

Monica M. Bradford

Colin Norman

MANAGING EDITOR, RESEARCH JOURNALS **Katrina L. Kelner**  
 DEPUTY EDITORS **R. Brooks Hanson, Barbara R. Jasny, Andrew M. Sugden**

EDITORIAL SENIOR EDITORS/COMMENTARY Lisa D. Chong, Brad Wible; SENIOR EDITORS Gilbert J. Chin, Pamela J. Hines, Paula A. Kiberstis (Boston), Marc S. Lavine (Toronto), Beverly A. Purnell, L. Bryan Ray, Guy Riddihough, H. Jesse Smith, Phillip D. Szuroni (Tennessee), Valda Vinson, Jake S. Veston, Laura M. Zahn (San Diego); ASSOCIATE EDITORS Kristen L. Mueller, Jelena Stajic, Sacha Vignier, Nicholas S. Wigginton; BOOK REVIEW EDITOR Sherman J. Suter; ASSOCIATE LETTERS EDITOR Jennifer Sills; EDITORIAL MANAGER Cara Tate; SENIOR COPY EDITORS Jeffrey E. Cook, Cynthia Howe, Harry Jach, Lauren Kmeck, Barbara P. Ordway, Trista Wagoner; COPY EDITOR Chris Filiatreu; SENIOR EDITORIAL COORDINATORS Carolyn Kyle, Beverly Shields; EDITORIAL COORDINATORS Joi S. Granger, Anita Wynn; PUBLICATIONS ASSISTANTS Ramatoulaye Diop, Anerea Dobbins, Emily Guise, Jeffrey Hearn, Michael Hicks, Lisa Johnson, Scott Miller, Jerry Richardson, Teresa R. Sakon, Brian White; EDITORIAL ASSISTANT Patricia M. Moore; EXECUTIVE EDITORIAL ASSISTANT Yolanda O'Bannon (San Francisco); EXECUTIVE ASSISTANT Alison Crawford; ADMINISTRATIVE SUPPORT Maryrose Madrid; EDITORIAL FELLOW Melissa R. McCarty

EDITORIAL DIRECTOR, WEB AND NEW MEDIA Stewart Wills; SENIOR WEB EDITOR Tara S. Marathe; RESEARCH ASSOCIATE Corinna Cohn; WEB DEVELOPMENT MANAGER Martyn Green; WEB DEVELOPER Andrew Whitesell; INTERNS Andrew Green, Kerry Klein

NEWS DEPUTY NEWS EDITORS Robert Coontz, David Grimm (Online), Eliot Marshall, Jeffrey Mervis, Leslie Roberts, John Travis; CONTRIBUTING EDITORS Elizabeth Culotta, Polly Shulman; NEWS WRITERS Yudhijit Bhattacharjee, Adrian Cho, Jennifer Couzin-Frankel, Carolyn Gramling, Jocelyn Kaiser, Richard A. Kerr, David Malachukoff, Greg Miller, Elizabeth Pennisi, Robert F. Service (Pacific NW), Erik Stokstad; WEB DEVELOPER Daniel Berger; INTERN Daniel Strain; CONTRIBUTING CORRESPONDENTS Jon Cohen (San Diego, CA), Daniel Ferber, Ann Gibbons, Sam Kean, Andrew Lawler, Mitch Leslie, Charles C. Mann, Virginia Morell, Gary Taubes; COPY EDITORS Linda B. Felaco, Melvin Gatling, Melissa Raimondi; ADMINISTRATIVE SUPPORT Scherraine Mack; BUREAU SAN DIEGO, CA: 760-942-3252, FAX 760-942-4979; Pacific Northwest: 503-963-1940  
 PRODUCTION DIRECTOR Wendy K. Shank; ASSISTANT MANAGER Rebecca Doshi; SENIOR SPECIALISTS Steve Forrester, Chris Redwood, Anthony Rosen; PREFLIGHT DIRECTOR David M. Tompkins; MANAGER Marcus Spiegler; SPECIALISTS Jason Hillman, Tara Kelly  
 ART DIRECTOR Yael Fitzpatrick; ASSOCIATE ART DIRECTOR Laura Creveling; SENIOR ILLUSTRATORS Chris Bickel, Katharine Sutliff; ILLUSTRATOR Yana Hammond; SENIOR ART ASSOCIATES Holly Bishop, Preston Huey, Nayomi Kevityayala, Matthew Twombly; ART ASSOCIATE Kay Engman; PHOTO EDITOR Leslie Blizzard

