University of Birmingham

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About

Professor John Leach is a member of the Applied Mathematics Group within the School of Mathematics at the University of Birmingham.

Qualifications

- Ph.D. in Applied Mathematics
- B.Sc. (Hons.) First Class degree in Mathematics

Teaching

- Single Honours Mathematics (G100, G103, G141)
- Mathematics Majors: Mathematics with Business Management (G1N2); Mathematics with Engineering (J920); Mathematics with Philosphy (G1V5)
- Joint Honours Mathematics: Mathematics & Computer Science (GG14); Pure Mathematics & Computer Science (GGC4); Mathematics & Sport Science (GC17); Mathematics & Music (GW13); Mathematics & Philosophy (GV15)
- Theoretical Physics and Applied Mathematics (FG31)
- Mathematics Minors: French Studies and Mathematics (GR11); German Studies and Mathematics (GR12)
- Natural Sciences (CFG0, FCG0)

Research

RESEARCH THEMES

- Reaction-diffusion theory (both classical and singular)
- Hyperbolic reaction-diffusion theory
- Dynamical systems theory
- Non-linear partial differential equations
- Non-linear waves and asymptotic methods

Publications

D.J. Needham and J.A. Leach. The evolution of travelling wave-fronts in a hyperbolic Fisher model. I. The travelling wave theory. Invited contribution to the special commemorative volume in honour of the late Professor A.C. King.
IMA J. Appl. Math. 73 (1) (2008) 158-198.

J.A. Leach and D.J. Needham. The large-time development of the solution to an initial value problem for the Korteweg-de Vries equation. I. Initial data has a discontinuous expansive step.
Nonlinearity 21 (10) (2008) 2391-2408.

J.A. Leach and D.J. Needham. The evolution of travelling wave-fronts in a hyperbolic Fisher model. III. The initial-value problem when the initial data has exponential decay rates.
IMA J. Appl. Math. 74 (6) (2009) 870-903.

J.A. Leach. The large-time development of the solution to an initial-boundary value problem for the Korteweg-de Vries equation. I. Steady state solutions.
J. Differential Equations 246 (9) (2009) 3681-3703.

J.A. Leach and A.P. Bassom. The large-time development of the solution to a non-linear fourth order equation. I. Initial distribution has a discontinuous expansive step.
ANZIAM J. 51 (2) (2009) 178-190.

J.A. Leach. The large-time development of the solution to an initial-boundary value problem for the Korteweg-de Vries equation on the negative quarter-plane.
J. Differential Equations 247 (4) (2009) 1206-1228.

J.A. Leach. The large-time development of the solution to an initial-value problem for the Korteweg-de Vries-Burgers equation. I. Initial data has a discontinuous compressive step.
IMA J. Appl. Math. 75 (5) (2010) 732-776.

J.A. Leach. The large-time development of the solution to an initial-value problem for the Korteweg-de Vries-Burgers equation. II. Initial data has a discontinuous expansive step.
Nonlinear Analysis 72 (6) (2010) 2787-2802.

J.A. Leach and S. Shaw. An initial-boundary value problem for the Korteweg-de Vries equation on the negative quarter-plane.
Wave Motion 47 (2) (2010) 85-102.

J.A. Leach. The large-time development of the solution to an initial-boundary value problem for the Korteweg-de Vries equation. II. Expansion wave solutions.
Q. Jl Mech. Appl. Math. 63 (4) (2010) 573-588.

J.A. Leach. The large-time development of the solution to an initial-value problem for the Korteweg-de Vries equation. III. Pure soliton solutions.
Nonlinear Analysis 73 (9) (2010) 3101-3115.

J.A. Leach. The large-time development of the solution to an initial-value problem for the generalized Korteweg-de Vries equation.
Applied Mathematics Letters 24 (2) (2011) 214-218.