

RAPID COMMUNICATIONS

Structure, structural phase transitions, mechanical properties, defects

- Iodine interstitials as a cause of nonradiative recombination in hybrid perovskites (*4 pages*) 140101(R)
Xie Zhang, Mark E. Turiensky, Jimmy-Xuan Shen, and Chris G. Van de Walle
- Atomic-scale origin of ultrahigh piezoelectricity in samarium-doped PMN-PT ceramics (*7 pages*) 140102(R)
Chunhui Li, Bin Xu, Dabin Lin, Shujun Zhang, Laurent Bellaiche, Thomas R. Shrout, and Fei Li

Magnetism

- Impurity moments conceal low-energy relaxation of quantum spin liquids (*6 pages*) 140401(R)
A. Pustogow, T. Le, H.-H. Wang, Yongkang Luo, E. Gati, H. Schubert, M. Lang, and S. E. Brown
- Manipulating magnetism in the topological semimetal EuCd_2As_2 (*6 pages*) 140402(R)
Na Hyun Jo, Brinda Kuthanazhi, Yun Wu, Erik Timmons, Tae-Hoon Kim, Lin Zhou, Lin-Lin Wang, Benjamin G. Ueland, Andriy Palasyuk, Dominic H. Ryan, Robert J. McQueeney, Kyungchan Lee, Benjamin Schunk, Anton A. Burkov, Ruslan Prozorov, Sergey L. Bud'ko, Adam Kaminski, and Paul C. Canfield
- Effect of perturbations on the kagome $S = \frac{1}{2}$ antiferromagnet at all temperatures (*7 pages*) 140403(R)
Bernard Bernu, Laurent Pierre, Karim Essafi, and Laura Messio
- Deterministic approach to skyrmionic dynamics at nonzero temperatures: Pinning sites and racetracks (*5 pages*) 140404(R)
Josep Castell-Queralt, Leonardo González-Gómez, Nuria Del-Valle, and Carles Navau
- Spin-torque switching of noncollinear antiferromagnetic antiperovskites (*7 pages*) 140405(R)
Gautam Gurung, Ding-Fu Shao, and Evgeny Y. Tsybal
- Localized singlets and ferromagnetic fluctuations in the dilute magnetic topological insulator $\text{Sn}_{0.95}\text{Mn}_{0.05}\text{Te}$ (*5 pages*) 140406(R)
D. Vaknin, Santanu Pakhira, D. Schlagel, F. Islam, Jianhua Zhang, D. M. Pajerowski, C. Z. Wang, D. C. Johnston, and R. J. McQueeney
- Presence and absence of itinerant gapless excitations in the quantum spin liquid candidate $\text{EtMe}_3\text{Sb}[\text{Pd}(\text{dmit})_2]_2$ (*4 pages*) 140407(R)
M. Yamashita, Y. Sato, T. Tominaga, Y. Kasahara, S. Kasahara, H. Cui, R. Kato, T. Shibauchi, and Y. Matsuda



