

# PHYSICAL REVIEW B

covering condensed matter and materials physics

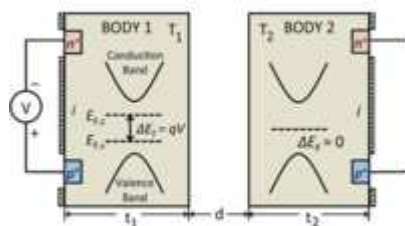
Volume 91, Issue 13, 1 April 2015

## HIGHLIGHTED ARTICLES

### Editors' Suggestion

[Heat-flux control and solid-state cooling by regulating chemical potential of photons in near-field electromagnetic heat transfer](#)

Kaifeng Chen, Parthiban Santhanam, Sunil Sandhu, Linxiao Zhu, and Shanhui Fan  
Phys. Rev. B **91**, 134301 (2015) – Published 13 April 2015



Near-field electromagnetic heat transfer is studied in a theoretical semiconductor heterojunction system in the presence of a non-zero chemical potential (via a bias voltage). Changing the potential enables electronic control of near-field heat transfer and suggests a novel and very exciting new possibility for achieving solid-state cooling, a holy grail in thermal science.

### Editors' Suggestion

[Classification and description of bosonic symmetry protected topological phases with semiclassical nonlinear sigma models](#)

Zhen Bi, Alex Rasmussen, Kevin Slagle, and Cenke Xu  
Phys. Rev. B **91**, 134404 (2015) – Published 6 April 2015

$$S_{2d} = \int d^2x d\tau \frac{1}{g} (\partial_\mu \vec{n})^2 + \frac{i2\pi k}{\Omega_3} \epsilon_{abcd} n^a \partial_t n^b \partial_x n^c \partial_y n^d,$$

Using semiclassical nonlinear sigma model techniques the authors classify a broad class of bosonic symmetry protected topological phases. This construction works in all dimensions.

## ARTICLES

### Structure, structural phase transitions, mechanical properties, defects

[Complete phase diagram and topological properties of interacting bosons in one-dimensional superlattices](#)

Tianhe Li, Huaiming Guo, Shu Chen, and Shun-Qing Shen  
Phys. Rev. B **91**, 134101 (2015) – Published 10 April 2015

[Relaxed dispersion constraints and metamaterial effective parameters with physical meaning for all frequencies](#)

Christopher A. Dirdal, Tarjei Bondevik, and Johannes Skaar  
Phys. Rev. B **91**, 134102 (2015) – Published 10 April 2015

[Structural, vibrational, and dielectric properties of Ruddlesden-Popper  \$\text{Ba}\_2\text{ZrO}\_4\$  from first principles](#)

Lydie Louis and Serge M. Nakhmanson  
Phys. Rev. B **91**, 134103 (2015) – Published 13 April 2015

[Noncentrosymmetric structural transitions in ultrashort ferroelectric  \$\text{AGaO}\_3/\text{A}'\text{GaO}\_3\$  superlattices](#)

Nayoung Song, James M. Rondinelli, and Bog G. Kim  
Phys. Rev. B **91**, 134104 (2015) – Published 13 April 2015

[Reconfigurable anisotropy and functional transformations with  \$\text{VO}\_2\$ -based metamaterial electric circuits](#)

Salvatore Savo, You Zhou, Giuseppe Castaldi, Massimo Moccia, Vincenzo Galdi, Shriram Ramanathan, and Yuki Sato

Phys. Rev. B **91**, 134105 (2015) – Published 16 April 2015

[Origin of the crossover between a freezing and a structural transition at low concentration in the relaxor](#)

ferroelectric  $\text{K}_{1-x}\text{Li}_x\text{TaO}_3$

Ling Cai, Jean Toulouse, Leland Harriger, R. Gregory Downing, and L. A. Boatner

Phys. Rev. B **91**, 134106 (2015) – Published 16 April 2015

[A-site-driven ferroelectricity in strained ferromagnetic  \$\text{La}\_2\text{NiMnO}\_6\$  thin films](#)

R. Takahashi, I. Ohkubo, K. Yamauchi, M. Kitamura, Y. Sakurai, M. Oshima, T. Oguchi, Y. Cho, and M. Lippmaa

Phys. Rev. B **91**, 134107 (2015) – Published 20 April 2015

[High pressure-temperature phase diagram and equation of state of titanium](#)