## SCIENCE INTERNATIONAL

EUROPE (science@science-int.co.uk) EDITORIAL: INTERNATIONAL MANAGING EDITOR Andrew M. Sugden; SENIOR EDITOR/COMMENTARY Julia Fahrenkemp-Uppenbrink; SENIOR EDITORS Caroline Ash, Stella M. Hurtle, Ian S. Osborne, Peter Stern; ASSOCIATE EDITOR Maria Cruz; LOCUM EDITOR Helen Pickersgill; EDITORIAL SUPPORT Samantha Hogg, Alice Whaley; ADMINISTRATIVE SUPPORT John Cannell, Janet Clements, Louise Hartwell; NEWS: DEPUTY NEWS EDITOR, U.K. Daniel Clery; NEWSWRITER Sara Reardon; CONTRIBUTING EDITOR, EUROPE Martin Enserink; CONTRIBUTING CORRESPONDENTS Michael Balter (Paris), John Bohannon (Vienna), Gretchen Vogel (Berlin)  
 ASIA Japan Office: Asca Corporation, Tomoko Furusawa, Rustic Bludg, 7F, 77 Tenjin-cho, Shinjuku-ku, Tokyo 162-0808, Japan; +81 3 6802 4616, FAX +81 3 6802 4615, inquiry@sciencemag.jp; ASIA NEWS EDITOR Richard Stone (Beijing: rstone@aaas.org); CONTRIBUTING CORRESPONDENTS Dennis Normile [Japan: +81 (0) 3 3391 0630, FAX +81 (0) 3 5936 3531; dnormile@gol.com]; Hao Xin [China: cindyhao@gmail.com]; Mara Hvistendahl [China: mara@marahvistendahl.com]; Pallava Bagla [South Asia: +91 (0) 11 2271 2896; pabagla@vsnl.com]

FULFILLMENT SYSTEMS AND OPERATIONS (membership@aaas.org); CUSTOMER SERVICE SUPERVISOR Pat Butler; SPECIALISTS Latoya Casteel, LaVonda Crawford, Vicki Linton, April Marshall; DATA ENTRY SUPERVISOR Cynthia Johnson; SPECIALISTS Shirlene Hall, Tarrika Hill, William Jones

BUSINESS OPERATIONS AND ADMINISTRATION DIRECTOR Deborah Rivera-Wienhold; BUSINESS SYSTEMS AND FINANCIAL ANALYSIS DIRECTOR Randy Yi; MANAGER, FULFILLMENT SYSTEMS Frits Buning; MANAGER, BUSINESS ANALYSIS Eric Knott; MANAGER, BUSINESS OPERATIONS Jessica Tierney; BUSINESS ANALYSTS Priti Pannani, Celeste Troxler; Christine Wehrli; RIGHTS AND PERMISSIONS: ADMINISTRATOR Emilie David; ASSOCIATE Elizabeth Sandler; MARKETING DIRECTOR Ian King; MARKETING MANAGERS Allison Pritchard, Alison Chandler, Julianne Wielga, Samantha Smith; MARKETING ASSOCIATES Aimee Aponte, Mary Ellen Crowley; SENIOR MARKETING EXECUTIVE Jennifer Reeves; DIRECTOR, SITE LICENSING Tom Ryan; DIRECTOR, CORPORATE RELATIONS Eileen Bernadette Moran; SENIOR PUBLISHER RELATIONS SPECIALIST Kiki Forsythe; PUBLISHER RELATIONS MANAGER Catherine Holland; PUBLISHER RELATIONS, EASTERN REGION Phillip Smith; PUBLISHER RELATIONS, WESTERN REGION Ryan Rexroth; CUSTOMER RELATIONS MANAGER Iquo Edim; CUSTOMER RELATIONS COORDINATOR David Lee; MARKETING MANAGER Christina Schlecht; MARKETING ASSOCIATES Laura Tutino, Chad Johnson; ELECTRONIC MEDIA DIRECTOR Elizabeth Harman; ASSISTANT MANAGER Lisa Stanford; SENIOR PRODUCTION SPECIALIST Ryan Atkins; PRODUCTION SPECIALISTS Antoinette Hodal, Michele Johnston, Kimberly Oster; DIRECTOR, WEB AND NEW MEDIA Will Collins; PROJECT MANAGER Trista Snyder; SENIOR PRODUCTION SPECIALIST Christopher Coleman; COMPUTER SPECIALISTS Walter Jones, Kai Zhang

