

GEOLOGY

NOVEMBER 2016 | VOLUME 44 | NUMBER 11

- 883 Destruction of the Wyoming craton: Seismic evidence and geodynamic processes**
Riddhi Dave and Aibing Li
- 887 The Neogene de-greening of Central Asia**
Jeremy K. Caves, Danielle Y. Moragne, Daniel E. Ibarra, Bolat U. Bayshashov, Yuan Gao, Matthew M. Jones, Aizhan Zhamangara, Anastasia V. Arzhannikova, Sergey G. Arzhannikov, and C. Page Chamberlain
- 891 Sub-ice shelf ironstone deposition during the Neoproterozoic Sturtian glaciation**
Maxwell Lechte and Malcolm Wallace
- 895 Evidence for Eocene–Oligocene glaciation in the landscape of the East Greenland margin**
Thomas Bernard, Philippe Steer, Kerry Gallagher, Adam Szulc, Andrew Whitham, and Christopher Johnson
- 899 Boron isotopic discrimination for subduction-related serpentinites**
Céline Martin, Kennet E. Flores, and George E. Harlow
- 903 Temperature and salinity of the Late Cretaceous Western Interior Seaway**
Sierra V. Petersen, Clay R. Tabor, Kyger C. Lohmann, Christopher J. Poulsen, Kyle W. Meyer, Scott J. Carpenter, J. Mark Erickson, Kelly K.S. Matsunaga, Selena Y. Smith, and Nathan D. Sheldon
- 907 The milling factory: Componentry-dependent fragmentation and fines production in pyroclastic flows**
Julien Bernard and Jean-Luc Le Pennec
- 911 The end of the Ediacaran: Two new exceptionally preserved body fossil assemblages from Mount Dunfee, Nevada, USA**
E.F. Smith, L.L. Nelson, M.A. Strange, A.E. Eyster, S.M. Rowland, D.P. Schrag, and F.A. Macdonald
- 915 A continental arc tempo discovered in the Pacific-Gondwana margin mudpile?**
Timothy Paulsen, Chad Deering, Jakub Sliwinski, Olivier Bachmann, and Marcel Guillong
- 919 Tectonic and climate controls on Neogene environmental change in the Zhada Basin, southwestern Tibetan Plateau**
Joel E. Saylor, Lokin Casturi, Timothy M. Shanahan, Junsheng Nie, and Crystal M. Saadeh
- 923 Peak intervals of equatorial Pacific export production during the middle Miocene climate transition**
Samantha C. Carter, Elizabeth M. Griffith, Donald E. Penman
- 927 Impact of tidal currents on delta-channel deepening, stratigraphic architecture, and sediment bypass beyond the shoreline**
Valentina Marzia Rossi, Wonsuck Kim, Julio Leva López, Douglas Edmonds, Nathanael Geleynse, Cornel Olariu, Ronald J. Steel, Matthew Hiatt, and Paola Passalacqua
- 931 Comparing submarine and fluvial channel kinematics: Implications for stratigraphic architecture**
Zane R. Jobe, Nick C. Howes, and Neal C. Aucher
- 935 Integrated geochemical-petrographic insights from component-selective $\delta^{238}\text{U}$ of Cryogenian marine carbonates**
Ashleigh v.S. Hood, Noah J. Planavsky, Malcolm W. Wallace, Xiangli Wang, Eric J. Bellefroid, Bleuenn Gueguen and Devon B. Cole
- 939 Giant landslides and highstands of the Caspian Sea**
Tomáš Pánek, Oliver Korup, Jozef Minár, and Jan Hradecký
- 943 Asian collisional subduction: A key process driving formation of the Tibetan Plateau**
Anne Replumaz, F. Funicello, R. Reitano, C. Faccenna, and M. Balon
- 947 Rolling open Earth's deepest forearc basin**
Jonathan M. Pownall, Robert Hall, and Gordon S. Lister
- 951 Exceptional preservation of soft-bodied Ediacara Biota promoted by silica-rich oceans**
Lidya G. Tarhan, Ashleigh v.S. Hood, Mary L. Droser, James G. Gehling, and Derek E.G. Briggs
- 955 Dodging snowballs: Geochronology of the Gaskiers glaciation and the first appearance of the Ediacaran biota**
Judy P. Pu, Samuel A. Bowring, Jahandar Ramezani, Paul Myrow, Timothy D. Raub, Ed Landing, Andrea Mills, Eben Hodgkin, and Francis A. Macdonald
- 959 Sea-surface temperature evolution across Aptian Oceanic Anoxic Event 1a**
B.D.A. Naafs and R.D. Pancost
- 963 The cause of Late Cretaceous cooling: A multimodel-proxy comparison**
Clay R. Tabor, Christopher J. Poulsen, Daniel J. Lunt, Nan A. Rosenbloom, Bette L. Otto-Bliesner, Paul J. Markwick, Esther C. Brady, Alexander Farnsworth, and Ran Feng
- 967 Unraveling alteration histories in serpentinites and associated ultramafic rocks with magnetite (U-Th)/He geochronology**
Emily H.G. Cooperdock and Daniel F. Stockli
- 971 Tropical circulation intensification and tectonic extension recorded by Neogene terrestrial $\delta^{18}\text{O}$ records of the western United States**
Ran Feng, Christopher J. Poulsen, Martin Werner
- 975 RESEARCH FOCUS: The age of tubes: A window into biological transition at the Precambrian-Cambrian boundary**
James D. Schiffbauer