Agnès Dewaele, Vincent Stutzmann, Johann Bouchet, François Bottin, Florent Occelli, and Mohamed Mezouar

Phys. Rev. B **91**, 134108 (2015) – Published 21 April 2015

[Ethane-xenon mixtures under shock conditions](#)

Rudolph J. Magyar, Seth Root, Kyle Cochrane, Thomas R. Mattsson, and Dawn G. Flicker

Phys. Rev. B **91**, 134109 (2015) – Published 22 April 2015

[Interstitial silicon ions in rutile  \$\text{TiO}\_2\$  crystals](#)

E. M. Golden, N. C. Giles, Shan Yang (杨山), and L. E. Halliburton

Phys. Rev. B **91**, 134110 (2015) – Published 22 April 2015

[Structure and energy of point defects in  \$\text{TiC}\$ : An \*ab initio\* study](#)

Weiwei Sun, Hossein Ehteshami, and Pavel A. Korzhavyi

Phys. Rev. B **91**, 134111 (2015) – Published 24 April 2015

[Finite-temperature properties of antiferroelectric  \$\text{PbZrO}\_3\$  from atomistic simulations](#)

B. K. Mani, S. Lisenkov, and I. Ponomareva

Phys. Rev. B **91**, 134112 (2015) – Published 27 April 2015

[Domain pinning near a single-grain boundary in tetragonal and rhombohedral lead zirconate titanate films](#)

D. M. Marincel, H. R. Zhang, J. Britson, A. Belianinov, S. Jesse, S. V. Kalinin, L. Q. Chen, W. M. Rainforth, I. M. Reaney, C. A. Randall, and S. Trolier-McKinstry

Phys. Rev. B **91**, 134113 (2015) – Published 27 April 2015

[Wavelength dependence of nanosecond infrared laser-induced breakdown in water: Evidence for multiphoton initiation via an intermediate state](#)

Norbert Linz, Sebastian Freidank, Xiao-Xuan Liang, Hannes Vogelmann, Thomas Trickl, and Alfred Vogel

Phys. Rev. B **91**, 134114 (2015) – Published 29 April 2015

[General method to predict voltage-dependent ionic conduction in a solid electrolyte coating on electrodes](#)

Jie Pan, Yang-Tse Cheng, and Yue Qi

Phys. Rev. B **91**, 134116 (2015) – Published 30 April 2015

**Inhomogeneous, disordered, and partially ordered systems**

[First-principles study of a sodium borosilicate glass-former. I. The liquid state](#)

Laurent Pedesseau, Simona Ispas, and Walter Kob

Phys. Rev. B **91**, 134201 (2015) – Published 6 April 2015

[First-principles study of a sodium borosilicate glass-former. II. The glass state](#)

Laurent Pedesseau, Simona Ispas, and Walter Kob

Phys. Rev. B **91**, 134202 (2015) – Published 6 April 2015

[Inherent structures in  \$\mathbb{M}\$ -component spin glasses](#)

M. Baity-Jesi and G. Parisi

Phys. Rev. B **91**, 134203 (2015) – Published 7 April 2015

[Atomic-scale dynamics of a model glass-forming metallic liquid: Dynamical crossover, dynamical decoupling, and dynamical clustering](#)

Abhishek Jaiswal, Takeshi Egami, and Yang Zhang

Phys. Rev. B **91**, 134204 (2015) – Published 20 April 2015

## Dynamics, dynamical systems, lattice effects

### Editors' Suggestion

[Heat-flux control and solid-state cooling by regulating chemical potential of photons in near-field electromagnetic heat transfer](#)

Kaifeng Chen, Parthiban Santhanam, Sunil Sandhu, Linxiao Zhu, and Shanhui Fan

Phys. Rev. B **91**, 134301 (2015) – Published 13 April 2015

[Theory of anharmonic phonons in two-dimensional crystals](#)

K. H. Michel, S. Costamagna, and F. M. Peeters

Phys. Rev. B **91**, 134302 (2015) – Published 17 April 2015

[Adiabatic many-body state preparation and information transfer in quantum dot arrays](#)

