochastic biochemical systems *(20 pages)* 044416
Juan David Marmolejo-Lozano, Nikola Popović, and Ramon Grima

Fluid Dynamics

Comprehensive interscale energy transfer in homogeneous isotropic turbulence *(20 pages)* 045101
Jun-Yang Li, Dong Sun, Si-Wei Dong, Peng-Xin Liu, and Xian-Xu Yuan

Analysis of instantaneous skin friction in a supersonic turbulent boundary layer *(14 pages)* 045102
Rongji Hu, Zhikang Huang, Geng Zhao, Xue-Lu Xiong, Feng Liu, Jian Fang, and Yi Zhou

Analytical solution for dynamic evaporation of liquid in isothermal condition *(13 pages)* 045103
Luiz Eduardo Czelusniak, Tim Niklas Bingert, Stephan Simonis, Alexander J. Wagner, and Mathias J. Krause

Emergence of vorticity and viscous stress in finite-scale quantum hydrodynamics *(10 pages)* 045104
Christopher Triola

Relation of exact hydrodynamics to the Chapman-Enskog series *(7 pages)* 045105
Florian Kogelbauer and Ilya Karlin

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Extreme events of quantum walks on networks *(9 pages)* 044302
Nisarg Vyas and M. S. Santhanam

Effect of phase-lag on synchronization in adaptive multilayer networks with higher-order interactions *(19 pages)* 044303
Anath Bandhu Das, Sangita Dutta, and Pinaki Pal

Emergence of autocatalysis in prebiotic reaction networks *(12 pages)* 044304
Varun Varanasi and Jun Korenaga

Spectral coarse-graining scheme inspired by Laplacian renormalization group for higher-order network reaction-diffusion systems *(16 pages)* 044305
Linhe Zhu, Wenlong Zhang, and Shuling Shen

Minimal model of self-organized clusters with phase transitions in ecological communities *(21 pages)* 044306
Shing Yan Li, Mehran Kardar, Zhijie Feng, and Washington Taylor

Optimal control and evolutionary behavior in a two-layer epidemic model with travel restriction and social distancing *(15 pages)* 044307
M. A. H. Sajib, Md. Rajib Arefin, Md. Aslam Hossain, and Jun Tanimoto

Impacts of bridging nodes on the epidemic activation mechanisms *(10 pages)* 044308
José Carlos M. Silva, Diogo H. Silva, Wesley Cota, Francisco A. Rodrigues, and Silvio C. Ferreira

Maximum entropy temporal networks *(7 pages)* 044309
Paolo Barucca

Statistical field theory for dialectology *(22 pages)* 044310
James Burridge

Algebraic topological characterizations of tie strength in higher-order social networks *(20 pages)* 044311
Arnab Sarker, Jean-Baptiste Seby, Austin Benson, and Ali Jadbabaie

PART B

Biological Physics

Policy heterogeneity improves collective olfactory search in three-dimensional turbulence *(7 pages)* 044401
Lorenzo Piro, Robin A. Heinonen, Maurizio Carbone, Luca Biferale, and Massimo Cencini

Simplified analytical framework for fundamental vesicle shapes *(9 pages)* 044402
Amir H. Bahrami

From scattered to focused: Task-dependent connectivity in honey bees, with midge swarms and bird flocks *(12 pages)* 044403
Ishriak Ahmed, Md. Saiful Islam, and Imraan A. Faruque

Learning to crawl: Benefits and limits of centralized versus distributed control *(16 pages)* 044404
Luca Gagliardi and Agnese Seminara

Elasticity and plasticity of epithelial gap closure *(17 pages)* 044405
Maryam Setoudeh and Pierre A. Haas

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Comparative study of indicators of chaos in the closed and open Dicke model *(15 pages)* 044205
Prasad Pawar, Arpan Bhattacharyya, and B. Prasanna Venkatesh

Multilators on a 3-Torus: A framework for high-dimensional coupled oscillators *(13 pages)* 044206
Porikshit Mondal, Rakshita Sharma, V. K. Chandrasekar, Wei Zou, and D. V. Senthilkumar

Chaotic ghosts in systems with parameter drift: Delay and control critical transitions *(11 pages)* 044207
Han Su, Denghui Li, Jicheng Duan, Xiaoming Zhang, Yuan Yue, and Celso Grebogi

Analytical determination of multitime correlation functions in quantum chaotic systems *(21 pages)* 044208
Yoana R. Chorbadzhiyska, Peter A. Ivanov, and Charlie Nation

