

LETTERS

Structure, structural phase transitions, mechanical properties, defects

- Higher-order Dirac semimetal in a photonic crystal (5 pages) L060101
Zihao Wang, Dongjue Liu, Hau Tian Teo, Qiang Wang, Haoran Xue, and Baile Zhang

- ☞ Phase transitions of zirconia: Machine-learned force fields beyond density functional theory (6 pages) L060102
Peitao Liu, Carla Verdi, Ferenc Karsai, and Georg Kresse

Dynamics, dynamical systems, lattice effects:

- Rainbow scars: From area to volume law (6 pages) L060301
Christopher M. Langlett, Zhi-Cheng Yang, Julia Wildeboer, Alexey V. Gorshkov,
Thomas Iadecola, and Shenglong Xu

- Transverse instability and universal decay of spin spiral order in the Heisenberg model (6 pages) L060302
Joaquin F. Rodriguez-Nieva, Alexander Schuckert, Dries Sels, Michael Knap, and Eugene Demler

- Inverted many-body mobility edge in a central qudit problem (5 pages) L060303
Saeed Rahmanian Koshkaki and Michael H. Kolodrubetz

Magnetism

- Analytical results for the unusual Grüneisen ratio in the quantum Ising model with Dzyaloshinskii-Moriya interaction (7 pages) L060401
Qiang Luo

- Bond-weighted tensor renormalization group (6 pages) L060402
Daiki Adachi, Tsuyoshi Okubo, and Synge Todo

- Excitation spectrum of spin-1 Kitaev spin liquids (6 pages) L060403
Yu-Hsueh Chen, Jozef Genzor, Yong Baek Kim, and Ying-Jer Kao

- Uniaxial pressure effects in the two-dimensional van der Waals ferromagnet CrI₃ (6 pages) L060404
J. Arneth, M. Jonak, S. Spachmann, M. Abdel-Hafiez, Y. O. Kvashnin, and R. Klingeler

- Instabilities of spin-1 Kitaev spin liquid phase in presence of single-ion anisotropies (6 pages) L060405
Owen Bradley and Rajiv R. P. Singh

- Role of electronic excitation on the anomalous magnetism of elemental copper (5 pages) L060406
Sudip Pal, Sumit Sarkar, Kranti Kumar, R. Raghunathan, R. J. Choudhary, A. Banerjee, and S. B. Roy



Energy-gap driven low-temperature magnetic and transport properties in $\text{Cr}_{1/3}\text{MS}_2$ ($M = \text{Nb}, \text{Ta}$) (6 pages)	L060407
T. J. Hicken, Z. Hawkhead, M. N. Wilson, B. M. Huddart, A. E. Hall, G. Balakrishnan, C. Wang, F. L. Pratt, S. J. Clark, and T. Lancaster	
Dynamical signatures of rank-2 $U(1)$ spin liquids (6 pages)	L060408
Emily Z. Zhang, Finn Lasse Buessen, and Yong Baek Kim	
 Quantum criticality and spin liquid phase in the Shastry-Sutherland model (7 pages)	L060409
Jianwei Yang, Anders W. Sandvik, and Ling Wang	
Magnetic terahertz resonances above the Néel temperature in the frustrated kagome antiferromagnet averievite (7 pages)	L060410
Tobias Biesner, Seulki Roh, Andrej Pustogow, Hong Zheng, J. F. Mitchell, and Martin Dressel	
Superfluidity and superconductivity	
Going beyond the Chandrasekhar-Clogston limit in a flatband superconductor (6 pages)	L060501
Atousa Ghanbari, Eirik Erlandsen, Asle Sudbø, and Jacob Linder	
Observation of a single quantized vortex vanishment in exciton-polariton superfluids (6 pages)	L060502
Daegwang Choi, Min Park, Byoung Yong Oh, Min-Sik Kwon, Suk In Park, Sooseok Kang, Jin Dong Song, Dogyun Ko, Meng Sun, Ivan G. Savenko, Yong-Hoon Cho, and Hyoungsoon Choi	
Anomalously small superconducting gap in a strong spin-orbit coupled superconductor: β -tungsten (5 pages)	L060503
Prashant Chauhan, Ramesh Budhani, and N. P. Armitage	

