

You'll get a lot of valuable information with the **new KODAK Laser Dye Catalog.** The 67-page handbook comes complete with references and applications for over 50 dyes. It also comes with a special overview of pulsed dye lasers, including operation. Absorbance, fluorescence and laser output curves (for nitrogen and YAG sources) are provided for each dye.

EASTMAN CHEMICAL INTERNATIONAL AG Laboratory and Research Products Division Hertizentrum 6, 6300 Zug 3, Switzerland

LASER AND PARTICLE BEAMS

Laser and Particle Beams

Physics of High Energy Densities

Editor in Chief: HEINRICH HORA Head, Department of Theoretical Physics University of New South Wales Kensington 2033, Australia

Managing (and USA) Editor: G. H. MILEY Director, Fusion Studies Laboratory, University of Illinois, 103 S. Goodwin Ave., Urbana, Il. 61801, USA

Associate Editors:

R. DAUTRAY (for Europe) Scientific Director, CEA Limeil, B.P. 27 94190 Villeneuve St. Georges, France C. YAMANAKA (for Japan) Director, Institute of Laser Engineering, Osaka University, Suita, 565 Osaka, Japan

Editorial Board

N. G. Basov (Moscow) P. van Devender (Albuquerque) S. Eliezer (Soreq, Israel) J. L. Emmett (Livermore) A. J. Glass (San Francisco) A. H. Guenther (Kirtland AFB) R. J. Jensen (Los Alamos) G. Kessler (Karlsruhe) M. H. Key (Rutherford Appleton Lab.) R. L. McCrory (Rochester) P. Mulser (Darmstadt) S. Nakai (Osaka) K. Niu (Nagatsuta) A. A. Offenberger (Alberta) A. M. Prokhorov (Moscow) B. Ripin (Washington) D. D. Ryutov (Novosibirsk) J. P. Watteau (CEA Limeil)

Laser and Particle Beams is an international journal which 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 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 will also publish occasional review articles, surveys of research at particular laboratories and reviews of recent books.

© Cambridge University Press 1988

Copying: This journal is registered with the Copyright Clearance Center, 27 Congress St., Salem, Mass. 01970. 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 percopy fee of \$05.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 5/0263–0346/88/\$5.00 + 00.

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

For all other use, permission must be sought from Cambridge or the American Branch of Cambridge University Press.

Subscriptions: Laser and Particle Beams (ISSN 0263-0346) is published quarterly. The subscription price (which includes postage) of volume 6, 1988 is £80 net UK, £90 elsewhere (US \$165 in USA and Canada). Single parts cost £25 net (US \$47 in USA and Canada) plus postage. Four parts form a volume. Orders, which must be accompanied by payment, may be sent to a bookseller, subscription agent or direct to the publishers: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU. Orders from the USA and Canada should be sent to Cambridge University Press, 32 East 57th Street, New York, NY 10022, USA. Copies of the journal for subscribers in the USA and Canada are sent by air to New York to arrive with minimum delay. Second class postage paid at New York, NY, and at additional mailing offices. POSTMASTER: send address changes in USA and Canada to Laser and Particle Beams, Cambridge University Press, 510 North Avenue, New Rochelle, NY 10801.

LASER AND PARTICLE BEAMS

VOLUME 6 1988



CAMBRIDGE UNIVERSITY PRESS CAMBRIDGE NEW YORK NEW ROCHELLE MELBOURNE SYDNEY

Published by the Press Syndicate of the University of Cambridge The Pitt Building, Trumpington Street, Cambridge CB2 1RP 32 East 57th Street, New York, NY 10022, USA 10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© Cambridge University Press 1988

Printed in Great Britain by The Universities Press (Belfast) Ltd, Belfast BT6 9HF

Information for Contributors

- 1. Manuscripts must be written in English. All manuscripts will be referred to acknowledged experts in the subject. Only those receiving favourable recommendations from the referees will be accepted for publication. Manuscripts may be sent to any Board member, any Associate Editor or the Editor.
- 2. The typescript should be double spaced, on one side of good grade paper, allowing a reasonable left-hand margin. An original and two copies should be submitted with the author's full postal address, position and affiliations.
- 3. The title and section headings should highlight the significant points. A short abstract should precede the main text.
- 4. One copy of photographs, prints or transparencies of good quality and unmarked should be submitted. Where lines or lettering are to appear on the photograph, an additional print should be supplied appropriately marked. Each should have, lightly written on the back, the author's name, the figure number and an indication of which is the top of the picture.
- 5. One copy of each line diagram should be submitted at approximately twice final size and unlettered. Diagrams must be drawn in indian ink on plain white or transparent paper. A second copy should be supplied with lettering included. The author's name and the figure number should be written on this copy.
- 6. Tables should be typewritten on separate sheets. Avoid, where possible, very wide tables.
- 7. References and footnotes should be cited according to the Harvard (Author/date system), also known as the "British form". In the text, author and year are cited in brackets e.g. "... was found by McCarthy (1980; 1980a) ..." or "(Emmett *et al.* 1972)". Full references are listed in alphabetic order at the end of the paper. References are not numbered. An example of a reference list is:

