

# American Journal of Science

Established in 1818 by Benjamin Silliman  
AN INTERNATIONAL EARTH SCIENCE JOURNAL

## EDITORS

DANNY M. RYE  
NEW HAVEN, CONNECTICUT

C. PAGE CHAMBERLAIN  
STANFORD, CALIFORNIA

## ASSOCIATE EDITORS

TO SERVE UNTIL JANUARY 1, 2016

JAY J. AGUE  
NEW HAVEN, CONNECTICUT

WILLIAM H. CASEY  
DAVIS, CALIFORNIA

JAMES CONNOLLY  
ZURICH, SWITZERLAND

RICHARD J. WALKER  
COLLEGE PARK, MARYLAND

SIMON WILDE  
PERTH, AUSTRALIA

EDWARD W. BOLTON  
NEW HAVEN, CONNECTICUT

PETER CAWOOD  
ST. ANDREWS, SCOTLAND, UK

TIMOTHY W. LYONS  
RIVERSIDE, CALIFORNIA

JOSHUA WEST  
LOS ANGELES, CALIFORNIA

ROBERT WINTSCH  
BLOOMINGTON, INDIANA

TO SERVE UNTIL JANUARY 1, 2017

PAUL AHARON  
TUSCALOOSA, ALABAMA

ANDREAS LUTTGE  
HOUSTON, TEXAS

ANDREAS MULCH  
FRANKFURT, GERMANY

CHRISTOPHER POULSEN  
ANN ARBOR, MICHIGAN

ZACHARY SHARP  
ALBUQUERQUE, NEW MEXICO

PHILIP D. GINGERICH  
ANN ARBOR, MICHIGAN

KATE MAHER  
STANFORD, CALIFORNIA

STEPHEN PORTER  
SEATTLE, WASHINGTON

STEVEN M. STANLEY  
HONOLULU, HAWAII

JOHN W. VALLEY  
MADISON, WISCONSIN

TO SERVE UNTIL JANUARY 1, 2018

RUTH E. BLAKE  
NEW HAVEN, CONNECTICUT

DARREL S. COWAN  
SEATTLE, WASHINGTON

MARK GHIORSO  
SEATTLE, WASHINGTON

FRANK J. PAZZAGLIA  
BETHLEHEM, PENNSYLVANIA

SEAN WILLETT  
ZURICH, SWITZERLAND

DONALD E. CANFIELD  
ODENSE, DENMARK

DAVID A.D. EVANS  
NEW HAVEN, CONNECTICUT

MARK PAGANI  
NEW HAVEN, CONNECTICUT

PETER REINERS  
TUCSON, ARIZONA

FRIEDHELM VON BLANCKENBURG  
POTSDAM, GERMANY

TO SERVE UNTIL JANUARY 1, 2019

ETHAN F. BAXTER  
BOSTON, MASSACHUSETTS

MARK T. BRANDON  
NEW HAVEN, CONNECTICUT

GRANT GARVEN  
MEDFORD, MASSACHUSETTS

JEFFREY J. PARK  
NEW HAVEN, CONNECTICUT

DENNIS K. BIRD  
STANFORD, CALIFORNIA

BARB DUTROW  
BATON ROUGE, LOUISIANA

JOHN I. GARVER  
SCHENECTADY, NEW YORK

JONATHAN PAYNE  
STANFORD, CALIFORNIA

BRAD SAGEMAN  
EVANSTON, ILLINOIS