

Editorial Information

As of March 31, 2002, the backlog for this journal was approximately 3 issues. This estimate is the result of dividing the number of manuscripts for this journal in the Providence office that have not yet gone to the printer on the above date by the average number of articles per issue over the previous twelve months, reduced by the number of issues published in six months (the time necessary for editing and composing a typical issue). In an effort to make articles available as quickly as possible, articles are posted to the AMS website individually after proof is returned from authors and before appearing in an issue.

A Consent to Publish and Copyright Agreement is required before a paper will be published in this journal. After a paper is accepted for publication, the Providence office will send out a Consent to Publish and Copyright Agreement to all authors of the paper. By submitting a paper to this journal, authors certify that the results have not been submitted to nor are they under consideration for publication by another journal, conference proceedings, or similar publication.

Information for Authors

Initial submission. An author should submit the manuscript by e-mail to `mathcomp@dam.brown.edu`. The manuscript should be sent as a single postscript or pdf file. Files can be compressed using zip or gzip making the files smaller in size. If e-mail submission is not feasible, three paper copies should be submitted. If the office of the Managing Editor is not able to print the file received from an e-mail submission, the author will be contacted and asked to send three paper copies instead. The author may suggest an appropriate editor for his or her paper. All paper copies of contributions and all books for review should be addressed to Chi-Wang Shu, Managing Editor, Mathematics of Computation, Division of Applied Mathematics, Brown University, 182 George Street, Providence, RI 02912 USA. The date received, which is published with the final version of an accepted paper, is the date received in the office of the Managing Editor, and it is the responsibility of the author to submit manuscripts directly to this office.

The first page must consist of a *descriptive title*, followed by an *abstract* that summarizes the article in language suitable for workers in the general field (algebra, analysis, etc.). The *descriptive title* should be short, but informative; useless or vague phrases such as “some remarks about” or “concerning” should be avoided. The *abstract* must be brief and reasonably self-contained. Included with the footnotes to the paper should be the 2000 *Mathematics Subject Classification* representing the primary and secondary subjects of the article. The classifications are accessible from www.ams.org/msc/. The list of classifications is also available in print starting with the 1999 annual index of *Mathematical Reviews*. The Mathematics Subject Classification footnote may be followed by a list of *key words and phrases* describing the subject matter of the article and taken from it. Journal abbreviations used in bibliographies are listed in the latest *Mathematical Reviews* annual index. The series abbreviations are also accessible from www.ams.org/publications/. To help in preparing and verifying references, the AMS offers MR Lookup, a Reference Tool for Linking, at www.ams.org/mrlookup/. When the manuscript is submitted, authors should supply the editor with electronic addresses if available. These will be printed after the postal address at the end of each article.

Electronically prepared manuscripts. For the final submission of accepted papers, the AMS encourages use of electronically prepared manuscripts, with a strong preference for $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}^{\mathcal{A}}\mathcal{T}\mathcal{E}\mathcal{X}$. To this end, the Society has prepared $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}^{\mathcal{A}}\mathcal{T}\mathcal{E}\mathcal{X}$ author packages for each AMS publication. Author packages include instructions for preparing electronic manuscripts, the *AMS Author Handbook*, samples, and a style file that generates the particular design specifications of that publication series. Articles properly prepared using the $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}^{\mathcal{A}}\mathcal{T}\mathcal{E}\mathcal{X}$ style file and the `\label` and `\ref` commands automatically enable extensive intra-document linking to the bibliography and other elements of the article for searching electronically on the Web. Because linking must often be added manually to electronically prepared manuscripts in other forms of $\mathcal{T}\mathcal{E}\mathcal{X}$, using $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}^{\mathcal{A}}\mathcal{T}\mathcal{E}\mathcal{X}$ also reduces the amount of technical intervention once the files are received by the AMS. This results in fewer errors

in processing and saves the author proofreading time. $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ papers also move more efficiently through the production stream, helping to minimize publishing costs.

$\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ is the highly preferred format of $\mathcal{T}\mathcal{E}\mathcal{X}$, but author packages are also available in $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{T}\mathcal{E}\mathcal{X}$. Those authors who make use of these style files from the beginning of the writing process will further reduce their own efforts. Manuscripts prepared electronically in $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ or plain $\mathcal{T}\mathcal{E}\mathcal{X}$ are normally not acceptable due to the high amount of technical time required to insure that the file will run properly through the AMS in-house production system. $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ users will find that $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ is the same as $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ with additional commands to simplify the typesetting of mathematics, and users of plain $\mathcal{T}\mathcal{E}\mathcal{X}$ should have the foundation for learning $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$.

