

# MATHEMATICAL PROCEEDINGS

*of the  
Cambridge Philosophical Society*

VOLUME 107

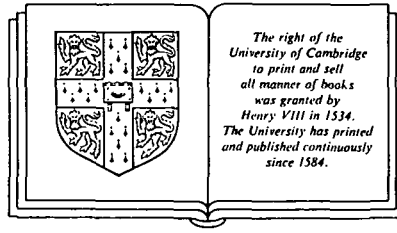


CAMBRIDGE UNIVERSITY PRESS

*Cambridge*

*New York Port Chester Melbourne Sydney*

1990



Published by the Press Syndicate of the University of Cambridge  
The Pitt Building, Trumpington Street, Cambridge CB2 1RP  
40 West 20th Street, New York, NY 10011, USA  
10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© The Cambridge Philosophical Society 1990

Printed in Great Britain by the University Press, Cambridge

# INDEX

	PAGE
Archbold, R. J. & Somerset, D. W. B. Quasi-standard $C^*$ -algebras . . . . .	349
Astala, K. & Tylli, H.-O. Seminorms related to weak compactness and to Tauberian operators . . . . .	367
Ayala, R., Dominguez, E. & Quintero, A. A theoretical framework for proper homotopy theory . . . . .	475
Baker, R. C. & Harman, G. Sequences with bounded logarithmic discrepancy . . . . .	213
Bastero, J. & Raynaud, Y. Representing types in Orlicz and Lorentz sequence spaces . . . . .	525
Bernau, S. J. & Huijsmans, C. B. Almost $f$ -algebras and $d$ -algebras . . . . .	287
Bjon, S. The Schwartz property and nuclearity of spaces of smooth and holomorphic functions in infinite dimensions . . . . .	377
Bowers, P. L. Maximally symmetric homogeneous metrics on manifolds . . . . .	115
Brown, R. & Higgins, P. J. Crossed complexes and chain complexes with operators . . . . .	33
Bryant, P. Global properties of supermanifolds and their bodies . . . . .	501
Bryce, R. A. Subgroups like Wielandt's in finite soluble groups . . . . .	239
Bunge, M. An application of descent to a classification theorem for toposes . . . . .	59
Cremona, J. E. & Odoni, R. W. K. A generalization of a result of Iwasawa on the capitulation problem . . . . .	1
Curtis, R. T. Geometric interpretations of the 'natural' generators of the Mathieu group . . . . .	19
Cusick, T. W. Units in real cyclic quartic fields . . . . .	5
Diestel, R. On end-faithful spanning trees in infinite graphs . . . . .	461
Dixon, P. G. Factorization and unbounded approximate identities in Banach algebras . . . . .	557
Dominguez, E., Quintero, A. & Ayala, R. A theoretical framework for proper homotopy theory . . . . .	475
Duncan, A. J. Infinite coverings of ideals by cosets with applications to regular sequences and balanced big Cohen-Macaulay modules . . . . .	443
Edwards, D. A. A note on stochastic integrators . . . . .	395
Farkas, D. R. Birational invariants of crystals and fields with a finite group of operators . . . . .	417
Fawcett, B. & Wood, R. J. Constructive complete distributivity I . . . . .	81
Flynn, E. V. The Jacobian and formal group of a curve of genus 2 over an arbitrary ground field . . . . .	425
Galambos, J. & Xu, Y. A new method for generating Bonferroni-type inequalities by iteration . . . . .	601
Glendinning, P. Topological conjugation of Lorenz maps by $\beta$ -transformations . . . . .	401
González, C. M., Martín, A. G. & Mira, J. A. C. Structure theory for $L^*$ -algebras . . . . .	361
Gopalsamy, K. & Zhang, B. G. Global attractivity in the delay logistic equation with variable parameters . . . . .	579
Gould, V. Completely right pure monoids on which $\mathcal{H}$ is a right congruence . . . . .	275
Harman, G. & Baker, R. C. Sequences with bounded logarithmic discrepancy . . . . .	213
Higgins, P. J. & Brown, R. Crossed complexes and chain complexes with operators . . . . .	33
Hirsch, M. D. The complement of a codimension- $k$ immersion . . . . .	103
Hoffman, P. N. & Humphreys, J. F. Real projective representations of finite groups . . . . .	27
Huijsmans, C. B. & Bernau, S. J. Almost $f$ -algebras and $d$ -algebras . . . . .	287
Humphreys, J. F. & Hoffman, P. N. Real projective representations of finite groups . . . . .	27
Hunton J. The Morava $K$ -theories of wreath products . . . . .	309

