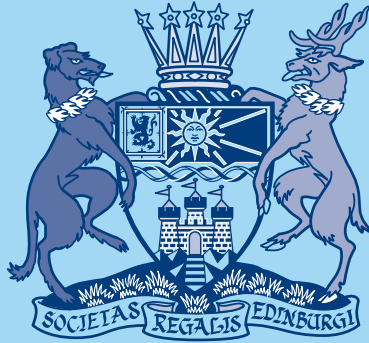


Volume 149 Part 5 (2019) pages 1123–1404

ISSN 0308-2105

THE ROYAL SOCIETY OF
EDINBURGH



PROCEEDINGS SECTION A
MATHEMATICS

PUBLISHED BY THE RSE SCOTLAND FOUNDATION
22 GEORGE STREET, EDINBURGH EH2 2PQ

EDITORIAL BOARD

B. PELLONI (Editor in Chief)
Heriot Watt University
Nonlinear PDEs and integrability

V. MOROZ
University of Swansea
Nonlinear partial differential equations

A. BARTEL
University of Glasgow
Number theory; representation theory

J. C. ROBINSON
University of Warwick
Ordinary and Partial Differential Equations

T. E. BRENDLE
University of Glasgow
*Geometric and combinatorial group theory;
low dimensional topology*

C. M. RONEY-DOUGAL
University of St. Andrews
Group theory, computational algebra

F. A. DAVIDSON
University of Dundee
Quantitative (systems) biology; applied analysis

L. SCARDIA
Heriot-Watt University
Calculus of variations and PDEs

L. FOSCOLO
University College London
Differential geometry, geometric analysis

M. J. TINDALL
University of Reading
Mathematical biology, pharmacology and medicine

J. M. FRASER
University of St Andrews
*Measure and integration. Dynamical systems
and ergodic theory*

J. H. VANNESTE
University of Edinburgh
Fluid dynamics; waves and instabilities; mixing

M. GRANT
University of Aberdeen
*Algebraic and differential topology and their
applications*

A. Y. VERETENNIKOV
University of Leeds
Stochastic analysis

D. MACLAGAN
University of Warwick

S. WHITE
University of Oxford
Functional analysis and operator algebras

S. ZELIK
University of Surrey
Dynamical systems and PDEs – theory and applications

Curator

C. HALL
University of Edinburgh

Subscription details

The journal is published and distributed every two months by Cambridge University Press on behalf of the RSE Scotland Foundation.

An annual subscription costs £628.00/\$1171.00 (Online plus Print) or £562.00/\$1031.00 (Online only). Orders should be placed with Cambridge University Press, Journals Fulfilment Department, UPH, Shaftesbury Road, Cambridge CB2 8BS UK Telephone: +44 (0)1223 326070; Fax: +44 (0)1223 325150; e-mail: journals@cambridge.org.

This journal is included in the Cambridge Core service which can be found at <https://www.cambridge.org/core/journals/proceedings-of-the-royal-society-of-edinburgh-section-a-mathematics>. Each new issue will be made available shortly before publication of the printed version. Volumes 61 to 147 (1941–2017) are also available via Cambridge Core.

© 2019 The Royal Society of Edinburgh

The Royal Society of Edinburgh, Scotland's National Academy, is Scottish Charity No. SC000470

The RSE Scotland Foundation, a charitable body connected to the Society, is Scottish Charity