Umer Farooq, Abolfazl Bayat, Stefano Mancini, and Sougato Bose

Phys. Rev. B **91**, 134303 (2015) – Published 22 April 2015

[Dynamics of heat and mass transport in a quantum insulator](#)

Mateusz Łacki, Dominique Delande, and Jakub Zakrzewski

Phys. Rev. B **91**, 134304 (2015) – Published 24 April 2015

[Voltage noise, multiple phase-slips, and switching rates in moderately damped Josephson junctions](#)

Martin Žonda, Wolfgang Belzig, and Tomáš Novotný

Phys. Rev. B **91**, 134305 (2015) – Published 27 April 2015

[Boundary scattering of phonons: Specularity of a randomly rough surface in the small-perturbation limit](#)

A. A. Maznev

Phys. Rev. B **91**, 134306 (2015) – Published 28 April 2015

## Magnetism

[Transport theory of metallic B20 helimagnets](#)

Jian Kang and Jiadong Zang

Phys. Rev. B **91**, 134401 (2015) – Published 1 April 2015

[Intraband and interband spin-orbit torques in noncentrosymmetric ferromagnets](#)

Hang Li, H. Gao, Liviu P. Zărbo, K. Výborný, Xuhui Wang, Ion Garate, Fatih Doğan, A. Čejchan, Jairo Sinova, T. Jungwirth, and Aurélien Manchon

Phys. Rev. B **91**, 134402 (2015) – Published 1 April 2015

[Magnetic single-domain state of the monochiral helimagnet MnSi in the zero-field limit: Magnetic properties study](#)

V. N. Narozhnyi and V. N. Krasnorussky

Phys. Rev. B **91**, 134403 (2015) – Published 3 April 2015

### Editors' Suggestion

[Classification and description of bosonic symmetry protected topological phases with semiclassical nonlinear sigma models](#)

Zhen Bi, Alex Rasmussen, Kevin Slagle, and Cenke Xu

Phys. Rev. B **91**, 134404 (2015) – Published 6 April 2015

[Strain dependence of antiferromagnetic interface coupling in  \$\text{La}\_{0.7}\text{Sr}\_{0.3}\text{MnO}\_3/\text{SrRuO}\_3\$  superlattices](#)

Sujit Das, Andreas Herklotz, Eckhard Pippel, Er Jia Guo, Diana Rata, and Kathrin Dörr

Phys. Rev. B **91**, 134405 (2015) – Published 6 April 2015

[Magnetocaloric effects, quantum critical points, and the Berezinsky-Kosterlitz-Thouless transition in two-dimensional coupled spin-dimer systems](#)

Dominik Straußel, Peter Kopietz, and Sebastian Eggert

Phys. Rev. B **91**, 134406 (2015) – Published 6 April 2015

[Thickness and power dependence of the spin-pumping effect in  \$\text{Y}\_3\text{Fe}\_5\text{O}\_{12}/\text{Pt}\$  heterostructures measured by the inverse spin Hall effect](#)

M. B. Jungfleisch, A. V. Chumak, A. Kehlberger, V. Lauer, D. H. Kim, M. C. Onbasli, C. A. Ross, M. Kläui, and B. Hillebrands

Phys. Rev. B **91**, 134407 (2015) – Published 7 April 2015

[Temperature and field dependence of magnetic domains in  \$\text{La}\_{1.2}\text{Sr}\_{1.8}\text{Mn}\_2\text{O}\_7\$](#)

Benjamin Bryant, Y. Moritomo, Y. Tokura, and G. Aeppli

Phys. Rev. B **91**, 134408 (2015) – Published 8 April 2015

[Anomalous Hall effect and current spin polarization in  \$\text{Co}\_2\text{FeX}\$  Heusler compounds](#)

[\( \$X=\text{Al, Ga, In, Si, Ge, and Sn}\$ \): A systematic \*ab initio\* study](#)

Hung-Lung Huang, Jen-Chuan Tung, and Guang-Yu Guo

Phys. Rev. B **91**, 134409 (2015) – Published 9 April 2015

[Quantifying the deleterious role of strong correlations in  \$\text{La}\_{1-x}\text{Ca}\_x\text{MnO}\_3\$  at the magnetocaloric transition](#)