<b>Itoh, T.</b> The maximal $C^*$ -norm and the Haagerup norm . . . . .	109
<b>Jakobsche, W. &amp; Repovš, D.</b> An exotic factor of $S^3 \times \mathbb{R}$ . . . . .	329
<b>Kennedy, J. &amp; Williams, D.</b> Probabilistic factorization of a quadratic matrix polynomial . . . . .	591
<b>Kobayashi, T.</b> A criterion for detecting inequivalent tunnels for a knot . . . . .	483
<b>Kornhauser, D. M.</b> On small solutions of the general nonsingular quadratic Diophantine equation in five or more unknowns . . . . .	197
<b>Kropholler, P. H.</b> A note on centrality in 3-manifold groups . . . . .	261
<b>Martín, A. G., Mira, J. A. C. &amp; González, C. M.</b> Structure theory for $L^*$ -algebras . . . . .	361
<b>Melkersson, L.</b> On asymptotic stability for sets of prime ideals connected with the powers of an ideal . . . . .	267
<b>Miller, J. B.</b> The natural ordering on a strictly real Banach algebra . . . . .	539
<b>Mira, J. A. C., González, C. M. &amp; Martín, A. G.</b> Structure theory for $L^*$ -algebras . . . . .	361
<b>Odoni, R. W. K. &amp; Cremona, J. E.</b> A generalization of a result of Iwasawa on the capitulation problem . . . . .	1
<b>Pakes, A.</b> The Markov branching process with density-independent catastrophies. III. The supercritical case . . . . .	177
<b>Palacios, A. R.</b> Automatic continuity with application to $C^*$ -algebras . . . . .	345
<b>Quintero, A., Ayala, R. &amp; Domínguez, E.</b> A theoretical framework for proper homotopy theory . . . . .	475
<b>Raynaud, Y. &amp; Bastero, J.</b> Representing types in Orlicz and Lorentz sequence spaces . . . . .	525
<b>Repovš, D. &amp; Jakobsche, W.</b> An exotic factor of $S^3 \times \mathbb{R}$ . . . . .	329
<b>Rieger, J. H.</b> Versal topological stratification and the bifurcation geometry of map-germs of the plane . . . . .	127
<b>Rudolph, L.</b> A congruence between link polynomials . . . . .	319
<b>Rynne, B. P.</b> A lower bound for the Hausdorff dimension of sets of singular $n$ -tuples . . . . .	387
<b>Sanjurjo, J. M. R.</b> Selections of multivalued maps and shape domination . . . . .	493
<b>Sankaran, G. K.</b> Stable quintuples and terminal quotient singularities . . . . .	91
<b>Schürmann, M.</b> A class of representations of involutive bialgebras . . . . .	149
<b>Somerset, D. W. B. &amp; Archbold, R. J.</b> Quasi-standard $C^*$ -algebras . . . . .	349
<b>Stewart, I. W.</b> A uniqueness theorem for the coagulation-fragmentation equation . . . . .	573
<b>Turull, A.</b> Groups of automorphisms and centralizers . . . . .	227
<b>Tylli, H.-O. &amp; Astala, K.</b> Seminorms related to weak compactness and to Tauberian operators. . . . .	367
<b>Vavilov, N. A.</b> A note on the subnormal structure of general linear groups . . . . .	193
<b>Williams, D. &amp; Kennedy, J.</b> Probabilistic factorization of a quadratic matrix polynomial . . . . .	591
<b>Wood, R. J. &amp; Fawcett, B.</b> Constructive complete distributivity I . . . . .	81
<b>Xu, Y. &amp; Galambos, J.</b> A new method for generating Bonferroni-type inequalities by iteration . . . . .	601
<b>Zhang, B. G. &amp; Gopalsamy, K.</b> Global attractivity in the delay logistic equation with variable parameters . . . . .	579
<b>Zhou, B.</b> A note on Morita context functors . . . . .	273

## THE PREPARATION OF MANUSCRIPTS

The attention of authors is particularly directed to the following requests.

1. Papers should be typed, double-spaced, on one side of white paper (of which A4, 210 by 297 mm, is a suitable size). The pages must be numbered. Margins of 30 mm should be left at the side, top and bottom of each page. Two clear copies should be sent.

A cover page should give the title, the author's name and institution, with the address at which mail is to be sent.

The title, while brief, must be informative (e.g. *A new proof of the prime-number theorem*, whereas *Some applications of a theorem of G. H. Hardy* would be useless).

The first paragraph or two should form a summary of the main theme of the paper, providing an abstract intelligible to mathematicians.

For a typescript to be accepted for publication, it must accord with the standard requirements of publishers, and be presented in a form in which the author's intentions regarding symbols etc. are clear to a printer (who is not a mathematician).

The following notes are intended to help the author in preparing the typescript. New authors may well enlist the help of senior colleagues, both as to the substance of their work and the details of setting it out correctly and attractively.

### 2. Notation

Notation should be chosen carefully so that mathematical operations are expressed with all possible neatness, to lighten the task of the compositor and to reduce the chance of error.

For instance  $n_k$  ( $n$  sub  $k$ ) is common usage, but avoid if possible using  $c$  sub  $n$  sub  $k$ . Fractions are generally best expressed by a solidus. Complicated exponentials like

$$\exp\{z^2 \sin \theta / (1 + y^2)\}$$

should be shown in this and no other way.

In the manuscript, italics, small capitals and capitals are specified by single, double and triple underlinings. Bold faced type is shown by wavy underlining; wavy will be printed wavy.