ARTICLES

Structure, structural phase transitions, mechanical properties, defects

 Lattice-mediated bulk flexoelectricity from first principles (17 pages)	064101
Miquel Royo and Massimiliano Stengel	
Hugoniot elastic limit of single-crystal tantalum at normal and elevated temperatures subjected to extreme strain rates (19 pages)	064102
Anuradha Singla and Aditi Ray	
Effects of Ga doping on the phase transitions of V_2O_3 (12 pages)	064103
Pavitra N. Shanbhag, Anjana Joseph, Fabio Orlandi, Pascal Manuel, R. Mahendiran, Francois Fauth, Chandrabhas Narayana, A. Sundaresan, and C. N. R. Rao	
Structural phase transitions in SrTiO_3 from deep potential molecular dynamics (10 pages)	064104
Ri He, Hongyu Wu, Linfeng Zhang, Xiaoxu Wang, Fangjia Fu, Shi Liu, and Zhicheng Zhong	
Critical point and supercritical regime of MgO (13 pages)	064105
T. F. J. Bögels and R. Caracas	
Sound velocities, and mechanical and electronic properties of the intermetallic compound CeAl_2 at high pressure (10 pages)	064106
Yaoshi Cheng, Ruiqi He, Yuanhua Xia, Tiexin Han, Leiming Fang, Shiliang Huang, and Benqiong Liu	
Competition between Ta-Ta and Te-Te bonding leading to the commensurate charge density wave in TaTe_4 (11 pages)	064107
Bogdan Guster, Miguel Pruneda, Pablo Ordejón, and Enric Canadell	

(Continued)

Successive electric polarization transitions induced by high magnetic field in the single-crystal antiferromagnet $\text{Co}_2\text{Mo}_3\text{O}_8$ (7 pages)	064108
Y. S. Tang, G. Z. Zhou, L. Lin, R. Chen, J. F. Wang, C. L. Lu, L. Huang, J. H. Zhang, Z. B. Yan, X. M. Lu, X. K. Huang, X. P. Jiang, and J.-M. Liu	
<i>In situ</i> x-ray diffraction study of dynamically compressed α -cristobalite using a dynamic diamond anvil cell (6 pages)	064109
M. O. Schoelmerich, A. S. J. Mendez, C. Plueckthun, N. Biedermann, R. Husband, T. R. Preston, L. Wollenweber, K. Klimm, T. Tschentscher, R. Redmer, H. P. Liermann, and K. Appel	
Pressure-induced charge ordering transition in $\text{CaMn}_7\text{O}_{12}$ (7 pages)	064110
M. Stekiel, A. Girard, D. Zimmer, V. Monteseguro, K. Glazyrin, I. de Pedro, L. Bayarjargal, B. Winkler, and J. Ruiz-Fuertes	
High-pressure phase transitions and melt structure of PbO_2 : An analog for silica (9 pages)	064111
Bora Kalkan, B. K. Godwal, Jinyuan Yan, and Raymond Jeanloz	
Anharmonic Grüneisen theory based on self-consistent phonon theory: Impact of phonon-phonon interactions neglected in the quasiharmonic theory (17 pages)	064112
Ryota Masuki, Takuya Nomoto, Ryotaro Arita, and Terumasa Tadano	
Inhomogeneous, disordered, and partially ordered systems	
Structure and transport properties of the quasi-one-dimensional telluride $\text{Ta}_{1.2}\text{Os}_{0.8}\text{Te}_4$ (8 pages)	064201
Wen-He Jiao, Shaozhu Xiao, Shi-Ju Zhang, Wu-Zhang Yang, Xiao-Meng Xie, Yi Liu, Ji-Yong Liu, Shi-Jie Song, Wei Liu, Zhi Ren, Guang-Han Cao, Xiaofeng Xu, and Shaolong He	
Identifying correlation clusters in many-body localized systems (10 pages)	064202
Kévin Hémerly, Frank Pollmann, and Adam Smith	
Synchrotron x-ray total scattering and modeling study of high-pressure-induced inhomogeneous atom reconfiguration in an equiatomic $\text{Zr}_{50}\text{Cu}_{50}$ metallic glassy alloy (10 pages)	064203
Shifeng Luo, Jia Chuan Khong, Dominik Daisenberger, Shi Huang, Paul F. McMillan, and Jiawei Mi	
Subdiffusive wave transport and weak localization transition in three-dimensional stealthy hyperuniform disordered systems (13 pages)	064204
F. Sgrignuoli, S. Torquato, and L. Dal Negro	
Unusual dynamical properties of disordered polaritons in microcavities (19 pages)	064205
Georg Engelhardt and Jianshu Cao	
Dynamics, dynamical systems, lattice effects:	
Topological continuum charges of acoustic phonons in two dimensions and the Nambu-Goldstone theorem (15 pages)	064301
Gunnar F. Lange, Adrien Bouhon, Bartomeu Monserrat, and Robert-Jan Slager	
 Nonequilibrium stationary states of quantum non-Hermitian lattice models (19 pages)	064302
A. McDonald, R. Hanai, and A. A. Clerk	
Lattice dynamics with molecular Berry curvature: Chiral optical phonons (11 pages)	064303
Daniyar Saparov, Bangguo Xiong, Yafei Ren, and Qian Niu	
Dynamic bulk-boundary correspondence for anomalous Floquet topology (17 pages)	064304
DinhDuy Vu	