J. A. Turcaud, A. M. Pereira, and L. F. Cohen

Phys. Rev. B **91**, 134410 (2015) – Published 9 April 2015

[Realization of the thermal equilibrium in inhomogeneous magnetic systems by the Landau-Lifshitz-Gilbert equation with stochastic noise, and its dynamical aspects](#)

Masamichi Nishino and Seiji Miyashita

Phys. Rev. B **91**, 134411 (2015) – Published 9 April 2015

[Effect of Bloch wave electron propagation and momentum-resolved signal detection on the quantitative and site-specific electron magnetic chiral dichroism of magnetic spinel oxide thin films](#)

B. Loukya, D. S. Negi, K. Dileep, N. Pachauri, A. Gupta, and R. Datta

Phys. Rev. B **91**, 134412 (2015) – Published 10 April 2015

[Effect of CoO/Ni orthogonal exchange coupling on perpendicular anisotropy of Ni films on Pd\(001\)](#)

P. Kuświk, P. L. Gastelois, M. M. Soares, H. C. N. Tolentino, M. De Santis, A. Y. Ramos, A. D. Lamirand, M. Przybylski, and J. Kirschner

Phys. Rev. B **91**, 134413 (2015) – Published 10 April 2015

[Competing chiral orders in the topological Haldane-Hubbard model of spin-1/2 fermions and bosons](#)

C. Hickey, P. Rath, and A. Paramekanti

Phys. Rev. B **91**, 134414 (2015) – Published 13 April 2015

[Local magnetism and structural properties of Heusler  \$\text{Ni}\_2\text{MnGa}\$  alloys](#)

M. Belesi, L. Giebeler, C. G. F. Blum, U. K. Rößler, B. Büchner, and S. Wurmehl

Phys. Rev. B **91**, 134415 (2015) – Published 13 April 2015

[Inclined magnetic structure of iron borate  \$\text{Pr}\_x\text{Y}\_{1-x}\text{Fe}\_3\(\text{BO}\_3\)\_4\$ : A neutron diffraction study and crystal-field calculations](#)

C. Ritter, A. I. Pankrats, A. A. Demidov, D. A. Velikanov, V. L. Temerov, and I. A. Gudim

Phys. Rev. B **91**, 134416 (2015) – Published 13 April 2015

[Spectroscopic evidence of band Jahn-Teller distortion upon martensitic phase transition in Heusler-type Ni-Fe\(Co\)-Ga ferromagnetic shape-memory alloy films](#)

K. Sumida, K. Shirai, S. Zhu, M. Taniguchi, M. Ye, S. Ueda, Y. Takeda, Y. Saitoh, I. R.

Aseguinolaza, J. M. Barandiarán, V. A. Chernenko, and A. Kimura

Phys. Rev. B **91**, 134417 (2015) – Published 14 April 2015

[Bridging the gap between discrete and continuous magnetic models in the scaling approach](#)

E. A. Velásquez, J. Mazo-Zuluaga, P. Vargas, and J. Mejía-López

Phys. Rev. B **91**, 134418 (2015) – Published 15 April 2015

[Phases and phase transitions of a perturbed Kekulé-Kitaev model](#)

Eoin Quinn, Subhro Bhattacharjee, and Roderich Moessner

Phys. Rev. B **91**, 134419 (2015) – Published 16 April 2015

[Thermal conductivity of  \$\text{IPA-CuCl}\_3\$ : Evidence for ballistic magnon transport and the limited applicability of the Bose-Einstein condensation model](#)

Z. Y. Zhao, B. Tong, X. Zhao, L. M. Chen, J. Shi, F. B. Zhang, J. D. Song, S. J. Li, J. C. Wu, H. S. Xu, X. G. Liu, and X. F. Sun

Phys. Rev. B **91**, 134420 (2015) – Published 17 April 2015

[Universal distribution of magnetic anisotropy of impurities in ordered and disordered nanograins](#)

A. Szilva, P. Balla, O. Eriksson, G. Zaránd, and L. Szunyogh

Phys. Rev. B **91**, 134421 (2015) – Published 20 April 2015

[Two-stage Kondo effect in T-shaped double quantum dots with ferromagnetic leads](#)