It helps if displayed equations or statements which will be quoted later are numbered in order on the right of their line. They can then be referred to by, for example, 'from (7)'.

The author must enable the printer (if necessary by pencilled notes in the margin) to distinguish between similar symbols such as  $o$ ,  $O$ ,  $o$ ,  $0$ ;  $x$ ,  $X$ ,  $\times$ ;  $\phi$ ,  $\Phi$ ,  $\varnothing$ ;  $l$ ,  $1$ ;  $\epsilon$ ,  $\epsilon$ ;  $\kappa$ ,  $k$ .

Greek letters can be denoted by Gk in the margin.

If an author wishes to mark the end of the proof of a theorem, the sign  $\square$  may be used.

Footnotes should be avoided.

### 3. Diagrams

It is extremely helpful if diagrams are drawn in Indian ink on white card, faintly blue or green-lined graph paper, or tracing cloth or paper. *Symbols, legends and captions should be given on a transparent overlay*. Each text figure must be numbered as Figure 1, Figure 2, ... and its intended position clearly indicated in the manuscript:

Figure 1 here

The author's name in pencil must be on all separate sheets of diagrams.

A figure is expensive to reproduce and should be included only when the subject matter demands it, or when it greatly clarifies the exposition.

The Society recognizes that some authors do not have the facilities for producing drawings of a sufficiently high standard to be reproduced directly and it is therefore willing to have such diagrams re-drawn, provided that they are clear.

### 4. Tables

Tables should be numbered (above the table) and set out on separate sheets. Indicate the position of each in the text as for figures:

Table 3 here

### 5. References

References should be collected at the end of the paper numbered in alphabetical order of the authors' names. Titles of journals should be abbreviated as in *Mathematical Reviews*. The following examples show the preferred style for references to a paper in a journal, a paper in a proceedings volume, a book and an unpublished dissertation:

- [1] J. F. ADAMS. On the non-existence of elements of Hopf invariant one. *Ann. of Math.* (2) 72 (1960), 20–104.
- [2] M. P. FOURMAN and D. S. SCOTT. Sheaves and logic. In *Applications of Sheaves*, Lecture Notes in Math. vol. 753 (Springer-Verlag, 1979), pp. 302–401.
- [3] P. T. JOHNSTONE. *Stone Spaces*. Cambridge Studies in Advanced Math. no. 3 (Cambridge University Press, 1982).
- [4] F. W. LAWVERE. Functorial semantics of algebraic theories. Ph.D. thesis, Columbia University (1963).

*Mathematical Proceedings of  
the Cambridge Philosophical Society*

MPCPCO 107 (Pt 3) 417–607 (1990) 0305-0041 May 1990

CONTENTS

	PAGE
FARKAS, DANIEL R. Birational invariants of crystals and fields with a finite group of operators . . . . .	417
FLYNN, EUGENE VICTOR. The Jacobian and formal group of a curve of genus 2 over an arbitrary ground field . . . . .	425
DUNCAN, ANDREW J. Infinite coverings of ideals by cosets with applications to regular sequences and balanced big Cohen–Macaulay modules . . . . .	443
DIESTEL, REINHARD. On end-faithful spanning trees in infinite graphs . . . . .	461
AYALA, R., QUINTERO, A. & DOMINGUEZ, E. A theoretical framework for proper homotopy theory . . . . .	475
KOBAYASHI, TSUYOSHI. A criterion for detecting inequivalent tunnels for a knot . . . . .	483
SANJURJO, JOSÉ M. R. Selections of multivalued maps and shape domination . . . . .	493
BRYANT, PETER. Global properties of supermanifolds and their bodies . . . . .	501
BASTERO, JESÚS & RAYNAUD, YVES. Representing types in Orlicz and Lorentz sequence spaces . . . . .	525
MILLER, JOHN BORIS. The natural ordering on a strictly real Banach algebra . . . . .	539
DIXON, P. G. Factorization and unbounded approximate identities in Banach algebras . . . . .	557
STEWART, I. W. A uniqueness theorem for the coagulation-fragmentation equation . . . . .	573
ZHANG, B. G. & GOPALSAMY, K. Global attractivity in the delay logistic equation with variable parameters . . . . .	579
KENNEDY, JOANNE & WILLIAMS, DAVID. Probabilistic factorization of a quadratic matrix polynomial . . . . .	591
GALAMBOS, JANOS & XU, YUAN. A new method for generating Bonferroni-type inequalities by iteration . . . . .	601

© The Cambridge Philosophical Society 1990

CAMBRIDGE UNIVERSITY PRESS

THE PITT BUILDING, TRUMPINGTON STREET, CB2 1RP

40 WEST 20TH STREET, NEW YORK, NY 10011, USA

10 STAMFORD ROAD, OAKLEIGH, MELBOURNE 3166, AUSTRALIA

*Price £23.00 net (USA and Canada US \$54.00)*

*Subscription price £65.50 per volume (£131.00 per annum) net post free*

*(US \$139.00 per volume (US \$278 per annum) in USA and Canada)*

*Printed in Great Britain by the University Press, Cambridge*