ARTICLES

János Kollár, Algebraic hypersurfaces ........................................... 543
Vaughn Climenhaga, Yakov Pesin, and Agnieszka Zelerowicz,
Equilibrium states in dynamical systems via geometric measure theory 569
Robert Benedetto, Patrick Ingram, Rafe Jones, Michelle Manes,
Joseph H. Silverman, and Thomas J. Tucker, Current trends and
open problems in arithmetic dynamics ........................................... 611

MATHEMATICAL PERSPECTIVES

Herwig Hauser, About the cover: Quaste ........................................ 687
Selected Mathematical Reviews .................................................... 691

BOOK REVIEWS

Eviatar B. Procaccia (Reviewer), Random walks and heat kernels on
graphs, by Martin T. Barlow ..................................................... 705
Ron Rosenthal (Reviewer), 50 years of first-passage percolation, by Antonio
Auffinger, Michael Damron, and Jack Hanson ............................ 713
INDEX TO VOLUME 56 (2019)

BULLETIN ARTICLES

Bedrossian, Jacob, Pierre Germain, and Nader Masmoudi. Stability of the Couette flow at high Reynolds numbers in two dimensions and three dimensions, 373

Benedetto, Robert, Patrick Ingram, Rafe Jones, Michelle Manes, Joseph H. Silverman, and Thomas J. Tucker. Current trends and open problems in arithmetic dynamics, 611

Ciesielski, Krzysztof C., and Juan B. Seoane-Sepúlveda. Differentiability versus continuity: Restriction and extension theorems and monstrous examples, 211

Climenhaga, Vaughn, Yakov Pesin, and Agnieszka Zelerowicz. Equilibrium states in dynamical systems via geometric measure theory, 569

De Loera, Jesús A., Xavier Goaoc, Frédéric Meunier, and Nabil H. Mustafa. The discrete yet ubiquitous theorems of Carathéodory, Helly, Sperner, Tucker, and Tverberg, 415

Erman, Daniel, Steven V Sam, and Andrew Snowden. Cubics in 10 variables vs. cubics in 1000 variables: Uniformity phenomena for bounded degree polynomials, 87

Farmer, David W., Ameya Pitale, Nathan C. Ryan, and Ralf Schmidt. Analytic L-functions: Definitions, theorems, and connections, 261

Gallagher, Isabelle. From Newton to Navier–Stokes, or how to connect fluid mechanics equations from microscopic to macroscopic scales, 65

Germain, Pierre. See Bedrossian, Jacob

Goaoc, Xavier. See De Loera, Jesús A.

Grochow, Joshua A. New applications of the polynomial method: The cap set conjecture and beyond, 29

Ingram, Patrick. See Benedetto, Robert

James, Richard D. Materials from mathematics, 1

Jones, Rafe. See Benedetto, Robert

Kollár, János. Algebraic hypersurfaces, 543

Manes, Michelle. See Benedetto, Robert

Masmoudi, Nader. See Bedrossian, Jacob

Meunier, Frédéric. See De Loera, Jesús A.

Mustafa, Nabil H. See De Loera, Jesús A.

Oh, Sung-Jin, and Daniel Tataru. The threshold theorem for the (4+1)-dimensional Yang–Mills equation: An overview of the proof, 171

Pesin, Yakov. See Climenhaga, Vaughn

Pitale, Ameya. See Farmer, David W.

Ryan, Nathan C. See Farmer, David W.

Sam, Steven V. See Erman, Daniel

Schmidt, Ralf. See Farmer, David W.

Seade, José. On Milnor's fibration theorem and its offspring after 50 years, 281

Seoane-Sepúlveda, Juan B. See Ciesielski, Krzysztof C.

Silverman, Joseph H. See Benedetto, Robert

Snowden, Andrew. See Erman, Daniel

Tataru, Daniel. See Oh, Sung-Jin

Tucker, Thomas J. See Benedetto, Robert

Zelerowicz, Agnieszka. See Climenhaga, Vaughn

MATHEMATICAL PERSPECTIVES

Alexanderson, Gerald L., and Leonard F. Klosinski. About the cover: Early American arithmetics, 349

Alexanderson. About the cover: Mathematicians in bronze, 513

Friedlander, Susan. About the cover: Olga Alexandrovna Ladyzhenskaya, 115

Hauser, Herwig. About the cover: Quaste, 687

Klosinski, Leonard F. See Alexanderson, Gerald L.