Floquet thermalization by power-law induced permutation symmetry breaking *(11 pages)* 044209
Manju C and Uma Divakaran

Hamiltonian structure and integrability of the susceptible-cleric-zombie-recovered epidemic model *(10 pages)* . . . 044210
Hamdi M. Abdelhamid

Self-consistent Born theory for the Duffing oscillator *(7 pages)* 044211
Martín E. Giuliano

Identifying wave sources using flow velocity method in excitable media *(11 pages)* 044212
Jin-Tao Mei, Qi-Hao Li, Yuan-Xun Xia, Jun-Ting Pan, Alexander V. Panfilov, and Hong Zhang

Partial amplitude death in aging transition of coupled oscillators with amplitude heterogeneity *(16 pages)* 044213
Longjun Wang, Jiangnan Chen, Lin Yan, and Weiqing Liu

Synchronization driven acoustics: The nonlinear scattering of a self-oscillating meta-atom *(10 pages)* 044214
Alexander K. Stoychev, Xinxin Guo, Ulrich Kuhl, and Nicolas Noiray

Trade-off between multiplicity and specificity in the interlayer connectivity of nonidentical multilayer networks *(17 pages)* 044215
Aradhana Singh, Amod Rai, Sheksha Dudekula, Devanarayanan P., and Antonio Palacios

Transient chaos and Rayleigh particle escape out of a time modulated optical trap *(7 pages)* 044216
Evgeny N. Bulgakov, Konstantin N. Pichugin, and Dmitrii N. Maksimov

Quantum chaos and semiclassical behavior in mushroom billiards I: Spectral statistics *(16 pages)* 044217
Matic Orel, Črt Lozej, Marko Robnik, and Hua Yan

Quantum chaos and semiclassical behavior in mushroom billiards II: Structure of quantum eigenstates and their phase space localization properties *(10 pages)* 044218
Matic Orel and Marko Robnik

Turing instability and pattern formation in a diffusive predator-prey system with opportunistic predators and weak Allee effect *(16 pages)* 044219
Wenjie Li, Wenhao Bai, and Jinde Cao

Networks and Complex Systems

Number of spanning trees as an indicator of critical phenomena: When Kirchhoff meets Ising *(9 pages)* 044301
Roberto da Silva, Henrique A. Fernandes, Paulo F. Gomes, Sebastian Gonçalves, E. V. Stock, and A. Alves

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Integrability and chaos via fractal analysis of spectral form factors: Gaussian approximations and exact results *(19 pages)* 044128
Lorenzo Campos Venuti, Jovan Odavić, and Alioscia Hamma

Temperature-Induced Quantum Migration and local heat capacity in confined Fermi gases *(16 pages)* 044129
Altug Sisman and Jonas Fransson

Reliability of a nonlinear fluctuation-dissipation relation as a test of Markovianity *(19 pages)* 044130
Georg Podhaisky, Igor M. Sokolov, Yael Roichman, and Benjamin Lindner

Hierarchical balance theory: Emergence of instability in follower layer below critical temperatures *(10 pages)* . . . 044131
Amir Kargaran, Houman Jafari, and G. Reza Jafari

Optimal finite-time thermodynamics of effective two-level systems *(8 pages)* 044133
Alberto Rolandi

Reinterpreting diffusive constraints: Concentration cloaking via homogenization and pseudoconformal mapping *(13 pages)* 044134
Yuqian Zhao, Yuhong Zhou, Peng Jin, and Jiping Huang

Transformation of the Maxwell-Boltzmann distribution to a power law *(19 pages)* 044135
Ari Laor and Igor Gitelman

Stochastic systems with Bose-Hubbard interactions: Effects of bias on particles on a one-dimensional lattice *(9 pages)* 044136
Swastik Majumder and Mustansir Barma

Stochastic systems with Bose-Hubbard interactions: Effects of bias on particles on a random comb *(5 pages)* 044137
Swastik Majumder and Mustansir Barma

Field-theoretic simulation of Dean-Kawasaki dynamics for interacting particles *(20 pages)* 044138
Jaehyeok Jin, Chen Liu, and David R. Reichman

Nonreciprocal interactions and high-dimensional chaos: Comparing dynamics and statistics of equilibria in a solvable class of models *(37 pages)* 044139
Samantha J. Fournier, Alessandro Pacco, Valentina Ros, and Pierfrancesco Urbani

Strong-damping limit of quantum Brownian motion in a disordered environment *(7 pages)* 044140
Arthur M. Faria, Marcus V. S. Bonança, and Eric Lutz