Authors may retrieve an author package from the AMS website starting from www.ams.org/tex/ or via FTP to [ftp.ams.org](ftp://ftp.ams.org) (login as `anonymous`, enter username as password, and type `cd pub/author-info`). The *AMS Author Handbook* and the *Instruction Manual* are available in PDF format following the author packages link from www.ams.org/tex/. The author package can also be obtained free of charge by sending email to pub@ams.org (Internet) or from the Publication Division, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. When requesting an author package, please specify $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ or $\mathcal{A}\mathcal{M}\mathcal{S}$ - $\mathcal{T}\mathcal{E}\mathcal{X}$, Macintosh or IBM (3.5) format, and the publication in which your paper will appear. Please be sure to include your complete mailing address.

The final version of the electronic manuscript should be sent to the Providence office immediately after the paper has been accepted for publication. The author should also send the final version of the paper manuscript to the Managing Editor, who will forward a copy to the Providence office. Editors will require authors to send their electronically prepared manuscripts to the Providence office in a timely fashion. Electronically prepared manuscripts can be sent via email to pub-submit@ams.org (Internet) or on diskette to the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. When sending a manuscript electronically, please be sure to include a message indicating in which publication the paper has been accepted. No corrections will be accepted electronically. Authors must mark their changes on their proof copies and return them to the Providence office. Complete instructions on how to send files are included in the author package.

Electronic graphics. Comprehensive instructions on preparing graphics are available starting from www.ams.org/jourhtml/authors.html. A few of the major requirements are given here.

Submit files for graphics as EPS (Encapsulated PostScript) files. This includes graphics originated via a graphics application as well as scanned photographs or other computer-generated images. If this is not possible, TIFF files are acceptable as long as they can be opened in Adobe Photoshop or Illustrator. No matter what method was used to produce the graphic, it is necessary to provide a paper copy to the AMS.

Authors using graphics packages for the creation of electronic art should also avoid the use of any lines thinner than 0.5 points in width. Many graphics packages allow the user to specify a “hairline” for a very thin line. Hairlines often look acceptable when proofed on a typical laser printer. However, when produced on a high-resolution laser imagesetter, hairlines become nearly invisible and will be lost entirely in the final printing process.

Screens should be set to values between 15% and 85%. Screens which fall outside of this range are too light or too dark to print correctly. Variations of screens within a graphic should be no less than 10%.

AMS policy on making changes to articles after posting. Articles are posted to the AMS website individually after proof is returned from authors and before appearing in an issue. To preserve the integrity of electronically published articles, once an article is individually posted to the AMS website but not yet in an issue, changes cannot be made in place in the paper. However, an “Added after posting” section may be added to the paper right before the References when there is a critical error in the content of the paper. The “Added after posting” section gives the author an opportunity to correct this type of critical error before the article is put into an issue for printing and before it is then

reposted with the issue. The “Added after posting” section remains a permanent part of the paper. The AMS does not keep author-related information, such as affiliation, current address, and email address, up to date after a paper is initially posted.

Once the article is assigned to an issue, even if the issue has not yet been posted to the AMS website, corrections may be made to the paper by submitting a traditional errata article to the Editor. The errata article will appear in a future print issue and will link back and forth on the web to the original article online.

Secure manuscript tracking on the Web and via email. Authors can track their manuscripts through the AMS journal production process using the personal AMS ID and Article ID printed in the upper right-hand corner of the Consent to Publish form sent to each author who publishes in AMS journals. Access to the tracking system is available from www.ams.org/mstrack/ or via email sent to mstrack-query@ams.org. To access by email, on the subject line of the message simply enter the AMS ID and Article ID. To track more than one manuscript by email, choose one of the Article IDs and enter the AMS ID and the Article ID followed by the word *all* on the subject line. An explanation of each production step is provided on the web through links from the manuscript tracking screen. Questions can be sent to mcom-query@ams.org.

T_EX files available. Beginning with the January 1992 issue of the *Bulletin* and the January 1996 issues of *Transactions*, *Proceedings*, *Mathematics of Computation*, and the *Journal of the AMS*, T_EX files can be downloaded from the AMS website, starting from www.ams.org/journals/. Authors without Web access may request their files at the address given below after the article has been published. For *Bulletin* papers published in 1987 through 1991 and for *Transactions*, *Proceedings*, *Mathematics of Computation*, and the *Journal of the AMS* papers published in 1987 through 1995, T_EX files are available upon request for authors without Web access by sending email to file-request@ams.org or by contacting the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. The request should include the title of the paper, the name(s) of the author(s), the name of the publication in which the paper has or will appear, and the volume and issue numbers if known. The T_EX file will be sent to the author making the request after the article goes to the printer. If the requestor can receive Internet email, please include the email address to which the file should be sent. Otherwise please indicate a diskette format and postal address to which a disk should be mailed. **Note:** Because T_EX production at the AMS sometimes requires extra fonts and macros that are not yet publicly available, T_EX files cannot be guaranteed to run through the author’s version of T_EX without errors. The AMS regrets that it cannot provide support to eliminate such errors in the author’s T_EX environment.

