

PROCEEDINGS
OF THE
EDINBURGH MATHEMATICAL SOCIETY

EDITED BY

C. M. CAMPBELL	S. D. COHEN
T. N. T. GOODMAN	A. A. LACEY
C. MACLACHLAN	L. O'CARROLL
S. C. POWER	I. TWEDDLE

CONSULTING EDITORS

Sir MICHAEL ATIYAH, F.R.S.	K. R. DAVIDSON
C. DE BOOR	K. R. GOODEARL
O. H. KEGEL	H. W. LENSTRA
A. J. MACINTYRE	A. PELCZYNSKI
G. P. SCOTT	C. A. STUART

VOLUME 39 (SERIES II)
1996

OXFORD UNIVERSITY PRESS

COPYRIGHT © 1996 THE EDINURGH MATHEMATICAL SOCIETY

**Printed in Great Britain by
Bell and Bain Ltd, Glasgow**

CONTENTS

	<i>Page</i>
M. E. ADAMS, M. ATALLAH AND R. BEAZER Congruence coherent distributive double p -algebras	71
N. H. ASMAR, B. P. KELLY AND S. MONTGOMERY-SMITH A note on UMD spaces and transference in vector-valued function spaces	485
M. ATALLAH, see M. E. ADAMS	
B. AUPETIT AND D. DRISSI Local spectrum and subharmonicity	571
R. BEAZER, see M. E. ADAMS	
ALLEN D. BELL, SHUBHANGI STALDER AND MARK L. TEPLY Prime ideals and radicals in semigroup-graded rings	1
RAJENDRA BHATIA AND PETER ŠEMRL Distance between Hermitian operators in Schatten classes	377
G. BLOWER Multipliers for semigroups	241
T. S. BLYTH AND M. H. ALMEIDA SANTOS A simplistic approach to inverse transversals	57
GABRIELE BONANNO Existence theorems on the Dirichlet problem for the equation $\Delta u + f(x, u) = 0$	31
BOOK REVIEWS	187, 403, 589
J. BRINKMAN Minimal permutation representations of the two double covers of S_n	285
J. W. BRUCE AND F. TARI Extrema of principal curvature and symmetry	397
ANGEL CAROCCA A note on the product of \mathfrak{F} -subgroups in a finite group	37
JÚLIA VAZ DE CARVALHO Principal congruences on distributive double p -algebras	491
J. CLARK AND P. F. SMITH On semi-artinian modules and injectivity conditions	263
SERGIO CONSOLE AND ANNA FINO Homogeneous structures on Kahler submanifolds of complex projective spaces	381
J. M. CORSON Amalgamated sums of groups	561
F. P. DA COSTA On the dynamic scaling behaviour of solutions to the discrete Smoluchowski equations	547
KENNETH R. DAVIDSON Normalizers of finite multiplicity nests	337

	<i>Page</i>
MANUEL DELGADO The solution via monotonicity methods of some nonscalar reaction-diffusion problems	271
D. DRISSI, see B. AUPETIT	
J. DURANY, G. GARCÍA AND C. VÁZQUEZ A mixed Dirichlet–Neumann problem for a nonlinear Reynolds equation in elastohydrodynamic piezoviscous lubrication	151
ANTHONY J. FELTON AND H. P. ROGOSINSKI Biorthogonality in the Banach spaces $l^p(n)$	325
ANNA FINO, see SERGIO CONSOLE	
G. GARCÍA, see J. DURANY	
R. Z. GOLDSTEIN Foldings and monomorphisms	51
JUDITH V. GRABINER A mathematician among the molasses barrels: Maclaurin’s unpublished memoir on volumes. Introduction: Maclaurin’s memoir and its place in eighteenth-century Scotland	193
SAIT HALICIOĞLU Submodules of Specht modules for Weyl groups	43
R. R. HALL Proof of a conjecture of Heath–Brown concerning quadratic residues	581
NEIL HINDMAN AND DONA STRAUSS Compact subsemigroups of $(\beta\mathbb{N}, +)$ containing the idempotents	291
DINH VAN HUYNH A characterization of Noetherian rings by cyclic modules	253
DAVID A. JORDAN AND IMOGEN E. WELLS Invariants for automorphisms of certain iterated skew polynomial rings	461
B. P. KELLY, see N. H. ASMAR	
J. K. LANGLEY A lower bound for the number of zeros of a meromorphic function and its second derivative	171
M. V. LAWSON Enlargements of regular semigroups	425
ENOCH K. S. LEE On primeness and nilpotence in structural matrix near-rings	345
INESSA LEVI On the inner automorphisms of finite transformation semigroups	27
BING LIU AND JURANG YAN Oscillatory and asymptotic behaviour of second order nonlinear difference equations	525
STANISLAW MIGÓRSKI On an existence result for nonlinear evolution inclusions	133
S. MONTGOMERY-SMITH, see N. H. ASMAR	
W. D. MUNN Direct finiteness of certain monoid algebras	365
W. D. MUNN Direct finiteness of certain monoid algebras II	371

