

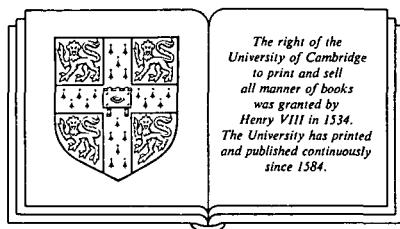
MATHEMATICAL PROCEEDINGS

(formerly *Proceedings*)
of the
Cambridge Philosophical Society

VOLUME 96



CAMBRIDGE UNIVERSITY PRESS
CAMBRIDGE
LONDON NEW YORK NEW ROCHELLE
MELBOURNE SYDNEY
1984



Published by the Press Syndicate of the University of Cambridge

The Pitt Building, Trumpington Street, Cambridge CB2 1RP

32 East 57th Street, New York, N.Y. 10022

10 Stamford Road, Oakleigh, Melbourne 3166, Australia

© The Cambridge Philosophical Society 1984

Printed in Great Britain at the University Press, Cambridge

INDEX

	PAGE
Al-Hussaini, A. N. & Elliot, R. J. Semimartingales and the empirical distribution	167
Al-Rashed, A. M. & Darst, R. B. Best L_∞ -approximation of measurable, vector-valued functions	477
Anderson, W. J. & Mathai, A. M. Various representations of a generalized hypergeometric function through statistical techniques	325
Atkin, C. J. A note on the algebra of Poisson brackets	45
Beardon, A. F. & Wilker, J. B. The norm of a Möbius transformation	301
Bleiler, S. A. A note on unknotting number	469
Carey, A. L. & Moran, W. Characters of nilpotent groups	123
Cochran, J. A. & Lee, C.-S. Inequalities related to Hardy's and Heinig's	1
Cusick, T. W. Finding fundamental units in totally real fields	191
Darst, R. B. & Al-Rashed, A. M. Best L_∞ -approximation of measurable, vector-valued functions	477
David, H. T., Werner, N. M. & Dorea, C. C. Y. Uniform ϵ -independence and the convergence in distribution of randomly indexed sequences	533
Davies, E. B. A generation theorem for operators commuting with group actions	313
Davis, D. M. & Mahowald, M. The spectrum $(P \wedge bo)_{-\infty}$	85
Dorea, C. C. Y., David, H. T. & Werner, N. M. Uniform ϵ -independence and the convergence in distribution of randomly indexed sequences	533
Elliot, R. J. & Al-Hussaini, A. N. Semimartingales and the empirical distribution	167
Fidal, D. L. The existence of sextactic points	433
Fidal, D. L. & Giblin, P. J. Generic 1-parameter families of caustics by reflexion in the plane	425
Fishel, B. & Zahreddine, Z. Boundary conditions and reducibility of differential operators	549
Flajolet, P. & Odlyzko, A. M. Limit distributions for coefficients of iterates of polynomials with applications to combinatorial enumerations	237
Fourie, J. H. On Λ -Mackey convergence in locally convex spaces	495
Fourie, J. H. & Ruckle, W. H. Projections and embeddings of locally convex operator spaces and their duals	321
Giblin, P. J. & Fidal, D. L. Generic 1-parameter families of caustics by reflexion in the plane	425
Gilmour, C. R. A. Realcompact spaces and regular σ -frames	73
Goswami, S. K. & Mandal, B. N. Scattering of surface waves obliquely incident on a fixed half immersed circular cylinder	359
Gräbe, H.-G. A dualizing complex for Stanley-Reisner rings	203
Gray, B. Unstable families related to the image of J	95
Grimmett, G. R., Keane, M. & Marstrand, J. M. On the connectedness of a random graph	151
Hall, P. Limit theorems for sums of general functions of m -spacings	517
Hannabuss, K. C. Holomorphic and abstract inducing	453
Howie, J. Spherical diagrams and equations over groups	255
Humphreys, J. F. Conjugacy classes of double covers of monomial groups	195
Jones, D. S. An exterior problem in elastodynamics	173
Joshi, J. M. C. & Upadhyay, R. A sequence of Gamma-type approximation operators	119

