

# GEOLOGICAL MAGAZINE

Volume 160 Issue 5

May 2023

E-ISSN: 1469-5081



CAMBRIDGE  
UNIVERSITY PRESS

# GEOLOGICAL MAGAZINE

---

## EDITOR-IN-CHIEF

**Professor Peter Clift** *Department of Geology and Geophysics, Louisiana State University, Baton Rouge, LA 70803, USA*  
pclift@lsu.edu

## EXECUTIVE EDITORS

**Dr Stephen M. Hubbard** *University of Calgary, Department of Geosciences, Calgary, Alberta, Canada*  
shubbard@ucalgary.ca

**Dr Tim Johnson** *Curtin University, Kent St, Bentley WA 6102, Australia*  
tim.johnson@curtin.edu.au

**Professor Olivier Lacombe** *University Pierre et Marie Curie, 4 Place Jussieu, 75005 Paris, France*  
olivier.lacombe@upmc.fr

**Dr Bas van de Schootbrugge** *Department of Earth Sciences, Utrecht University, Princetonlaan 8A, 3584 CB Utrecht, The Netherlands*  
B.vanderSchootbrugge@uu.nl

**Dr Sarah Sherlock** *Open University, Walton Hall, Kents Hill, Milton Keynes MK7 6AA, UK*  
sarah.sherlock@open.ac.uk

## BOOK REVIEW EDITOR

Please contact the Editorial Office at [geomag@cambridge.org](mailto:geomag@cambridge.org)

---

## ASSOCIATE EDITORS

**Dr Antonio Álvarez-Valero** *University of Salamanca, Spain*  
**Professor Anne Bernhardt** *Free University of Berlin, Germany*  
**Professor Maria de Fatima Bitencourt** *Federal University of Rio Grande do Sul, Brazil*

**Dr Stephen Brusatte** *University of Edinburgh, UK*

**Dr Susanne Buiter** *University of Oslo, Norway*

**Professor Alan Collins** *University of Adelaide, Australia*

**Dr Irene Cornacchia** *Istituto di Geoscienze e Georisorse IGG-CNR, Pisa, Italy*

**Professor Yildirim Dilek** *Miami University, USA*

**Dr Kathryn Fitzsimmons** *Max Planck Institute for Chemistry, Germany*

**Dr Kathryn Goodenough** *British Geological Survey, UK*

**Dr Jacqueline Halpin** *University of Tasmania, Australia*

**Dr Lily Jackson** *University of Texas, USA*

**Professor Eleanor Jennings** *Birkbeck, University of London, UK*

**Dr Soren Jensen** *Universidad de Extramadura, Spain*

**Professor Johan Le Goff** *Katholieke Universiteit Leuven, Belgium*

**Professor Xian-Hua Li** *Institute of Geology and Geophysics CAS, China*

**Dr Guido Meinhold** *Keele University, UK*

**Dr Sarbani Patranabis-Deb** *Indian Statistical Institute (ISI), Kolkata, India*

**Professor Dejan Prelevic** *Johannes Gutenberg University of Mainz, Germany*

**Dr Dilip Saha** *Indian Statistical Institute, India*

**Professor Renata Schmitt** *Universidade Federal do Rio de Janeiro, Brazil*

**Dr Lara Sciscio** *JURASSICA Museum, Switzerland*

**Professor Paul Spry** *Iowa State University, USA*

**Dr Holly Stein** *Colorado State University, USA; CEED, University of Oslo, Norway*

**Dr Hans-Dieter Sues** *Smithsonian National Museum of Natural History, USA*

**Dr Shiming Wan** *Institute of Oceanology, Chinese Academy of Sciences, China*

**Professor Yongdong Wang** *Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, China*

**Professor Chun-Jing Wei** *Peking University, China*

---

The *Geological Magazine* was originally established in 1864 and has been published continuously ever since. It covers the whole field of earth sciences, has a worldwide readership and has a particular strength in providing a niche for interdisciplinary papers and papers that would be of interest to geologists from many different specialities. Papers of any length are considered, provided that the length is justifiable.

The *Magazine* publishes both original and review articles, rapid communications, discussions of papers which have already appeared in the *Magazine*, book reviews and a list of new publications.

There are no page charges for papers published in the *Magazine*.

© Cambridge University Press & Assessment 2023

## Internet Access

This journal can be found online at <https://www.cambridge.org/geo>. *Geological Magazine* (ISSN 0016-7568). Twelve parts form a volume in 2023.

**Copying** : This journal is registered with the Copyright Clearance Center, 222 Rosewood Drive, Danvers, Mass. 01923, USA. Organizations in the USA who are also registered with C.C.C. may therefore copy material (beyond the limits permitted by sections 107 and 108 of US copyright law) subject to payment to C.C.C. This consent does not extend to multiple copying for promotional or commercial purposes.

Organizations authorized by the Copyright Licensing Agency may also copy material subject to the usual conditions.

**For all other use**, permission should be sought from Cambridge or the American Branch of Cambridge University Press & Assessment

**Claims** for missing issues can only be considered if made immediately after receipt of the subsequent issue.

**Advertising** : Details of advertising in *Geological Magazine* may be obtained from the publisher.