	<i>Page</i>
TAKAHIKO NAKAZI Factorizations of outer functions and extremal problems	535
DONAL O'REGAN Boundary value problems singular in the solution variable with nonlinear boundary data	505
VERN I. PAULSEN The maximal operator space of a normed space	309
Y. B. QIN The decomposition of Artinian modules over hyper- (cyclic or finite) groups	115
H. P. ROGOSINSKI, see ANTHONY J. FELTON	
JOHN ROSSI AND SHUPEI WANG The radial oscillation of solutions to ODE's in the complex domain	473
VOLKER RUNDE Local spectral properties of convolution operators on non-abelian groups	143
J. A. RUSH Lattice packing of nearly-euclidean balls in spaces of even dimension	163
M. H. ALMEIDA SANTOS, see T. S. BLYTH	
PETER ŠEMRL, see RAJENDRA BHATIA	
H. SEZINANDO On Rhodes expansions of bands	409
P. F. SMITH, see J. CLARK	
SHUBHANGI STALDER, see ALLEN D. BELL	
DONA STRAUSS, see NEIL HINDMAN	
R. J. STROEKER AND B. M. M. DE WEGER On a quartic diophantine equation	97
F. TARI, see J. W. BRUCE	
MARK L. TEPLY, see ALLEN D. BELL	
D. E. TZANETIS Asymptotic behaviour and blow-up of some unbounded solutions for a semilinear heat equation	81
C. VÁZQUEZ, see J. DURANY	
HANS VOLKMER Asymptotic spectrum of multiparameter eigenvalue problems	119
PETER WALKER Upper bounds for the separation of real zeros of polynomials	357
SHUPEI WANG, see JOHN ROSSI	
B. M. M. DE WEGER, see R. J. STROEKER	
IMOGEN E. WELLS, see DAVID A. JORDAN	
JURAND YAN, see BING LIU	

THE EDINBURGH MATHEMATICAL SOCIETY

The Edinburgh Mathematical Society was instituted in 1883 for "the promotion and extension of Mathematical Science, Pure and Applied".

Members may subscribe to the *Proceedings* at a reduced rate. Further information about membership can be obtained from the Secretary.

The Society's address is

The Edinburgh Mathematical Society
James Clerk Maxwell Building
The King's Buildings
Edinburgh EH9 3JZ

Submission of papers

Papers to be considered for publication should be sent to the Secretary or to an Editor. Manuscripts (2 copies) should be typewritten on A4 paper with double spacing and generous margins. The style and arrangement should conform to current practice in the *Proceedings*. Each manuscript should contain a short abstract of not more than 200 words and also a primary classification number from the American Mathematical Society's 1990 Mathematics Subject Classification Scheme. References, including titles of papers, should be given in the form adopted by *Mathematical Reviews*, footnotes being avoided if possible. Figures should be separated from the text and lettered, ready for photographic reduction; their intended location should be clearly indicated. Manuscripts which are not suitable for submission to the printer will not be accepted. Authors are advised to retain a copy of any material submitted as the Society cannot accept responsibility for any loss.

A proof is supplied once. Authors are particularly requested to correct and return the proof promptly. Excessive corrections may be charged to authors. Fifty free offprints, and additional copies at cost, will be supplied if ordered on a form returned with the proof.

Addresses of editors

C. M. Campbell
Mathematical Institute
University of St Andrews
North Haugh
St Andrews KY16 9SS

S. D. Cohen
Department of Mathematics
University of Glasgow
University Gardens
Glasgow G12 8QW

T. N. T. Goodman
Department of Mathematics and
Computer Science
University of Dundee
Dundee DD1 4HN

A. A. Lacey
Department of Mathematics
Heriot-Watt University
Riccarton
Edinburgh EH14 4AS

C. Maclachlan
Department of Mathematical Sciences
University of Aberdeen
Edward Wright Building
Dunbar Street
Aberdeen AB9 2TY

L. O'Carroll
Department of Mathematics and Statistics
The University of Edinburgh
James Clerk Maxwell Building
The King's Buildings
Edinburgh EH9 3JZ

S. C. Power
Department of Mathematics
University of Lancaster
Lancaster LA1 4YF

I. Tweddle
Department of Mathematics
University of Strathclyde
Livingstone Tower
Richmond Street
Glasgow G1 1XH

Proceedings of the Edinburgh Mathematical Society

VOLUME 39 (SERIES II), PART 3

OCTOBER 1996

On Rhodes expansions of bands	409
<i>H. Sezinando</i>	
Enlargements of regular semigroups	425
<i>M. V. Lawson</i>	
Invariants for automorphisms of certain iterated skew polynomial rings	461
<i>David A. Jordan and Imogen E. Wells</i>	
The radial oscillation of solutions to ode's in the complex domain	473
<i>John Rossi and Shupeí Wang</i>	
A note on UMD spaces and transference in vector-valued function spaces	485
<i>N. H. Asmar, B. P. Kelly and S. Montgomery-Smith</i>	
Principal congruences on distributive double p-algebras	491
<i>Júlia Vaz de Carvalho</i>	
Boundary value problems singular in the solution variable with nonlinear boundary data	505
<i>Donal O'Regan</i>	
Oscillatory and asymptotic behaviour of second order nonlinear difference equations	525
<i>Bing Liu and Jurang Yan</i>	
Factorizations of outer functions and extremal problems	535
<i>Takahiko Nakazi</i>	
On the dynamic scaling behaviour of solutions to the discrete Smoluchowski equations	547
<i>F. P. Da Costa</i>	
Amalgamated sums of groups	561
<i>J. M. Corson</i>	
Local spectrum and subharmonicity	571
<i>B. Aupetit and D. Drissi</i>	
Proof of a conjecture of Heath-Brown concerning quadratic residues	581
<i>R. R. Hall</i>	
Book Reviews	589