

Volume 8 Issue 2 April 2009

ISSN 1473 5504

# International Journal of Astrobiology

**CAMBRIDGE**  
UNIVERSITY PRESS



# INTERNATIONAL JOURNAL OF ASTROBIOLOGY

## Managing Editor

Dr Simon Mitton, University of Cambridge, UK

## Associate Editors

Dr Rocco Mancinelli, SETI Institute, USA    Dr Frances Westall, CNRS, France

## Editorial Board

Professor Robert E. Blankenship, Arizona State University, USA  
Professor André Brack, CNRS, France  
Dr Natalie Cabrol, SETI Institute, USA  
Dr Steve Clifford, Lunar and Planetary Institute, USA  
Dr Charles Cockell, The Open University, UK  
Professor Don Cowan, University of the Western Cape, South Africa  
Dr Steven Dick, NASA, USA  
Professor H. G. M. Edwards, University of Bradford, UK  
Professor Pascale Ehrenfreund, University of Leiden, The Netherlands  
Dr Alex Ellery, University of Surrey, UK  
Dr Jack Farmer, Arizona State University, USA  
Professor David Field, University of Aarhus, Denmark  
Dr Bernard Foing, ESA-ESTEC, The Netherlands  
Dr David Gilichinsky, Academy of Sciences of Russia, Russia  
Dr Beda Anton Hofmann, Bern Natural History Museum, Switzerland

Dr Gerda Horneck, DLR FF-ME, Germany  
Professor Bruce M. Jakosky, University of Colorado, USA  
Professor Barrie Jones, The Open University, UK  
Dr Helmut Lammer, Space Research Institute, Austria  
Dr Ralph Lorenz, University of Arizona, USA  
Dr Chris McKay, NASA Ames Research Center, USA  
Dr Nobuo Munakata, Rikkyo University, Japan  
Dr Kenneth Nealson, University of Southern California/JPL, USA  
Professor Juan Perez-Mercader, Centro de Astrobiología (CSIC/INTA), Spain  
Dr Lynn Rothschild, NASA Ames Research Center, USA  
Professor Woodruff T. Sullivan III, University of Washington, USA  
Professor Malcolm Walter, Australian Centre for Astrobiology, Sydney, Australia

## Founding Editor

Dr David Wynn-Williams (1946–2002)

### SUBSCRIPTIONS

*International Journal of Astrobiology* (ISSN 1473-5504), electronic 1475-3006 is published four times a year (one volume per annum) in January, April, July, and October. The 2009 subscription price (excluding VAT) of a volume, which includes print and electronic access, is £230 (US \$440 in USA, Canada and Mexico). The electronic-only price available to institutional subscribers is £195 (US \$360 in USA, Canada and Mexico). For individuals ordering direct from the publisher and certifying that the journal is for their personal use, the subscription price for print plus electronic access is £75 (US \$140 in USA, Canada and Mexico).

Orders, which must be accompanied by payment, may be sent to any bookseller, subscription agent or direct to the publisher: Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 8RU, UK; or in the USA, Canada and Mexico: Cambridge University Press, Journals Fulfillment Department, 100 Brook Hill Drive, West Nyack, New York 10994-2133. EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered members should provide their VAT registration number. Japanese prices for institutions (including ASP delivery) are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Prices include delivery by air. *Postmaster*: send address changes in USA, Canada and Mexico to: *International Journal of Astrobiology*, Cambridge University Press, 100 Brook Hill Drive, West Nyack,

New York 10994-2133. Claims for missing issues should be made immediately on receipt of the subsequent issue.

### ADVERTISING

Apply to the Publisher Cambridge University Press (address above). Address enquiries to the Advertising Promoter.

### COPYRIGHT AND PERMISSIONS

This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA. Organizations in the USA who are also registered with C.C.C. may therefore photocopy material (beyond the limits permitted by Section 107 and 108 of U.S. Copyright law) subject to payment to C.C.C. of the per-copy fee of \$16.00. This consent does not extend to multiple copying for promotional or commercial purposes. Code 1473-5504/2009 \$16.00. *ISI Tear Sheet Service*, 3501 Market Street, Philadelphia, PA 19104, USA, is authorised to supply single photocopies of separate articles for private use only. Organizations authorised by the UK Copyright Licensing Agency may also copy material subject to the usual conditions. For all other use, permission should be sought from Cambridge University Press.

No part of this publication may otherwise be reproduced, stored or distributed by any means without permission in writing from Cambridge University Press, acting for the copyright holder.

Copyright © 2009 Cambridge University Press

### ELECTRONIC ACCESS

This journal is included in the *Cambridge Journals Online* service which can be found at: [journals.cambridge.org](http://journals.cambridge.org)  
For further information on other Press titles access [uk.cambridge.org](http://uk.cambridge.org) or [us.cambridge.org](http://us.cambridge.org)

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see [www.fsc.org](http://www.fsc.org) for information.