Nonlinear Dynamics and Chaos

Toda-like Hamiltonian as a probe for quantized prey-predator dynamics *(15 pages)* 044201
Alex E. Bernardini and Orfeu Bertolami

Robust stabilization of fractional spatiotemporal chaos via model-free deep reinforcement learning *(10 pages)* . . . 044202
Gang-Cheng Huang

Chaotic variability in a model of coupled ice streams *(11 pages)* 044203
Kolja Kypke, Peter Ashwin, and Peter Ditlevsen

Dispersive shock waves in periodic lattices *(13 pages)* 044204
Su Yang, Sathyanarayanan Chandramouli, and P. G. Kevrekidis

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Generalized master equation for particle transport in binary random media with renewal statistics *(20 pages)* 044111
Anil K. Prinja and Dominic A. Lioce

Domain coarsening in fractonic systems: A cascade of critical exponents *(14 pages)* 044112
Jacopo Gliozzi, Federico Balducci, and Giuseppe De Tomasi

Quantum thermodynamics of Gross-Pitaevskii qubits *(9 pages)* 044113
Sebastian Deffner

Building causation links in stochastic nonlinear systems from data *(23 pages)* 044114
Sergio Chibbaro, Cyril Furtlehner, Théo Marchetta, Andrei-Tiberiu Pantea, and Davide Rossetti

Equilibrium properties in a harmonically confined two-component log gas *(8 pages)* 044115
Saikat Santra

Microscopically reversible kinetic theory of flocking *(17 pages)* 044116
Ruben Lier

Revisiting the phase diagram of hard-sphere dumbbells with nested sampling: Known phases and alternative packing variants *(11 pages)* 044117
Omar-Farouk Adesida, David Quigley, and Livia B. Pártay

Beyond constant-temperature reservoirs: A Stirling cycle with constant heat-generation rate *(7 pages)* 044118
Xinshu Xia, Hongbo Huang, and Hui Dong

Entropic and kinetic susceptibility equality out of equilibrium *(7 pages)* 044119
Takaaki Monnai

Exponents and front fluctuations in the quenched Kardar-Parisi-Zhang universality class of one- and two-dimensional interfaces *(14 pages)* 044120
A. Tajuelo-Valbuena, J. Trujillo-Mulero, J. J. Meléndez, R. Cuerno, and J. J. Ruiz-Lorenzo

Enhancing quantum heat engine performance via unitary-enabled exponential speedup of thermalization *(14 pages)* 044121
Dehua Liu and Jianhui Wang

Impact of fluctuations on particle systems described by Dean-Kawasaki-type equations *(10 pages)* 044122
Nathan O. Silvano, Emilio Hernández-García, and Cristóbal López

Symmetry breaking of current response in disordered exclusion processes *(10 pages)* 044123
Issei Sakai and Takuma Akimoto

Logarithmic subdiffusion from a damped bath model *(7 pages)* 044124
Thomas Guff and Andrea Rocco

Random planting with harvest: A statistical-mechanical analysis *(10 pages)* 044125
Julian Talbot

Reaching maximum efficiency in quantum Stirling engines using multilayer graphene *(14 pages)* 044126
Bastian Castorene, Francisco J. Peña, Eric Suárez Morell, Caio Lewenkopf, Martin HvE Groves, Natalia Cortés, and Patricio Vargas

Diversity as an entropic measure derived from entropiclike functionals *(7 pages)* 044127
Eugenio E. Vogel, Constantino Tsallis, and Gonzalo Saravia

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E **THIRD SERIES, VOLUME 113, NUMBER 4** **APRIL 2026**

Renormalization-inspired effective field neural networks for scalable modeling of classical and quantum many-body systems *(7 pages)* L043302
Xi Liu, Yujun Zhao, Chun Yu Wan, Yang Zhang, and Junwei Liu

Mirror states enable lower viscosity lattice gases *(5 pages)* L043303
Noah Seekins and Alexander J. Wagner

Soft Matter including Polymers, Liquid Crystals, and Granular Materials

Spontaneous rotation and propulsion of suspended capsules in active nematics *(6 pages)* L043401
Júlio P. A. Santos, Margarida M. Telo da Gama, and Rodrigo C. V. Coelho

General two-parameter model of alpha-relaxation in glasses *(7 pages)* L043402
Valeriy V. Ginzburg, Oleg Gendelman, Riccardo Casalini, and Alessio Zaccone