BOOK REVIEWS

Aguiar, Marcelo, and Swapneel Mahajan. Topics in hyperplane arrangements, reviewed by S. Forcey, 367

Arthur, James. The endoscopic classification of representations—orthogonal and symplectic groups, reviewed by Freydoon Shahidi, 151
Auffinger, Antonio, Michael Damron, and Jack Hanson. 50 years of first-passage percolation, reviewed by Ron Rosenthal, 713

Barlow, Martin T. Random walks and heat kernels on graphs, reviewed by Eviatar B. Procaccia, 705

Bóna, Miklós (Editor). Handbook of enumerative combinatorics, reviewed by Robin Pemantle, 159

Chandler, John. See Steele, Brian

Cornulier, Yves, and Pierre de la Harpe. Metric geometry of locally compact groups, reviewed by V. Nekrashevych, 165

Damron, Michael. See Auffinger, Antonio


Fricain, Emmanuel, and Javad Mashreghi. The theory of H(b) spaces, Vol. 1, reviewed by Brett D. Wick, 535

Fricain, Emmanuel, and Javad Mashreghi. The theory of H(b) spaces, Vol. 2, reviewed by Brett D. Wick, 535

Hanson, Jack. See Auffinger, Antonio

de la Harpe, Pierre. See Cornulier, Yves

Hastie, Trevor. See Efron, Bradley

Mahajan, Swapneel. See Aguiar, Marcelo

Mashreghi, Javad. See Fricain, Emmanuel

Reddy, Swarna. See Steele, Brian

Steel, Mike. Phylogeny—discrete and random processes in evolution, reviewed by Sebastien Roch, 527

Steele, Brian, John Chandler, and Swarna Reddy. Algorithms for data science, reviewed by Richard D. De Veaux and Nicholas R. De Veaux, 143

Tao, Terence. Expansion in finite simple groups of Lie type, reviewed by Alexander Lubotzky, 361
BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY
CONTENTS

Vol. 56, No. 1 January 2019

Articles

Richard D. James, Materials from mathematics .......................... 1
Joshua A. Grochow, New applications of the polynomial method: The cap
set conjecture and beyond .................................................... 29
Isabelle Gallagher, From Newton to Navier–Stokes, or how to connect fluid
mechanics equations from microscopic to macroscopic scales .......... 65
Daniel Erman, Steven V Sam, and Andrew Snowden, Cubics
in 10 variables vs. cubics in 1000 variables: Uniformity phenomena for
bounded degree polynomials ................................................. 87

Mathematical Perspectives

Susan Friedlander, About the cover: Olga Alexandrovna Ladyzhenskaya . 115

Selected Mathematical Reviews .................................................. 119

Book Reviews

Robert B. Gramacy (Reviewer), Computer age statistical inference:
Algorithms, evidence, and data science, by Bradley Efron and Trevor
Hastie .......................................................... 137
Richard D. De Veaux and Nicholas R. De Veaux (Reviewers),
Algorithms for data science, by Brian Steele, John Chandler, and
Swarna Reddy ......................................................... 143
Freydoon Shahidi (Reviewer), The endoscopic classification of representa-
tions—orthogonal and symplectic groups, by James Arthur .......... 151
Robin Pemantle (Reviewer), Handbook of enumerative combinatorics,
edited by Miklós Bóna .................................................... 159
V. Nekrashevych (Reviewer), Metric geometry of locally compact groups,
by Yves Cornulier and Pierre de la Harpe ............................... 165

Vol. 56, No. 2 April 2019

Articles

Sung-Jin Oh and Daniel Tataru, The threshold theorem for the (4 + 1)-
dimensional Yang–Mills equation: An overview of the proof .......... 171
Krzysztof C. Ciesielski and Juan B. Seoane-Sepúlveda, Differentiability
versus continuity: Restriction and extension theorems and monstrous
examples ........................................................................... 211
David W. Farmer, Ameya Pitale, Nathan C. Ryan, and Ralf
Schmidt, Analytic L-functions: Definitions, theorems, and connections 261
José Seade, On Milnor’s fibration theorem and its offspring after 50 years 281
Mathematical Perspectives

Gerald L. Alexanderson and Leonard F. Klosinski, About the cover:
  Early American arithmetics ........................................ 349
  Selected mathematical reviews .................................... 355

Book Reviews

Alexander Lubotzky (Reviewer), Expansion in finite simple groups of Lie type, by Terence Tao ........................................ 361
S. Forcey (Reviewer), Topics in hyperplane arrangements, by Marcelo Aguiar and Swapneel Mahajan ......................... 367

Vol. 56, No. 3  July 2019

Articles

Jacob Bedrossian, Pierre Germain, and Nader Masmoudi, Stability of the Couette flow at high Reynolds numbers in two dimensions and three dimensions ........................................ 373
Jesús A. De Loera, Xavier Goaoc, Frédéric Meunier, and Nabil H. Mustafa, The discrete yet ubiquitous theorems of Carathéodory, Helly, Sperner, Tucker, and Tverberg ................................. 415