DEUTSCH, C. & KLARSFELD, S. 1973 Phys. Rev. A7, 2081.

- NICHOLSON, D. R. 1983 Plasma Theory, (John Wiley, New York).
- OOMURA, H. et al. 1982 Res. Rep ILE, ILE-8207p.

OOMURA, H. et al. 1982a Trans. ANS, 43, 617.

Note that the year of publication appears after the author's name. If possible, all authors names should be listed in preference to "*et al.*" If one author or team is referred to more than once in any year, the letters a, b, etc should be added after the year to distinguish the individual references.

8. Correction to proofs should be restricted to printers' errors only. Authors are entitled to 25 offprints of their article free of charge. Additional offprints may be purchased if they are ordered on the form sent with the proofs.

Cambridge University Press, The Pitt Building, Trumpington Street, Cambridge CB2 1RP 32 East 57th Street, New York, NY 10022, USA 10 Stamford Road, Oakleigh, Melbourne 3166, Australia

LASER AND PARTICLE BEAMS

Volume 6 Part 4 November 1988

Heinrich Hora (UNSW, Kensington-Sydney, Australia): Dynamic superposition of laser fields for acceleration of ions and electrons up to TeV/cm gain 625

E. M. Gavrilov (Ac. Sci., Moscow, USSR), A. M. Rubenchik (Ac. Sci., Novosibirsk, USSR), and V. F. Shvets (Ac. Sci., Moscow, USSR): Electron acceleration in plasma under the action of strong electromagnetic radiation 649

R. C. Davidson (MIT, Cambridge, MA, USA) and K. T. Tsang (SAIC, McLean, VA, USA): Analysis of magnetron instability for relativistic nonneutral electron flow in cylindrical high-voltage diodes 661

R. F. Lucey, Jr., R. M. Gilgenbach, J. E. Tucker, and C. L. Enloe (U. Michigan, Ann Arbor, MI, USA): Propagation of microsecond electron beams in gases and excimer laser-ionized channels in the ion-focused regime 687

T. Okada (Tokyo U. AT, Tokyo, Japan) and K. Niu (Tokyo Inst. Tech., Yokohama, Japan): Filamentation instability of rotating light ion beam 699

S. I. Kaśkova, G. S. Romanov, and K. L. Stepanov (IAPP, Minsk, USSR): Line radiation transfer in nonequilibrium laser plasma 703

B. N. Bazylev, F. N. Borovik, G. A. Vergunova, S. I. Kaskova, G. S. Romanov, V. B. Rozanov, L. K. Stanchits, K. L. Stepanov, and A. V. Teterev (IAPP, Minsk, USSR): Non-equilibrium emission from laser-generated target plasma 709

W. Brunner, R. W. John, H. Paul, and H. Steudel (Acad. Wissenschaften, Berlin, GDR): Radiation reabsorption in a laser-produced plasma 723

E. M. Barkhudarov, G. V. Gelashvili, G. G. Gumberidze, and M. I. Taktakishvili (Ac. Sc., Tbilisi, USSR): Current generation in laser plasma using the preaction of low-energy radiation pulse on the target 731

Takayuki Aoki and Keishiro Niu (Tokyo Inst. of Tech., Yokohama, Japan): Numerical experiments for focus of rotating and propagating LIB in Plasma I—Quasi-neutral approximation 737

D. G. Nilson, S. B. Brown, C. J. Keane, B. J. MacGowan, D. L. Matthews, J. E. Trebes (LLNL, Livermore, CA, USA), O. R. Wood, II, and W. T. Silfvast (AT & T Bell Labs., Holmdel, NJ, USA): Soft X-ray laser pointing and focusing experiments 751

Book Reviews 757

Errata 761

Index 763

© Cambridge University Press 1988 Printed in Northern Ireland by The Universities Press (Belfast) Ltd, Belfast BT6 9HF