(Continued)

Entanglement transitions in the quantum Ising chain: A comparison between different unravelings of the same Lindbladian (<i>14 pages</i>)	064305
Giulia Piccitto, Angelo Russomanno, and Davide Rossini	
Measurement-induced criticality in $\mathbb{Z}_2$ -symmetric quantum automaton circuits (<i>14 pages</i>)	064306
Yiqiu Han and Xiao Chen	
Magnetism	
Quantum mechanical modeling of magnon-phonon scattering heat transport across three-dimensional ferromagnetic/nonmagnetic interfaces (<i>16 pages</i>)	064401
Hui Pan, Li-Ming Tang, and Ke-Qiu Chen	
Nonlinear and thermal effects in the absorption of microwaves by random magnets (<i>8 pages</i>)	064402
Dmitry A. Garanin and Eugene M. Chudnovsky	
Slater-Pauling behavior of interfacial magnetic properties of 3d transition metal alloy/Pt structures (<i>7 pages</i>)	064403
Nam-Hui Kim, Qurat-ul-ain, Joonwoo Kim, Eunchong Baek, June-Seo Kim, Hyeon-Jong Park, Hiroshi Kohno, Kyung-Jin Lee, Sonny H. Rhim, Hyun-Woo Lee, and Chun-Yeol You	
Probing the magnetic polaron state in the ferromagnetic semiconductor HgCr_2Se_4 with muon-spin spectroscopy and resistance-fluctuation measurements (<i>12 pages</i>)	064404
Merlin Mitschek, Thomas J. Hicken, Shuai Yang, Murray N. Wilson, Francis L. Pratt, Chennan Wang, Stephen J. Blundell, Zhilin Li, Yongqing Li, Tom Lancaster, and Jens Müller	
Anti- $\mathcal{PT}$ symmetry enhanced interconversion between microwave and optical fields (<i>8 pages</i>)	064405
Debsuvra Mukhopadhyay, Jayakrishnan M. P. Nair, and Girish S. Agarwal	
Magnetism of competing high-spin/low-spin states in $\text{Ba}_2\text{NiO}_2(\text{AgSe})_2$ and related two-orbital two-electron systems (<i>6 pages</i>)	064406
Rajiv R. P. Singh	
Dynamics of domain walls in curved antiferromagnetic wires (<i>7 pages</i>)	064407
Kostiantyn V. Yershov	
Fate of local order in topologically frustrated spin chains (<i>16 pages</i>)	064408
V. Marić, S. M. Giampaolo, and Fabio Franchini	
Nonthermal breaking of magnetic order via photogenerated spin defects in the spin-orbit coupled insulator $\text{Sr}_3\text{Ir}_2\text{O}_7$ (<i>10 pages</i>)	064409
Ernest Pastor, David Moreno-Mencía, Maurizio Monti, Allan S. Johnson, Nina Fleischmann, Cuixiang Wang, Youguo Shi, Xuerong Liu, Daniel G. Mazzone, Mark P. M. Dean, and Simon Wall	
Manipulating ferrimagnets by fields and currents (<i>9 pages</i>)	064410
Mingda Guo, Hantao Zhang, and Ran Cheng	
Zeeman-ladder analysis of the Raman magnon energies in the quasi-one-dimensional antiferromagnet RbCoCl_3 (<i>6 pages</i>)	064411
M. G. Cottam and D. J. Lockwood	
First-principles calculations of spin-orbit torques in Mn_2Au /heavy-metal bilayers (<i>8 pages</i>)	064412
Wuzhang Fang and K. D. Belashchenko	
Quantum Kasteleyn transition (<i>10 pages</i>)	064413
Stephen Powell	

