

# JOURNAL JOI THE

# AMERICAN MATHEMATICAL SOCIETY

## **EDITORS**

Michael Artin H. Blaine Lawson, Jr. Richard Melrose Wilfried Schmid Robert E. Tarjan

## ASSOCIATE EDITORS

James G. Arthur
Peter Bickel
Gerd Faltings
Charles L. Fefferman
Michael H. Freedman
Daniel Friedan
Ronald L. Graham
Joe Harris
Hendrik W. Lenstra, Jr.
Andrew Majda
Hugh L. Montgomery
Paul H. Rabinowitz
Karen Uhlenbeck
W. Hugh Woodin

## PROVIDENCE, RHODE ISLAND USA

ISSN 0894-0347

## Journal of the American Mathematical Society

The Journal of the American Mathematical Society has been established for the publication of research articles in all areas of pure and applied mathematics.

### **EDITORS**

Chairman
Michael Artin
Department of Mathematics 2-239
Massachusetts Institute of Technology
Cambridge, MA 02139

H. Blaine Lawson, Jr. Department of Mathematics SUNY at Stony Brook Stony Brook, NY 11794

Richard Melrose Department of Mathematics 2-180 Massachusetts Institute of Technology Cambridge, MA 02139 Wilfried Schmid Department of Mathematics Harvard University Science Center 430 Cambridge, MA 02138

Robert E. Tarjan Department of Computer Science Princeton University Princeton, NJ 08544

### ASSOCIATE EDITORS

James G. Arthur, University of Toronto
Peter Bickel, University of California, Berkeley
Gerd Faltings, Princeton University
Charles L. Fefferman, Princeton University
Michael H. Freedman, University of California, San Diego
Daniel Friedan, University of Chicago
Ronald L. Graham, AT & T Bell Laboratories
Joe Harris, Harvard University
Hendrik W. Lenstra, Jr., University of California, Berkeley
Andrew Majda, Princeton University
Hugh L. Montgomery, University of Michigan
Paul H. Rabinowitz, University of Wisconsin
Karen Uhlenbeck, University of Texas at Austin
H. Hugh Woodin, California Institute of Technology

Subscription information. The Journal of the American Mathematical Society is published quarterly. Subscription prices for Volume 1 (1988) are \$100 list, \$80 institutional member, \$60 individual member. Subscribers outside the United States and India must pay a postage surcharge of \$8; subscribers in India must pay a postage surcharge of \$18.

Manuscript submission. See inside back cover.

02940.

Subscriptions and orders for publications of the American Mathematical Society should be addressed to American Mathematical Society, P.O. Box 1571, Annex Station, Providence, R.I. 02901-9930. All orders must be accompanied by payment. Other correspondence should be addressed to P.O. Box 6248, Providence, R.I. 02940. The Journal of the American Mathematical Society is published quarterly by the American Mathematical Society at 201 Charles Street, Providence, R.I. 02904 and is mailed from Providence, Rhode Island. Postmaster: Send address changes to Journal of the AMS, American Mathematical Society, P.O. Box 6248, Providence, R.I.

Copyright © 1988 American Mathematical Society. All rights reserved.
Printed in the United States of America
Information on Copying and Reprinting can be found at the back of this journal.
The paper used in this journal is acid-free and falls within the guidelines established to ensure permanence and durability.



# JOURNAL JOE THE

# AMERICAN MATHEMATICAL SOCIETY

## **EDITORS**

Michael Artin H. Blaine Lawson, Jr. Richard Melrose Wilfried Schmid Robert E. Tarjan

# ASSOCIATE EDITORS

James G. Arthur
Peter Bickel
Gerd Faltings
Charles L. Fefferman
Michael H. Freedman
Daniel Friedan
Ronald L. Graham
Joe Harris
Hendrik W. Lenstra, Jr.
Andrew Majda
Hugh L. Montgomery
Paul H. Rabinowitz
Karen Uhlenbeck
W. Hugh Woodin

# PROVIDENCE, RHODE ISLAND USA

Copying and reprinting. Individual readers of this publication, and nonprofit libraries acting for them, are permitted to make fair use of the material, such as to copy a chapter for use in teaching or research. Permission is granted to quote brief passages from this publication in reviews, provided the customary acknowledgement of the source is given.

Republication, systematic copying, or multiple reproduction of any material in this publication (including abstracts) is permitted only under license from the American Mathematical Society. Requests for such permission should be addressed to the Executive Director, American Mathematical Society, P.O. Box 6248, Providence, Rhode Island 02940.

The owner consents to copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law, provided that a fee of \$1.00 plus \$.25 per page for each copy be paid directly to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, Massachusetts 01970. When paying this fee please use the code 0894-0347/88 to refer to this publication. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotion purposes, for creating new collective works, or for resale.

Copyright ©1988 by the American Mathematical Society. All rights reserved.

Printed in the United States of America

The American Mathematical Society retains all rights except those granted to the United States Government.

The paper used in this book is acid-free and falls within the guidelines established to ensure permanence and durability.