GEOLOGY

GEOLOGY publishes timely, innovative, and provocative articles relevant to its international audience, representing research from all fields of the geosciences.

GEOLOGY (ISSN 0091-7613 USPS 994-580 CODEN GLGYB) is published monthly by the Geological Society of America, Inc. (GSA), with offices at 3300 Penrose Place, Boulder, Colorado, USA. Mailing address is P.O. Box 9140, Boulder, CO 80301-9140, USA. Periodicals postage paid at Boulder, Colorado, and at additional mailing offices. Postmaster: Send address changes to *Geology*, Sales & Service, P.O. Box 9140, Boulder, CO 80301-9140, USA.

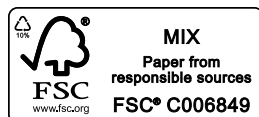
Copyright © 2016, The Geological Society of America, Inc. (GSA). All rights reserved. Copyright not claimed on content prepared wholly by U.S. government employees within the scope of their employment. Individual scientists are hereby granted permission, without fees or further requests to GSA, to use a single figure, a single table, and/or a brief paragraph of text in other subsequent works and to make unlimited photocopies of items in this journal for noncommercial use in classrooms to further education and science. In addition, an author has the right to use his or her article or a portion of the article in a thesis or dissertation without requesting permission from GSA, provided the bibliographic citation and the GSA copyright credit line are given on the appropriate pages. For any other form of capture, reproduction, and/or distribution of any item in this journal by any means, contact: Permissions, GSA, P.O. Box 9140, Boulder, CO 80301-9140, USA, fax +1-303-357-1073, editing@geosociety.org; reference *Geology*, ISSN 0091-7613. Permission is granted to authors to post the abstracts only of their articles on their own or their organization's Web site providing the posting includes this reference: "The full paper was published in the Geological Society of America's journal *Geology*, [include year, month, and page numbers, if known, where the article appears or will appear]."

GSA provides this and other forums for the presentation of diverse opinions and positions by scientists worldwide, regardless of their race, citizenship, gender, religion, sexual orientation, or political viewpoint. Opinions presented in this publication do not reflect official positions of the Society.