Molecular dynamics insights into the Debye process of 1-propanol *(7 pages)* L043403
Marceau Hénot and Jan Philipp Gabriel

ARTICLES

Statistical Physics

Diffusion of gravitactic chiral active Brownian particles in an asymmetric channel *(8 pages)* 044101
Narender Khatri, Vikas Sharma, Anton F. Burnet, and Suneet Kumar Awasthi

Tethering effects on first-passage variables of lattice random walks in linear and quadratic focal point potentials *(21 pages)* 044102
Debraj Das and Luca Giuggioli

Virtual walks in the Ising model: Finite-time scaling *(12 pages)* 044103
Amit Pradhan, Parongama Sen, and Sagnik Seth

Understanding jump discontinuity in disordered system *(9 pages)* 044104
Anjan Daimari and Diana Thongjaomayum

Three-state majority-vote model on a simple cubic lattice *(5 pages)* 044105
Wooseop Kwak, Jae Hwan Lee, and Jin Min Kim

Generation of concurrence in a generalized central spin model with a three-spin interacting environment *(12 pages)* 044106
Adithya A. Vasista, Anushka Agrawal, and Tanay Nag

Renormalization group for spectral collapse in random matrices with power-law variance profiles *(17 pages)* 044107
Philipp Fleig

Diffusion in nonequilibrium two-dimensional crystals *(7 pages)* 044108
Ashley Z. Guo, Sam Wilken, Dov Levine, and Paul M. Chaikin

Heat dissipation in marginally stable linear time-delayed Langevin systems *(14 pages)* 044109
Xin Wang

Stochastic field effects in a two-state system: Symmetry breaking and symmetry restoring *(10 pages)* 044110
Sara Oliver-Bonafoux, Raúl Toral, and Amitabha Chakrabarti

(Continued)

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).

PHYSICAL REVIEW E™

For editorial and subscription correspondence,
please see inside front cover
(ISSN: 2470-0045)

PERIODICALS
Postmaster send address changes to:

APS Subscription Services
P.O. Box 41
Annapolis Junction, MD 20701

THIRD SERIES, VOLUME 113, NUMBER 4
PARTS A AND B

CONTENTS

APRIL 2026

The Table of Contents is a total listing of Parts A and B.
Part A consists of pages L042101–044311, and Part B pages 044401–049906(E).

PART A

LETTERS

Statistical Physics

Proxitaxis: An adaptive search strategy based on proximity and stochastic resetting *(7 pages)* L042101
Giuseppe Del Vecchio Del Vecchio, Manas Kulkarni, Satya N. Majumdar, and Sanjib Sabhapandit

Universality of shocks in conserved driven single-file motions with bottlenecks *(7 pages)* L042102
Sourav Pal and Abhik Basu

Phase transitions and finite-size effects in integrable virial statistical models *(6 pages)* L042103
Xin An, Francesco Giglio, and Giulio Landolfi

Reversal of tracer advection and Hall drift in an interacting chiral fluid *(7 pages)* L042104
Erik Kalz, Shashank Ravichandir, Johannes Birkenmeier, Ralf Metzler, and Abhinav Sharma

Networks and Complex Systems

Interlinks enhance quantum transport on multilayer networks *(6 pages)* L042301
Mircea Galiceanu

Plasma Physics

Nonmodal growth and optimal perturbations in magnetohydrodynamic shear flows *(7 pages)* L043201
Adrian E. Fraser, Alexis K. Kaminski, and Jeffrey S. Oishi

Milestone toward an electron cyclotron resonance ion plasma accelerator demonstrator *(6 pages)* L043202
Andrea Cernuschi, Thomas Thuillier, and Laurent Garrigues

Self-mediation of runaway electrons via self-excited wave-wave and wave-particle interactions *(7 pages)* L043203
Qile Zhang, Yanzeng Zhang, Qi Tang, and Xian-Zhu Tang

Optimizing particle transport for enhanced confinement in quasi-isodynamic stellarators *(7 pages)* L043204
A. Bañón Navarro, A. Di Siena, F. Jenko, A. Merlo, and E. Laude

Computational Physics, Machine Learning, and Artificial Intelligence

Universal spin models are universal approximators in machine learning *(6 pages)* L043301
Tobias Reinhart and Gemma De les Coves

(Continued)

2470-0045(202604)113:4:B;1-Z

This paper was highlighted in the APS publication *Physics* (physics.aps.org).

The editors and referees of PRE find these papers to be of particular interest, importance, or clarity. Please see our Announcement Phys. Rev. E 89, 010001 (2014).