
VOLUME 358 NUMBER 12



DECEMBER 2006

WHOLE NUMBER 859

TRANSACTIONS

OF THE

A M E R I C A N M A T H E M A T I C A L S O C I E T Y

EDITED BY

Dan Abramovich

Alejandro Adem

Peter W. Bates

Mladen Bestvina

Krzysztof Burdzy

Tobias Colding

Marius Dadarlat

Robert Guralnick, Managing Editor

Lisa C. Jeffrey

Alexander Kleshchev

Steffen Lemp

V. Kumar Murty

Alexander Nagel

Gustavo Ponce

Robert J. Stanton

John R. Stembridge

Daniel Tataru

Mina Teicher

Amie Wilkinson

PROVIDENCE, RHODE ISLAND USA

ISSN 0002-9947

Available electronically at
www.ams.org/tran/

Transactions of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics.

Submission information. See **Information for Authors** at the end of this issue.

Publisher Item Identifier. The Publisher Item Identifier (PII) appears at the top of the first page of each article published in this journal. This alphanumeric string of characters uniquely identifies each article and can be used for future cataloging, searching, and electronic retrieval.

Postings to the AMS website. Articles are posted to the AMS website individually after proof is returned from authors and before appearing in an issue.

Subscription information. *Transactions of the American Mathematical Society* is published monthly. Beginning in January 1996 *Transactions* is accessible from www.ams.org/journals/. Subscription prices for Volume 358 (2006) are as follows: for paper delivery, US\$1677 list, US\$1342 institutional member, US\$1509 corporate member; for electronic delivery, US\$1509 list, US\$1207 institutional member, US\$1358 corporate member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. If ordering the paper version, add US\$39 for surface delivery outside the United States and India; US\$51 to India. Expedited delivery to destinations in North America is US\$50; elsewhere US\$144. For paper delivery a late charge of 10% of the subscription price will be imposed upon orders received from nonmembers after January 1 of the subscription year.

Back number information. For back issues see www.ams.org/bookstore.

Subscriptions and orders should be addressed to the American Mathematical Society, P.O. Box 845904, Boston, MA 02284-5904 USA. *All orders must be accompanied by payment.* Other correspondence should be addressed to 201 Charles Street, Providence, RI 02904-2294 USA.

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 Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. 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.)

Transactions of the American Mathematical Society is published monthly by the American Mathematical Society at 201 Charles Street, Providence, RI 02904-2294 USA. Periodicals postage is paid at Providence, Rhode Island. Postmaster: Send address changes to *Transactions*, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA.

© 2006 by the American Mathematical Society. All rights reserved.

This journal is indexed in *Mathematical Reviews*, *Zentralblatt MATH*, *Science Citation Index*[®], *Science Citation Index*TM-*Expanded*, *ISI Alerting Services*SM, *CompuMath Citation Index*[®], and *Current Contents*[®]/*Physical, Chemical & Earth Sciences*.

Printed in the United States of America.

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

10 9 8 7 6 5 4 3 2 1 11 10 09 08 07 06

TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY

CONTENTS

Vol. 358, No. 12

Whole No. 859

December 2006

V. V. Bludov and A. M. W. Glass, On the variety generated by all nilpotent lattice-ordered groups	5179
John Douglas Moore, Bumpy metrics and closed parametrized minimal surfaces in Riemannian manifolds	5193
Robert J. Daverman and Thomas L. Thickstun, The 3-manifold recognition problem	5257
Dorin Ervin Dutkay, Low-pass filters and representations of the Baumslag Solitar group	5271
M. Schechter and W. Zou, Sign-changing critical points from linking type theorems	5293
Mishio Kawashita, Wakako Kawashita, and Hideo Soga, Scattering theory for the elastic wave equation in perturbed half-spaces	5319
Vladimir Derkach, Seppo Hassi, Mark Malamud, and Henk de Snoo, Boundary relations and their Weyl families	5351
Sudhir R. Ghorpade and K. N. Raghavan, Hilbert functions of points on Schubert varieties in the symplectic Grassmannian	5401
Seiichi Kamada, Shin Satoh, and Manabu Takabayashi, The braid index is not additive for the connected sum of 2-knots	5425
Wendy Lowen and Michel Van den Bergh, Deformation theory of abelian categories	5441
Antonio Laface and Luca Ugaglia, On a class of special linear systems of \mathbb{P}^3	5485
Leonardo Colzani, Fourier expansions of functions with bounded variation of several variables	5501
Massimiliano Mella, Singularities of linear systems and the Waring problem	5523
Markus Kiderlen, Blaschke- and Minkowski-endomorphisms of convex bodies	5539
Antonio Lanteri and Roberto Muñoz, Varieties with small discriminant variety	5565
Zdzisław Brzeźniak and Yuhong Li, Asymptotic compactness and absorbing sets for 2D stochastic Navier-Stokes equations on some unbounded domains	5587
Sergey Antonyan, Corrigendum to “West’s problem on equivariant hyperspaces and Banach-Mazur compacta”	5631
Bo Chen and Zhi Lü, Corrections to “Involutions fixing $\mathbb{R}\mathbb{P}^{\text{odd}} \sqcup P(h, i)$, II”	5635

INDEX TO VOLUME 358 (2006)

- Adams, C., A. Colestock, J. Fowler, W. Gillam, and E. Katerman. *Cusp size bounds from singular surfaces in hyperbolic 3-manifolds*, 727
- Adem, Alejandro, and Jianzhong Pan. *Toroidal orbifolds, gerbes and group cohomology*, 3969
- Agol, Ian, Joel Hass, and William Thurston. *The computational complexity of knot genus and spanning area*, 3821
- Aharoni, Ron, and Eli Berger. *The intersection of a matroid and a simplicial complex*, 4895
- Ai, Shangbing, Xinfu Chen, and Stuart P. Hastings. *Layers and spikes in non-homogeneous bistable reaction-diffusion equations*, 3169
- Antonyan, Sergey. *Corrigendum to "West's problem on equivariant hyperspaces and Banach-Mazur compacta"*, 5631
- Arcozzi, Nicola, Enrico Casadio Tarabusi, Fausto Di Biase, and Massimo A. Picardello. *Twist points of planar domains*, 2781
- Asadollahi, Javad, and Shokrollah Salarian. *Cohomology theories based on Gorenstein injective modules*, 2183
- Aschbacher, Michael, Michael K. Kinyon, and J. D. Phillips. *Finite Bruck loops*, 3061
- Ashwin, Peter, and Arek Goetz. *Polygonal invariant curves for a planar piecewise isometry*, 373
- Baddeley, Robert W., Cheryl E. Praeger, and Csaba Schneider. *Imately transitive subgroups of wreath products in product action*, 1619
- Bahls, Patrick. *Automorphisms of Coxeter groups*, 1781
- Banagl, Markus. *On topological invariants of stratified maps with non-Witt target*, 1921
- Bande, G., and D. Kotschick. *The geometry of symplectic pairs*, 1643
- Barnea, Y., and D. S. Passman. *Filtrations in semisimple Lie algebras, I*, 1983
- Bartholdi, Laurent, and Said N. Sidki. *The automorphism tower of groups acting on rooted trees*, 329
- Bayart, Frédéric, and Sophie Grivaux. *Frequently hypercyclic operators*, 5083
- Behrens, Mark. *Root invariants in the Adams spectral sequence*, 4279
- Bell, G. C., and A. N. Dranishnikov. *A Hurewicz-type theorem for asymptotic dimension and applications to geometric group theory*, 4749
- Bendersky, Martin, Donald M. Davis, and Mark Mahowald. *Stable geometric dimension of vector bundles over even-dimensional real projective spaces*, 1585
- Benedetto, John J., and Alexander M. Powell. *A (p, q) version of Bourgain's theorem*, 2489
- Ben-Gal, Nitsan, Abby Shaw-Krauss, Robert S. Strichartz, and Clint Young. *Calculus on the Sierpinski gasket II: Point singularities, eigenfunctions, and normal derivatives of the heat kernel*, 3883
- Berend, Daniel, and Jørgen E. Harmse. *On polynomial-factorial diophantine equations*, 1741
- Berger, Eli. *See Aharoni, Ron*
- Berkove, Ethan. *The integral cohomology of the Bianchi groups*, 1033
- Berkovich, Alexander, and Frank G. Garvan. *On the Andrews-Stanley refinement of Ramanujan's partition congruence modulo 5 and generalizations*, 703
- Bessenrodt, Christine, and Jørn B. Olsson. *On Cartan matrices and lower defect groups for covering groups of symmetric groups*, 3623
- Bielawski, Roger. *Manifolds with an $SU(2)$ -action on the tangent bundle*, 3997
- Bigorajska, Teresa, and Henryk Kotlarski. *Partitioning α -large sets: Some lower bounds*, 4981
- Biliotti, Leonardo. *Coisotropic and polar actions on compact irreducible Hermitian symmetric spaces*, 3003
- Bini, Gilberto, and Claudio Fontanari. *Moduli of curves and spin structures via algebraic geometry*, 3207
- Blaom, Anthony D. *Geometric structures as deformed infinitesimal symmetries*, 3651
- Blokh, Alexander, Lex Oversteegen, and E. D. Tymchatyn. *On almost one-to-one maps*, 5003
- Bludov, V. V., and A. M. W. Glass. *On the variety generated by all nilpotent lattice-ordered groups*, 5179
- Boca, Florin P., and Alexandru Zaharescu. *On the correlations of directions in the Euclidean plane*, 1797
- Böhm, Christoph, and Megan M. Kerr. *Low-dimensional homogeneous Einstein manifolds*, 1455
- Bökstedt, Marcel, and Iver Ottosen. *An alternative approach to homotopy operations*, 3985
- Bombieri, E., D. Masser, and U. Zannier. *Intersecting curves and algebraic subgroups: Conjectures and more results*, 2247