SUBSCRIPTIONS for 2016 calendar year. GSA Members and Fellows: \$89 (print + online), \$89 (international print + online), \$60 (online only). GSA Student, K–12 Teacher, and Early Career Professional Members: \$45 (print only; online included in membership). Nonmembers and institutions: \$1125 (print + online). Details on subscription choices, formats, and pricing, at www.geosociety.org/pubs/. For all orders, call GSA Sales & Service at +1.888.443.4472 or +1.303.357.1000, or e-mail gsaservice@geosociety.org. Claims: for nonreceipt or damaged copies, please contact GSA Sales & Service. Claims are honored for one year; please allow sufficient delivery time (up to 8 weeks) for overseas copies.

GSA ONLINE

Organization home page: www.geosociety.org
Journals and books: www.gsapubs.org
Manuscript submission: www.editorialmanager.com/geology/



EDITORS

Robert Holdsworth
Durham University
r.e.holdsworth@durham.ac.uk

Brendan Murphy
St. Francis Xavier University
bmurphy@stfx.ca

Judith Totman Parrish
University of Idaho
Geology.editor.jtp@gmail.com

James Schmitt
Montana State University
jschmitt@montana.edu

James Spotila
Virginia Tech
spotila@vt.edu

EDITORIAL BOARD

2014–2016
Dennis Brown
David Chew
Chris Clark
Cristiano Collettini
Giulio di Toro
Katy A. Evans
W. Ashley Griffith
Galen Pippa Halverson
David J. Prior
Ursula Röhl
Renata Schmitt
Caroline Slomp
Dena M. Smith
Debbie Thomas

2015–2017
Ilya N. Bindeman
Katharine Cashman
Sally A. Gibson
Christopher W. Hamilton
Yvette D. Kuiper
Jade Star Lackey
Peir K. Pufahl
Christie D. Rowe
Natalie A. Starkey
Kevin G. Taylor
Rebecca Williams

2016–2018

Jennifer L. Aschoff
Rónadh Cox
Jean Louise Dixon
Eduardo Garzanti
Elizabeth Hajek
Christopher L. Hill
Ganqing Jiang
Zheng-Xiang Li
Shoufa Lin
Steven Micklethwaite
J. Gregory Shellnutt
Steven A.F. Smith
Fabrizio Storti
Brian Windley
Xing Xu

COUNCILORS

2013–2017
Elizabeth J. Catlos
John J. Clague
Neil Fishman

2014–2018
Timothy J. Bralower
Anke Friedrich
Stephen G. Pollock

2015–2019
Christopher M. Bailey
Mary J. Kraus
Frank J. Pazzaglia

2016–2020
F. Edwin "Ed" Harvey
Mark Little
Marjorie A. Chan

GEOLOGY STAFF

Director of Publications
Jeanette Hammann

Managing Editor
Lyne Yohe
lyohe@geosociety.org

Editorial Staff
Jennifer Olivarez
jolivarez@geosociety.org

Production
Heather L. Sutphin

GSA OFFICERS

Executive Director
Vicki S. McConnell

President
Claudia I. Mora

Vice President
Isabel P. Montanez

Past President
Jonathan G. Price

Treasurer
Bruce R. Clark



COVER: Cathodoluminescence photomicrograph of fibrous dolomite marine cements filling a sheet cavity from the Cryogenian Balcanoona reef, South Australia. These cements show finely preserved cathodoluminescent growth zones and optical characteristics that indicate they originally precipitated as dolomite. Uranium isotope values of well-preserved marine cements such as these suggest anoxia and iron-rich marine conditions at ca. 650 Ma. In contrast, depositional components (red-mottled micrite at edges) and late-stage diagenetic dolomites (center, bright orange) may show uranium isotope compositions spanning almost the entire range of the Earth system. See "Integrated geochemical-petrographic insights from component-selective $\delta^{238}\text{U}$ of Cryogenian marine carbonates" by Hood et al., p. 935–938.

Image by: Ashleigh Hood and Malcolm Wallace

Cover design by: Heather L. Sutphin