

PHYSICAL REVIEW LETTERS

Providing rapid publication of short reports of important fundamental research, with coverage of major advances in all aspects of physics and of developments with significant consequences across subdisciplines.

Editors

HUGUES CHATÉ
ROBERT GARISTO
SAMINDRANATH MITRA
REINHARDT B. SCHUHMAN

Associate Editors

ABHISHEK AGARWAL
ROCIO CORTES
SERENA DALENA
OLGA DUDKO
KEVIN DUSLING
SONJA GRONDALSKI
DONAVAN HALL
SAAD E. HEBBOUL
FRANK NARDUCCI
STOJAN REBIC
DANIEL UCKO
DENIZ VAN HEIJNSBERGEN
ALESSANDRO VILLAR
RAPHAEL VOITURIEZ
MU WANG
KYLE WELCH

Assistant Editor

VALERIE L. MILLER

Editorial Board (Divisional Associate Editors)

Astrophysics

J. BEACOM, D. HOOPER, S. REDDY

Atomic, Molecular, and Optical Physics

M. DAVIS, P. DOMOKOS, R. DÖRNER, M.D. HAVEY, N. LUTKENHAUS,
G. REMPE, H. RITSCH, J. RUOSTEKOSKI, F. SCHMIDT-KALER, R. ZAMBRINI

Biological Physics

N. BRENNER, J.W. SHAEVITZ, L. TSIMRING

Chemical Physics

K. MORGENSTERN, A. TKATCHENKO

Condensed Matter Physics

K. BEHNIA, A. BLACK-SCHAFER, A.L. CHERNYSHEV, P. DAI, M. FRANZ,
F.J. GARCIA-VIDAL, H. GLYDE, M.W. HAVERKORT, T. HEINZEL,
C.H. MARROWS, A. MOREO, E. PAVARINI, S. RAO, H.R. SCHOBER,
S.H. SIMON, O.V. TCHERNYSHYOV,
D. VANDEMBROUCQ, K. YANG, S. ZHANG

Fluid Dynamics

B. DUBRULLE, R. GOVINDARAJAN, R.L. LEHENY, A. PUMIR, E. WEEKS

Gravitational Physics

A. ASHTEKAR, E. BERTI

Laser Science

P.D. DRUMMOND, E. GIACOBINO, G.-L. OPPO, D.D. YAVUZ

Materials Physics

J. HLINKA, F. LIU

Nuclear Physics

C.N. DAVIDS, J. KOLATA, R. LIOTTA, C. MANUEL, G. MOORE,
J. VELKOVSKA, D. VRETNAR, A. WUOSMAA

Particles and Fields

A. DE GOUVEA, T.A. DEGRAND, R. GOPAKUMAR, G. LANDSBERG,
W. VOGELSANG, C.E.M. WAGNER

Physics of Beams

A. WOLSKI

Plasma Physics

J. CHITTENDEN, J.S. DEGRASSIE, D. DUBIN, M. HOSHINO,
A. POUQUET, V. TIKHONCHUK

Polymer Physics

K. DALNOKI-VERESS, P. OLMSTED, G. REITER, F. SCHMID

Foundations of Quantum Mechanics

C. MACCHIAVELLO

Quantum Information

J. EISERT, A.V. SERGIENKO, L. VIOLA

Soft Matter

K. DANIELS, K. MARTENS, A. WURGER

Statistical Physics and Nonlinear Dynamics

E. AGLIARI, M. ESPOSITO, R. GOLESTANIAN, V. HAKIM, Y. KAFRI,
Y. MORENO, S.-I. SASA, K. SNEPPEN, I.M. SOKOLOV

American Physical Society

President PHILIP H. BUCKSBAUM
Speaker of the Council ANDREA J. LIU
Chief Executive Officer KATE P. KIRBY
Editor in Chief MICHAEL THOENNESSEN
Publisher MATTHEW SALTER
Chief Information Officer MARK D. DOYLE
Chief Financial Officer JANE HOPKINS GOULD
Deputy Executive Officer and
Chief Operating Officer JAMES TAYLOR
Chief Government Affairs Officer FRANCIS SLAKEY
Chief Human Resources Officer BETH GUNZEL

One Physics Ellipse
College Park, MD 20740-3844

APS Editorial Office

Directors

Journal Operations CHRISTINE M. GIACCONE
Information Systems PAUL DLUG

1 Research Road

Ridge, NY 11961-2701

Phone: (631) 591-4060

Email: prl@aps.org

Web: <https://journals.aps.org/>

Submissions:

<https://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

Institutional Subscriptions:

APS Subscription Services

P.O. Box 41

Annapolis Junction, MD 20701

Toll free: (888) 339-9655

Phone: (301) 617-7809 Email: subs@aps.org

Letters intended for this journal must be short and self-contained. Information for Contributors and a description of editorial Policies and Practices can be found at <http://journals.aps.org/prl/authors>.

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. An executed APS **copyright-transfer** form (effective only on acceptance for publication) must be provided.

To help defray editorial and production expenses, authors of published Letters are expected to pay a **publication charge** of \$800 (\$295 for a Comment or Reply). Charges are higher (\$995 for a Letter, \$370 for a Comment or Reply) for those which are not submitted in an acceptable electronic format. Acceptable formats are REVTeX (preferred), L^AT_EX, plain T_EX, MS Word; PostScript figures (preferred). **Reprints** are offered for sale to corresponding authors.

For additional information regarding the online version of this journal, please visit: <http://journals.aps.org/prl/>. Institutional subscribers requesting address changes, filing claims, or requesting additional information, please contact the APS Subscription Services at subs@aps.org. Member subscribers requiring changes, claims or additional information should contact the APS Membership Department at membership@aps.org.

Copyright © 2020 American Physical Society. All rights reserved.

*Physical Review Letters*TM is a trademark of the American Physical Society, registered in the United States, Canada, European Union and Japan.

Rights and Permissions: <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 via Aptara's SciPrisTM platform. To request permission to republish, refer to the Reuse and Permissions link that can be found on each APS article page and provide the requested information.

Other Use: Permission is granted to quote from the journal with the customary acknowledgment of the source. Permission must be sought using Aptara's SciPrisTM platform. To request permission to reproduce a figure, table, or excerpt of an article refer to the Reuse and Permissions link that can be found on each APS article page and provide the requested information. 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 Letters [ISSN: 0031-9007 (print), 1079-7114 (online); CODEN PRLTAO; printed in USA] is published weekly by the American Physical Society, 1 Research Road, Ridge, NY 11961-2701.