(Continued)

Origin of nonlinear magnetoelectric response in rare-earth orthoferrite perovskite oxides (8 pages)	064414
Alireza Sasani, Jorge Íñiguez, and Eric Bousquet	
First-principles determination of magnetic properties of CoCp ₂ on the Cr(001) surface (7 pages)	064415
S. B. Song, Z. Wang, J. Li, and R. Q. Wu	
Commensurate helicoidal order in the triangular layered magnet Na ₂ MnTeO ₆ (9 pages)	064416
A. I. Kurbakov, A. E. Susloparova, V. Y. Pomjakushin, Y. Skourski, E. L. Vavilova, T. M. Vasilchikova, G. V. Raganyan, and A. N. Vasiliev	
Semiconducting spin glass to metallic ferromagnetic state phase transition in double-substituted La _{1-x} Sr _x Co _{1-y} Ni _y O _{3-γ} perovskites (7 pages)	064417
R. A. Lanovsky, M. V. Bushinsky, N. V. Tereshko, O. S. Mantyskaya, A. V. Nikitin, and D. P. Kozlenko	
Negative Gilbert damping (8 pages)	064418
Yunshan Cao and Peng Yan	
Exact solutions of few-magnon problems in the spin- <i>S</i> periodic XXZ chain (14 pages)	064419
Ning Wu, Hosho Katsura, Sheng-Wen Li, Xiaoming Cai, and Xi-Wen Guan	
Frustrated magnetism of spin- $\frac{1}{2}$ Heisenberg diamond and octahedral chains as a statistical mechanical monomer-dimer problem (18 pages)	064420
Jozef Strečka, Taras Verkholyak, Johannes Richter, Katarína Karl'ová, Oleg Derzhko, and Jürgen Schnack	
Probing the tunability of magnetism with external pressure in metastable Sr ₂ NiIrO ₆ double perovskite (8 pages)	064421
M. A. Laguna-Marco, E. Arias-Egido, V. Cuartero, J. Herrero-Albillos, P. Kayser, J. A. Alonso, G. Fabbris, D. Haskel, and T. Irifune	
Large Dzyaloshinskii-Moriya interaction and atomic layer thickness dependence in a ferromagnet-WS ₂ heterostructure (11 pages)	064422
Sajid Husain, Sreya Pal, Xin Chen, Prabhat Kumar, Ankit Kumar, Amrit Kumar Mondal, Nilamani Behera, Nanhe Kumar Gupta, Soumyarup Hait, Rahul Gupta, Rimantas Brucas, Biplab Sanyal, Anjan Barman, Sujeet Chaudhary, and Peter Svedlindh	
Optical control of topological memory based on orbital magnetization (15 pages)	064423
Sergey S. Pershoguba and Victor M. Yakovenko	
Structures of magnetic excitations in the spin- $\frac{1}{2}$ kagome-lattice antiferromagnets Cs ₂ Cu ₃ SnF ₁₂ and Rb ₂ Cu ₃ SnF ₁₂ (15 pages)	064424
Mutsuki Saito, Ryunosuke Takagishi, Nobuyuki Kurita, Masari Watanabe, Hidekazu Tanaka, Ryuji Nomura, Yoshiyuki Fukumoto, Kazuhiko Ikeuchi, and Ryoichi Kajimoto	
 <i>Ab initio</i> calculation of the magnetic Gibbs free energy of materials using magnetically constrained supercells (16 pages)	064425
Eduardo Mendive-Tapia, Jörg Neugebauer, and Tilmann Hickel	
Nanoscale magnetic bubbles in Nd ₂ Fe ₁₄ B at room temperature (8 pages)	064426
Yangkun He, Toni Helm, Ivan Soldatov, Sebastian Schneider, Darius Pohl, Abhay Kant Srivastava, Ankit Kumar Sharma, Johannes Kroder, Walter Schnelle, Rudolf Schaefer, Bernd Rellinghaus, Gerhard H. Fecher, Stuart S. P. Parkin, and Claudia Felser	
Comparison of spin-wave transmission in parallel and antiparallel magnetic configurations (12 pages)	064427
Y. W. Xing, Z. R. Yan, and X. F. Han	

