

PHYSICAL REVIEW A

covering atomic, molecular, and optical physics and quantum information

EDITORIAL BOARD

Term ending 31 December 2021

Editor
JAN MICHAEL ROST
(Max Planck Institute for the
Physics of Complex Systems)

Managing Editor
THOMAS PATTARD
(APS Editorial Office)

Associate Editors
UGO ANCARANI
(Université de Lorraine)
ERIKA ANDERSSON
(Heriot-Watt University)
DIRK JAN BUKMAN
(APS Editorial Office)
FRANCO DALFOVO
(Università di Trento)
GABRIELE DE CHIARA
(Queen's University Belfast)

DANIEL FELINTO
(Federal University of
Pernambuco)
BILL MUNRO
(NTT Basic Research Labs)
FRANK NARDUCCI
(Naval Postgraduate School)
MARGARET REID
(Swinburne University of
Technology)
MARK SAFFMAN
(University of Wisconsin)
XIANGYU YIN
(APS Editorial Office)

Senior Assistant Editor
JILL M. GARGANO
Assistant Editor
ERIN KNUTSON
Senior Editorial Assistant
TERRE ARENA
Consulting Editor
MARGARET MALLOY

A. J. DALEY
G. JOHANSSON
G. KLIMCHITSKAYA
L. B. MADSEN
S. PASCAZIO
S. G. PORSEV
H. PU
T. VIDICK
Cold Quantum Gases and Quantum Optics
Quantum Physics and Quantum Information
with Superconducting Circuits
Fluctuation Phenomena, Casimir Forces,
Atom-Surface Interactions
Attosecond Physics, and Atoms and
Molecules in Strong Fields
Cold Atoms, Entanglement, and Quantum Information
Atomic Theory and Structure
Theory of Quantum Gases
Quantum Information, Quantum Cryptography,
and Quantum Complexity

Term ending 31 December 2022

D. BAUER
N. GOLDMAN
P. HORAK
S. HUELGA
T. KIRCHNER
V. I. KOROBV
D. LEYKAM
F. MARINO
D. PETROSYAN
T. PFAU
P. RABL
A. SANPERA
E. TIESINGA
S. WABNITZ
Atoms, Molecules, and Clusters in Strong Fields
Ultracold Atoms, Quantum Simulation, and
Topological Properties in Quantum Matter
Nonlinear and Quantum Optics, Photonic Systems
Open Quantum Systems and Quantum Technology
Dynamics, Interactions, and Collisions of Atomic and
Molecular Few-Body Systems
Theoretical Atomic and Molecular Physics
Matter Waves, Nonlinear Optics, Classical Optics
Nonlinear Optics and Optomechanics
Quantum Optics and Quantum Information
Experiments with Cold Atoms and Vapor Cells
Theoretical Quantum Optics, Quantum Computing and Simulation
Quantum Information, Ultracold Atoms, and Quantum Simulators
Ultracold Atoms, Molecular Spectroscopy
Nonlinear Optics and Soliton Theory

Term ending 31 December 2023

N. CHANCELLOR
M. HALL
V. KONOTOP
L. C. KWEK
H-K. LO
M. PARIS
F. ROBICHEAUX
J. THYWSSEN
Quantum Computing and Quantum Algorithms
Quantum Optics and Information, Foundations of
Quantum Mechanics, Open Quantum Systems
Matter Waves, Nonlinear Optics, Soliton Theory,
and non-Hermitian Systems
Quantum Information, Quantum Cryptography
Quantum Cryptography
Quantum Optics, Quantum Information,
Open Quantum Systems, and Quantum Walks
Time-dependent Atomic Phenomena,
Highly excited Atoms, and Ultracold Plasmas
Ultracold Atoms

American Physical Society

President SYLVESTER J. GATES
Speaker of the Council BABA BALANTEKIN
Chief Executive Officer JONATHAN A. BAGGER
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

Executive Editor JESSICA THOMAS
Director, Journal
Operations CHRISTINE M. GIACCONE
Director, Information Systems PAUL DLUG
1 Research Road
Ridge, NY 11961-2701
Phone: (631) 591-4010
Email: pra@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

Manuscripts should be submitted electronically in acceptable format (see <https://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 must be provided (effective only on acceptance for publication) unless open access publication is required and the appropriate OA fees paid. Information for Contributors and a description of editorial Policies and Practices can be found at <https://journals.aps.org/pr/a/authors>.

Acceptable formats are REVTeX (preferred), L^AT_EX, MS Word; PostScript figures are preferred. **Reprints** are offered for sale to authors.

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

Copyright © 2021 American Physical Society. All rights reserved.

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

Rights and Permissions: <https://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 SciPris™ platform. To request permission to republish, refer to the Reuse and Permissions link that can be found (online) 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 SciPris™ 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 A [ISSN: 2469-9926 (print), 2469-9934 (online); CODEN PLRAAN; printed in USA] is published monthly by the American Physical Society, 1 Research Road, Ridge, NY 11961-2701.