# Mathematics of Computation 

A MERICAN MATHEMATICALSOCIETY

EDITED BY
James H. Bramble
Susanne C. Brenner
Howard Elman
Richard S. Falk
Walter Gautschi
Daniel W. Lozier
James N. Lyness
Harald Niederreiter
Syvert P. Nørsett
Andrew M. Odlyzko
John E. Osborn
Stanley Osher
Carl Pomerance
René Schoof
L. Ridgway Scott

Daniel Shanks
Chi-Wang Shu
Frank Stenger
Hans J. Stetter
G. W. Stewart

Nico M. Temme
Vidar Thomée
Lars B. Wahlbin, Managing Editor
Joseph D. Ward
Hugh C. Williams
John W. Wrench, Jr.
Stephen J. Wright

## Mathematics of Computation

This journal publishes research articles in computational mathematics. Areas covered include numerical analysis, the application of computational methods, algorithms for advanced computer architectures, computational number theory and algebra, and related fields. Table errata and reviews of books in areas related to computational mathematics are also included.

Subscription information. Mathematics of Computation is published quarterly. Beginning in January 1996 Mathematics of Computation is accessible from e-MATH via the World Wide Web at the URL http: //www.ams.org/publications/. Subscription prices for Volume 65 (1996) are as follows: for paper delivery, $\$ 290$ list, $\$ 232$ institutional member, $\$ 261$ corporate member, $\$ 189$ MAA \& SIAM members; $\$ 174$ individual member; for electronic delivery, $\$ 261$ list, $\$ 209$ institutional member, $\$ 235$ corporate member, $\$ 170$ MAA \& SIAM members, $\$ 157$ individual member; for combination paper and electronic delivery, $\$ 334$ list, $\$ 267$ insititutional member, $\$ 301$ corporate member, $\$ 217$ MAA \& SIAM members, $\$ 200$ individual member. If ordering the paper product, add $\$ 9$ for surface delivery outside the United States and India; $\$ 18$ to India. Expedited delivery to destinations in North America $\$ 13$; elsewhere $\$ 40$.

Back number information. For back issues see the AMS Catalog of Publications.
Subscriptions and orders should be addressed to the American Mathematical Society, P.O. Box 5904, Boston, MA 02206-5904. All orders must be accompanied by payment. Other correspondence should be addressed to P.O. Box 6248, Providence, RI 02940-6248.

Unpublished Mathematical Tables. The editorial office of the journal maintains a repository of Unpublished Mathematical Tables (UMT). When a table is deposited in the UMT repository a brief summary of its contents is published in the section Reviews and Descriptions of Tables and Books. Upon request, the chairman of the editorial committee will supply copies of any table for a nominal cost per page. All tables and correspondence concerning the UMT should be sent to Lars B. Wahlbin, Chairman, Editorial Committee, Mathematics of Computation, Center for Applied Mathematics, 657 Frank H. T. Rhodes Hall, Cornell University, Ithaca, NY 14853.

Copying and reprinting. Material in this journal may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Assistant to the Publisher, American Mathematical Society, P.O. Box 6248, Providence, RI 02940-6248. Requests can also be made by e-mail to reprint-permission@ams.org.

Excluded from these provisions is material in articles for which the author holds copyright. In such cases, requests for permission to use or reprint should be addressed directly to the author(s). (Copyright ownership is indicated in the notice in the lower right-hand corner of the first page of each article.)

Mathematics of Computation is published quarterly by the American Mathematical Society at 201 Charles Street, Providence, RI 02904-2213. Second-class postage is paid at Providence, Rhode Island. Postmaster: Send address changes to Mathematics of Computation, American Mathematical Society, P. O. Box 6248, Providence, RI 02940-6248.
(C) 1996 by the American Mathematical Society. All rights reserved.

This journal is indexed in Science Citation Index ${ }^{\circledR}$, SciSearch ${ }^{\circledR}$, Research Alert ${ }^{\circledR}$, CompuMath Citation Index ${ }^{\circledR}$, and Current Contents ${ }^{\circledR} /$ Physical, Chemical \& Earth Sciences.
(®) The paper used in this book is acid-free and falls within the guidelines established to ensure permanence and durability.
$\Leftrightarrow$ Printed on recycled paper.

The American Mathematical Society is pleased to announce that
Mathematics of Computation is also available electronically over the Internet.

The electronic version of<br>Mathematics of Computation and other electronic AMS publications are accessible from e-MATH via the World Wide Web at the URL http://www.ams.org/publications/

For subscription details, please see the inside front cover of this issue or contact AMS Customer Services
e-mail: cust-serv@ams.org tel: 800-321-4267 or 401-455-4000