Emergent spin-1 Haldane gap and ferroelectricity in a frustrated spin- $\frac{1}{2}$ ladder (6 pages)	140408(R)
H. Ueda, S. Onoda, Y. Yamaguchi, T. Kimura, D. Yoshizawa, T. Morioka, M. Hagiwara, M. Hagihara, M. Soda, T. Masuda, T. Sakakibara, K. Tomiyasu, S. Ohira-Kawamura, K. Nakajima, R. Kajimoto, M. Nakamura, Y. Inamura, N. Reynolds, M. Frontzek, J. S. White, M. Hase, and Y. Yasui	
Large anomalous Hall effect in a hexagonal ferromagnetic Fe ₅ Sn ₃ single crystal (6 pages)	140409(R)
Hang Li, Bingwen Zhang, Jinghua Liang, Bei Ding, Jie Chen, Jianlei Shen, Zefang Li, Enke Liu, Xuekui Xi, Guangheng Wu, Yuan Yao, Hongxin Yang, and Wenhong Wang	
High-field quantum disordered state in α -RuCl ₃ : Spin flips, bound states, and multiparticle continuum (6 pages)	140410(R)
A. Sahasrabudhe, D. A. S. Kaib, S. Reschke, R. German, T. C. Koethe, J. Buhot, D. Kamenskyi, C. Hickey, P. Becker, V. Tsurkan, A. Loidl, S. H. Do, K. Y. Choi, M. Grüninger, S. M. Winter, Zhe Wang, R. Valentí, and P. H. M. van Loosdrecht	
Ground-state magnetic structure of Mn ₃ Ge (5 pages)	140411(R)
J.-R. Soh, F. de Juan, N. Qureshi, H. Jacobsen, H.-Y. Wang, Y.-F. Guo, and A. T. Boothroyd	
Quantum spiral spin-tensor magnetism (7 pages)	140412(R)
Xiaofan Zhou, Xi-Wang Luo, Gang Chen, Suotang Jia, and Chuanwei Zhang	
Fragile magnetic ground state of a spin- $\frac{1}{2}$ metal-organic kagome lattice (5 pages)	140413(R)
A. Jain, S. M. Yusuf, P. Kanoo, S. K. Dhar, and Tapas Kumar Maji	
Superfluidity and superconductivity	
Experimental conditions for the observation of electron-hole superfluidity in GaAs heterostructures (6 pages)	140501(R)
Samira Saberi-Pouya, Sara Conti, Andrea Perali, Andrew F. Croxall, Alexander R. Hamilton, François M. Peeters, and David Neilson	
Tuning stoichiometry and its impact on superconductivity of monolayer and multilayer FeSe on SrTiO ₃ (6 pages)	140502(R)
Chong Liu and Ke Zou	
Enhancement and reentrance of spin triplet superconductivity in UTe ₂ under pressure (6 pages)	140503(R)
Sheng Ran, Hyunsoo Kim, I-Lin Liu, Shanta R. Saha, Ian Hayes, Tristin Metz, Yun Suk Eo, Johnpierre Paglione, and Nicholas P. Butch	
Anisotropic effect of a magnetic field on the neutron spin resonance in FeSe (7 pages)	140504(R)
Tong Chen, Youzhe Chen, David W. Tam, Bin Gao, Yiming Qiu, Astrid Schneidewind, Igor Radelytskyi, Karel Prokes, Songxue Chi, Masaaki Matsuda, Collin Broholm, and Pengcheng Dai	
Tunable structural phase transition and superconductivity in the Weyl semimetal Mo _{1-x} W _x Te ₂ (6 pages)	140505(R)
R. Dahal, L. Z. Deng, N. Poudel, M. Gooch, Z. Wu, H. C. Wu, H. D. Yang, C. K. Chang, and C. W. Chu	

ARTICLES

Structure, structural phase transitions, mechanical properties, defects

Quantum and thermal fluctuations of a thin elastic plate (5 pages)	144101
Dennis P. Clougherty and Eliot Heinrich	
Persistent insulating state at megabar pressures in strongly spin-orbit coupled Sr ₂ IrO ₄ (7 pages)	144102
Chunhua Chen, Yonghui Zhou, Xuliang Chen, Tao Han, Chao An, Ying Zhou, Yifang Yuan, Bowen Zhang, Shuyang Wang, Ranran Zhang, Lili Zhang, Changjin Zhang, Zhaorong Yang, Lance E. DeLong, and Gang Cao	

(Continued)