Mathematical Perspectives

Gerald L. Alexanderson and Leonard F. Klosinski, About the cover:
  Mathematicians in bronze ........................................... 513
  Selected Mathematical Reviews .................................... 521

Book Reviews

Sebastien Roch (Reviewer), Phylogeny—discrete and random processes in evolution, by Mike Steel ........................................ 527
Brett D. Wick (Reviewer), The theory of $H(b)$ spaces, Vol. 1, by Emmanuel Fricain and Javad Mashreghi; The theory of $H(b)$ spaces, Vol. 2, by Emmanuel Fricain and Javad Mashreghi ......................... 535

Vol. 56, No. 4  October 2019

Articles

János Kollár, Algebraic hypersurfaces ................................. 543
Vaughn Climenhaga, Yakov Pesin, and Agnieszka Zelerowicz,
  Equilibrium states in dynamical systems via geometric measure theory 569
Robert Benedetto, Patrick Ingram, Rafe Jones, Michelle Manes,
  Joseph H. Silverman, and Thomas J. Tucker, Current trends and open problems in arithmetic dynamics ............................. 611
Mathematical Perspectives

Herwig Hauser, About the cover: Quaste ........................................ 687
Selected Mathematical Reviews .................................................. 691

Book Reviews

Eviatar B. Procaccia (Reviewer), Random walks and heat kernels on graphs, by Martin T. Barlow ...................................................... 705
Ron Rosenthal (Reviewer), 50 years of first-passage percolation, by Antonio Auffinger, Michael Damron, and Jack Hanson ....................... 713
Editorial Board for Articles

Emmanuel Candes
Ivan Z. Corwin
Daniel S. Freed
Edward Frenkel
Susan Friedlander, Chair
Irene M. Gamba
Mark Goresky
Andrew Granville
Robert M. Guralnick
Herwig Hauser
Bryna R. Kra
William P. Minicozzi II
Ulrike Tillmann
Burt Totaro
Yuri Tschinkel
Maciej Zworski

Editorial Board for Book Reviews

David A. Cox
Mark Embree
Lisa Claire Jeffrey
Steven G. Krantz
Peter Kuchment, Chair
Ken Ono
Philip Protter
Israel Michael Sigal

Consultants to the Editors

Gerald L. Alexanderson
Edward G. Dunne
Leonard F. Klosinski

Chief Editor: Susan Friedlander

Editorial Information

Information on the backlog for this journal can be found on the AMS website starting from http://www.ams.org/bull.

In an effort to make articles available as quickly as possible, articles are electronically published on the AMS website individually after proof is returned from authors and before appearing in an issue.

A Consent to Publish is required before we can begin processing your paper. After a paper is accepted for publication, the Providence office will send a Consent to Publish form 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

The Bulletin publishes expository articles on contemporary mathematical research written in a way that gives insight to mathematicians who may not be experts in the particular topic. All articles submitted to this journal are peer reviewed. The AMS has a single-blind peer-review process in which the reviewers know who the authors of the manuscripts are, but the authors do not have access to information on who the peer reviewers are.

The first page must consist of a short descriptive title, followed by an abstract that summarizes the article in language suitable for mathematicians in the general area. The descriptive title should be short but informative; useless or vague phrases such as “some remarks about” or “concerning” should be avoided. The abstract should be a brief technical description of the new material.

A well-written expository article will include motivating problems and examples, some indication of the historical development of the subject, and of course the results and open problems that make it an interesting and exciting area of mathematics. In most cases proofs should be at most briefly sketched, and there should be a good bibliography whose main aim is to help those wishing to pursue the subject further. Articles reporting on recent mathematical research should include an introductory section addressed to nonexperts describing the motivation, background, and significance of the results announced.
Following the statement of results, there should be a sketch of proofs that may be addressed to experts, including elements of the proof which are novel. References should be given so that an interested reader can find the details.

Each paper should include a footnote with the 2010 Mathematics Subject Classification representing the primary and secondary subjects of the article. The classifications are accessible from www.ams.org/msc/. 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/msnhtml/serials.pdf. 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.

Mathematicians giving AMS lectures (Gibbs Lectures, Colloquium Lectures, and Progress in Mathematics Lectures) or invited hour addresses at meetings of the Society are encouraged to write up their lectures using the guidelines for expository articles described above. Submissions will be reviewed by the Editorial Board for Articles, and authors will be notified of its decision.