Krzysztof P. Wójcik and Ireneusz Weymann

Phys. Rev. B **91**, 134422 (2015) – Published 21 April 2015

[Magnons and excitation continuum in XXZ triangular antiferromagnetic model: Application to  \$\text{Ba}\_3\text{CoSb}\_2\text{O}\_9\$](#)

E. A. Ghioldi, A. Mezio, L. O. Manuel, R. R. P. Singh, J. Oitmaa, and A. E. Trumper

Phys. Rev. B **91**, 134423 (2015) – Published 22 April 2015

[Ferromagnetic resonance in a topographically modulated permalloy film](#)

J. Sklenar, P. Tucciarone, R. J. Lee, D. Tice, R. P. H. Chang, S. J. Lee, I. P. Nevirkovets, O. Heinonen, and J. B. Ketterson

Phys. Rev. B **91**, 134424 (2015) – Published 23 April 2015

[Muon spin rotation and neutron scattering study of the noncentrosymmetric tetragonal compound  \$\text{CeAuAl}\_3\$](#)

D. T. Adroja, C. de la Fuente, A. Fraile, A. D. Hillier, A. Daoud-Aladine, W. Kockelmann, J. W. Taylor, M. M. Koza, E. Burzurí, F. Luis, J. I. Arnaudás, and A. del Moral  
Phys. Rev. B **91**, 134425 (2015) – Published 24 April 2015

[Close correlation between magnetic properties and the soft phonon mode of the structural transition in  \$\text{BaFe}\_2\text{As}\_2\$  and  \$\text{SrFe}\_2\text{As}\_2\$](#)

D. Parshall, L. Pintschovius, J. L. Niedziela, J.-P. Castellan, D. Lamago, R. Mittal, Th. Wolf, and D. Reznik  
Phys. Rev. B **91**, 134426 (2015) – Published 27 April 2015

[Separation of magnetic and superconducting behavior in  \$\text{YBa}\_2\text{Cu}\_3\text{O}\_{6.33}\$  \( \$T\_c=8.4\text{K}\$ \)](#)

Zahra Yamani, W. J. L. Buyers, F. Wang, Y.-J. Kim, J.-H. Chung, S. Chang, P. M. Gehring, G. Gasparovic, C. Stock, C. L. Broholm, J. C. Baglo, Ruixing Liang, D. A. Bonn, and W. N. Hardy  
Phys. Rev. B **91**, 134427 (2015) – Published 29 April 2015

[Activation of antiferromagnetic domain switching in exchange-coupled  \$\text{Fe}/\text{CoO}/\text{MgO}\(001\)\$  systems](#)

Q. Li, G. Chen, T. P. Ma, J. Zhu, A. T. N'Diaye, L. Sun, T. Gu, Y. Huo, J. H. Liang, R. W. Li, C. Won, H. F. Ding, Z. Q. Qiu, and Y. Z. Wu

Phys. Rev. B **91**, 134428 (2015) – Published 29 April 2015

## Superfluidity and superconductivity

[Tunneling spectroscopy and Majorana modes emergent from topological gapless phases in high- \$T\_c\$  cuprate superconductors](#)

Jun-Ting Kao, Shin-Ming Huang, Chung-Yu Mou, and C. C. Tsuei  
Phys. Rev. B **91**, 134501 (2015) – Published 7 April 2015

[Reversed anisotropy of the in-plane resistivity in the antiferromagnetic phase of iron tellurides](#)

L. Liu, T. Mikami, M. Takahashi, S. Ishida, T. Kakeshita, K. Okazaki, A. Fujimori, and S. Uchida  
Phys. Rev. B **91**, 134502 (2015) – Published 8 April 2015

[Continuous and discontinuous dark solitons in polariton condensates](#)

Stavros Komineas, Stephen P. Shipman, and Stephanos Venakides  
Phys. Rev. B **91**, 134503 (2015) – Published 9 April 2015

[Modeling and simulations of quantum phase slips in ultrathin superconducting wires](#)

Andreas Andersson and Jack Lidmar

Phys. Rev. B **91**, 134504 (2015) – Published 10 April 2015

[Locally gauge-invariant spin response of  \$\text{He}\_3\text{-B}\$  films with Majorana surface states](#)