- Bownik, Marcin, and Kwok-Pun Ho. *Atomic and molecular decompositions of anisotropic Triebel-Lizorkin spaces*, 1469
- Brändén, Petter. *On linear transformations preserving the Pólya frequency property*, 3697
- Braverman, Maxim, and Valentin Silant'ev. *Kirwan-Novikov inequalities on a manifold with boundary*, 3329
- Brzeźniak, Zdzisław, and Yuhong Li. *Asymptotic compactness and absorbing sets for 2D stochastic Navier-Stokes equations on some unbounded domains*, 5587
- Byrnes, Christopher I., Tryphon T. Georgiou, Anders Lindquist, and Alexander Megretski. *Generalized interpolation in H^∞ with a complexity constraint*, 965
- Cai, Jin-Xing. *Automorphisms of fiber surfaces of genus 2, inducing the identity in cohomology*, 1187
- Caldero, P., F. Chapoton, and R. Schiffler. *Quivers with relations arising from clusters (A_n case)*, 1347
- Calegari, Danny. *Dynamical forcing of circular groups*, 3473
- Carey, Richard W., and Joel D. Pincus. *Steinberg symbols modulo the trace class, holonomy, and limit theorems for Toeplitz determinants*, 509
- Carlson, Timothy J., Neil Hindman, and Dona Strauss. *An infinitary extension of the Graham-Rothschild Parameter Sets Theorem*, 3239
- Casadio Tarabusi, Enrico. *See Arcozzi, Nicola*
- Castellana, Natália. *On the p -compact groups corresponding to the p -adic reflection groups $G(q, r, n)$* , 2799
- Cha, Jae Choon, and Ki Hyoung Ko. *Signature invariants of covering links*, 3399
- Chandler, David B., Peter Sin, and Qing Xiang. *The invariant factors of the incidence matrices of points and subspaces in $PG(n, q)$ and $AG(n, q)$* , 4935
- Chapoton, F. *See Caldero, P.*
- Chappa, Eduardo. *On the characterization of the kernel of the geodesic X-ray transform*, 4793
- Chen, Bing-Long, Xiao-Yong Fu, Le Yin, and Xi-Ping Zhu. *Sharp dimension estimates of holomorphic functions and rigidity*, 1435
- Chen, Bo, and Zhi Lü. *Corrections to "Involutions fixing $\mathbb{RP}^{\text{odd}} \sqcup P(h, i)$, II"*, 5635
- Chen, Gui-Qiang, and Kenneth H. Karlsen. *L^1 -framework for continuous dependence and error estimates for quasilinear anisotropic degenerate parabolic equations*, 937
- Chen, Xinfu. *See Ai, Shangbing*
- Cheng, Qing-Ming, and Hongcang Yang. *Inequalities for eigenvalues of a clamped plate problem*, 2625
- Chéniot, D., and C. Eyral. *Homotopical variations and high-dimensional Zariski-van Kampen theorems*, 1
- Chern, Peter Tien-Yu. *On meromorphic functions with finite logarithmic order*, 473
- Childs, Lindsay N. *See Underwood, Robert G.*
- Chin, William, and Leonid Krop. *Spectra of quantized hyperalgebras*, 4553
- Christiansen, Jacob S., and Mourad E. H. Ismail. *A moment problem and a family of integral evaluations*, 4071
- Christiansen, T. *Resonances for steplike potentials: Forward and inverse results*, 2071
- Ciaurri, Óscar, and Krzysztof Stempak. *Transplantation and multiplier theorems for Fourier-Bessel expansions*, 4441
- Coandă, I., and G. Trautmann. *Horrocks theory and the Bernstein-Gel'fand-Gel'fand correspondence*, 1015
- Colestock, A. *See Adams, C.*
- Collet, Pierre, Servet Martinez, and Jaime San Martin. *Ratio limit theorem for parabolic horn-shaped domains*, 5059
- Colzani, Leonardo. *Fourier expansions of functions with bounded variation of several variables*, 5501
- Conder, M. D. E., C. R. Leedham-Green, and E. A. O'Brien. *Constructive recognition of $PSL(2, q)$* , 1203
- Cox, Anton, and Alison Parker. *Homomorphisms between Weyl modules for $SL_3(k)$* , 4159
- Curto, Raúl E., and Jasang Yoon. *Jointly hyponormal pairs of commuting subnormal operators need not be jointly subnormal*, 5139
- Czarnecki, Marc-Olivier, and Ludovic Rifford. *Approximation and regularization of Lipschitz functions: Convergence of the gradients*, 4467

