Journal of Optics A: Pure and Applied Optics

Published monthly in hard copy and online by IOP Publishing, Dirac House, Temple Back, Bristol BS1 6BE, UK.

Institutional subscription information: 2009 volume
For all countries, except the United States, Canada and Central and South America, the subscription rate is £782.00 per annual volume. Single-issue price £77.00 (except conference issues/supplements—prices available on application). Delivery is by air-speeded mail from the UK.

Orders to:
Journals Subscription Fulfillment
IOP Publishing
Dirac House, Temple Back
Bristol BS1 6BE, UK

For the USA, Canada and Central and South America, the subscription rate is US$1545.00 per annual volume. Delivery is by transatlantic airfreight and onward mailing.

Orders to:
American Institute of Physics Subscriber Services
Suite 1NO1, 2 Huntington Quadrangle
Melville, NY 11747-4502, USA

Non-institutional subscription rates are also available.

Back issues
Orders and enquiries for earlier volumes should be sent to the subscription addresses above.

United States Postal Identification Statement
Journal of Optics A: Pure and Applied Optics (ISSN: 1464-4258) is published monthly by IOP Publishing, Dirac House, Temple Back, Bristol BS1 6BE, UK in association with the American Institute of Physics, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502, USA. Periodicals Postage Paid at Huntington Station, NY, and additional mailing offices.

POSTMASTER: Send address changes to Journal of Optics A: Pure and Applied Optics, American Institute of Physics, Suite 1NO1, 2 Huntington Quadrangle, Melville, NY 11747-4502, USA.

Copyright ©2009 by IOP Publishing Ltd and individual contributors. All rights reserved. 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 photocopies of single articles may be made for private study or research. Illustrations and short extracts from the text of individual contributions may be copied provided that the source is acknowledged; the permission of the authors is obtained and IOP Publishing Ltd is notified. Multiple copying is permitted in accordance with the terms of licences issued by the Copyright Licensing Agency under the terms of its agreement with Universities UK (UK). Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by IOP Publishing Ltd to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $30.00 per copy is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923, USA.


Printed in the UK by Page Bros (Norwich) Ltd, Norwich NR6 6SA.

Covers all aspects of modern and classical optics: experimental and theoretical studies, applications and instrumentation.

Editor-in-Chief
Nikolay Zheludev University of Southampton, UK

Nanophotonics and plasmonics
Topical Editor: Niek van Hulst Institut de Ciències Fotòniques, Spain
Deputy Editor: Alexandra Boltasseva Purdue University, USA

Metamaterials and structured photonic materials
Topical Editor: Allan Boardman University of Salford, UK
Deputy Editor: Gennady Shvets University of Texas at Austin, USA

Nonlinear and ultrafast optics
Topical Editor: Eugenio Fazio Università di Roma ‘La Sapienza’, Italy
Deputy Editor: Hervé Maillotte Université de Franche-Comté, France

Photonics at the life science interface
Topical Editor: Kishan Dholakia University of St Andrews, UK
Deputy Editor: Enzo di Fabrizio University of Magna Graecia, Italy

Information and communication optics
Topical Editor: Theirry Fournel Université Jean Monnet, France

Integrated optics systems and devices

Material processing with light
Topical Editor: Bill O’Neill University of Cambridge, UK
Deputy Editor: Andrei Rode Australian National University, Australia

Propagation, diffraction and scattering
Deputy Editor: Mark Dennis University of Bristol, UK

EOS Representative
Cornelia Denz Westfälische Wilhelms-Universität Münster, Germany

Publisher Claire Bedrock
Publishing Editors Julia Dickinson and Miranda Addey
Publishing Administrator Stuart Roberts
Production Editor Rachael Kriefman
Marketing Executive Amanda Herrin

Publishing office
IOP Publishing
Dirac House
Temple Back
Bristol BS1 6BE, UK
Tel: +44 (0)117 929 7481
Fax: +44 (0)117 929 4318
E-mail: jopa@iop.org

Advertisement sales
Robert Fisher
IOP Publishing
Dirac House
Temple Back
Bristol BS1 6BE, UK
Tel: +44 (0)117 930 1019
Fax: +44 (0)117 920 0908
E-mail: robert.fisher@iop.org

Front cover picture
Artistic impression of a 3D chiral metamaterial structure.
(Courtesy of E Plum, University of Southampton.)