

CAMBRIDGE

JOURNALS

# JFM ARCHIVE

**Journal of  
Fluid Mechanics**  
Digital Archive  
1956–1996

*Vital research from  
the definitive source*

The JFM Digital Archive contains every article from the first 40 years of the journal, scanned and digitised to the highest standards.

Please speak to your librarian about gaining access.

**[journals.cambridge.org/jfm](https://journals.cambridge.org/jfm)**



**CAMBRIDGE**  
UNIVERSITY PRESS



CAMBRIDGE

JOURNALS

**JFM FAST  
TRACK HAS  
EVOLVED**

# JFM RAPIDS

.....

- Faster publication
- Greater visibility for papers
- Freely available to all for the first year

For more information visit

**[journals.cambridge.org/rapids](https://journals.cambridge.org/rapids)**



**CAMBRIDGE  
UNIVERSITY PRESS**

# Journal of Mechanics

Published on behalf of The Society of Theoretical and Applied Mechanics, R.O.C.

## Editor-in-Chief

K. C. Wu, National Taiwan University, Taiwan

The objective of the *Journal of Mechanics* is to provide an international forum to foster exchange of ideas among mechanics communities in different parts of world.

The Journal publishes original research in all fields of theoretical and applied mechanics.

The *Journal of Mechanics* especially welcomes papers that are related to recent technological advances, such as micro/nanomechanics, medical and biological systems, and microscale heat transfer. The contributions, which may be analytical, experimental or numerical, should be of significance to the progress of mechanics. Papers which are merely illustrations of established principles and procedures will generally not be accepted. Reports that are of technical interest are published as Short articles. Review articles are published only by invitation.

## Price information

is available at: <http://journals.cambridge.org/jom>

## Free email alerts

Keep up-to-date with new material – sign up at

<http://journals.cambridge.org/jom-alerts>



## Journal of Mechanics

is available online at:

<http://journals.cambridge.org/jom>

## To subscribe contact Customer Services

### in Cambridge:

Phone +44 (0)1223 326070

Fax +44 (0)1223 325150

Email [journals@cambridge.org](mailto:journals@cambridge.org)

### in New York:

Phone +1 (845) 353 7500

Fax +1 (845) 353 4141

Email

[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

For free online content visit:  
<http://journals.cambridge.org/jom>



**CAMBRIDGE**  
UNIVERSITY PRESS

# Journal of Plasma Physics

## Editors

Bill Dorland, University of Maryland Honors College, USA  
Alex Schekochihin, University of Oxford, UK

With two new Editors and seven new Associate Editors joining the editorial team *Journal of Plasma Physics* aspires to be the intellectual home of those who think of plasma physics as a fundamental discipline. The journal will particularly focus on publishing research on laboratory plasmas, space physics and plasma astrophysics that takes advantage of the rapid ongoing progress in instrumentation and computing to advance fundamental understanding of multiscale plasma dynamics.

---

## Price information

is available at: <http://journals.cambridge.org/pla>

## Free email alerts

Keep up-to-date with new material – sign up at  
<http://journals.cambridge.org/pla-alerts>



## *Journal of Plasma Physics*

is available online at:  
<http://journals.cambridge.org/pla>

## To subscribe contact Customer Services

### in Cambridge:

Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

### in New York:

Phone +1 (845) 353 7500  
Fax +1 (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

For free online content visit:  
<http://journals.cambridge.org/pla>



**CAMBRIDGE**  
UNIVERSITY PRESS

CAMBRIDGE

JOURNALS

# The ANZIAM Journal

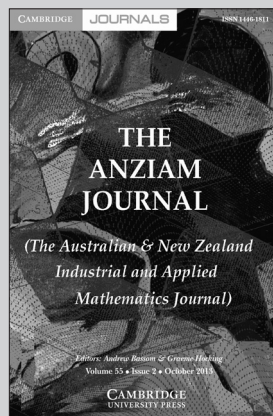
Published for the Australian Mathematical Society

## Editors-in-Chief

A. Bassom, *The University of Western Australia, Australia*

G. C. Hocking, *Murdoch University, Australia*

*The ANZIAM Journal* considers papers in any field of applied mathematics and related mathematical sciences with the aim of rapid publication in print and electronic formats. Novel applications of mathematics in real situations are especially welcomed. All papers should include some indication of applicability, and an introduction that can be understood by non-specialist readers from the whole applied mathematical community.