- Dalang, Robert C., and Olivier Lévêque. *Second-order hyperbolic s.p.d.e.'s driven by homogeneous Gaussian noise on a hyperplane*, 2123
- D'Ambrosio, Lorenzo, Enzo Mitidieri, and Stanislav I. Pohozaev. *Representation formulae and inequalities for solutions of a class of second order partial differential equations*, 893
- Daverman, Robert J., and Thomas L. Thickstun. *The 3-manifold recognition problem*, 5257
- Davis, Donald M. *See Bendersky, Martin*
- Davis, James F., and Swatee Naik. *Alexander polynomials of equivariant slice and ribbon knots in S^3* , 2949
- De Maesschalck, Peter, and Freddy Dumortier. *Canard solutions at non-generic turning points*, 2291
- Deng, Bangming, and Jie Du. *Frobenius morphisms and representations of algebras*, 3591
- Deng, Donggao, Yongsheng Han, and Dachun Yang. *Besov spaces with non-doubling measures*, 2965
- Derkach, Vladimir, Seppo Hassi, Mark Malamud, and Henk de Snoo. *Boundary relations and their Weyl families*, 5351
- Di Biase, Fausto. *See Arcozzi, Nicola*
- Dilworth, S. J., Ralph Howard, and James W. Roberts. *A general theory of almost convex functions*, 3413
- Ding, Pisheng. *Topological obstructions to certain Lie group actions on manifolds*, 3937
- Dranishnikov, A. N. *See Bell, G. C.*
- Du, Jie. *See Deng, Bangming*
- Dumortier, Freddy. *See De Maesschalck, Peter*
- Dutkay, Dorin Ervin. *Low-pass filters and representations of the Baumslag Solitar group*, 5271
- Dydak, Jerzy. *Algebra of dimension theory*, 1537
- Efrat, Ido. *A generalization of Marshall's equivalence relation*, 2561
- Eyral, C. *See Chéniot, D.*
- Farmaki, V., and S. Negrepointis. *Block combinatorics*, 2759
- de Fernex, Tommaso. *Length, multiplicity, and multiplier ideals*, 3717
- Fløystad, Gunnar. *Koszul duality and equivalences of categories*, 2373
- Fonf, V. P., W. B. Johnson, A. M. Plichko, and V. V. Shevchyk. *Covering a compact set in a Banach space by an operator range of a Banach space with basis*, 1421
- Fontanari, Claudio. *See Bini, Gilberto*
- Fontich, Ernest, Rafael de la Llave, and Pau Martín. *Invariant pre-foliations for non-resonant non-uniformly hyperbolic systems*, 1317
- Foth, Philip, and Jiang-Hua Lu. *Poisson structures on complex flag manifolds associated with real forms*, 1705
- Fowler, J. *See Adams, C.*
- Fu, Xiao-Yong. *See Chen, Bing-Long*
- Fuchs, Laszlo, William Heinzer, and Bruce Olberding. *Commutative ideal theory without finiteness conditions: Completely irreducible ideals*, 3113
- Fulman, Jason. *Martingales and character ratios*, 4533
- Garcia, Stephan Ramon, and Mihai Putinar. *Complex symmetric operators and applications*, 1285
- Garibaldi, Skip. *Unramified cohomology of classifying varieties for exceptional simply connected groups*, 359
- Garofalo, Nicola, and Federico Tournier. *New properties of convex functions in the Heisenberg group*, 2011
- Garvan, Frank G. *See Berkovich, Alexander*
- Gehrke, Mai, John Harding, and Yde Venema. *MacNeille completions and canonical extensions*, 573
- Geisser, Thomas, and Lars Hesselholt. *On the K-theory and topological cyclic homology of smooth schemes over a discrete valuation ring*, 131
- Georgiou, Tryphon T. *See Byrnes, Christopher I.*
- Gesztesy, Fritz, Karl Unterkofler, and Rudi Weikard. *An explicit characterization of Calogero-Moser systems*, 603
- Ghomi, Mohammad, and Marek Kossowski. *h -principles for hypersurfaces with prescribed principle curvatures and directions*, 4379

- Ghorpade, Sudhir R., and K. N. Raghavan. *Hilbert functions of points on Schubert varieties in the symplectic Grassmannian*, 5401
- Giaimo, Daniel. *On the Castelnuovo-Mumford regularity of connected curves*, 267
- Gillam, W. *See Adams, C.*
- Gillespie, James. *The flat model structure on complexes of sheaves*, 2855
- Glass, A. M. W. *See Bludov, V. V.*
- Godinho, L. *Semifree symplectic circle actions on 4-orbifolds*, 4919
- Goetz, Arek. *See Ashwin, Peter*
- Gonzalez, Eduardo. *Quantum cohomology and S^1 -actions with isolated fixed points*, 2927
- Gorkin, Pamela, and Raymond Mortini. *Norms and essential norms of linear combinations of endomorphisms*, 553
- Gorla, Elisa. *The general hyperplane section of a curve*, 819
- Gray, Brayton. *On decompositions in homotopy theory*, 3305
- Greenblatt, Michael. *Newton polygons and local integrability of negative powers of smooth functions in the plane*, 657
- Grivaux, Sophie. *See Bayart, Frédéric*
- Gröchenig, Karlheinz, and Michael Leinert. *Symmetry and inverse-closedness of matrix algebras and functional calculus for infinite matrices*, 2695
- Grønbaek, Niels. *Bounded Hochschild cohomology of Banach algebras with a matrix-like structure*, 2651
- Gutiérrez, Cristian E., and Federico Tournier. *$W^{2,p}$ -estimates for the linearized Monge–Ampère equation*, 4843
- Hajduk, Bogusław, and Rafał Walczak. *Symplectic forms invariant under free circle actions on 4-manifolds*, 1953
- Hambly, B. M., and Michel L. Lapidus. *Random fractal strings: Their zeta functions, complex dimensions and spectral asymptotics*, 285
- Han, Qing, Jia-Xing Hong, and Chang-Shou Lin. *On the Cauchy problem of degenerate hyperbolic equations*, 4021
- Han, Yongsheng. *See Deng, Donggao*
- Hanke, Bernhard, and Volker Puppe. *Equivariant Gysin maps and pulling back fixed points*, 687
- Harding, John. *See Gehrke, Mai*
- Harmse, Jørgen E. *See Berend, Daniel*
- Hass, Joel. *See Agol, Ian*
- Hassi, Seppo. *See Derkach, Vladimir*
- Hastings, Stuart P. *See Ai, Shangbing*
- Hayashi, Nakao, Elena I. Kaikina, and Pavel I. Naumkin. *Damped wave equation with a critical nonlinearity*, 1165
- Heinzer, William. *See Fuchs, Laszlo*
- Herrero, M. A., G. E. Oleaga, and J. J. L. Velázquez. *On the Eshelby-Kostrov property for the wave equation in the plane*, 3673
- Herzog, Jürgen, Takayuki Hibi, and Xinxian Zheng. *The monomial ideal of a finite meet-semilattice*, 4119
- Hesselholt, Lars. *See Geisser, Thomas*
- Hibi, Takayuki. *See Herzog, Jürgen*
- Hidalgo, Rubén, and Bernard Maskit. *On neoclassical Schottky groups*, 4765
- Himonas, A. Alexandrou, and Gerson Petronilho. *On C^∞ and Gevrey regularity of sublaplacians*, 4809
- Hindman, Neil. *See Carlson, Timothy J.*
- Ho, Kwok-Pun. *See Bownik, Marcin*
- Hoffman, David, Jorge H. S. de Lira, and Harold Rosenberg. *Constant mean curvature surfaces in $M^2 \times \mathbf{R}$* , 491
- Hoffman, J. William, and Hao Hao Wang. *Curvilinear base points, local complete intersection and Koszul syzygies in biprojective spaces*, 3385
- Homburg, Ale Jan, and Jürgen Knobloch. *Multiple homoclinic orbits in conservative and reversible systems*, 1715
- Homma, Yasushi. *Bochner-Weitzenböck formulas and curvature actions on Riemannian manifolds*, 87