Inquiries. Any inquiries concerning a paper that has been accepted for publication that cannot be answered via the manuscript tracking system mentioned above should be sent to mcom-query@ams.org or directly to the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA.

Editorial Committee

RENÉ SCHOOF, Dipartimento di Matematica, 2a Università di Roma “Tor Vergata”, I-00133 Roma, Italy; *E-mail:* schoof@wins.uva.nl

CHI-WANG SHU, Chairman. Applied Mathematics Division, Brown University, P.O. Box F, 182 George St., Providence, RI 02912-0001 USA; *E-mail:* mathcomp@dam.brown.edu

LARS B. WAHLBIN, Center for Applied Mathematics, 657 Frank H. T. Rhodes Hall, Cornell University, Ithaca, NY 14853-3801 USA; *E-mail:* awahlbin@cam.cornell.edu

JOSEPH D. WARD, Department of Mathematics, Texas A&M University, College Station, TX 77843-3368 USA; *E-mail:* jward@math.tamu.edu

Board of Associate Editors

RANDOLPH E. BANK, Department of Mathematics, University of California San Diego, C-012, La Jolla, CA 92093-0001 USA; *E-mail:* reb@sdna2.ucsd.edu

DAVID W. BOYD, Department of Mathematics, University of British Columbia, Vancouver, BC Canada V6T 1Z2; *E-mail*: boyd@math.ubc.ca

SUSANNE C. BRENNER, Department of Mathematics, University of South Carolina, Columbia, SC 29208 USA; *E-mail*: brenner@math.sc.edu

RICHARD P. BRENT, Oxford University Computing Laboratory, Wolfson Building, Parks Road, Oxford OX1 3QD, England; *E-mail*: Richard.Brent@comlab.ox.ac.uk

JOE P. BUHLER, Mathematical Sciences, Research Institute, 1000 Centennial Drive, Berkeley, CA 94720-5070 USA; *E-mail*: jpb@msri.org

CARSTEN CARSTENSEN, Mathematisches Seminar, Christian-Albrechts-Universität zu Kiel, Ludewig-Meyn-Straße 4, D-24098 Kiel, Germany; *E-mail*: cc@numerik.uni-kiel.de

ARJEH M. COHEN, Faculteit Wiskunde en Informatica, TU Eindhoven, Postbus 513, 5600 MB Eindhoven, Netherlands; *E-mail*: amc@win.tue.nl

RONALD F. A. COOLS, Department of Computer Science, Katholieke Universiteit Leuven, Celestijnenlaan 200A, B-3001 Heverlee, Belgium; *E-mail*: ronald.cools@cs.kuleuven.ac.be

HOWARD ELMAN, Department of Computer Science, University of Maryland, College Park, MD 20742-0001 USA; *E-mail*: elman@cs.umd.edu

RICHARD S. FALK, Department of Mathematics, Rutgers University, Hill Center, 110 Frelinghuysen Road, Piscataway, NJ 08854-8019 USA; *E-mail*: falk@math.rutgers.edu

DANIEL W. LOZIER, National Institute of Standards and Technology, 100 Bureau Drive, Mail Stop 8910, Gaithersburg, MD 20899-8910 USA; *E-mail*: dlozier@nist.gov

ZHI-QUAN LUO, Department of Electrical and Computer Engineering, McMaster University, Room CRL/225, Hamilton, ON Canada L8S 4K1; *E-mail*: luozq@mcmaster.cis.mcmaster.ca

ROSWITHA MÄRZ, Institut für Mathematik, Humboldt-Universität zu Berlin, Unter den Linden 6, D-10099 Berlin, Germany; *E-mail*: maerz@mathematik.hu-berlin.de

HARALD NIEDERREITER, Department of Mathematics, National University of Singapore, 2 Science Drive 2, Singapore 117543, Republic of Singapore; *E-mail*: nied@math.nus.edu.sg

RICARDO HORACIO NOCHETTO, Department of Mathematics, University of Maryland, Mathematics Building 084, College Park, MD 20742-0001 USA; *E-mail*: rhn@math.umd.edu

STANLEY OSHER, Department of Mathematics, University of California, P. O. Box 951555, Los Angeles, CA 90095-1555 USA; *E-mail*: sjo@math.ucla.edu

HAESUN PARK, Department of Computer Science, University of Minnesota, 4-192 EE/CS, 200 Union Street, Minneapolis, MN 55455 USA; *E-mail*: hpark@cs.umn.edu

