

# GLASGOW MATHEMATICAL JOURNAL

EDITED BY

N. K. DICKSON

H. R. DOWSON

W. D. MUNN

R. W. OGDEN

P. F. SMITH

R. J. STEINER

W. W. STOTHERS

M. J. TOMKINSON

D. B. WEBBER

VOLUME 28

1986

PUBLISHED BY

SCOTTISH ACADEMIC PRESS LIMITED

33 MONTGOMERY STREET

EDINBURGH EH7 5JX

Printed in Northern Ireland at The  
Universities Press (Belfast) Ltd.

## CONTENTS

<b>Anderson, D. D. and Johnson, E. W.</b> , A new characterization of Dedekind domains	237
<b>Aparicio, C., Ocaña, F., Payá, R. and Rodríguez, A.</b> , A non-smooth extension of Frechet differentiability of the norm with applications to numerical ranges	121
<b>Ariño, M. A. and Canela, M. A.</b> , Complemented subspaces and the Hahn-Banach extension property in $l_p$ ( $0 < p < 1$ )	115
<b>Beidleman, J. C. and Karbe, M. J.</b> , On normally embedded subgroups of locally soluble FC-groups	153
<b>Bonsall, F. F. and Walsh, D.</b> , Symbols for trace class Hankel operators with good estimates for norms	47
<b>Brown, Kenneth A.</b> , Class groups and automorphism groups of groups rings	79
<b>Canela, M. A.</b> , <i>See</i> Ariño, M. A. and Canela, M. A.	115
<b>Chatters, A. W. and Gilchrist, M. P.</b> , The principal ideal theorem in prime Noetherian rings	63
<b>Chō, Muneo</b> , Joint spectra of operators on Banach space	69
<b>Crabb, M. J. and McGregor, C. M.</b> , Numerical ranges of powers of hermitian elements	37
<b>Deszyński, Krzysztof</b> , A theorem on polynomial Lorentz structures	229
<b>Fletcher, P. and Lindgren, W. F.</b> , Compactifications of totally bounded quasi-uniform spaces	31
<b>Gerhard, J. A. and Petrich, Mario</b> , Free bands and free *-bands	161
<b>Gilchrist, M. P.</b> , <i>See</i> Chatters, A. W. and Gilchrist, M. P.	63
<b>Gould, Victoria</b> , Clifford semigroups of left quotients	181
<b>Gretsky, Neil E. and Ostroy, Joseph M.</b> , The compact range property and $C_0$	113
<b>Holub, J. R.</b> , Bounded completeness and Schander's basis for $C[0, 1]$	15
<b>Johnson, E. W.</b> , <i>See</i> Anderson, D. D. and Johnson, E. W.	237
<b>Karbe, M. J.</b> , <i>See</i> Beidleman, J. C. and Karbe, M. J.	153
<b>Le Bruyn, Lieven</b> , Trace rings of generic matrices are unique factorization domains	11
<b>Lindgren, W. F.</b> , <i>See</i> Fletcher, P. and Lindgren, W. F.	31