- Honda, Nobuhiro. *Non-Moishezon twistor spaces of $4\mathbb{C}P^2$ with non-trivial automorphism group*, 1897
- Hong, Jia-Xing. *See Han, Qing*
- Hörmann, Günther, Michael Oberguggenberger, and Stevan Pilipović. *Microlocal hypoellipticity of linear partial differential operators with generalized functions as coefficients*, 3363
- Horváth, Miklós. *Inverse scattering with fixed energy and an inverse eigenvalue problem on the half-line*, 5161
- Howard, Ralph. *See Dilworth, S. J.*
- Ih, Su-ion. *Height uniformity for integral points on elliptic curves*, 1657
- Irwin, Trevor, and Sławomir Solecki. *Projective Fraïssé limits and the pseudo-arc*, 3077
- Ismail, Mourad E. H. *See Christiansen, Jacob S.*
- Jacobowitz, Howard. *Generic systems of co-rank one vector distributions*, 4521
- Janakiraman, Prabhu. *Limiting weak-type behavior for singular integral and maximal operators*, 1937
- de Jeu, Marcel. *Paley–Wiener theorems for the Dunkl transform*, 4225
- Johansen, Ørjan, and Alf B. Rustad. *Construction and properties of quasi-linear functionals*, 2735
- Johnson, W. B. *See Fonf, V. P.*
- Jose, Selby, and Ravi A. Rao. *A structure theorem for the elementary unimodular vector group*, 3097
- Kaikina, Elena I. *See Hayashi, Nakao*
- Kamada, Seiichi, Shin Satoh, and Manabu Takabayashi. *The braid index is not additive for the connected sum of 2-knots*, 5425
- Karlsen, Kenneth H. *See Chen, Gui-Qiang*
- Kartsatos, Athanassios G., and Igor V. Skrypnik. *On the eigenvalue problem for perturbed non-linear maximal monotone operators in reflexive Banach spaces*, 3851
- Katman, E. *See Adams, C.*
- Kawashita, Mishio, Wakako Kawashita, and Hideo Soga. *Scattering theory for the elastic wave equation in perturbed half-spaces*, 5319
- Kawashita, Wakako. *See Kawashita, Mishio*
- Kenig, Carlos E., and Yvan Martel. *Global well-posedness in the energy space for a modified KP II equation via the Miura transform*, 2447
- Kerr, Megan M. *See Böhm, Christoph*
- Khovanov, Mikhail. *An invariant of tangle cobordisms*, 315
- Kiderlen, Markus. *Blaschke- and Minkowski-endomorphisms of convex bodies*, 5539
- Kim, Min Kyu. *Frankel’s theorem in the symplectic category*, 4367
- Kinnunen, Juha, and Nageswari Shanmugalingam. *Polar sets on metric spaces*, 11
- Kinyon, Michael K. *See Aschbacher, Michael*
- Kleppe, Jan O. *Maximal families of Gorenstein algebras*, 3133
- Knobloch, Jürgen. *See Homburg, Ale Jan*
- Ko, Ki Hyoung. *See Cha, Jae Choon*
- Komendarczyk, R. *On the contact geometry of nodal sets*, 2399
- König, Wolfgang, and Peter Mörters. *Brownian intersection local times: Exponential moments and law of large masses*, 1223
- Kossowski, Marek. *See Ghomi, Mohammad*
- Kotlarski, Henryk. *See Bigorajska, Teresa*
- Kotschick, D. *See Bande, G.*
- Kovacic, Jerald J. *Geometric characterization of strongly normal extensions*, 4135
- Kowalski, Piotr, and Anand Pillay. *Quantifier elimination for algebraic D -groups*, 167
- Krop, Leonid. *See Chin, William*
- Krötz, Bernhard, and Michael Otto. *Lagrangian submanifolds and moment convexity*, 799
- Kruglikov, Boris, and Valentin Lychagin. *Mayer brackets and solvability of PDEs – II*, 1077
- Kulczycki, Tadeusz, and Bartłomiej Siudeja. *Intrinsic ultracontractivity of the Feynman-Kac semigroup for relativistic stable processes*, 5025
- Kummer, Martin. *The complexity of recursion theoretic games*, 59
- Kunyavskii, Boris È., Louis H. Rowen, Sergey V. Tikhonov, and Vyacheslav I. Yanchevskii. *Bi-cyclic algebras of prime exponent over function fields*, 2579

- Lacey, Michael T., and Xiaochun Li. *Maximal theorems for the directional Hilbert transform on the plane*, 4099
- Laface, Antonio, and Luca Ugaglia. *On a class of special linear systems of \mathbb{P}^3* , 5485
- Lam, Ngau, and R. B. Zhang. *Quasi-finite modules for Lie superalgebras of infinite rank*, 403
- Lamel, Bernhard. *Explicit bounds for the finite jet determination problem*, 3447
- Landers, D., and L. Rogge. *Lower and upper Loeb-integrals*, 3263
- Lanteri, Antonio, and Roberto Muñoz. *Varieties with small discriminant variety*, 5565
- Lapidus, Michel L. *See Hambly, B. M.*
- Lasserre, Jean B. *A moment approach to analyze zeros of triangular polynomial sets*, 1403
- Lau, Yuk-Kam, and Jie Wu. *A density theorem on automorphic L -functions and some applications*, 441
- Lee, Hyeonmi. *Crystals of type $D_n^{(1)}$ and Young walls*, 1847
- Lee, Kang-Hyurk. *Almost complex manifolds and Cartan's uniqueness theorem*, 2057
- Lee, Sanghyuk. *Bilinear restriction estimates for surfaces with curvatures of different signs*, 3511
- Leedham-Green, C. R. *See Conder, M. D. E.*
- Leinert, Michael. *See Gröchenig, Karlheinz*
- Lévêque, Olivier. *See Dalang, Robert C.*
- Li, Cai Heng. *Finite edge-transitive Cayley graphs and rotary Cayley maps*, 4605
- Li, Xiaochun. *See Lacey, Michael T.*
- Li, Yuhong. *See Brzeźniak, Zdzisław*
- Lin, Chang-Shou. *See Han, Qing*
- Lindquist, Anders. *See Byrnes, Christopher I.*
- de Lira, Jorge H. S. *See Hoffman, David*
- Littmann, Friedrich. *Entire majorants via Euler–Maclaurin summation*, 2821
- Liu, Pei-Dong, and Jian-Sheng Xie. *Dimension of hyperbolic measures of random diffeomorphisms*, 3751
- Liu, Yue, Xiao-Ping Wang, and Ke Wang. *Instability of standing waves of the Schrödinger equation with inhomogeneous nonlinearity*, 2105
- Liu, Yuming, and Changchang Xi. *Construction of stable equivalences of Morita type for finite-dimensional algebras I*, 2537
- de la Llave, Rafael. *See Fontich, Ernest*
- López, F. J., Francisco Martin, and Santiago Morales. *Complete nonorientable minimal surfaces in a ball of \mathbb{R}^3* , 3807
- Lorenz, Martin. *On the Cohen-Macaulay property of multiplicative invariants*, 1605
- Lowen, Wendy, and Michel Van den Bergh. *Deformation theory of abelian categories*, 5441
- Lu, Jiang-Hua. *See Foth, Philip*
- Lü, Zhi. *See Chen, Bo*
- Lychagin, Valentin. *See Kruglikov, Boris*
- Lytchak, Alexander, and Asli Yaman. *On Hölder continuous Riemannian and Finsler metrics*, 2917
- Magnanini, R., J. Prajapat, and S. Sakaguchi. *Stationary isothermic surfaces and uniformly dense domains*, 4821
- Mahowald, Mark. *See Bendersky, Martin*
- Maier, Robert S. *A generalization of Euler's hypergeometric transformation*, 39
- Malamud, Mark. *See Derkach, Vladimir*
- Marco, José Manuel, and Javier Parcet. *A new approach to the theory of classical hypergeometric polynomials*, 183
- Markl, Martin, and Steve Shnider. *Associahedra, cellular W -construction and products of A_∞ -algebras*, 2353
- Markovic, Vladimir, and Dragomir Šarić. *Teichmüller mapping class group of the universal hyperbolic solenoid*, 2637
- Martel, Yvan. *See Kenig, Carlos E.*
- Martin, Francisco. *See López, F. J.*
- Martín, Pau. *See Fontich, Ernest*
- Martínez, Consuelo, and Efim Zelmanov. *Unital bimodules over the simple Jordan superalgebra $D(t)$* , 3637