ADVERTISING DIRECTOR, WORLDWIDE AD SALES Bill Moran

COMMERCIAL EDITOR Sean Sanders: 202-326-6430

ASSISTANT COMMERCIAL EDITOR Tianna Hicklin 202-326-6463

PRODUCT (science\_advertising@aaas.org); **MIDWEST** Rick Bongiovanni: 330-405-7080, FAX 330-405-7081; **EAST COAST/ E. CANADA** Laurie Faraday: 508-747-9395, FAX 617-507-8189; **WEST COAST/ W. CANADA** Lynne Stickrod: 415-931-9782, FAX 415-520-6940; **UK/EUROPE/ASIA** Roger Goncalves: TEL/FAX +41 43 243 1358; **JAPAN** ASCA Corporation, Makiko Hara: +81 (0) 3 6802 4616, FAX +81 (0) 3 6802 4615; ads@sciencemag.jp; **CHINA/TAIWAN** Ruele Wu: +86 1367 1015 294 rwu@aaas.org

WORLDWIDE ASSOCIATE DIRECTOR OF **SCIENCE CAREERS** Tracy Holmes: +44 (0) 1223 326252, FAX +44 (0) 1223 326532

CLASSIFIED (advertise@sciencecareers.org); **U.S.: MIDWEST/WEST COAST/ SOUTH CENTRAL/CANADA** Tina Burks: 202-326-6577; **EAST COAST/INDUSTRY** Elizabeth Early: 202-326-6578; **SALES ADMINISTRATOR** Marci Gallun; **EUROPE/ROW SALES** Simone Jux, Alex Palmer; **SALES ASSISTANT** Lisa Paterson; **JAPAN** ASCA Corporation, Makiko Hara +81 (0) 3 6802 4616, FAX +81 (0) 3 6802 4615; careersads@sciencemag.jp; **CHINA/TAIWAN** Ruele Wu: +86 1367 1015 294 rwu@aaas.org; **ADVERTISING SUPPORT MANAGER** Karen Foote: 202-326-6740; **ADVERTISING PRODUCTION OPERATIONS MANAGER** Deborah Tompkins; **SENIOR PRODUCTION SPECIALIST/GRAPHIC DESIGNER** Amy Hardcastle; **PRODUCTION SPECIALIST** Yuse Lajimimuhuy; **SENIOR TRAFFIC ASSOCIATE** Christine Hall; **SALES COORDINATOR** Shirley Young

**AAAS BOARD OF DIRECTORS** RETIRING PRESIDENT, CHAIR Alice Huang; PRESIDENT Nina Fedoroff; PRESIDENT-ELECT William Press; TREASURER David E. Shaw; CHIEF EXECUTIVE OFFICER Alan I. Leshner; BOARD Nancy Knowlton, Stephen Mayo, Raymond Orbach, Julia M. Phillips, Sue V. Rosser, David D. Sabatini, Inder Verma, Thomas A. Woolsey

**SUBSCRIPTION SERVICES** For change of address, missing issues, new orders and renewals, and payment questions: 866-434-AAAS (2227) or 202-326-6417, FAX 202-842-1065. Mailing addresses: AAAS, P.O. Box 96178, Washington, DC 20090-6178 or AAAS Member Services, 1200 New York Avenue, NW, Washington, DC 20005

**INSTITUTIONAL SITE LICENSES** please call 202-326-6755 for any questions or information

REPRINTS: Author Inquiries 800-635-7181

Commercial Inquiries 803-359-4578

PERMISSIONS 202-326-7074, FAX 202-682-0816

**MEMBER BENEFITS** AAAS/Barnes&Noble.com bookstore www.aaas.org/bn/ AAAS Online Store www.apisource.com/aaas/ code MKB6; AAAS Travels: Betchart Expeditions 800-252-4910; Apple Store www.apple.com/epptstore/aaas; Bank of America MasterCard 1-800-833-6262 priority code FAA3YU; Cold Spring Harbor Laboratory Press Publications www.cshlpress.com/affiliates/aaas.htm; GEICO Auto Insurance www.geico.com/landingpage/goo51.htm?logo=17624; Hertz 800-654-2200 CDP#343457; Office Depot https://bsd.officedepot.com/portallogin.do; Seabury & Smith Life Insurance 800-424-9883; Subaru VIP Program 202-326-6417; VIP Moving Services www.vipmayflower.com/domestic/index.html; Other Benefits: AAAS Member Services 202-326-6417 or www.aaasmember.org.