JOSEPH E. PASCIAK, Department of Mathematics, Texas A&M University, 507B Blocker Hall, MS 3368, College Station, TX 77843 USA; *E-mail*: pasciak@math.tamu.edu

LOTHAR REICHEL, Department of Mathematics & Computer Science, Kent State University, P.O. Box 5190, Kent, OH 44242-0001 USA; *E-mail*: reichel@mcs.kent.edu

IGOR E. SHPARLINSKI, Department of Computing, Macquarie University, Sydney, New South Wales 2109, Australia; *E-mail*: igor@comp.mq.edu.au

FRANK STENGER, School of Computing, University of Utah, Salt Lake City, UT 84112-1102 USA; *E-mail*: stenger@cs.utah.edu

DENIS TALAY, INRIA, 2004 Route des Lucioles, BP 93, 06902 Sophia Antipolis Cedex, France; *E-mail*: talay@sophia.inria.fr

NICO M. TEMME, Centrum voor Wiskunde en Informatica, P.O. Box 94079, 1090-GB Amsterdam, Netherlands; *E-mail*: nicot@cwi.nl

HUGH C. WILLIAMS, Department of Mathematics and Statistics, University of Calgary, Calgary AB, Canada T2N 1N4; *E-mail*: williams@math.ucalgary.ca

JINCHAO XU, Department of Mathematics, Pennsylvania State University, McAllister Building, University Park, PA 16802-6401 USA; *E-mail*: xu@math.psu.edu

AMS Website

www.ams.org

AMERICAN MATHEMATICAL SOCIETY

[• ABOUT THE AMS](#)
[• JOIN THE AMS](#)
[• CONTACT US](#)
[• YOUR SUBSCRIPTIONS](#)

[Bookstores](#) | [CML](#) | [Journals](#) | [MathSciNet](#) | [MR Lookup](#) | [MSC](#)

<p>Membership Join, Renew, Benefits, For Members Only</p> <p>Customer Services Contact Us, Customer FAQ, License Agreements . . .</p> <p>Employment Services Job Ads, Employment Center, AMS CoverSheet Service</p> <p>Meetings & Conferences Sectionals, National, International, AMS Conferences, Other Meetings and Activities</p> <p>AMS Governance Secretaries, Leadership, Elections, Committees . .</p> <p>Careers & Education Survey Data, Funding, Programs at all levels</p>	<p>MathSciNet Abstract, Subscriptions, Consortia, Free Trial, Demo, Support, Feedback</p> <p>Journals Subscriptions, Search Authors, Support . .</p> <p>Books AMS Bookstore, Books Order, Author Resources</p> <p>Mathematical Reviews Database Editorial Statement, Publication Formats, MSE, Featured Reviews, Review Submissions . .</p> <p>Math on the Web Guides, Services, People</p> <p>Reference Tools TeX Resources, Books Online, Preprints, Journal Entry System, Tools, Staff, Other Services</p>	<p>Government Relations AMS in Washington News & Alerts, Communicating with Congress, Federal Budget Information . .</p> <p>Public Awareness Information for Journalists, Press Releases, AMS Fact Sheet</p> <p>Prizes & Awards Recipients, Press Releases</p> <p>Giving to the AMS Giving, Fidelity Fund .</p> <p>Search the AMS website Site Search, Site map</p>	<p>News Summer 2001 Followups Opportunity for Graduate Students Joint Mathematics Meetings in New Orleans Call for Proposals for Summer Research Conferences 2002</p> <p>What's New in Math Feature Column Celestial Mechanics on a Graphing Calculator by Tony Phillips</p> <p>Math in the Media Y Race to settle Catalan conjecture Y President mentions math Y The much needed drama</p> <p>Calendar 1/15 AMS-AAAS Summer Media Fellows Application Due 2/1 Deadline for Proposals for Summer Research Conferences 2002 Reserve hotel rooms early for the Williams College meeting, October 13 - 14, 2001.</p> <p>Recent Additions AMS Electronic CoverSheet Service</p>
--	---	--	---

The website of the AMS facilitates access to scientific information, resources, and tools for the mathematical community. Sample topics that you'll find include ...

Membership

www.ams.org/membership

Join the AMS, renew your membership, take advantage of member-only services, and more!

Employment Services

www.ams.org/employment

Check out job listings, visit the employment center, get help with your academic job search, and more!

Meetings & Conferences

www.ams.org/meetings

Register for meetings, find out about dates and places of meetings and conferences, learn how to submit an abstract or paper, and more!

Books

www.ams.org/bookstore

Visit the AMS Bookstore to browse and purchase publications, products, and services.

Journals

www.ams.org/journals

Read about cutting-edge research; view papers online prior to their publication in the printed issue, browse *Notices of the AMS* and *Bulletin of the AMS*—both are free online!