- Martínez, Cristina. *The degree of the variety of rational ruled surfaces and Gromov-Witten invariants*, 2611
- Martinez, Servet. *See Collet, Pierre*
- Maryama, Ken-ichi. *π_* -kernels of Lie groups*, 2335
- Maskit, Bernard. *See Hidalgo, Rubén*
- Massaneda, Xavier, Joaquim Ortega-Cerdà, and Myriam Ounaies. *A geometric characterization of interpolation in $\mathcal{E}'(\mathbb{R})$* , 3459
- Masser, D. *See Bombieri, E.*
- Matsuki, Toshihiko. *Equivalence of domains arising from duality of orbits on flag manifolds*, 2217
- Mattman, Thomas, Katura Miyazaki, and Kimihiko Motegi. *Seifert-fibered surgeries which do not arise from primitive/Seifert-fibered constructions*, 4045
- Mauer-Oats, Andrew. *Algebraic Goodwillie calculus and a cotriple model for the remainder*, 1869
- Megretski, Alexander. *See Byrnes, Christopher I.*
- Mella, Massimiliano. *Singularities of linear systems and the Waring problem*, 5523
- Mese, Chikako, and Sumio Yamada. *The parameterized Steiner problem and the singular Plateau problem via energy*, 2875
- Miatello, Roberto J., and Ricardo A. Podestá. *The spectrum of twisted Dirac operators on compact flat manifolds*, 4569
- Miller, Daniel J. *A preparation theorem for Weierstrass systems*, 4395
- Mishou, Hidehiko, and Hirofumi Nagoshi. *Functional distribution of $L(s, \chi_d)$ with real characters and denseness of quadratic class numbers*, 4343
- Mitidieri, Enzo. *See D'Ambrosio, Lorenzo*
- Miyazaki, Katura. *See Mattman, Thomas*
- Moore, John Douglas. *Bumpy metrics and closed parametrized minimal surfaces in Riemannian manifolds*, 5193
- Morales, Santiago. *See López, F. J.*
- Mörters, Peter. *See König, Wolfgang*
- Mortini, Raymond. *See Gorkin, Pamela*
- Motegi, Kimihiko. *See Mattman, Thomas*
- Muić, Goran. *On the non-unitary unramified dual for classical p -adic groups*, 4653
- Muñoz, Roberto. *See Lanteri, Antonio*
- Mustață, Mircea. *Multiplicator ideals of hyperplane arrangements*, 5015
- Nagasaki, Ikumitsu. *Isovariant Borsuk-Ulam results for pseudofree circle actions and their converse*, 743
- Nagel, Uwe, and Tim Römer. *Extended degree functions and monomial modules*, 3571
- Nagoshi, Hirofumi. *See Mishou, Hidehiko*
- Naik, Swatee. *See Davis, James F.*
- Nakamura, Gen, and Jenn-Nan Wang. *The limiting absorption principle for the two-dimensional inhomogeneous anisotropic elasticity system*, 147
- . *Unique continuation for the two-dimensional anisotropic elasticity system and its applications to inverse problems*, 2837
- Nakasuji, Maki. *Prime geodesic theorem for higher-dimensional hyperbolic manifold*, 3285
- Nasu, Masakazu. *Nondegenerate q -biresolving textile systems and expansive automorphisms of onesided full shifts*, 871
- Naumkin, Pavel I. *See Hayashi, Nakao*
- Negrepontis, S. *See Farmaki, V.*
- Neusel, Mara D. *Inseparable extensions of algebras over the Steenrod algebra with applications to modular invariant theory of finite groups*, 4689
- Nishiyama, Kyo, Hiroyuki Ochiai, and Chen-bo Zhu. *Theta lifting of nilpotent orbits for symmetric pairs*, 2713
- Oberguggenberger, Michael. *See Hörmann, Günther*
- O'Brien, E. A. *See Conder, M. D. E.*
- Ochiai, Hiroyuki. *See Nishiyama, Kyo*
- Olberding, Bruce. *See Fuchs, Laszlo*
- Oleaga, G. E. *See Herrero, M. A.*
- Olsson, Jørn B. *See Bessenrodt, Christine*
- Ortega-Cerdà, Joaquim. *See Massaneda, Xavier*

- Otto, Michael. *See* Krötz, Bernhard
- Ottosen, Iver. *See* Bökstedt, Marcel
- Ounaies, Myriam. *See* Massaneda, Xavier
- Oversteegen, Lex. *See* Blokh, Alexander
- Pakianathan, Jonathan, and Sarah Witherspoon, and with an appendix by Stephen F. Siegel. *Quillen stratification for Hochschild cohomology of blocks*, 2897
- Palmieri, J. H. *Some quotient Hopf algebras of the dual Steenrod algebra*, 671
- Pan, Jianzhong. *See* Adem, Alejandro
- Pan, Shu-Yen. *Local theta correspondence for small unitary groups*, 1511
- Parcet, Javier. *See* Marco, José Manuel
- Park, Euisung. *On higher syzygies of ruled surfaces*, 3733
- Parker, Alison. *See* Cox, Anton
- Pascucci, Andrea, and Sergio Polidoro. *Harnack inequalities and Gaussian estimates for a class of hypoelliptic operators*, 4873
- Passman, D. S. *See* Barnea, Y.
- Pedregal, Pablo. *Multi-scale Young measures*, 591
- Petronilho, Gerson. *See* Himonas, A. Alexandrou
- Phillips, J. D. *See* Aschbacher, Michael
- Picardello, Massimo A. *See* Arcozzi, Nicola
- Pilipović, Stevan. *See* Hörmann, Günther
- Pillay, Anand. *See* Kowalski, Piotr
- Pincus, Joel D. *See* Carey, Richard W.
- Plichko, A. M. *See* Fonf, V. P.
- Podestá, Ricardo A. *See* Miatello, Roberto J.
- Pohozaev, Stanislav I. *See* D'Ambrosio, Lorenzo
- Polidoro, Sergio. *See* Pascucci, Andrea
- Polizzi, Francesco. *Surfaces of general type with $p_g = q = 1$, $K^2 = 8$ and bicanonical map of degree 2*, 759
- Powell, Alexander M. *See* Benedetto, John J.
- Praeger, Cheryl E. *See* Baddeley, Robert W.
- Prajapat, J. *See* Magnanini, R.
- Puppe, Volker. *See* Hanke, Bernhard
- Putinar, Mihai. *See* Garcia, Stephan Ramon
- Quinn, Frank. *Dual decompositions of 4-manifolds II: Linear invariants*, 2161
- Raghavan, K. N. *See* Ghorpade, Sudhir R.
- Rao, Ravi A. *See* Jose, Selby
- Rifford, Ludovic. *See* Czarnecki, Marc-Olivier
- Roberts, Gareth E. *Some counterexamples to a generalized Saari's conjecture*, 251
- Roberts, James W. *See* Dilworth, S. J.
- Rogge, L. *See* Landers, D.
- Römer, Tim. *See* Nagel, Uwe
- Rosas, Mercedes H., and Bruce E. Sagan. *Symmetric functions in noncommuting variables*, 215
- Rosenberg, Harold. *See* Hoffman, David
- Rotthaus, Christel, and Liana M. Şega. *Open loci of graded modules*, 4959
- Rouse, Jeremy. *Vanishing and non-vanishing of traces of Hecke operators*, 4637
- Rowen, Louis H. *See* Kunyavskii, Boris È.
- Rubin, Leonard R., and Philip J. Schapiro. *Resolutions for metrizable compacta in extension theory*, 2507
- Rulla, William F. *Effective cones of quotients of moduli spaces of stable n -pointed curves of genus zero*, 3219
- Runde, Volker. *A Connes-amenable, dual Banach algebra need not have a normal, virtual diagonal*, 391
- Rustad, Alf B. *See* Johansen, Ørjan
- Saeki, Osamu. *Stable mapping class groups of 4-manifolds with boundary*, 2091
- Sagan, Bruce E. *See* Rosas, Mercedes H.
- Saghin, Radu, and Zhihong Xia. *Partial hyperbolicity or dense elliptic periodic points for C^1 -generic symplectic diffeomorphisms*, 5119
- Sakaguchi, S. *See* Magnanini, R.