Observation of a 1.979-eV spectral line of a germanium-related color center in microdiamonds and nanodiamonds (<i>11 pages</i>)	144103
V. S. Krivobok, E. A. Ekimov, S. G. Lyapin, S. N. Nikolaev, Yu. A. Skakov, A. A. Razgulov, and M. V. Kondrin	
Thickness dependence of hydrogen-induced phase transition in MoTe ₂ (<i>7 pages</i>)	144104
Priyanka Manchanda, Pankaj Kumar, and Pratibha Dev	
Nucleation mechanism for hcp → bcc phase transformation in shock-compressed Zr (<i>12 pages</i>)	144105
Hongxiang Zong, Ping He, Xiangdong Ding, and Graeme J. Ackland	
Structural and electronic properties of two-dimensional freestanding BaTiO ₃ /SrTiO ₃ heterostructures (<i>7 pages</i>)	144106
Fanhao Jia, Shaowen Xu, Guodong Zhao, Chao Liu, and Wei Ren	
Shocked ceramics melt: An atomistic analysis of thermodynamic behavior of boron carbide (<i>12 pages</i>)	144107
Matthew DeVries, Ghatu Subhash, and Amnaya Awasthi	
Performance of the standard exchange-correlation functionals in predicting melting properties fully from first principles: Application to Al and magnetic Ni (<i>12 pages</i>)	144108
Li-Fang Zhu, Fritz Körmann, Andrei V. Ruban, Jörg Neugebauer, and Blazej Grabowski	
Local vibrational modes of Si vacancy spin qubits in SiC (<i>9 pages</i>)	144109
Z. Shang, A. Hashemi, Y. Berencén, H.-P. Komsa, P. Erhart, S. Zhou, M. Helm, A. V. Krasheninnikov, and G. V. Astakhov	

Inhomogeneous, disordered, and partially ordered systems

Floquet Anderson localization of two interacting discrete time quantum walks (<i>7 pages</i>)	144201
Merab Malishava, Ihor Vakulchyk, Mikhail Fistul, and Sergej Flach	
Viscosity measurement from microscale convection at high pressure and temperature (<i>6 pages</i>)	144202
Hannah B. Bartlett, Natalia Gomez-Perez, Michiel Hermes, and R. Stewart McWilliams	
Quantifying thermal transport in amorphous silicon using mean free path spectroscopy (<i>7 pages</i>)	144203
Ying Pan, Jiawei Zhou, and Gang Chen	
Persistence of chirality in the Su-Schrieffer-Heeger model in the presence of on-site disorder (<i>5 pages</i>)	144204
Myles Scollon and Malcolm P. Kennett	

Dynamics, dynamical systems, lattice effects:

 Ultracold quantum wires with localized losses: Many-body quantum Zeno effect (<i>24 pages</i>)	144301
Heinrich Fröml, Christopher Muckel, Corinna Kollath, Alessio Chiocchetta, and Sebastian Diehl	
Scaling of Loschmidt echo in a boundary-driven critical $\mathbb{Z}_3$ Potts model (<i>7 pages</i>)	144302
Naveen Nishad and G. J. Sreejith	
Emergence of anomalous dynamics from the underlying singular continuous spectrum in interacting many-body systems (<i>8 pages</i>)	144303
J. Settino, N. W. Talarico, F. Cosco, F. Plastina, S. Maniscalco, and N. Lo Gullo	
Optical high-order harmonic generation as a structural characterization tool (<i>6 pages</i>)	144304
Lei Jia, Zhiya Zhang, D. Z. Yang, Yanqing Liu, M. S. Si, G. P. Zhang, and Y. S. Liu	

(Continued)