MathSciNet

www.ams.org/mathscinet

Mathematical Reviews on the Web—the premier source for searching the world's mathematical literature.

Math Reviews

www.ams.org/mr-database

Submit reviews, learn about MR-derived products, utilize MR resources, and more!

Careers and Education

www.ams.org/careers-edu

Find student help, learn about funding, surveys, and programs in the mathematical sciences!

There's more! Other AMS Website features include:

- AMS User Account Services **NEW!**
- "Your Subscriptions" Information
- Mathematical News and Information
- What's New in Math



AMS

AMERICAN MATHEMATICAL SOCIETY



Visit the **AMS Bookstore**,
our online catalog including
thousands of books, videos,
journals, software,
and gift items at
www.ams.org/bookstore.

 **AMS BOOKSTORE**

FULL SEARCH	NEW TITLES	BOOKSTORE FAQ	RECOMMENDED TEXTS	BOOKS IN SERIES	EXPRESS ORDER FORM
-----------------------------	----------------------------	-------------------------------	-----------------------------------	---------------------------------	------------------------------------

Quick Search Browse

CONTENTS

Over 3000 Books
And More!

- [AMS Chelsea Publishing Titles](#)
- [Journals](#)
- [MathSciNet](#)
- [Videos](#)
- [Gift Items](#)
- [Where to find AMS Titles](#)
- [Sales Items](#)

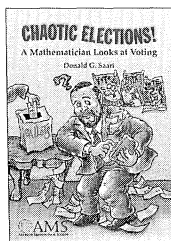


FEATURED PUBLICATIONS

**Chaotic Elections!
A Mathematician Looks
At Voting**

Donald G. Saari

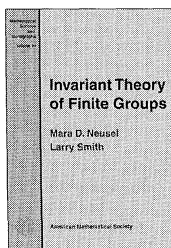
Required reading for anyone who wants to understand how we can avoid problems from appearing anytime any group is making a choice using a voting procedure.



**Invariant Theory
of Finite Groups**

**Mara D. Neusel
Larry Smith**

The questions that have been at the center of invariant theory since the 19th century have revolved around the following themes: finiteness, computation, and special classes of invariants. This book contains numerous examples to illustrate the theory, often of more than passing interest.



NEWS

• [New titles from the AMS: See New Titles.](#)

• [New Title Email Notification:](#) Sign up to receive email notification about new publications as they are posted to the AMS Bookstore.

• [AMS Publications Update](#) Click here to receive our quarterly mailing announcing new AMS titles.

www.ams.org/bookstore

AMS Electronic Journals

Mission Statement
About AMS Journals
About Journals Searching

Over a Century of Publishing Mathematics

Quick Search: Go

Advanced Search | Journals Site Map | Email Alert | For Authors | Tech Support | Help | Subscribe

Journals Published by the American Mathematical Society

- » Bulletin of the American Mathematical Society
- » Conformal Geometry and Dynamics
- » Electronic Research Announcements
- » Journal of the American Mathematical Society
- » Mathematics of Computation
- » Proceedings of the American Mathematical Society
- » Representation Theory
- » Transactions of the American Mathematical Society

Additional Products Available from the AMS

Notices
Notices of the American Mathematical Society

Notices is one of the world's most widely read periodicals for professional mathematicians. In addition to publishing expository articles about mathematics research, information and news pertaining to the mathematics profession, and opinion pieces on a range of topics, the Notices serves as the journal of record for the AMS.

MathSciNet
Mathematical Reviews on the Web

MathSciNet is partnering with the AMS Journals program providing links to article reviews when they become available. Those with subscriptions to MathSciNet and AMS journals now have the ability to link from AMS journals into the MathSciNet database.

AMS Distributed Journals

The AMS also distributes high-quality mathematics research, applied mathematics, and specialized mathematics journals from selected publishers around the world. Visit the AMS Bookstore and view a complete listing of journals.

30-day free trial!*

www.ams.org/journals

- Over 100 years of the highest quality in mathematical research
- Unique articles, book reviews, and reports
- Editors who are prominent in their fields
- Subscribe to the 2002 print versions of *Journal of Algebraic Geometry (JAG)*, *Journal of the American Mathematical Society (JAMS)*, *Mathematics of Computation (MCOM)*, *Proceedings of the American Mathematical Society (PROC)*, *Transactions of the American Mathematical Society (TRAN)* or *Moscow Mathematical Journal (MMJ)*, and receive the electronic versions for FREE.
- Once you arrange access to one or more free electronic versions of AMS Journals, you will have access—at no additional charge—to two electronic-only journals of the AMS, *Conformal Geometry and Dynamics (ECGD)* and *Representation Theory (ERT)*.
- Lower rate for the electronic version: Enjoy a lower subscription rate on JAMS, MCOM, PROC, TRAN, and JAG when you choose to receive only the electronic version.

