

# Applied Mathematics

*European Journal of*

VOLUME 1 · PART 4 · DECEMBER 1990

CAMBRIDGE UNIVERSITY PRESS

EDITOR-IN-CHIEF

DR J. R. OCKENDON

*Mathematical Institute, University of Oxford, 24-29 St Giles, Oxford, OX1 3LB, UK*  
EJAM@UK.AC.OX.VAX

ASSISTANT EDITOR

DR S. D. HOWISON

*Mathematical Institute, University of Oxford, 24-29 St Giles, Oxford, OX1 3LB, UK*  
EJAM@UK.AC.OX.VAX

EDITORS

PROF. A. FRIEDMAN

*Institute for Mathematics and Applications, University of Minnesota, Minneapolis, MN 55455-0436, USA*  
FRIEDMAN@CSFSA.CS.UMN.EDU  
@UMN-CS.CS.UMN.EDU

PROF. K.-H. HOFFMANN

*Lehrstuhl für Angewandte Mathematik 1, Inst. für Mathematik der Universität Augsburg, Universitätstr. 8, D8900 Augsburg, West Germany*  
HOFFKH@UNIAUG.DE@RELAY.CS.NET

PROF. M. PRIMICERIO

*Università degli Studi, Istituto Matematico U. Dini, Viale Morgagni 67/a, 50134 Firenze, Italy*  
FISMAT@EARN.IFIIDG

ASSOCIATE EDITORS

PROF. C. BARDOS

*U.E.R. de Mathématique et d'Informatiques, Tour 45 55 5<sup>e</sup> Etage, 2 Place Jussieu, 75230 Paris Cédex 05, France*  
BARDOS@EARN.FRULM63

PROF. C. M. ELLIOTT

*Department of Mathematics, University of Sussex, Falmer, Brighton BN1 9QH*  
MMFC8@UK.AC.SUSSEX.CLUSTER

PROF. B. J. MATKOWSKY

*Department of Engineering Sciences and Applied Mathematics, The Technological Institute, Northwestern University, Evanston, Illinois 60201, USA*  
MATKOWSKY@NUACC.ACNS.NWU.EDU

PROF. M. CHIPOT

*Université de Metz, Département de Mathématiques, Ile du Sauley, 57045 Metz Cédex 01, France*

DR. A. K. HEAD

*CSIRO (Materials Science and Technology), Locked Bag 33, Clayton, Victoria 3168, Australia*  
AKH@OZ.DMS.DMSMELB

PROF. V. V. PUKHNACHOV

*Lavrentyev Institute of Hydrodynamics, Siberian Division of the USSR Academy of Sciences, Novosibirsk 630090, USSR*

PROF. D. G. CRIGHTON

*DAMTP, University of Cambridge, Silver Street, Cambridge CB3 9EW*

PROF. A. LIÑAN

*Dpto. Motorpropulsión y Termo-fluidodinámica, Universidad Politécnica de Madrid, ETSI Aeronáuticos, Plaza Cardenal Cisneros 3, 28040 Madrid, Spain*

PROF. D. G. SCHAEFFER

*Department of Mathematics, Duke University, North Carolina 27706, USA*

PROF. A. DAMLAMIAN

*Ecole Polytechnique, Centre de Mathématiques, Route de Saclay, 91128 Palaiseau, France*  
MATDAMLA@EARN.FRPPOLY11

PROF. LI TATSIEN

*Department of Mathematics, Fudan University, Shanghai, China*

PROF. J. R. WILLIS

*School of Mathematics, University of Bath, Claverton Down, Bath BA2 7AY*  
JRW@UK.AC.BATH.MATHS

PROF. S. LUCKHAUS

*Institut für Angewandte Mathematik, Universität Bonn, Wegelerstrasse 6, 5300 Bonn, West Germany*  
SFB256@DBNRHRZ1.bitnet

© CAMBRIDGE UNIVERSITY PRESS 1990

SUBSCRIPTIONS

*European Journal of Applied Mathematics* (ISSN: 0956-7925) is published quarterly in March, June, September and December. The subscription price of Volume 1, 1990, is £75 net (UK), £80 elsewhere (USA and Canada US \$150) post free; single parts cost £21 net (USA and Canada US \$40) plus postage. Four parts form a volume. Orders, which must be accompanied by payment, may be sent to any bookseller, subscription agent or to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, or in the USA and Canada to Cambridge University Press, The Journals Department, 40 West 20th Street, New York, NY 10011-4211, 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 *European Journal of Applied Mathematics*, Cambridge University Press, 40 West 20th Street, New York, NY 10011-4211.

Claims for missing issues should be made immediately on receipt of the subsequent issue.