- Salarian, Shokrollah. *See* Asadollahi, Javad
- San Martin, Jaime. *See* Collet, Pierre
- Šarić, Dragomir. *Real and complex earthquakes*, 233
 ———. *See* Markovic, Vladimir
- Satoh, Shin. *See* Kamada, Seiichi
- Schapiro, Philip J. *See* Rubin, Leonard R.
- Scharlemann, Martin, and Jennifer Schultens. *3-manifolds with planar presentations and the width of satellite knots*, 3781
- Schechter, M., and W. Zou. *Sign-changing critical points from linking type theorems*, 5293
- Schenck, Henry K., and Alexander I. Suciú. *Resonance, linear syzygies, Chen groups, and the Bernstein-Gelfand-Gelfand correspondence*, 2269
- Schiffler, R. *See* Caldero, P.
- Schneider, Csaba. *See* Baddeley, Robert W.
- Schneiderman, Rob. *Whitney towers and gropes in 4-manifolds*, 4251
- Schultens, Jennifer. *See* Scharlemann, Martin
- Scowcroft, Philip. *Nonnegative solvability of linear equations in certain ordered rings*, 3535
- Şega, Liana M. *See* Rotthaus, Christel
- Shanmugalingam, Nageswari. *See* Kinnunen, Juha
- Shaw-Krauss, Abby. *See* Ben-Gal, Nitsan
- Shevchyk, V. V. *See* Fonf, V. P.
- Shin, Sujin. *Relative entropy functions for factor maps between subshifts*, 2205
- Shnider, Steve. *See* Markl, Martin
- Shore, Richard A. *Invariants, Boolean algebras and ACA_0^+* , 989
- Sidki, Said N. *See* Bartholdi, Laurent
- Siegel, Stephen F. *See* Pakianathan, Jonathan
- Silantyev, Valentin. *See* Braverman, Maxim
- Sin, Peter. *See* Chandler, David B.
- Siudeja, Bartłomiej. *See* Kulczycki, Tadeusz
- Sköldberg, Emil. *Morse theory from an algebraic viewpoint*, 115
- Skrypnik, Igor V. *See* Kartsatos, Athanassios G.
- Smania, Daniel. *On the hyperbolicity of the period-doubling fixed point*, 1827
- de Snoo, Henk. *See* Derkach, Vladimir
- Soga, Hideo. *See* Kawashita, Mishio
- Solanes, Gil. *Integral geometry and the Gauss-Bonnet theorem in constant curvature spaces*, 1105
- Solecki, Sławomir. *See* Irwin, Trevor
- Soma, Teruhiko. *Scott's rigidity theorem for Seifert fibered spaces; revisited*, 4057
- Sommers, Eric, and Julianna Tymoczko. *Exponents for B-stable ideals*, 3493
- Stempak, Krzysztof. *See* Ciaurri, Óscar
- Strauss, Dona. *See* Carlson, Timothy J.
- Strichartz, Robert S. *See* Ben-Gal, Nitsan
- Suciú, Alexander I. *See* Schenck, Henry K.
- Takabayashi, Manabu. *See* Kamada, Seiichi
- Taylor, Michael. *Existence and regularity of isometries*, 2415
- Teragaito, Masakazu. *Distance between toroidal surgeries on hyperbolic knots in the 3-sphere*, 1051
- Thickstun, Thomas L. *See* Daverman, Robert J.
- Thurston, William. *See* Agol, Ian
- Tikhonov, Sergey V. *See* Kunyavskii, Boris È.
- Töben, Dirk. *Parallel focal structure and singular Riemannian foliations*, 1677
- Toth, Gabor. *On the shape of the moduli of spherical minimal immersions*, 2425
- Tournier, Federico. *See* Garofalo, Nicola
 ———. *See* Gutiérrez, Cristian E.
- Trapani, Stefano. *Torus actions on weakly pseudoconvex spaces*, 1971
- Trautmann, G. *See* Coandă, I.
- Tu, Jean-Louis. *Groupoid cohomology and extensions*, 4721
- Tymchatyn, E. D. *See* Blokh, Alexander
- Tymoczko, Julianna. *See* Sommers, Eric

- Ugaglia, Luca. *See* Laface, Antonio
- Underwood, Robert G., and Lindsay N. Childs. *Duality for Hopf orders*, 1117
- Unterkofer, Karl. *See* Gesztesy, Fritz
- Van den Bergh, Michel. *See* Lowen, Wendy
- Velázquez, J. J. L. *See* Herrero, M. A.
- Veliche, Oana. *Gorenstein projective dimension for complexes*, 1257
- Venema, Yde. *See* Gehrke, Mai
- Walczak, Rafał. *See* Hajduk, Bogusław
- Wang, Hao Hao. *See* Hoffman, J. William
- Wang, Jenn-Nan. *See* Nakamura, Gen
- Wang, Ke. *See* Liu, Yue
- Wang, Xiao-Ping. *See* Liu, Yue
- Weber, Michel. *Uniform bounds under increment conditions*, 911
- Weber, Rebecca. *Invariance in \mathcal{E}^* and \mathcal{E}_Π* , 3023
- Webster, Corran, and Adam Winchester. *Busemann points of infinite graphs*, 4209
- Weikard, Rudi. *See* Gesztesy, Fritz
- Winchester, Adam. *See* Webster, Corran
- Witherspoon, Sarah. *See* Pakianathan, Jonathan
- Wong, R., and Wenjun Zhang. *Uniform asymptotics for Jacobi polynomials with varying large negative parameters—a Riemann-Hilbert approach*, 2663
- Wu, Jie. *See* Lau, Yuk-Kam
- Xi, Changchang. *See* Liu, Yuming
- Xia, Zhihong. *See* Saghin, Radu
- Xiang, Qing. *See* Chandler, David B.
- Xie, Jian-Sheng. *See* Liu, Pei-Dong
- Yamada, Sumio. *See* Mese, Chikako
- Yaman, Asli. *See* Lytchak, Alexander
- Yanchevskii, Vyacheslav I. *See* Kunyavskii, Boris È.
- Yang, Dachun. *See* Deng, Donggao
- Yang, Hongcang. *See* Cheng, Qing-Ming
- Ye, Yangbo. *The fourth power moment of automorphic L -functions for $GL(2)$ over a short interval*, 2259
- Yin, Le. *See* Chen, Bing-Long
- Yoon, Jasang. *See* Curto, Raúl E.
- Young, Clint. *See* Ben-Gal, Nitsan
- Yu, Gang. *Average size of 2-Selmer groups of elliptic curves, I*, 1563
- Zaharescu, Alexandru. *See* Boca, Florin P.
- Zambon, Marco, and Chenchang Zhu. *Contact reduction and groupoid actions*, 1365
- Zannier, U. *See* Bombieri, E.
- Zelmanov, Efim. *See* Martínez, Consuelo
- Zhang, R. B. *See* Lam, Ngau
- Zhang, Wenjun. *See* Wong, R.
- Zheng, Xinxian. *See* Herzog, Jürgen
- Zhu, Chen-bo. *See* Nishiyama, Kyo
- Zhu, Chenchang. *See* Zambon, Marco
- Zhu, Xi-Ping. *See* Chen, Bing-Long
- Zou, W. *See* Schechter, M.

VOLUME 358



2006

TRANSACTIONS

OF THE

A M E R I C A N M A T H E M A T I C A L S O C I E T Y

EDITED BY

Dan Abramovich

Alejandro Adem

Peter W. Bates

Mladen Bestvina

Krzysztof Burdzy

Tobias Colding

Marius Dadarlat

Robert Guralnick, Managing Editor

Lisa C. Jeffrey

Alexander Kleshchev

Steffen Lemp

V. Kumar Murty

Alexander Nagel

Gustavo Ponce

Robert J. Stanton

John R. Stembridge

Daniel Tataru

Mina Teicher

Amie Wilkinson

PROVIDENCE, RHODE ISLAND USA

ISSN 0002-9947

Transactions of the American Mathematical Society

This journal is devoted entirely to research in pure and applied mathematics.

Submission information. See **Information for Authors** at the end of this issue.

Publisher Item Identifier. The Publisher Item Identifier (PII) appears at the top of the first page of each article published in this journal. This alphanumeric string of characters uniquely identifies each article and can be used for future cataloging, searching, and electronic retrieval.

Postings to the AMS website. Articles are posted to the AMS website individually after proof is returned from authors and before appearing in an issue.

Subscription information. *Transactions of the American Mathematical Society* is published monthly. Beginning in January 1996 *Transactions* is accessible from www.ams.org/journals/. Subscription prices for Volume 358 (2006) are as follows: for paper delivery, US\$1677 list, US\$1342 institutional member, US\$1509 corporate member; for electronic delivery, US\$1509 list, US\$1207 institutional member, US\$1358 corporate member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. If ordering the paper version, add US\$39 for surface delivery outside the United States and India; US\$51 to India. Expedited delivery to destinations in North America is US\$50; elsewhere US\$144. For paper delivery a late charge of 10% of the subscription price will be imposed upon orders received from nonmembers after January 1 of the subscription year.