Entanglement and its relation to energy variance for local one-dimensional Hamiltonians (<i>12 pages</i>)	144305
Mari Carmen Bañuls, David A. Huse, and J. Ignacio Cirac	
☞ Phonon rotoelectric effect (<i>7 pages</i>)	144306
Masato Hamada and Shuichi Murakami	
Magnetism	
Density functional theory of magnetic dipolar interactions (<i>10 pages</i>)	144401
Camilla Pellegrini, Tristan Müller, John K. Dewhurst, Sangeeta Sharma, Antonio Sanna, and Eberhard K. U. Gross	
Calculating Curie temperatures for rare-earth permanent magnets: <i>Ab initio</i> inspection of localized magnetic moments in <i>d</i> -electron ferromagnetism (<i>5 pages</i>)	144402
Munehisa Matsumoto and Hisazumi Akai	
Tuning magnetic order with geometry: Thermalization and defects in two-dimensional artificial spin ices (<i>11 pages</i>)	144403
Gavin M. Macauley, Gary W. Paterson, Yue Li, Rair Macêdo, Stephen McVitie, and Robert L. Stamps	
Interface-driven giant tunnel magnetoresistance in (111)-oriented junctions (<i>5 pages</i>)	144404
Keisuke Masuda, Hiroyoshi Itoh, and Yoshio Miura	
Electric field induced modulation of transverse resistivity anomalies in ultrathin SrRuO ₃ epitaxial films (<i>5 pages</i>)	144405
Daisuke Kan, Kento Kobayashi, and Yuichi Shimakawa	
Magnetic excitations in magnetization plateaus of a frustrated spin ladder (<i>9 pages</i>)	144407
Kota Sasaki, Takanori Sugimoto, Takami Tohyama, and Shigetoshi Sota	
Toroidal spin states in molecular magnets (<i>10 pages</i>)	144408
Y. Pavlyukh	
Emergence of <i>d</i> -orbital magnetic Dirac fermions in a MoS ₂ monolayer with squared pentagon structure (<i>5 pages</i>)	144409
Xuanyi Li, Sheng Meng, and Jia-Tao Sun	
Magnetization dynamics in synthetic antiferromagnets: Role of dynamical energy and mutual spin pumping (<i>10 pages</i>)	144410
S. Sorokin, R. A. Gallardo, C. Fowley, K. Lenz, A. Titova, G. Y. P. Atcheson, G. Dennehy, K. Rode, J. Fassbender, J. Lindner, and A. M. Deac	
☞ Low-energy magnons in the chiral ferrimagnet Cu ₂ OSeO ₃ : A coarse-grained approach (<i>19 pages</i>)	144411
Yi Luo, G. G. Marcus, B. A. Trump, J. Kindervater, M. B. Stone, J. A. Rodriguez-Rivera, Yiming Qiu, T. M. McQueen, O. Tchernyshyov, and C. Broholm	
Spin transmission in IrMn through measurements of spin Hall magnetoresistance and spin-orbit torque (<i>8 pages</i>)	144412
Xiao Wang, Caihua Wan, Yizhou Liu, Qiming Shao, Hao Wu, Chenyang Guo, Chi Fang, Yao Guang, Wenlong Yang, Congli He, Bingshan Tao, Xiaomin Zhang, Tianyi Ma, Jing Dong, Yu Zhang, Jiafeng Feng, Jiang Xiao, Kang L. Wang, Guoqiang Yu, and Xiufeng Han	
☞ Mean-field phase diagram and spin-glass phase of the dipolar kagome Ising antiferromagnet (<i>15 pages</i>)	144413
Leticia F. Cugliandolo, Laura Foini, and Marco Tarzia	
Higher-order exceptional points in ferromagnetic trilayers (<i>8 pages</i>)	144414
Tianlin Yu, Huanhuan Yang, Lingling Song, Peng Yan, and Yunshan Cao	

(Continued)