Keane, M., Marstrand, J. M. & Grimmett, G. R. On the connectedness of a random graph	151
Kobayashi, T. Note on almost complex structures on products of lens space	81
Kojima, S. Bounding finite groups acting on 3-manifolds	269
Kuttner, B. On non-uniqueness of the order of saturation (II)	115
Kwasik, S. & Vogel, P. On invariant knots	473
Lee, C.-S. & Cochran, J. A. Inequalities related to Hardy's and Heinig's	1
Lorenz-Petzold, D. Exact Brans-Dicke-Bianchi type-V solutions	183
Mackay, R. S. & Tresser, C. Badly ordered orbits of circle maps	447
McCloskey, J. P. Characterizations of r -potent matrices	213
McCradden, M. On the supports of Gauss measures on algebraic groups	437
Mahowald, M. & Davis, D. M. The spectrum $(P \wedge bo)_{-\infty}$	85
Mandal, B. N. & Goswami, S. K. Scattering of surface waves obliquely incident on a fixed half immersed circular cylinder	359
Marstrand, J. M., Grimmett, G. R. & Keane, M. On the connectedness of a random graph	151
Mathai, A. M. & Anderson, W. J. Various representations of a generalized hypergeometric function through statistical techniques	321
Mathias, A. R. D. Unsound ordinals	391
Mattila, K. Complex strict and uniform convexity and hyponormal operators	483
Moerdijk, I. & Reyes, G. E. De Rham's theorem in a smooth topos	61
Moran, W. & Carey, A. L. Characters of nilpotent groups	123
Mori, T. On the limit distributions of lightly trimmed sums	507
Morton, H. R. Alexander polynomials of closed 3-braids	295
Munn, W. D. On the Jacobson radical of certain commutative semigroup algebras	15
Odlyzko, A. M. & Flajolet, P. Limit distributions for coefficients of iterates of polynomials with applications to combinatorial enumerations	237
Pinch, R. G. E. Elliptic curves with good reduction away from 2	25
Raina, R. K. & Srivastava, H. M. Some combinatorial series identities	9
Ramsey, T. & Weit, Y. Mean values and classes of harmonic functions	501
Ransford, T. J. A short elementary proof of the Bishop-Stone-Weierstrass theorem	309
Reyes, G. E. & Moerdijk, I. De Rham's theorem in a smooth topos	61
Rhodes, F. The role of the principal part in factorizing block maps	223
Ricker, W. Semigroups of operators and an application to spectral theory	143
Ruckle, W. H. and Fourie, J. H. Projections and embeddings of locally convex operator spaces and their duals	321
Small, C. G. A classification theorem for planar distributions based on the shape statistics of independent tetrads	543
Soma, T. Hyperbolic, fibred links and fibre-concordances	283
Spouge, J. L. An existence theorem for the discrete coagulation-fragmentation equations	351
Srivastava, H. M. & Raina, R. K. Some combinatorial series identities	9
Stewart, I. & Woodcock, A. Bifurcation and hysteresis varieties for the thermal-chainbranching model II: positive modal parameter	331
Thomas, E. & Vasquez, A. T. A family of elliptic curves and cyclic cubic field extensions	39
Tresser, C. & Mackay, R. S. Badly ordered orbits of circle maps	447
Tricot, C. A new proof for the residual set dimension of the apollonian packing	413
Upreti, R. & Joshi, J. M. C. A sequence of Gamma-type approximation operators	119

Index

v

Vasquez, A. T. & Thomas, E. A family of elliptic curves and cyclic cubic field extensions	39
Vogel, P. & Kwasik, S. On invariant knots	473
Wehrfritz, B. A. F. Soluble-by-periodic skew linear groups	379
Weiss, R. 3-transpositions in infinite groups	371
Weit, Y. & Ramsey, T. Mean values and classes of harmonic functions	501
Werner, N. M., Dorea, C. C. Y. & David, H. T. Uniform ϵ -independence and the convergence in distribution of randomly indexed sequences	533
Wilker, J. B. & Beardon, A. F. The norm of a Möbius transformation	301
Woodcock, A. & Stewart, T. Bifurcation and hysteresis varieties for the thermal-chainbranching model II: positive modal parameter	331
Wulfsohn, A. Prime characteristic functions on compact separable groups	139
Zahreddine, Z. & Fishel, B. Boundary conditions and reducibility of differential operators	549

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 reduce the chance of error.

For instance n_k (n sub k) is common usage, but avoid if possible using $c n k$. 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 underlining. 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 σ , O , σ , O , o , 0 ; x , X , \times ; ϕ , Φ , \emptyset ; l , L ; ϵ , \in ; κ , 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 | 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 96 (Pt 3) 371–563 (1984) 0305-0041 November 1984

CONTENTS

	PAGE
WEISS, RICHARD. 3-transpositions in infinite groups	371
WEHRFRITZ, B. A. F. Soluble-by-periodic skew linear groups	379
MATHIAS, A. R. D. Unsound ordinals	391
TRICOT, CLAUDE. A new proof for the residual set dimension of the apollonian packing	413
FIDAL, D. L. & GIBLIN, P. J. Generic 1-parameter families of caustics by reflexion in the plane	425
FIDAL, D. L. The existence of sextactic points	433
McCRUDEN, M. On the supports of Gauss measures on algebraic groups	437
MACKAY, R. S. & TRESSER, C. Badly ordered orbits of circle maps	447
HANNABUS, K. C. Holomorphic and abstract inducing	453
BLEILER, STEVEN A. A note on unknotting number	469
KWASIK, SEAWOMIR & VOGEL, PIERRE. On invariant knots	473
AL-RASHED, ABDALLAH M. & DARST, RICHARD B. Best L_∞ -approximation of measurable, vector-valued functions	477
MATTILA, KIRSTI. Complex strict and uniform convexity and hyponormal operators	483
FOURIE, JAN H. On Λ -Mackey convergence in locally convex-spaces	495
RAMSEY, THOMAS & WEIT, YITZHAK. Mean values and classes of harmonic functions	501
MORI, TOSHIO. On the limit distributions of lightly trimmed sums	507
HALL, PETER. Limit theorems for sums of general functions of m -spacings	517
DOREA, C. C. Y., DAVID, H. T. & WERNER, N. M. Uniform ϵ -independence and the convergence in distribution of randomly indexed sequences	533
SMALL, CHRISTOPHER G. A classification theorem for planar distributions based on the shape statistics of independent tetrads	543
FISHEL, B. & ZAHREDDINE, Z. Boundary conditions and reducibility of differential operators	549
PROCEEDINGS 1983–84	555

© The Cambridge Philosophical Society 1984

CAMBRIDGE UNIVERSITY PRESS

THE PITT BUILDING, TRUMPINGTON STREET, CB2 1RP
32 EAST 57TH STREET, NEW YORK, N.Y. 10022, U.S.A.
10 STAMFORD ROAD, OAKLEIGH, MELBOURNE 3166, AUSTRALIA

— Price £18.40 net (U.S.A. and Canada US \$44.00)

Subscription price £46.00 per volume (£92.00 per annum) net post free
(US \$110.00 per volume (US \$220.00 per annum) in U.S.A. and Canada)

Printed in Great Britain at the University Press, Cambridge