science\_editors@aaas.org (for general editorial queries)

science\_letters@aaas.org (for queries about letters)

science\_reviews@aaas.org (for returning manuscript reviews)

science\_bookrevs@aaas.org (for book review queries)

Published by the American Association for the Advancement of Science (AAAS), *Science* serves its readers as a forum for the presentation and discussion of important issues related to the advancement of science, including the presentation of minority or conflicting points of view, rather than by publishing only material on which a consensus has been reached. Accordingly, all articles published in *Science*—including editorials, news and comment, and book reviews—are signed and reflect the individual views of the authors and not official points of view adopted by AAAS or the institutions with which the authors are affiliated.

AAAS was founded in 1848 and incorporated in 1874. Its mission is to advance science, engineering, and innovation throughout the world for the benefit of all people. The goals of the association are to: enhance communication among scientists, engineers, and the public; promote and defend the integrity of science and its use; strengthen support for the science and technology enterprise; provide a voice for science on societal issues; promote the responsible use of science in public policy; strengthen and diversify the science and technology workforce; foster education in science and technology for everyone; increase public engagement with science and technology; and advance international cooperation in science.

## INFORMATION FOR AUTHORS

See pages 784 and 785 of the 11 February 2011 issue or access www.sciencemag.org/about/authors



## SENIOR EDITORIAL BOARD

**A. Paul Alivisatos**, Lawrence Berkeley Nat'l Laboratory  
**Cori Bargmann**, The Rockefeller Univ.  
**Ernst Fehr**, Univ. of Zurich  
**Richard Losick**, Harvard Univ.  
**Michael S. Turner**, University of Chicago  
**BOARD OF REVIEWING EDITORS**  
**Adriano Aguzzi**, Univ. Hospital Zürich  
**Takuzo Aida**, Univ. of Tokyo  
**Sonia Altiz**, Univ. of Georgia  
**Sebastian Amigorena**, Institut Curie  
**Angelika Amon**, MIT  
**Kathryn Anderson**, Memorial Sloan-Kettering Cancer Center  
**Siv G. E. Andersson**, Uppsala Univ.  
**Peter Andolfatto**, Princeton Univ.  
**Meinrat O. Andreae**, Max Planck Inst., Mainz  
**John A. Bargh**, Yale Univ.  
**Ben Barnes**, Stanford Medical School  
**Maria Bartolomei**, Univ. of Penn. School of Med.  
**Jordi Bascompte**, Estación Biológica de Doñana, CSIC  
**Facundo Batista**, London Research Inst.  
**Ray H. Baughman**, Univ. of Texas, Dallas  
**David Baum**, Univ. of Wisconsin  
**Yasmine Elkaid**, MIT, NIH  
**Philip Benfey**, Duke Univ.  
**Stephen J. Benkovic**, Penn State Univ.  
**Gregory C. Borzofan**, Stanford Univ.  
**Peer Bork**, EMBL  
**Bernard Bourdon**, Ecole Normale Supérieure de Lyon  
**Ilan Bank**, Univ. of St. Andrews  
**Paul M. Brakefield**, Univ. of Cambridge  
**Christina Büchel**, Universitätsklinikum Hamburg-Eppendorf  
**Joseph A. Burns**, Cornell Univ.  
**William P. Butz**, Population Reference Bureau  
**Gyorgy Buszaki**, Rutgers Univ.  
**Mats Carlsson**, Univ. of Oslo  
**Mildred Cho**, Stanford Univ.  
**David Clapham**, Children's Hospital, Boston  
**David Clark**, Univ. of Oxford  
**J. M. Claverie**, CNRS, Marseille  
**Jonathan D. Cohen**, Princeton Univ.  
**Alan Cowman**, Walter & Eliza Hall Inst.  
**Robert H. Crabtree**, Yale Univ.  
**Wolfgang Grammes**, Max Inst. for Ecology & Paleocology  
**F. Fleming Crim**, Univ. of Wisconsin  
**Jeff L. Dangl**, Univ. of North Carolina