Geometric phase control of a spin-torque oscillator (<i>6 pages</i>)	144415
A. Rückriegel and R. A. Duine	
Magnetic hedgehog lattices in noncentrosymmetric metals (<i>12 pages</i>)	144416
Shun Okumura, Satoru Hayami, Yasuyuki Kato, and Yukitoshi Motome	
Iron telluride ladder compounds: Predicting the structural and magnetic properties of BaFe_2Te_3 (<i>8 pages</i>)	144417
Yang Zhang, Ling-Fang Lin, Adriana Moreo, Shuai Dong, and Elbio Dagotto	
Unveiling ferrimagnetic ground state, anomalous behavior of the exchange-bias field around spin reorientation, and magnetoelectric coupling in $\text{YbCr}_{1-x}\text{Fe}_x\text{O}_3$ ($0.1 \leq x \leq 0.6$) (<i>12 pages</i>)	144418
Biswajit Dalal, Babusona Sarkar, S. Rayaprol, Moumita Das, V. Siruguri, Prabhat Mandal, and Subodh Kumar De	
Magnetic multipoles and correlation shortage in the pyrochlore cerium stannate $\text{Ce}_2\text{Sn}_2\text{O}_7$ (<i>7 pages</i>)	144419
S. W. Lovesey and G. van der Laan	
Micromagnetic modeling and imaging of vortex meron structures in an oxide metal heterostructure (<i>10 pages</i>)	144420
P. G. Radaelli, J. Radaelli, N. Waterfield-Price, and R. D. Johnson	
Multiple magnetic transitions and electrical transport transformation of a BaFeO_3 cubic perovskite single crystal (<i>7 pages</i>)	144421
Yuxuan Liu, Zhehong Liu, Zhi Li, Shijun Qin, Xubin Ye, Xudong Shen, Bowen Zhou, Guanghui Zhou, Stefano Agrestini, Manuel Valvidares, Hari Babu Vasili, Zhiwei Hu, and Youwen Long	
Complicated magnetic structure and its strong correlation with the anomalous Hall effect in Mn_3Sn (<i>7 pages</i>)	144422
Yuzhu Song, Yiqing Hao, Shaobo Wang, Ji Zhang, Qingzhen Huang, Xianran Xing, and Jun Chen	
Magnetism of $(\text{LaCoO}_3)_n + (\text{LaTiO}_3)_n$ superlattices ($n = 1, 2$) (<i>15 pages</i>)	144423
Alex Taekyung Lee and Sohrab Ismail-Beigi	
Complex antiferromagnetic order in the garnet $\text{Co}_3\text{Al}_2\text{Si}_3\text{O}_{12}$ (<i>9 pages</i>)	144424
Q. Cui, Q. Huang, Jose A. Alonso, Denis Sheptyakov, C. R. De la Cruz, M. T. Fernández-Díaz, N. N. Wang, Y. Q. Cai, D. Li, X. L. Dong, H. D. Zhou, and J.-G. Cheng	
Time- and space-resolved nonlinear magnetoacoustic dynamics (<i>10 pages</i>)	144425
M. Kraimia, P. Kuszewski, J.-Y. Duquesne, A. Lemaître, F. Margailan, C. Gourdon, and L. Thevenard	
Vollhardt invariance in chiral magnets (<i>9 pages</i>)	144426
A. M. Belemuk and S. M. Stishov	
Experimental demonstration and analysis of random field effects in ferromagnet/antiferromagnet bilayers (<i>10 pages</i>)	144427
Guanxiong Chen, Dylan Collette, and Sergei Urazhdin	
Exact plaquette singlet phases in an orthogonal-plaquette model (<i>6 pages</i>)	144428
C. Boos and K. P. Schmidt	
Sonic horizons and causality in phase transition dynamics (<i>16 pages</i>)	144429
Debasis Sadhukhan, Aritra Sinha, Anna Francuz, Justyna Stefaniak, Marek M. Rams, Jacek Dziarmaga, and Wojciech H. Zurek	
Spin-wave transmission through an internal boundary: Beyond the scalar approximation (<i>11 pages</i>)	144430
Roman Verba, Vasil Tiberkevich, and Andrei Slavin	

(Continued)