## INDEX TO VOLUME 1

## January-December 1988

Arthur, James. The invariant trace formula. I. Local theory, 323

——. The invariant trace formula. II. Global theory, 501

Brownawell, W. Dale. Local Diophantine nullstellen inequalities, 311

Chang, Sheldon Xu-Dong. Two dimensional area minimizing integral currents are classical minimal surfaces, 699

Christ, Michael. Regularity properties of the  $\overline{\partial}_b$  equation on weakly pseudoconvex CR manifolds of dimension 3, 587

Constantin, P. and Saut, J. C. Local smoothing properties of dispersive equations, 413

Dahlberg, Bjorn E. J. and Kenig, Carlos E. Nonnegative solutions of the initial-Dirichlet problem for generalized porous medium equations in cylinders, 401

De Concini, C., Lusztig, G., and Procesi, C. Homology of the zero-set of a nilpotent vector field on a flag manifold, 15

Diperna, Ronald J. and Majda, Andrew. Reduced Hausdorff dimension and concentration-cancellation for two-dimensional incompressible flow, 59

Faltings, Gerd. p-adic Hodge theory, 255

Goodman, Jacob E. and Pollack, Richard. Hadwiger's transversal theorem in higher dimensions, 301

Jerison, David and Lee, John M. Extremals for the Sobolev inequality on the Heisenberg group and the CR Yamabe problem, 1

Kenig, Carlos E. See Dahlberg, Bjorn E. J.

Kirwan, Frances. Intersection homology and torus actions, 385

Kollár, János. Sharp effective nullstellensatz, 963

Lee, John M. See Jerison, David

Long, Ding-Gwo. Convergence of the random vortex method in two dimensions, 779

Lusztig, G. See De Concini, C.

Majda, Andrew. See Diperna, Ronald J.

Mallet-Paret, John and Sell, George R. Inertial manifolds for reaction diffusion equations in higher space dimensions, 805

Mori, Shigefumi. Flip theorem and the existence of minimal models for 3-folds, 117

Mostow, G. D. On discontinuous action of monodromy groups on the complex n-ball, 555

Pollack, Richard. See Goodman, Jacob E. Procesi, C. See De Concini, C.

Quinn, Frank. Homotopically stratified sets, 441

Saut, J. C. See Constantin, P.

Sell, George R. See Mallet-Paret, John

Shelah, Saharon. Primitive recursive bounds for van der Waerden numbers, 683

Shelah, Saharon and Spencer, Joel. Zero-one laws for sparse random graphs, 97

Simpson, Carlos T. Constructing variations of Hodge structure using Yang-Mills theory and applications to uniformization, 867

Sleator, Daniel D., Tarjan, Robert E., and Thurston, William P. Rotation distance, triangulations, and hyperbolic geometry, 647

Spencer, Joel. See Shelah, Saharon

Stanley, Richard P. Differential posets, 919

Tarjan, Robert E. See Sleator, Daniel D.

Thurston, William P. See Sleator, Daniel D.

Zimmer, Robert J. Arithmeticity of holonomy groups of Lie foliations, 35

Manuscript submission. Manuscripts submitted for publication should either be typewritten double spaced or prepared using  $T_EX$  and the  $A_MS$ - $T_EX$  package. Two copies of the manuscript should be sent directly to one of the Editors. The signing of a Copyright Transfer Agreement is a requirement for publication.

**Subject classification.** Included with the footnotes to the paper, but placed before the first footnote, the subject classification should represent the primary and secondary subjects of the article. A list may be found in the annual subject index of *Mathematical Reviews*, published with the December issue starting in 1984.

Galley proof. When a paper with more than one author has been accepted for publication, only one set of proof will be sent. Joint authors should, therefore, indicate on the original manuscript which of them should receive galley proof in the event that the manuscript is accepted for publication.

Copying and reprinting. Individual readers of this publication, and nonprofit libraries acting for them, are permitted to make fair use of the material, such as to copy an article for use in teaching or research. Permission is granted to quote brief passages from this publication in reviews, provided the customary acknowledgment of the source is given.

Republication, systematic copying, or multiple reproduction of any material in this publication (including abstracts) is permitted only under license from the American Mathematical Society. Requests for such permission should be addressed to the Executive Director, American Mathematical Society, P.O. Box 6248, Providence, Rhode Island 02940.

The appearance of the code on the first page of an article in this journal indicates the copyright owner's consent for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law, provided that the fee of \$1.00 plus \$.25 per page for each copy be paid directly to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, Massachusetts 01970. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

# JOURNAL OF THE AMERICAN MATHEMATICAL SOCIETY

October 1988

963

Volume 1, Number 4

Differential posets

Sharp effective nullstellensatz

Two dimensional area minimizing integral currents are classical minimal surfaces	
SHELDON XU-DONG CHANG	699
Convergence of the random vortex method in two dimensions  DING-GWO LONG	779
Inertial manifolds for reaction diffusion equations in higher space dimensions  JOHN MALLET-PARET and GEORGE R. SELL	805
Constructing variations of Hodge structure using Yang-Mills theory and applications to uniformization  CARLOS T. SIMPSON	867
CIMILOG 1. SIMI SON	301

RICHARD P. STANLEY ..... 919

JÁNOS KOLLÁR .....