<b>McGregor, C. M.</b> , <i>See</i> Crabb, M. J. and McGregor, C. M.	37
<b>Mammone, P. and Tignol, J. P.</b> , Clifford division algebras and anisotropic quadratic forms: two counterexamples	227
<b>Mazur, T. and Skwarczyński, M.</b> , Spectral properties of holomorphic automorphism with fixed point	25
<b>Nagy, B.</b> , Finitely spectral operators	95
<b>Naphtine, A. K. and Pride, S. J.</b> , On generalized braid groups	199
<b>Nugari, Rita</b> , A note on continuation problems	55
<b>Ocaña, F.</b> , <i>See</i> Aparicio, C., Ocaña, F., Payá, R. and Rodríguez, A.	121
<b>O'Meara, K. C.</b> , Products of idempotents in regular rings	143
<b>Ostroy, Joseph M.</b> , <i>See</i> Gretskey, Neil E. and Ostroy, Joseph M.	113
<b>Ouzomgi, S. I.</b> , Factorization and bounded approximate identities for a class of convolution Banach algebras	211
<b>Payá, R.</b> , <i>See</i> Aparicio, C., Ocaña, F., Payá, R. and Rodríguez, A.	121
<b>Petrich, Mario</b> , <i>See</i> Gerhard, J. A. and Petrich, Mario	161
<b>Pettet, Martin R.</b> , Groups whose automorphisms are almost determined by their restriction to a subgroup	87
<b>Pride, S. J.</b> , <i>See</i> Naphtine, A. K. and Pride, S. J.	199
<b>Puczyłowski, E. R.</b> , On Sands' question concerning strong and hereditary radicals	1
<b>Rakočević, Vladimir</b> , Approximate point spectrum and commuting compact perturbations	193
<b>Ricker, W.</b> , Spectral operators and weakly compact homomorphisms in a class of Banach spaces	215
<b>Rodríguez, A.</b> , <i>See</i> Aparicio, C., Ocaña, F., Payá, R. and Rodríguez, A.	121
<b>Rooney, P. G.</b> , On the spectrum of an integral operator	5
<b>Skwarczyński, M.</b> , <i>See</i> Mazur, T. and Skwarczyński, M.	25
<b>Tam, Bit-Shun</b> , A simple proof of the Goldberg-Straus theorem on numerical radii	139
<b>Tignol, J. P.</b> , <i>See</i> Mammone, P. and Tignol, J. P.	227
<b>Tomiuk, B. J.</b> , Isomorphisms of multiplier algebras	73
<b>van Huynh, Dinh</b> , Some characterizations of hereditarily artinian rings	21
<b>Varadarajan, K. and Wehrhahn, K.</b> p-injectivity of simple pre-torsion modules	223
<b>Walsh, D.</b> , <i>See</i> Bonsall, F. F. and Walsh, D.	47
<b>Wehrhahn, K.</b> , <i>See</i> Varadarajan, K. and Wehrhahn, K.	223
<b>Wohlfahrt, K.</b> , Corrigendum	241

GLASGOW MATHEMATICAL JOURNAL

VOLUME 28



**SCOTTISH ACADEMIC PRESS**

*Texts in Mathematics*

Edited by Professor W. N. Everitt of the University of Dundee and Professor A. Jeffrey of the University of Newcastle upon Tyne.

A series designed for mathematical students in their final year, postgraduate students and research workers.

**THE SPECTRAL THEORY OF PERIODIC DIFFERENTIAL EQUATIONS**

M. S. P. Eastham

*Reader in Mathematical Analysis, University of London*

The text is the first connected account of a body of results, relating in particular to eigenvalue and spectral theory, which has been developed in the *Mathematical Journals* over the past twenty years.

"The book can be strongly recommended to mathematicians and physicists at post-graduate level who want to reach a well-worked yet little-known frontier."

*Times Higher Education Supplement*

144 pp. £5.00

**ANALYTICAL METHODS OF OPTIMIZATION**

D. F. Lawden

*University of Aston in Birmingham*

The scope of this book is essentially that of the classical theory of the calculus of variations, cast into a form which is most suitable for application to modern problems of optimizing the behaviour of engineering systems. All methods and principles are illustrated by worked problems, and there are sets of exercises at the end of each chapter. The book is suitable for final year applied mathematicians and for use as a text by all post-graduate students making a special study of systems theory.

164 pp. £5.50

**THEORY AND APPLICATION OF THE BOLTZMANN EQUATION**

Carlo Cercignani

*Institute of Mathematics, The Polytechnic of Milan*

The book presents a unified approach to recent developments in the fields of electron transport in plasmas; neutron transport in solids and plasmas, and in nuclear reactors; phonon transports in superfluids and radiative transfer in planetary and stellar atmospheres. The main line of exposition is tied to the classical equation established by Boltzmann which still forms the basis for the kinetic theory of gases.

432 pp. £15.00