## ANZIAM Journal

is available online at:  
<http://journals.cambridge.org/anz>

## To subscribe contact Customer Services

### in Cambridge:

Phone +44 (0)1223 326070  
Fax +44 (0)1223 325150  
Email [journals@cambridge.org](mailto:journals@cambridge.org)

### in New York:

Phone +1 (845) 353 7500  
Fax +1 (845) 353 4141  
Email  
[subscriptions\\_newyork@cambridge.org](mailto:subscriptions_newyork@cambridge.org)

## Free email alerts

Keep up-to-date with new material – sign up at

[journals.cambridge.org/register](http://journals.cambridge.org/register)

For free online content visit:  
<http://journals.cambridge.org/anz>



CAMBRIDGE  
UNIVERSITY PRESS

491 Second-order sensitivity of parallel shear flows and optimal spanwise-periodic flow modifications

**E. Boujo, A. Fani & F. Gallaire**

515 On the self-sustained nature of large-scale motions in turbulent Couette flow

**S. Rawat, C. Cossu, Y. Hwang & F. Rincon**

541 Effects of frontal and plan solidities on aerodynamic parameters and the roughness sublayer in turbulent boundary layers

**M. Placidi & B. Ganapathisubramani**

567 On the role of the history force for inertial particles in turbulence

**A. Daitche**

### **JFM Rapids (online only)**

R1 Mixing in axisymmetric gravity currents

**P. Samasiri & A. W. Woods**

S R2 Viscous fingering and deformation of a miscible circular blob in a rectilinear displacement in porous media

**S. Pramanik, A. De Wit & M. Mishra**

*S* indicates supplementary data or movies available online.

- 1 Electrokinetics meets electrohydrodynamics  
**M. Z. Bazant**
- 5 Hydraulic jumps in a shallow flow down a slightly inclined substrate  
**E. S. Benilov**
- 25 On the kurtosis of deep-water gravity waves  
**F. Fedele**
- 37 Vorticity reconnection during vortex cutting by a blade  
**D. C. Saunders & J. S. Marshall**
- S 63 Precession of a rapidly rotating cylinder flow: traverse through resonance  
**F. Marques & J. M. Lopez**
- 99 On Knudsen-minimum effect and temperature bimodality in a dilute granular Poiseuille flow  
**M. Alam, A. Mahajan & D. Shivanna**
- 127 On the selection of viscosity to suppress the Saffman–Taylor instability in a radially spreading annulus  
**T. H. Beeson-Jones & A. W. Woods**
- 144 Inertia–gravity waves in a liquid-filled, differentially heated, rotating annulus  
**A. Randriamampianina & E. Crespo del Arco**
- 178 Wave field and zonal flow of a librating disk  
**S. Le Dizès**
- S 209 Partial coalescence from bubbles to drops  
**F. H. Zhang, M.-J. Thoraval, S. T. Thoroddsen & P. Taborek**
- S 240 Direct control of the small-scale energy balance in two-dimensional fluid dynamics  
**J. Frank, B. Leimkuhler & K. W. Myerscough**
- 260 Heat/mass transport in shear flow over a heterogeneous surface with first-order surface-reactive domains  
**P. N. Shah & E. S. G. Shaqfeh**
- 300 U-shaped fairings suppress vortex-induced vibrations for cylinders in cross-flow  
**F. Xie, Y. Yu, Y. Constantinides, M. S. Triantafyllou & G. E. Karniadakis**
- 333 Energy-consistent entrainment relations for jets and plumes  
**M. van Reeuwijk & J. Craske**
- 356 Asymptotic descriptions of oblique coherent structures in shear flows  
**K. Deguchi & P. Hall**
- 368 Localized turbulence structures in transitional rectangular-duct flow  
**K. Takeishi, G. Kawahara, H. Wakabayashi, M. Uhlmann & A. Pinelli**
- 380 Physical and scale-by-scale analysis of Rayleigh–Bénard convection  
**R. Togni, A. Cimarelli & E. De Angelis**
- 405 The evolution of segregation in dense inclined flows of binary mixtures of spheres  
**M. Larcher & J. T. Jenkins**
- S 430 Exact coherent states and connections to turbulent dynamics in minimal channel flow  
**J. S. Park & M. D. Graham**
- S 455 Filling box flows in porous media  
**C. K. Sahu & M. R. Flynn**
- S 479 A scaling law for the lift of hovering insects  
**J. Lee, H. Choi & H.-Y. Kim**

Contents continued on inside back cover.