* A 30-day free trial is available to corporations and academic institutions. A downloadable Free Trial Form is available at: www.ams.org/customers/msntrial.pdf or www.ams.org/customers/ejournaltrial.pdf. For more information, contact AMS Membership and Customer Services, 201 Charles Street, Providence, RI 02904-2294, USA; phone 1-800-321-4267 or 1-401-455-4000 worldwide; fax 1-401-455-4046; email: cust-serv@ams.org.

AMS journals include:

- *Bulletin of the American Mathematical Society*
- *Conformal Geometry and Dynamics*
- *Electronic Research Announcements*
- *Journal of the American Mathematical Society*
- *Mathematics of Computation*
- *Proceedings of the American Mathematical Society*
- *Representation Theory*
- *Transactions of the American Mathematical Society*

Benefits of subscribing:

- There are over 6,000 AMS journal articles from 1996 to date available online.
- Articles are now posted online upon acceptance and before appearing in a print issue.
- You can search, browse, view math symbols, and print articles specifically in your discipline.
- We offer free email notification of new articles.
- There is extensive linking between MathSciNet and AMS electronic journals.
- AMS electronic journals are also accessible through OCLC FirstSearch, EBSCO Online, SwetsNet, Dawson Information Quest, and the U.S. Department of Energy's PubSCIENCE.

AMS-distributed journals:

The AMS also distributes scientific journals from other publishers. Contact us for additional information or for a complete list of AMS-distributed journals, visit www.ams.org/distribution.




AMS

AMERICAN MATHEMATICAL SOCIETY

MATHEMATICS OF COMPUTATION

AMERICAN MATHEMATICAL SOCIETY



**MATHEMATICS
OF COMPUTATION**
AMERICAN MATHEMATICAL SOCIETY
ISSN 1088-6842 (e) ISSN 0025-5718 (p)

[Recently posted articles](#) | [Most recent issue](#) | [All issues](#)

About this journal

- [Journal overview](#)
- [Editorial board](#)
- [Copying and reprinting](#)
- [Publishing cycle and posting notes](#)
- [Back issues from 1974](#)

Subscription information

- [Subscribe from the AMS Book Store](#)
- [Electronic Journals Online Subscription Agreement](#)


For authors

- [Initial submission](#)
- [Author packages](#)
- [Consent to publish and copyright agreements](#)
- [Permissions](#)
- [Where to send files for accepted papers](#)
- [AMS policy on making changes to articles after posting](#)
- [Backlog information](#)
- [Information for authors on submitting citations](#)
- [Manuscript tracking system](#)

- [Journals Home](#)
- [Search Journals](#)
- [For Authors](#)
- [Subscribers](#)
- [Tech Support](#)
- [Help](#)

Journal overview: This journal is devoted to research articles in computational mathematics. Areas covered include numerical analysis, with emphasis on the mathematical analysis and development of methods, computational number theory and algebra, and related fields. Table errata and reviews of books in areas related to computational mathematics and occasional microfiche supplements are also included.

Submission information: Information can be found on the journal's Initial Submission page.



**MATHEMATICS
OF COMPUTATION**
AMERICAN MATHEMATICAL SOCIETY
ISSN 1088-6842 (e) ISSN 0025-5718 (p)

[Recently posted articles](#) | [Most recent issue](#) | [All issues](#)

Journal overview: This journal is devoted to research articles in computational mathematics. Areas covered include numerical analysis, with emphasis on the mathematical analysis and development of methods, computational number theory and algebra, and related fields. Table errata and reviews of books in areas related to computational mathematics and occasional microfiche supplements are also included.

Submission information: Information can be found on the journal's Initial Submission page.

- [Journals Home](#)
- [Search Journals](#)
- [For Authors](#)
- [Subscribers](#)
- [Tech Support](#)
- [Help](#)

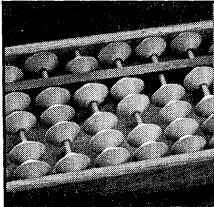
The AMS has released enhanced versions of its electronic journals. These upgrades improve usefulness and relevance for both journal subscribers and journal authors.

A 30-day free trial is available to corporations and institutions. A downloadable Free Trial Form is available at: www.ams.org/customers/ejournaltrial.pdf.

Contact AMS Membership and Customer Services, P. O. Box 6248, Providence, RI 02940-6248, USA; phone 1-800-321-4267 or 1-401-455-4000 worldwide; fax 1-401-455-4046; email: cust-serv@ams.org. Note: A signed license agreement is required for AMS electronic journal subscriptions. A newly updated and expanded agreement can be found online at <http://www.ams.org/customers/jour-license.html>.