Edward Taylor, A. John Berlinsky, and Catherine Kallin  
Phys. Rev. B **91**, 134505 (2015) – Published 13 April 2015

[Partially ordered vortex lattices in the high-field low-temperature mixed state of quasi-two-dimensional organic superconductors](#)

A. Maniv, V. Zhuravlev, T. Maniv, O. Ofer, R. Rommel, J. Müller, and J. E. Sonier  
Phys. Rev. B **91**, 134506 (2015) – Published 15 April 2015

[Scattering length of Andreev reflection from quantized vortices in  \$\text{He}\_3\text{-B}\$](#)

Y. A. Sergeev, C. F. Barenghi, S. N. Fisher, V. Tsepelin, and N. Suramlishvili  
Phys. Rev. B **91**, 134507 (2015) – Published 16 April 2015

[Evidence of double-gap superconductivity in noncentrosymmetric  \$\text{Nb}\_{0.18}\text{Re}\_{0.82}\$  single crystals](#)

C. Cirillo, R. Fittipaldi, M. Smidman, G. Carapella, C. Attanasio, A. Vecchione, R. P. Singh, M. R. Lees, G. Balakrishnan, and M. Cuoco  
Phys. Rev. B **91**, 134508 (2015) – Published 20 April 2015

[Emergence of superconductivity in a doped single-valley quadratic band crossing system of spin-1/2 fermions](#)

Kelly Ann Pawlak, James M. Murray, and Oskar Vafek  
Phys. Rev. B **91**, 134509 (2015) – Published 20 April 2015

[Quasiparticle interference patterns in a topological superconductor](#)

Aaron Farrell, Maxime Beaudry, M. Franz, and T. Pereg-Barnea  
Phys. Rev. B **91**, 134510 (2015) – Published 20 April 2015

[Theoretical study of correlation between spin fluctuations and  \$T\_c\$  in isovalent-doped 1111 iron-based superconductors](#)

Hayato Arai, Hidetomo Usui, Katsuhiko Suzuki, Yuki Fuseya, and Kazuhiko Kuroki  
Phys. Rev. B **91**, 134511 (2015) – Published 21 April 2015

[Large Chern-number topological superfluids in a coupled-layer system](#)

Beibing Huang, Chun Fai Chan, and Ming Gong  
Phys. Rev. B **91**, 134512 (2015) – Published 23 April 2015

[Effects of lasing in a one-dimensional quantum metamaterial](#)

Hidehiro Asai, Sergey Savel'ev, Shiro Kawabata, and Alexandre M. Zagoskin  
Phys. Rev. B **91**, 134513 (2015) – Published 23 April 2015

[Time-reversal-invariant topological superconductivity in  \$\mathbb{1}\$ -doped BiH](#)

Fan Yang, Cheng-Cheng Liu, Yu-Zhong Zhang, Yugui Yao, and Dung-Hai Lee  
Phys. Rev. B **91**, 134514 (2015) – Published 23 April 2015

## ERRATA

[Erratum: Electron energy loss and inelastic x-ray scattering cross sections from time-dependent density-functional perturbation theory \[Phys. Rev. B \*\*88\*\*, 064301 \(2013\)\]](#)

Iurii Timrov, Nathalie Vast, Ralph Gebauer, and Stefano Baroni  
Phys. Rev. B **91**, 139901 (2015) – Published 6 April 2015

[Publisher's Note: Quantifying the deleterious role of strong correlations in  \$\text{La}\_{1-x}\text{Ca}\_x\text{MnO}\_3\$  at the magnetocaloric transition \[Phys. Rev. B \*\*91\*\*, 134410 \(2015\)\]](#)

J. A. Turcaud, A. M. Pereira, and L. F. Cohen  
Phys. Rev. B **91**, 139902 (2015) – Published 17 April 2015

[Erratum: Dynamics of entanglement entropy and entanglement spectrum crossing a quantum phase transition \[Phys. Rev. B \*\*89\*\*, 104303 \(2014\)\]](#)

Elena Canovi, Elisa Ercolessi, Piero Naldesi, Luca Taddia, and Davide Vodola  
Phys. Rev. B **91**, 139903 (2015) – Published 24 April 2015