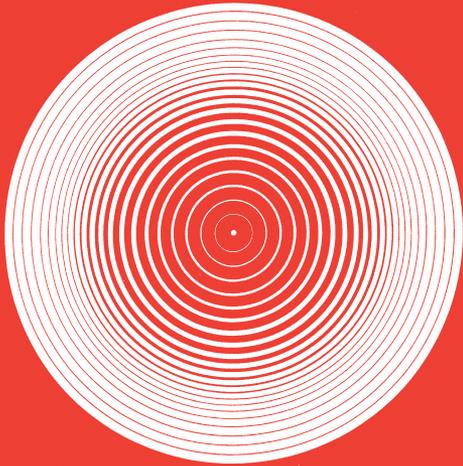


VOLUME 31 NUMBER 4 2013



LASER AND PARTICLE BEAMS



Pulse Power, High Energy Densities,
Hot Dense Matter, and
Warm Dense Matter



CAMBRIDGE
UNIVERSITY PRESS

ISSN 0263-0346

Laser and Particle Beams

Pulse Power, High Energy Densities, Hot Dense Matter, and Warm Dense Matter

Editor in Chief:

DIETER H.H. HOFFMANN
 Technical University Darmstadt
 Nuclear Physics Institute
 Radiation and Nuclear Physics Department
 Schlossgartenstrasse 9
 64289 Darmstadt, Germany

Emeritus Editor in Chiefs:

HEINRICH HORA
 University of New South Wales
 Kensington 2033 NSW, Australia

G.H. MILEY
 University of Illinois
 Urbana, IL 61801, USA

Assistant Editor:

C.V. MEISTER
 Technical University Darmstadt
 Nuclear Physics Institute
 64289 Darmstadt, Germany

Associate Editors:

CLAUDE DEUTSCH
 Laboratoire de Physique de Gaz et Plasmas
 Universite de Paris XI
 Orsay 91405, Cedex France

B.G. LOGAN
 Virtual National Laboratory for Heavy Ion Fusion
 Lawrence Berkeley National Laboratory
 Berkeley, CA 94720

BORIS YU. SHARKOV
 Institute for Theoretical and Experimental Physics
 117259 Moscow, Russia

Editorial Board

D. Batani (University of Bordeaux)
 A. Caruso (ENEA Frascati)
 M. Decroisette (Centre d'Etudes de Limeil-Valenton)
 T. Desai (National Research Institute for Applied Mathematics)
 S. Eliezer (SOREQ)
 J. Honrubia (Universidad Politecnica)
 K. Horioka (Tokyo Institute of Technology)
 M. Kalal (Czech Technical University)
 M.H. Key (Lawrence Livermore National Laboratory)
 Hong Jin Kong (KAIST)
 Y. Maron (Weizmann Institute of Science)
 G.A. Mesyats (P.N. Lebedev Physical Institute)
 A. Ng (University of British Columbia)
 A.R. Piriz (Universidad de Castilla-La Mancha)
 M. Roth (Technical University)
 D.D. Ryutov (Lawrence Livermore National Laboratory)
 A.S. Shikanov (P.N. Lebedev Physical Institute)
 N.A. Tahir (GSI)
 V.F. Tarasenko (High Current Electronics Institute)
 A.V. Zrodnikov (Institute of Physics and Power Engineering)

Laser and Particle Beams is an international journal that covers the generation, and the interaction with matter, of high intensity laser and particle beams. It also covers the physics of systems with high energy densities. Specific fields of interest include nuclear fusion, especially inertial confinement, magnetic confinement, diagnostics, material treatment, laboratory astrophysics, plasmas and spectroscopy at extreme conditions, physical properties of hot dense matter, warm dense matter, and intense particle beams and optical (laser) beams from the microwave to the X-ray region. The exploration of these fields and their new physics, including nonlinear and nonclassical phenomena, should find a forum in this journal.

As well as publishing original articles, the journal also publishes occasional review articles, surveys of research at particular laboratories, and reviews of recent books.

Laser and Particle Beams is indexed in Chemical Abstracts, Computerized Engineering Index, Current Contents, Engineering Index Monthly, Inspec, Mechanical Engineering Abstracts, Referativnyi Zhurnal, Science Citation Index, SCOPUS, Index of Scientific Reviews.

© Cambridge University Press, 2013. All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopy, or otherwise, without permission in writing from Cambridge University Press. For further information see <http://us.cambridge.org/information/rights/> or <http://www.cambridge.org/uk/information/rights/>

Copying: This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. Organizations in the USA who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. of the per copy fee of US \$20.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 5/0263-0346/13 \$20.00.

ISI Tear Sheet Service, 3501 Market Street, Philadelphia, PA 19104, USA, is authorized to supply single copies of separate articles for private use only.

Subscriptions: *Laser and Particle Beams* (ISSN 0263-0346) is published in March, June, September, and December by Cambridge University Press, 32 Avenue of the Americas, New York, NY 10013-2473/Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK. 2014 Annual rates for institutions electronic: US \$1308.00 in the USA, Canada, and Mexico; UK £715.00 + VAT elsewhere. Individuals electronic: US \$246.00 in the USA, Canada, and Mexico; UK £131.00 + VAT elsewhere.

Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent, or direct to the publishers: Cambridge University Press, Journals Department, 32 Avenue of the Americas, New York, NY 10013-2473, USA; orders outside the US, Canada, or Mexico may be sent to Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, England. Claims for missing issues should be made immediately after receipt of the next issue.

POSTMASTER: Send address changes in the US, Canada, and Mexico to *Laser and Particle Beams*, Cambridge University Press, 100 Brook Hill Drive, West Nyack, NY 10994-2133.

Periodicals Postage paid at New York, NY, and at additional mailing offices.