Back number information. For back issues see www.ams.org/bookstore.

Subscriptions and orders should be addressed to the American Mathematical Society, P.O. Box 845904, Boston, MA 02284-5904 USA. *All orders must be accompanied by payment.* Other correspondence should be addressed to 201 Charles Street, Providence, RI 02904-2294 USA.

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 Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. 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.)

Transactions of the American Mathematical Society is published monthly by the American Mathematical Society at 201 Charles Street, Providence, RI 02904-2294 USA. Periodicals postage is paid at Providence, Rhode Island. Postmaster: Send address changes to *Transactions*, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA.

© 2006 by the American Mathematical Society. All rights reserved.

This journal is indexed in *Mathematical Reviews*, *Zentralblatt MATH*, *Science Citation Index*[®], *Science Citation Index*TM-*Expanded*, *ISI Alerting Services*SM, *CompuMath Citation Index*[®], and *Current Contents*[®]/*Physical, Chemical & Earth Sciences*.

Printed in the United States of America.

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

TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY

CONTENTS

Vol. 358, No. 1

Whole No. 848

January 2006

D. Chéniot and C. Eyral, Homotopical variations and high-dimensional Zariski-van Kampen theorems	1
Juha Kinnunen and Nageswari Shanmugalingam, Polar sets on metric spaces	11
Robert S. Maier, A generalization of Euler's hypergeometric transformation	39
Martin Kummer, The complexity of recursion theoretic games	59
Yasushi Homma, Bochner-Weitzenböck formulas and curvature actions on Riemannian manifolds	87
Emil Sköldberg, Morse theory from an algebraic viewpoint	115
Thomas Geisser and Lars Hesselholt, On the K -theory and topological cyclic homology of smooth schemes over a discrete valuation ring	131
Gen Nakamura and Jenn-Nan Wang, The limiting absorption principle for the two-dimensional inhomogeneous anisotropic elasticity system ..	147
Piotr Kowalski and Anand Pillay, Quantifier elimination for algebraic D -groups	167
José Manuel Marco and Javier Parcet, A new approach to the theory of classical hypergeometric polynomials	183
Mercedes H. Rosas and Bruce E. Sagan, Symmetric functions in noncommuting variables	215
Dragomir Šarić, Real and complex earthquakes	233
Gareth E. Roberts, Some counterexamples to a generalized Saari's conjecture	251
Daniel Ghiu, On the Castelnuovo-Mumford regularity of connected curves	267
B. M. Hambly and Michel L. Lapidus, Random fractal strings: Their zeta functions, complex dimensions and spectral asymptotics	285
Mikhail Khovanov, An invariant of tangle cobordisms	315
Laurent Bartholdi and Said N. Sidki, The automorphism tower of groups acting on rooted trees	329
Skip Garibaldi, Unramified cohomology of classifying varieties for exceptional simply connected groups	359
Peter Ashwin and Arek Goetz, Polygonal invariant curves for a planar piecewise isometry	373
Volker Runde, A Connes-amenable, dual Banach algebra need not have a normal, virtual diagonal	391
Ngau Lam and R. B. Zhang, Quasi-finite modules for Lie superalgebras of infinite rank	403
Yuk-Kam Lau and Jie Wu, A density theorem on automorphic L -functions and some applications	441

Peter Tien-Yu Chern, On meromorphic functions with finite logarithmic order	473
David Hoffman, Jorge H. S. de Lira, and Harold Rosenberg, Constant mean curvature surfaces in $M^2 \times \mathbf{R}$	491
Richard W. Carey and Joel D. Pincus, Steinberg symbols modulo the trace class, holonomy, and limit theorems for Toeplitz determinants ..	509
Pamela Gorkin and Raymond Mortini, Norms and essential norms of linear combinations of endomorphisms	553
Mai Gehrke, John Harding, and Yde Venema, MacNeille completions and canonical extensions	573
Pablo Pedregal, Multi-scale Young measures	591
Fritz Gesztesy, Karl Unterkofler, and Rudi Weikard, An explicit characterization of Calogero–Moser systems	603
Michael Greenblatt, Newton polygons and local integrability of negative powers of smooth functions in the plane	657
J. H. Palmieri, Some quotient Hopf algebras of the dual Steenrod algebra	671
Bernhard Hanke and Volker Puppe, Equivariant Gysin maps and pulling back fixed points	687
Alexander Berkovich and Frank G. Garvan, On the Andrews–Stanley refinement of Ramanujan’s partition congruence modulo 5 and generalizations	703
C. Adams, A. Colestock, J. Fowler, W. Gillam, and E. Katerman, Cusp size bounds from singular surfaces in hyperbolic 3-manifolds	727
Ikumitsu Nagasaki, Isovariant Borsuk–Ulam results for pseudofree circle actions and their converse	743
Francesco Polizzi, Surfaces of general type with $p_g = q = 1$, $K^2 = 8$ and bicanonical map of degree 2	759
Bernhard Krötz and Michael Otto, Lagrangian submanifolds and moment convexity	799
Elisa Gorla, The general hyperplane section of a curve	819
Masakazu Nasu, Nondegenerate q -biresolving textile systems and expansive automorphisms of oneshifted full shifts	871
Lorenzo D’Ambrosio, Enzo Mitidieri, and Stanislav I. Pohozaev, Representation formulae and inequalities for solutions of a class of second order partial differential equations	893
Michel Weber, Uniform bounds under increment conditions	911

Gui-Qiang Chen and Kenneth H. Karlsen, L^1 -framework for continuous dependence and error estimates for quasilinear anisotropic degenerate parabolic equations	937
Christopher I. Byrnes, Tryphon T. Georgiou, Anders Lindquist, and Alexander Megretski, Generalized interpolation in H^∞ with a complexity constraint	965
Richard A. Shore, Invariants, Boolean algebras and ACA_0^+	989

I. Coandă and G. Trautmann, Horrocks theory and the Bernstein-Gel'fand-Gel'fand correspondence	1015
Ethan Berkove, The integral cohomology of the Bianchi groups	1033
Masakazu Teragaito, Distance between toroidal surgeries on hyperbolic knots in the 3-sphere	1051
Boris Kruglikov and Valentin Lychagin, Mayer brackets and solvability of PDEs – II	1077
Gil Solanes, Integral geometry and the Gauss-Bonnet theorem in constant curvature spaces	1105
Robert G. Underwood and Lindsay N. Childs, Duality for Hopf orders	1117
Nakao Hayashi, Elena I. Kaikina, and Pavel I. Naumkin, Damped wave equation with a critical nonlinearity	1165
Jin-Xing Cai, Automorphisms of fiber surfaces of genus 2, inducing the identity in cohomology	1187
M. D. E. Conder, C. R. Leedham-Green, and E. A. O'Brien, Constructive recognition of $\mathrm{PSL}(2, q)$	1203
Wolfgang König and Peter Mörters, Brownian intersection local times: Exponential moments and law of large masses	1223
Oana Veliche, Gorenstein projective dimension for complexes	1257
Stephan Ramon Garcia and Mihai Putinar, Complex symmetric operators and applications	1285
Ernest Fontich, Rafael de la Llave, and Pau Martín, Invariant pre-foliations for non-resonant non-uniformly hyperbolic systems	1317
P. Caldero, F. Chapoton, and R. Schiffler, Quivers with relations arising from clusters (A_n case)	1347
Marco Zambon and Chenchang Zhu, Contact reduction and groupoid actions	1365