(Continued)

Isothermal and adiabatic magnetization processes of the spin- $\frac{1}{2}$ Heisenberg model on an anisotropic triangular lattice (8 pages)	064428
Katsuhiko Morita	
Local control of magnetic interface effects in chiral Ir Co Pt multilayers using Ga ⁺ ion irradiation (10 pages)	064429
Mark C. H. de Jong, Mariëlle J. Meijer, Juriaan Lucassen, Jos van Liempt, Henk J. M. Swagten, Bert Koopmans, and Reinoud Lavrijsen	
Spin-space groups and magnon band topology (28 pages)	064430
A. Corticelli, R. Moessner, and P. A. McClarty	
Tripartite high-dimensional magnon-photon entanglement in phases with broken $\mathcal{PT}$ -symmetry of a non-Hermitian hybrid system (12 pages)	064431
Jin-Xuan Han, Jin-Lei Wu, Yan Wang, Yan Xia, Yong-Yuan Jiang, and Jie Song	
Ultrafast probe of magnetization dynamics in multiferroic CoCr ₂ O ₄ and Co _{0.975} Ge _{0.025} Cr ₂ O ₄ (8 pages)	064432
S. Parchenko, N. Ortiz Hernández, M. Savoini, M. Porer, M. Decker, B. Burganov, E. M. Bothschafter, C. Dornes, Y. W. Windsor, M. Ramakrishnan, L. Rettig, M. Buzzi, D. Schick, K. Holldack, N. Pontius, C. Schüßler-Langeheine, M. Radovic, J. A. Heuver, B. Noheda, S. L. Johnson, and U. Staub	
Observation of magnetic domain patterns with tilted uniaxial anisotropy using a single-spin magnetometer (5 pages)	064433
Zhi Cheng, Cheng-Jie Wang, Bei Ding, Pengfei Wang, Mengqi Wang, Rui Li, Ya Wang, Wenhong Wang, Fazhan Shi, and Jiangfeng Du	
Electron-spin interaction in the spin-Peierls phase of the organic spin chain (<i>o</i> -DMTTF) ₂ X (X=Cl, Br, I) (13 pages)	064434
L. Soriano, O. Pilone, M. D. Kuz'min, H. Vezin, O. Jeannin, M. Fourmigué, M. Orio, and S. Bertaina	
Superfluidity and superconductivity	
Josephson effects in twisted cuprate bilayers (14 pages)	064501
Tarun Tummuru, Stephan Plugge, and Marcel Franz	
Pattern-dependent proximity effect and Majorana edge mode in one-dimensional quasicrystals (6 pages)	064502
Junmo Jeon and SungBin Lee	
Electrically modulated Josephson junction of light-dressed topological insulators (9 pages)	064503
Pei-Hao Fu, Yong Xu, Xiang-Long Yu, Jun-Feng Liu, and Jiansheng Wu	
Proximity-driven ferromagnetism and superconductivity in the triangular Rashba-Hubbard model (12 pages)	064504
Mehdi Biderang, Mohammad-Hossein Zare, and Jesko Sirker	
Nematic state of the FeSe superconductor (8 pages)	064505
Sahana Rößler, Mauro Coduri, Alexander A. Tsirlin, Clemens Ritter, Gabriel Cuello, Cevriye Koz, Liudmila Muzica, Ulrich Schwarz, Ulrich K. Rößler, Steffen Wirth, and Marco Scavini	
Quasiclassical boundary conditions for spin-orbit coupled interfaces with spin-charge conversion (9 pages)	064506
Jacob Linder and Morten Amundsen	
Superconductivity near the saddle point in the two-dimensional Rashba system Si(111)- $\sqrt{3} \times \sqrt{3}$ -(Tl,Pb) (9 pages)	064507
T. Machida, Y. Yoshimura, T. Nakamura, Y. Kohsaka, T. Hanaguri, C.-R. Hsing, C.-M. Wei, Y. Hasegawa, S. Hasegawa, and A. Takayama	