**Tom Daniel**, Univ. of Washington  
**Stanlas Dehaene**, Collège de France  
**Emmanouil T. Dermitzakis**, Univ. of Geneva Medical School  
**Robert Desimone**, MIT  
**Claude Desplan**, New York Univ.  
**Ar Dijksterhuis**, Radboud Univ. of Nijmegen  
**Dennis Discher**, Univ. of Pennsylvania  
**Scott C. Doney**, Woods Hole Oceanographic Inst.  
**Jennifer A. Doudna**, Univ. of California, Berkeley  
**Lithan downward**, Cancer Research UK  
**Bruce Dunn**, Univ. of California, Los Angeles  
**Christopher Dye**, WHO  
**David Ehrhardt**, Carnegie Inst. of Washington  
**Michael B. Elowitz**, Calif. Inst. of Technology  
**Tim Elston**, Univ. of North Carolina at Chapel Hill  
**Gerhard Ertl**, Fritz-Haber-Institut, Berlin  
**Barry Everitt**, Univ. of Cambridge  
**Paul G. Falkowski**, Rutgers Univ.  
**Ernst Fehr**, Univ. of Zurich  
**Tom Fenchel**, Univ. of Copenhagen  
**Alain Fischer**, Univ. of Oxford  
**Wulfraam Gerstner**, EPFL Lausanne  
**Karl-Heinz Glassmeier**, TU Braunschweig  
**Diane Griffin**, Johns Hopkins Bloomberg School of Public Health  
**Elizabeth Grove**, Univ. of Chicago  
**Taekjip Ha**, Univ. of Illinois at Urbana-Champaign  
**Christian Haas**, Ludwig Maximilians Univ.  
**Steven Hahn**, Fred Hutchinson Cancer Research Center  
**Gregory J. Hannon**, Cold Spring Harbor Lab.  
**Ilhan Heimann**, Max Planck Inst., Jena  
**Isaac Held**, NOAA  
**James A. Hendler**, Rensselaer Polytechnic Inst.  
**Janet G. Hering**, Swiss Fed. Inst. of Aquatic Science & Technology  
**Ray Hilborn**, Univ. of Washington  
**Michael E. Himmel**, National Renewable Energy Lab.  
**Kai-Uwe Hinrichs**, Univ. of Bremen  
**Kei Hirose**, Tokyo Inst. of Technology  
**David Holdell**, Univ. of Cambridge  
**Owe Hoegh-Guldberg**, Univ. of Queensland  
**David Holden**, Imperial College  
**Lora Hooper**, UT Southwestern Medical Ctr at Dallas  
**Jeffrey A. Hubbell**, EPFL Lausanne  
**Steven Jacobsen**, Univ. of California, Los Angeles  
**Kat Johnson**, EPFL Lausanne  
**Peter Jonas**, Universität Freiburg  
**William Kaelin**, Dana-Farber Cancer Inst.

