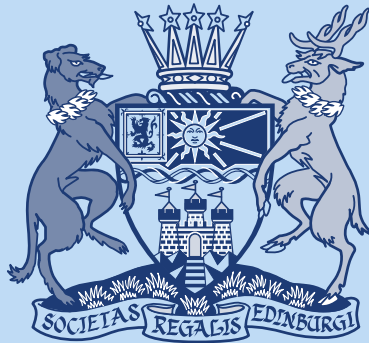


Volume 151 Part 4 (2021) pages 1135–1406

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

S. WHITE (Editor in Chief)

University of Oxford

Functional analysis and operator algebras

A. MONDINO

University of Oxford

Calculus of Variations

A. BARTEL

University of Glasgow

Number theory; representation theory

V. MOROZ

University of Swansea

Nonlinear partial differential equations

T. E. BRENDLE

University of Glasgow

*Geometric and combinatorial group theory;
low dimensional topology*

B. PELLONI

Heriot Watt University

Nonlinear PDEs and integrability

F. A. DAVIDSON

University of Dundee

Quantitative (systems) biology; applied analysis

J. C. ROBINSON

University of Warwick

Ordinary and Partial Differential Equations

L. FOSCOLO

University College London

Differential geometry, geometric analysis

C. M. RONEY-DOUGAL

University of St. Andrews

Group theory, computational algebra

J. M. FRASER

University of St Andrews

*Measure and integration. Dynamical systems
and ergodic theory*

L. SCARDIA

Heriot-Watt University

Calculus of variations and PDEs

M. GRANT

University of Aberdeen

*Algebraic and differential topology and their
applications*

M. J. TINDALL

University of Reading

Mathematical biology, pharmacology and medicine

J. H. VANNESTE

University of Edinburgh

Fluid dynamics; waves and instabilities; mixing

S. GUTIERREZ

University of Birmingham,

*Harmonic analysis with applications to pdes coming
from mathematical physics*

A. Y. VERETENNIKOV

University of Leeds

Stochastic analysis

D. MACLAGAN

University of Warwick

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 £693.00/\$1292.00 (Online plus Print) or £620.00/\$1137.00 (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.

© 2021 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