Book Reviews are by invitation only. The first page must include the title of the book being reviewed; the name(s) of the author(s); publisher; city of publication; year of publication; number of pages, including front matter; price if known; and ISBN. There should also be a footnote with the 2010 Mathematics Subject Classification representing the primary and secondary subjects of the book under review. The classifications are accessible from www.ams.org/msc/. To help in preparing and verifying references, the AMS offers MR Lookup, a Reference Tool for Linking, at www.ams.org/mrlookup/.

**Initial submission.** Authors of articles may submit manuscripts for consideration as PDF files at http://www.ams.org/peer-review/submission.pl. Manuscripts must be a single file with images embedded. Authors will have a chance to view the manuscript and data entered before releasing the manuscript into the system. Two-digit 2010 Mathematics Subject Classification numbers are included in a pull-down menu; classifications are accessible from http://www.ams.org/msc/. Complete author instructions are available at the site.

Authors who cannot supply a PDF file may submit a paper copy of their manuscript to Bulletin/Peer-Review Manuscript Submissions, 201 Charles Street, Providence, RI 02904-2213 USA. These submissions will be scanned into a PDF file and entered by AMS staff into the peer-review system. All the data required in the submission form must be provided to avoid delays in publishing the manuscript.

The Bulletin Chief Editor will be notified as new submissions arrive. The Editor will collect these submissions and assign them to subject area specialists.

**Electronically prepared manuscripts.** Manuscripts should be electronically prepared in \texttt{AMS-\LaTeX}. To this end, the Society has prepared \texttt{AMS-\LaTeX} 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 \texttt{AMS-\LaTeX} style file and the \texttt{\label} and \texttt{\ref} commands automatically enable extensive intra-document linking to the bibliography and other elements of the article for searching electronically on the Web.

Authors may retrieve an author package for the Bulletin of the AMS from www.ams.org/bull/bullauthorpac.html. The AMS Author Handbook is available in PDF format from the author package link. The author package can also be obtained free of charge by sending email to tech-support@ams.org or from the Publication Division, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2213 USA. When requesting an author package, please specify the publication in which your paper will appear. Please be sure to include your complete email address.
After acceptance. The source files for the final version of the electronic manuscript should be sent to the Providence office immediately after the paper has been accepted for publication. Authors should indicate if the paper has been prepared using \texttt{AMS-\LaTeX} or \texttt{AMS-\TeX}. Electronically prepared manuscripts can be submitted via the Web at \url{www.ams.org/submit-book-journal/}, sent via email to \texttt{pub-submit@ams.org}, or sent on CD to the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2213 USA. When sending a manuscript electronically via email or CD, please be sure to include a message indicating in which publication the paper has been accepted. Complete instructions on how to send files are included in the author package.

The final file of an accepted article should also be sent by email to both \texttt{bulletin@math.uic.edu} and \texttt{susan@math.northwestern.edu}.

Electronic graphics. Comprehensive instructions on preparing graphics are available from \url{www.ams.org/authors/journals.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.

Authors using graphics packages for the creation of electronic art should 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 publication. Articles are published on 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 published to the AMS website, changes cannot be made in place in 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 electronically published.

Corrections of critical errors may be made to the paper by submitting an errata article to the Editor. The errata article will be published electronically, will appear in a future print issue, and will link back and forth on the Web with the original article.

Secure manuscript tracking on the Web. 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 \url{www.ams.org/mstrack/}. An explanation of each production step is provided on the Web through links from the manuscript tracking screen. Questions may be sent to \texttt{bull-query@ams.org}.

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 \texttt{bull-query@ams.org} or directly to the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2213 USA.
BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY

CONTENTS

Vol. 56, No. 4 October 2019

ARTICLES

János Kollár, Algebraic hypersurfaces ................................. 543
Vaughn Climenhaga, Yakov Pesin, and Agnieszka Zelerowicz,
Equilibrium states in dynamical systems via geometric measure theory 569
Robert Benedetto, Patrick Ingram, Rafe Jones, Michelle Manes,
Joseph H. Silverman, and Thomas J. Tucker,
Current trends and open problems in arithmetic dynamics ....................... 611

MATHEMATICAL PERSPECTIVES

Herwig Hauser, About the cover: Quaste ............................... 687
Selected Mathematical Reviews ........................................... 691

BOOK REVIEWS

Eviatar B. Procaccia (Reviewer), Random walks and heat kernels on graphs, by Martin T. Barlow ........................................ 705
Ron Rosenthal (Reviewer), 50 years of first-passage percolation, by Antonio Auffinger, Michael Damron, and Jack Hanson ....................... 713