(Continued)

Optical spin transport theory of spin- $\frac{1}{2}$ topological Fermi superfluids (<i>9 pages</i>)	064508
Hiroyuki Tajima, Yuta Sekino, and Shun Uchino	
Pressure tuning of localization and superconductivity in LaOPbBiS_3 and $\text{La}_2\text{O}_2\text{Bi}_3\text{AgS}_6$ (<i>5 pages</i>)	064509
Y. Yuan, H. Arima, M. Masaoka, Y. Naito, Y. Hijikata, R. Jha, Y. Mizuguchi, and K. Matsubayashi	
Giant electromagnetic proximity effect in superconductor/ferromagnet superlattices (<i>10 pages</i>)	064510
A. V. Putilov, S. V. Mironov, A. S. Mel'nikov, and A. I. Buzdin	
Cavitation on single electron bubbles in liquid helium at small negative pressures (<i>11 pages</i>)	064511
S. N. Burmistrov and L. B. Dubovskii	
Two-gap $s_{\pm}$ -wave superconductivity at an oxide interface (<i>9 pages</i>)	064512
G. Singh, G. Venditti, G. Saiz, G. Herranz, F. Sánchez, A. Jouan, C. Feuillet-Palma, J. Lesueur, M. Grilli, S. Caprara, and N. Bergeal	
Quantitative relationship between structural orthorhombicity, shear modulus, and heat capacity anomaly of the nematic transition in iron-based superconductors (<i>8 pages</i>)	064513
Joshua Javier Sanchez, Paul Malinowski, Jong-Woo Kim, Philip Ryan, and Jiun-Haw Chu	
Charging in the vortex lattice of type-II superconductors (<i>7 pages</i>)	064514
Marie Ohuchi, Hikaru Ueki, and Takafumi Kita	
Distinguishing finite-momentum superconducting pairing states with two-electron photoemission spectroscopy (<i>11 pages</i>)	064515
Fahad Mahmood, Thomas Devereaux, Peter Abbamonte, and Dirk K. Morr	
High- T_c superconductivity in doped boron-carbon clathrates (<i>6 pages</i>)	064516
Simone Di Cataldo, Shadi Qulaghasi, Giovanni B. Bachelet, and Lilia Boeri	
Nonsymmorphic band sticking in a topological superconductor (<i>11 pages</i>)	064517
Yundi Quan, Valentin Taufour, and Warren E. Pickett	
Effect of repulsion on superconductivity at low density (<i>11 pages</i>)	064518
Dan Phan and Andrey V. Chubukov	
Mixed-state Hall scaling behavior and vortex phase diagram in $\text{FeSe}_{0.7}\text{Te}_{0.3}$ thin films (<i>7 pages</i>)	064519
Dongwon Shin, Soon-Gil Jung, Sehun Seo, Jongmin Lee, Sanghan Lee, Jin Hee Kim, Jong-Soo Rhyee, Woo Seok Choi, and Tuson Park	