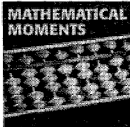
www.ams.org/mcom



MATHEMATICAL MOMENTS

The **Mathematical Moments** program is a series of illustrated “snapshots” designed to promote appreciation and understanding of the role mathematics plays in science, nature, technology, and human culture.

Download these and other **Mathematical Moments** pdf files at www.ams.org/mathmoments.



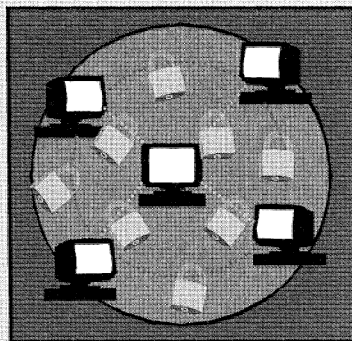
Securing Internet Communication

No one could shop, pay bills, or conduct business securely on the Internet without the mathematics of encryption. Although based on algebraic facts proved centuries ago, today's sophisticated encryption techniques were formulated within the past twenty-five years.

Public key encryption allows a user to publish the encryption key for all to use, while keeping the decryption key secret. One such algorithm, called RSA, is behind the encryption in modern browsers. The National Institute of Standards and Technology recently adopted an Advanced Encryption Standard that will be used for electronic communication in the years to come. This new standard uses permutations, modular arithmetic, polynomials, matrices, and finite fields to transmit information freely but securely.

For More Information:

“Communications Security for the Twenty-first Century,” Susan Landau, *Notices of the American Mathematical Society*, April 2000.



The **Mathematical Moments** program promotes appreciation and understanding of the role mathematics plays in science, nature, technology, and human culture.

- Describing the Oceans
- Designing Aircraft
- Deciphering DNA
- Storing Fingerprints
- Investing in Markets
- Creating Crystals
- Seeing the World through Fractals
- Experimenting with the Heart
- Securing Internet Communication
- Making Movies Come Alive
- Listening to Music
- Routing Traffic through the Internet
- Tracking Products
- Forecasting Weather
- Manufacturing Better Lenses



AMS
AMERICAN MATHEMATICAL SOCIETY

www.ams.org/mathmoments

MathSciNet

www.ams.org/mathscinet

New version of MathSciNet released!

In 2001, the AMS released a new version of MathSciNet to subscribers. New features and enhancements include:

Reference lists

- Full reference lists from original items are now available in MathSciNet. Lists have been added initially from 65 leading math journals, covering material published since January 2000.

Reference citations

- Reference citations are now available in MathSciNet. If an item appears in a MathSciNet reference list, a Reference Citations link is displayed. This link will bring you to a Headline list of those MathSciNet items whose reference lists include the on-screen item.

Database expansion items

- The MR Database has been expanded to include items in the area of Applied Statistics. These database expansion items receive full author identification, journal linking, and original item linking (when available).

Improved search screens

- Modifications have been made to improve the MathSciNet search screens, making them more user-friendly.

See www.ams.org/msnhtml/whats_new.html for additional details.

MathSciNet Facts and Figures as of Fall 2001:

71,024 items added; **1,799** journals covered; links to over **186,000** original articles; **10,843** active reviewers; **366,945** authors indexed

AMERICAN MATHEMATICAL SOCIETY
MathSciNet *Mathematical Reviews on the Web*

Facts and Figures: 71,024 items added in 2001; 1,799 journals covered; links to 185,786 original articles; 10,843 active reviewers; 366,945 authors indexed

Quick Search
 Providence [dropdown]
 Select a field [dropdown] [input]
 Go [button]

Searches
 Full Search
 Author database
 Journals database
 MSC by Keyword

Browse
 Current books
 Current journals
 Math. Subject Classification

Reviewers, Authors, Publishers
 MR Lookup
 Verify references and add links
 MathSciNet GetItem
 Create direct links
 Electronic submission
 Submit reviews
 Guide for Reviewers
 Reviewing schedules, style elements, etc.

What's New
 • Reference Lists
 • Reference Citations
 • Database Expansion Items
 • Coming Soon! Improved Help Files
 • More...

About MathSciNet
 • About
 • Serials
 • Original article links
 • Featured Reviews
 • Subscriptions
 • Consortia
 • 30-Day Free Trial
 • Guidebook
 • Demo
 • Support

30-day free trial*

MathSciNet Consortia Pricing

The AMS is pleased to offer consortia pricing for MathSciNet, your premier source for searching over 60 years of mathematical literature in the MR Database. The AMS's goal is to increase MathSciNet access to the mathematical research community. Consortia arrangements can be very valuable for small- and mid-sized institutions that have relatively limited budgets.