**Barbara B. Kahn**, Harvard Medical School  
**Daniel Kahne**, Harvard Univ.  
**Bernhard Keimer**, Max Planck Inst., Stuttgart  
**Joel Kingsolver**, Univ. of North Carolina at Chapel Hill  
**Robert Kingston**, Harvard Medical School  
**Alberto R. Kornblith**, Univ. of Buenos Aires  
**Leonid Kruglyak**, Princeton Univ.  
**Mitchell A. Lazar**, Univ. of Pennsylvania  
**David Lazer**, Harvard Univ.  
**Virginia Lee**, Univ. of Pennsylvania  
**Anne Magurran**, Univ. of St. Andrews  
**Olle Lindvall**, Univ. Hospital, Lund  
**Marcia C. Linn**, Univ. of California, Berkeley  
**John Lis**, Cornell Univ.  
**Jianguo Liu**, Michigan State Univ.  
**Richard Losick**, Stanford Univ.  
**Jonathan Losos**, Harvard Univ.  
**Ke Lu**, Chinese Acad. of Sciences  
**Laura Machesky**, CRUK Beatson Inst. for Cancer Research  
**Andrew P. MacKenzie**, Univ. of St. Andrews  
**Oscar Marin**, CSIC & Univ. Miguel Hernández  
**Charles Marshall**, Univ. of California, Berkeley  
**Martin M. Matzuk**, Baylor College of Medicine  
**Richard Medley**, Univ. of Warwick  
**Yasushi Miyashita**, Univ. of Tokyo  
**Gregory Morris**, Univ. of Edinburgh  
**Edward Moser**, Norwegian Univ. of Science and Technology  
**Sean Munro**, MRC Lab. of Molecular Biology  
**Naoto Nagasawa**, Univ. of Tokyo  
**James Nelson**, Univ. of Texas at Austin  
**Timothy W. Nilsen**, Case Western Reserve Univ.  
**Pär Nordlund**, Karolinska Inst.  
**Helga Nowotny**, European Research Advisory Board  
**Luke O'Neill**, Trinity College, Dublin  
**Owe Hoegh-Guldberg**, Dana-Farber Cancer Inst.  
**Christine Ortiz**, MIT  
**Elinor Ostrom**, Indiana Univ.  
**Andrew Oswald**, Univ. of Warwick  
**Jane Parker**, Max-Planck Inst. of Plant Breeding Research  
**David R. Paul**, Univ. of California, Berkeley  
**P. David Pearson**, Univ. of California, Irvine  
**Reginald M. Penner**, Univ. of California, Irvine  
**John H. J. Petrini**, Memorial Sloan-Kettering Cancer Center  
**Simon Phillips**, Univ. of Florida  
**Philip Politi**, CNRS  
**Colin Renfrew**, Univ. of Cambridge  
**Trevor Robbins**, Univ. of Cambridge

**Barbara A. Romanowicz**, Univ. of California, Berkeley  
**Jens Rostrup-Nielsen**, Haldor Topsøe  
**Edward M. Rubin**, Lawrence Berkeley National Lab  
**Mike Ryan**, Univ. of Texas, Austin  
**Shimon Sakaguchi**, Kyoto Univ.  
**Mikael Salmeron**, Lawrence Berkeley National Lab  
**Jürgen Sandkühler**, Medical Univ. of Vienna  
**Randy Seeley**, Univ. of Cincinnati  
**Christine Seidman**, Harvard Medical School  
**Vladimir Shalaeu**, Purdue Univ.  
**Joseph Silk**, Univ. of Oxford  
**Dennis Simon**, Univ. of Oregon  
**Alison Smith**, John Innes Centre  
**Davor Solter**, Inst. of Medical Biology, Singapore  
**John Speakman**, Univ. of Aberdeen  
**Alan C. Spradling**, Carnegie Institution of Washington  
**Jonathan Sprent**, Garvan Inst. of Medical Research  
**Elisbeth Stern**, ETH Zürich  
**Ira Tabas**, Columbia Univ.  
**Yoshiko Takahashi**, Nara Inst. of Science and Technology  
**John Thomas**, Duke Univ.  
**Herbert Vöhringer**, Washington Univ.  
**Bert Vogelstein**, Johns Hopkins Univ.  
**Cynthia Volkert**, Univ. of Gottingen  
**Bruce D. Walker**, Harvard Medical School  
**Douglas Wallace**, Leibniz Inst. of Marine Sciences  
**Ian Wamsey**, Univ. of Oxford  
**David A. Wardle**, Swedish Univ. of Agric. Sciences  
**Dettef Weigel**, Max Planck Inst., Tübingen  
**Jonathan Weissman**, Univ. of California, San Francisco  
**John Wessler**, Univ. of Georgia, Westside  
**Ian A. Wilson**, The Scripps Res.  
**Timothy D. Wilson**, Univ. of Virginia  
**Zan Jaanen**, Leiden Univ.  
**Mayana Zatz**, University of Sao Paulo  
**Jonathan Zeitlin**, Univ. of California, Santa Cruz  
**Huda Zoghbi**, Baylor College of Medicine  
**Maria Zuber**, MIT

## BOOK REVIEW BOARD

**John Aldrich**, Duke Univ.  
**David Bloom**, Harvard Univ.  
**Angela Creager**, Princeton Univ.  
**Richard Sweder**, Univ. of Chicago  
**Ed Wasserman**, Dupont  
**Lewis Wolpert**, Univ. College London