Numerical computation of spin-transfer torques for antiferromagnetic domain walls (<i>8 pages</i>)	144431
Hyeon-Jong Park, Yunboo Jeong, Se-Hyeok Oh, Gyungchoon Go, Jung Hyun Oh, Kyoung-Whan Kim, Hyun-Woo Lee, and Kyung-Jin Lee	
Crystal-field Hamiltonian and anisotropy in KErSe ₂ and CsErSe ₂ (<i>9 pages</i>)	144432
A. Scheie, V. O. Garlea, L. D. Sanjeewa, J. Xing, and A. S. Sefat	
Non-Griffiths-like cluster formation in the double-perovskite Gd ₂ CoMnO ₆ : Evidence from critical behavior (<i>8 pages</i>)	144433
Moumita Das, Prosenjit Sarkar, and Prabhat Mandal	
Origin of the large voltage-controlled magnetic anisotropy in a Cr/Fe/MgO junction with an ultrathin Fe layer: First-principles investigation (<i>9 pages</i>)	144434
W. Z. Chen, L. N. Jiang, Z. R. Yan, Y. Zhu, C. H. Wan, and X. F. Han	
Static and dynamic properties of bimerons in a frustrated ferromagnetic monolayer (<i>14 pages</i>)	144435
Xichao Zhang, Jing Xia, Laichuan Shen, Motohiko Ezawa, Oleg A. Tretiakov, Guoping Zhao, Xiaoxi Liu, and Yan Zhou	
Disorder-induced critical exponents near a ferromagnetic quantum critical point in Mn _{1-x} Cr _x Si (<i>7 pages</i>)	144436
Ashish Kumar Mishra, S. Shanmukharao Samatham, Martin R. Lees, and V. Ganesan	
Helical and collinear spin density wave order in the $S = \frac{1}{2}$ one-dimensional frustrated chain compound NaCuMoO ₄ (OH) investigated by neutron scattering (<i>8 pages</i>)	144437
Shinichiro Asai, Takuma Oyama, Kazuhiro Nawa, Akiko Nakao, Koji Munakata, Keitaro Kuwahara, Masato Hagihala, Shinichi Itoh, Zenji Hiroi, and Takatsugu Masuda	
Hybrid modes of a cavity photon coupled with multiple magnons in ferromagnetic nanostructures (<i>9 pages</i>)	144438
Zahra Haghshenasfard and Michael G. Cottam	
Non-Hermitian dynamic strings and anomalous topological degeneracy on a non-Hermitian toric-code model with parity-time symmetry (<i>14 pages</i>)	144439
Cui-Xian Guo, Xiao-Ran Wang, Can Wang, and Su-Peng Kou	
Magnetic and transport anomalies in R ₂ RhSi ₃ ($R = \text{Gd, Tb, and Dy}$) resembling those of the exotic magnetic material Gd ₂ PdSi ₃ (<i>7 pages</i>)	144440
Ram Kumar, Kartik K. Iyer, P. L. Paulose, and E. V. Sampathkumaran	
Superfluidity and superconductivity	
Evolution of charge density wave order and superconductivity under pressure in LaPt ₂ Si ₂ (<i>5 pages</i>)	144501
B. Shen, F. Du, R. Li, A. Thamizhavel, M. Smidman, Z. Y. Nie, S. S. Luo, T. Le, Z. Hossain, and H. Q. Yuan	
Variation of shear moduli across superconducting phase transitions (<i>6 pages</i>)	144502
Dimitri Labat, Panagiotis Kotetes, Brian M. Andersen, and Indranil Paul	
Self-consistent-field ensembles of disordered Hamiltonians: Efficient solver and application to superconducting films (<i>11 pages</i>)	144503
Matthias Stosiek, Bruno Lang, and Ferdinand Evers	
Vortex nucleation in superconductors within time-dependent Ginzburg-Landau theory in two and three dimensions: Role of surface defects and material inhomogeneities (<i>10 pages</i>)	144504
Alden R. Pack, Jared Carlson, Spencer Wadsworth, and Mark K. Transtrum	

(Continued)

CONTENTS - *Continued*

PHYSICAL REVIEW B

THIRD SERIES, VOLUME 101, NUMBER 14

APRIL 2020-1(II)

Predicting novel superconducting hydrides using machine learning approaches (<i>9 pages</i>)	144505
Michael J. Hutcheon, Alice M. Shipley, and Richard J. Needs	
Interplay of interactions and disorder at the superfluid-insulator transition: A dirty two-dimensional quantum critical point (<i>21 pages</i>)	144506
Hart Goldman, Alex Thomson, Laimei Nie, and Zhen Bi	
Josephson junctions in a local inhomogeneous magnetic field (<i>8 pages</i>)	144507
V. M. Krasnov	
Unconventional superconducting properties of noncentrosymmetric $\text{Re}_{5.5}\text{Ta}$ (<i>9 pages</i>)	144508
Arushi, D. Singh, P. K. Biswas, A. D. Hillier, and R. P. Singh	