As a result of AMS consortia pricing arrangements, there are over 90 Consortia worldwide that now enjoy access to MathSciNet. Participants include over 900 public and private colleges and universities, community colleges, satellite campuses, corporations, and more.

See www.ams.org/bookstore/mathsciprice#consortia for additional information.

Links from MathSciNet to Online Articles

Linking capabilities continue to expand. MathSciNet now provides over 186,000 links from reviews directly to original articles in over 220 journals from commercial, society, and independent publishers.

* A 30-day free trial is available to corporations and academic institutions. A downloadable Free Trial Form is available at: www.ams.org/customers/msntrial.pdf or www.ams.org/customers/ejournaltrial.pdf. For more information, contact AMS Membership and Customer Services, 201 Charles Street, Providence, RI 02904-2294, USA; phone 1-800-321-4267 or 1-401-455-4000 worldwide; fax 1-401-455-4046; email: cust-serv@ams.org.



(Continued from back cover)

Keith Matthews , Thue's theorem and the diophantine equation $x^2 - Dy^2 = \pm N$	1281
Denis Simon , Solving norm equations in relative number fields using S -units	1287
A. Paszkiewicz and A. Schinzel , On the least prime primitive root modulo a prime	1307
H. Dubner, T. Forbes, N. Lygeros, M. Mizony, H. Nelson, and P. Zimmermann , Ten consecutive primes in arithmetic progression	1323
Reviews and Descriptions of Tables and Books	1329
Heinz-Otto Kreiss and Hedwig Ulmer Busenhardt 1 , Ronald A. Devore, Arie Iserles, and Endre Süli, Editors 2 , Zhaojun Bai, James Demmel, Jack Dongarra, Axel Ruhe, and Henk van der Vorst, Editors 3 , Guillermo Sapiro 4 , Chee Keng Yap 5 , Kwok-Yan Lam, Igor Shparlinski, Huaxiong Wang, and Chaoping Xing, Editors 6	
Table Errata	1335
I. S. Gradshteyn and I. M. Ryzhik 636 , I. S. Gradshteyn and I. M. Ryzhik 637	
Toshihiro Kumada, Hannes Leeb, Yoshiharu Kurita, and Makoto Matsumoto , Corrigenda to "New primitive t -nomials ($t = 3, 5$) over $GF(2)$ whose degree is a Mersenne exponent," and some new primitive pentanomials	1337

No microfiche supplement in this issue

MATHEMATICS OF COMPUTATION

CONTENTS

Vol. 71, No. 239

July 2002

Douglas N. Arnold, Daniele Boffi, and Richard S. Falk, Approximation by quadrilateral finite elements	909
Ville Havu and Juhani Pitkäranta, Analysis of a bilinear finite element for shallow shells I: Approximation of inextensional deformations	923
Carsten Carstensen and Sören Bartels, Each averaging technique yields reliable a posteriori error control in FEM on unstructured grids. Part I: Low order conforming, nonconforming, and mixed FEM	945
Sören Bartels and Carsten Carstensen, Each averaging technique yields reliable a posteriori error control in FEM on unstructured grids. Part II: Higher order FEM	971
Vladimir Druskin and Shari Moskow, Three-point finite-difference schemes, Padé and the spectral Galerkin method. I. One-sided impedance approximation	995
Heinrich Freistühler and Christian Rohde, Numerical computation of viscous profiles for hyperbolic conservation laws	1021
V. Girault and L. R. Scott, Hermite interpolation of nonsmooth functions preserving boundary conditions	1043
Donald J. Estep and Andrew M. Stuart, The dynamical behavior of the discontinuous Galerkin method and related difference schemes ...	1075
Xue-Cheng Tai and Paul Tseng, Convergence rate analysis of an asyn- chronous space decomposition method for convex minimization	1105
Pierre Dusart, Estimates of $\theta(x; k, l)$ for large values of x	1137
M. C. De Bonis, B. Della Vecchia, and G. Mastroianni, Approximation of the Hilbert transform on the real line using Hermite zeros	1169
Beatrice Meini, Efficient computation of the extreme solutions of $X + A^*X^{-1}A = Q$ and $X - A^*X^{-1}A = Q$	1189
David W. Boyd, On a problem of Byrnes concerning polynomials with restricted coefficients, II	1205
Andreas Enge and Andreas Stein, Smooth ideals in hyperelliptic function fields	1219
Karl Entacher, Thomas Schell, and Andreas Uhl, Efficient lattice assessment for LCG and GLP parameter searches	1231
Hyun Kwang Kim and Jung Soo Kim, Evaluation of zeta function of the simplest cubic field at negative odd integers	1243
D. W. Farmer and K. James, The irreducibility of some level 1 Hecke polynomials	1263
Jesse Ira Deutsch, A computational approach to Hilbert modular group fixed points	1271

(Continued on inside back cover)

