

# PHYSICAL REVIEW B<sub>TM</sub>

## CONDENSED MATTER AND MATERIALS PHYSICS

### Editor

LAURENS W. MOLENKAMP

### Managing Editor

ANTHONY M. BEGLEY

### Editor

PETER D. ADAMS

### Associate Editors

ALEXIOS KLIRONOMOS      ROBERT M. KONIK

### Senior Assistant Editors

SUSAN H. FARRANT      SARMA KANCHARLA

BRADLEY RUBIN

### Assistant Editors

ATHANASIOS CHANTIS

HARI DAHAL

LUIGI LONGOBARDI

ASHOT MELIKYAN

VICTOR VAKARYUK

### Senior Editorial Assistant

MARIE RUPOLO

### EDITORIAL BOARD

R. BERNDT

ANDREY V. CHUBUKOV

AKIRA FURUSAKI

TSUYOSHI KIMURA

JOCHEN MANNHART

CHRIS PALMSTROM

YAROSLAV TSEKOVNYAK

QI-KUN XUE

IMMANUEL FELIX BLOCH

TOMASZ DIETL

FRANCISCO GUINEA

KARYN LE HUR

I. I. MAZIN

JUKKA P. PEKOLA

GERRIT VAN DER LAAN

ROBERT J. CAVA

KRISTEN A. FICHTHORN

MARK S. HYBERTSEN

A. I. LICHTENSTEIN

FREDERIC MILA

PETER SCHIFFER

LIEVEN VANDERSYPEN

CHE-TING CHAN

MANFRED FIEBIG

PAUL J. KELLY

ALLAN H. MACDONALD

JOEL E. MOORE

I.F. SILVERA

MARTIN WEGENER

### American Physical Society

#### Officers

*President* MALCOLM R. BEASLEY  
*President-Elect* SAMUEL H. ARONSON  
*Vice-President* HOMER A. NEAL  
*Past President* MICHAEL S. TURNER  
*Editor in Chief* GENE D. SPROUSE  
*Treasurer and Publisher* JOSEPH W. SERENE  
*Executive Officer* KATE P. KIRBY

One Physics Ellipse  
College Park, MD 20740-3844

### APS Editorial Office

#### Directors

*Editorial* DANIEL T. KULP  
*Journal Information Systems* MARK D. DOYLE  
*Journal Operations* CHRISTINE M. GIACCONE

1 Research Road  
Ridge, NY 11961-2701  
Phone: (631) 591-4020

Email: prb@aps.org  
Web: <http://journals.aps.org/>

Submissions: <http://authors.aps.org/Submissions/>

### Member Subscriptions:

#### APS Membership Department

One Physics Ellipse  
College Park, MD 20740-3844  
Phone: (301) 209-3280 Fax: (301) 209-0867  
Email: [membership@aps.org](mailto:membership@aps.org)

### Institutional Subscriptions:

#### APS Subscription Services

P.O. Box 41  
Annapolis Junction, MD 20701  
Toll free: (888) 339-9655  
Phone: (301) 617-7809 Fax: (240) 757-4289  
Email: [subs@aps.org](mailto:subs@aps.org)

**Manuscripts** should be submitted electronically in acceptable format (see <http://authors.aps.org/Submissions/>). Submission is a representation that the manuscript has not been published previously and is not currently under consideration for publication elsewhere. Authors should provide indexing codes according to the PACS scheme (available at <http://journals.aps.org/PACS/>). An executed APS **copyright-transfer** form must be provided (effective only on acceptance for publication). Information for contributors may be found on our Web server.

To help defray editorial and production expenses, authors of manuscripts which are not submitted in acceptable electronic format are expected to pay a **publication charge** of \$1405/article, \$875/Rapid Communication, \$320/Comment or Reply. Acceptable formats are REVTeX (preferred), L<sup>A</sup>T<sub>E</sub>X, plain T<sub>E</sub>X; MS Word; PostScript figures (preferred). **Reprints** are offered for sale to authors.

For information about **subscription prices** and about the **online version** of the journal, see our Web server, or inquire at [assocpub@aps.org](mailto:assocpub@aps.org). **Member** inquiries regarding **subscriptions**, renewals, address changes, missing or damaged copies, and single-copy orders should be addressed to the APS Membership Department. **Institutional subscribers** should address subscription inquiries to APS Subscription Services. For address changes please send both old and new addresses, and if possible, send the mailing label from a recent issue.

### Copyright © 2014 American Physical Society. All rights reserved.

*Physical Review B<sub>TM</sub>* is a trademark of the American Physical Society.

**Rights and Permissions:** See <http://journals.aps.org/copyrightFAQ.html>.

**Copying:** No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the publisher, except as stated below. Single copies of individual articles may be made for private use or research. Authorization is given to copy articles beyond the use permitted by Sections 107 and 108 of the U.S. Copyright Law, provided the copying fee of \$25.00 per copy per article is paid to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA.

**Reproduction** of an entire article in a reprint collection, or for advertising or promotional purposes, or republication in any form requires permission from APS. Permission must be sought from the Associate Publisher, American Physical Society, One Physics Ellipse, College Park, MD 20740-3844; email: [assocpub@aps.org](mailto:assocpub@aps.org).

**Other Use:** Permission is granted to quote from the journal with the customary acknowledgment of the source. Permission must be sought from the APS Associate Publisher to reproduce a figure, table, or excerpt of an article. Authorization for private use or research does not extend to systematic or multiple reproduction, to copying for promotional purposes, to distribution in any format, or to republication in any form. In all such cases, specific permission from APS must be obtained.

*Physical Review B<sub>TM</sub>* [ISSN: 1098-0121 (print), 1550-235X (online); CODEN PRBMDO; printed in USA] is published four times a month by the American Physical Society, 1 Research Road, Ridge, NY 11961-2701.

**POSTMASTER:** Send address changes to *Physical Review B<sub>TM</sub>*, APS Subscription Services, P.O. Box 41, Annapolis Junction, MD 20701. The 2014 print + online base price is \$7825. Periodicals postage rates are paid at College Park, MD, and additional mailing offices.