Vol. 358, No. 4

Whole No. 851

April 2006

Jean B. Lasserre, A moment approach to analyze zeros of triangular polynomial sets	1403
V. P. Fonf, W. B. Johnson, A. M. Plichko, and V. V. Shevchyk, Covering a compact set in a Banach space by an operator range of a Banach space with basis	1421
Bing-Long Chen, Xiao-Yong Fu, Le Yin, and Xi-Ping Zhu, Sharp dimension estimates of holomorphic functions and rigidity	1435
Christoph Böhm and Megan M. Kerr, Low-dimensional homogeneous Einstein manifolds	1455
Marcin Bownik and Kwok-Pun Ho, Atomic and molecular decompositions of anisotropic Triebel-Lizorkin spaces	1469
Shu-Yen Pan, Local theta correspondence for small unitary groups	1511
Jerzy Dydak, Algebra of dimension theory	1537
Gang Yu, Average size of 2-Selmer groups of elliptic curves, I	1563
Martin Bendersky, Donald M. Davis, and Mark Mahowald, Stable geometric dimension of vector bundles over even-dimensional real projective spaces	1585

Martin Lorenz, On the Cohen-Macaulay property of multiplicative invariants	1605
Robert W. Baddeley, Cheryl E. Praeger, and Csaba Schneider, Innately transitive subgroups of wreath products in product action ...	1619
G. Bande and D. Kotschick, The geometry of symplectic pairs	1643
Su-ion Ih, Height uniformity for integral points on elliptic curves	1657
Dirk Töben, Parallel focal structure and singular Riemannian foliations ..	1677
Philip Foth and Jiang-Hua Lu, Poisson structures on complex flag manifolds associated with real forms	1705
Ale Jan Homburg and Jürgen Knobloch, Multiple homoclinic orbits in conservative and reversible systems	1715
Daniel Berend and Jørgen E. Harmse, On polynomial-factorial diophantine equations	1741
Patrick Bahl, Automorphisms of Coxeter groups	1781
Florin P. Boca and Alexandru Zaharescu, On the correlations of directions in the Euclidean plane	1797
Daniel Smania, On the hyperbolicity of the period-doubling fixed point ..	1827
Hyeonmi Lee, Crystals of type $D_n^{(1)}$ and Young walls	1847

Vol. 358, No. 5

Whole No. 852

May 2006

Andrew Mauer-Oats, Algebraic Goodwillie calculus and a cotriple model for the remainder	1869
Nobuhiro Honda, Non-Moishezon twistor spaces of $4\mathbb{C}P^2$ with non-trivial automorphism group	1897
Markus Banagl, On topological invariants of stratified maps with non-Witt target	1921
Prabhu Janakiraman, Limiting weak-type behavior for singular integral and maximal operators	1937
Bogusław Hajduk and Rafał Walczak, Symplectic forms invariant under free circle actions on 4-manifolds	1953
Stefano Trapani, Torus actions on weakly pseudoconvex spaces	1971
Y. Barnea and D. S. Passman, Filtrations in semisimple Lie algebras, I	1983
Nicola Garofalo and Federico Tournier, New properties of convex functions in the Heisenberg group	2011
Kang-Hyurk Lee, Almost complex manifolds and Cartan's uniqueness theorem	2057
T. Christiansen, Resonances for steplike potentials: Forward and inverse results	2071
Osamu Saeki, Stable mapping class groups of 4-manifolds with boundary .	2091
Yue Liu, Xiao-Ping Wang, and Ke Wang, Instability of standing waves of the Schrödinger equation with inhomogeneous nonlinearity	2105
Robert C. Dalang and Olivier Lévêque, Second-order hyperbolic s.p.d.e.'s driven by homogeneous Gaussian noise on a hyperplane	2123
Frank Quinn, Dual decompositions of 4-manifolds II: Linear invariants ...	2161
Javad Asadollahi and Shokrollah Salarian, Cohomology theories based on Gorenstein injective modules	2183

Sujin Shin, Relative entropy functions for factor maps between subshifts .	2205
Toshihiko Matsuki, Equivalence of domains arising from duality of orbits on flag manifolds	2217
E. Bombieri, D. Masser, and U. Zannier, Intersecting curves and algebraic subgroups: Conjectures and more results	2247
Yangbo Ye, The fourth power moment of automorphic L -functions for $GL(2)$ over a short interval	2259
Henry K. Schenck and Alexander I. Suciú, Resonance, linear syzygies, Chen groups, and the Bernstein-Gelfand-Gelfand correspondence	2269
Peter De Maesschalck and Freddy Dumortier, Canard solutions at non-generic turning points	2291

Vol. 358, No. 6

Whole No. 853

June 2006

Ken-ichi Maruyama, π_* -kernels of Lie groups	2335
Martin Markl and Steve Shnider, Associahedra, cellular W -construction and products of A_∞ -algebras	2353
Gunnar Fløystad, Koszul duality and equivalences of categories	2373
R. Komendarczyk, On the contact geometry of nodal sets	2399
Michael Taylor, Existence and regularity of isometries	2415
Gabor Toth, On the shape of the moduli of spherical minimal immersions	2425
Carlos E. Kenig and Yvan Martel, Global well-posedness in the energy space for a modified KP II equation via the Miura transform	2447
John J. Benedetto and Alexander M. Powell, A (p, q) version of Bourgain's theorem	2489
Leonard R. Rubin and Philip J. Schapiro, Resolutions for metrizable compacta in extension theory	2507
Yuming Liu and Changchang Xi, Construction of stable equivalences of Morita type for finite-dimensional algebras I	2537
Ido Efrat, A generalization of Marshall's equivalence relation	2561
Boris È. Kunyavskiĭ, Louis H. Rowen, Sergey V. Tikhonov, and Vyacheslav I. Yanchevskiĭ, Bicyclic algebras of prime exponent over function fields	2579
Cristina Martínez, The degree of the variety of rational ruled surfaces and Gromov-Witten invariants	2611
Qing-Ming Cheng and Hongcang Yang, Inequalities for eigenvalues of a clamped plate problem	2625
Vladimir Markovic and Dragomir Šarić, Teichmüller mapping class group of the universal hyperbolic solenoid	2637
Niels Grønbaek, Bounded Hochschild cohomology of Banach algebras with a matrix-like structure	2651
R. Wong and Wenjun Zhang, Uniform asymptotics for Jacobi polynomials with varying large negative parameters—a Riemann-Hilbert approach	2663
Karlheinz Gröchenig and Michael Leinert, Symmetry and inverse-closedness of matrix algebras and functional calculus for infinite matrices	2695
Kyo Nishiyama, Hiroyuki Ochiai, and Chen-bo Zhu, Theta lifting of nilpotent orbits for symmetric pairs	2713

Ørjan Johansen and Alf B. Rustad, Construction and properties of quasi-linear functionals	2735
V. Farmaki and S. Negrepontis, Block combinatorics	2759
Nicola Arcozzi, Enrico Casadio Tarabusi, Fausto Di Biase, and Massimo A. Picardello, Twist points of planar domains	2781

Vol. 358, No. 7

Whole No. 854

July 2006

Natàlia Castellana, On the p -compact groups corresponding to the p -adic reflection groups $G(q, r, n)$	2799
Friedrich Littmann, Entire majorants via Euler–Maclaurin summation ..	2821
Gen Nakamura and Jenn-Nan Wang, Unique continuation for the two-dimensional anisotropic elasticity system and its applications to inverse problems	2837
James Gillespie, The flat model structure on complexes of sheaves	2855
Chikako Mese and Sumio Yamada, The parameterized Steiner problem and the singular Plateau problem via energy	2875
Jonathan Pakianathan and Sarah Witherspoon, and with an appendix by Stephen F. Siegel, Quillen stratification for Hochschild cohomology of blocks	2897
Alexander Lytchak and Asli Yaman, On Hölder continuous Riemannian and Finsler metrics	2917
Eduardo Gonzalez, Quantum cohomology and S^1 -actions with isolated fixed points	2927
James F. Davis and Swatee Naik, Alexander polynomials of equivariant slice and ribbon knots in S^3	2949
Donggao Deng, Yongsheng Han, and Dachun Yang, Besov spaces with non-doubling measures	2965
Leonardo Biliotti, Coisotropic and polar actions on compact irreducible Hermitian symmetric spaces	3003
Rebecca Weber, Invariance in \mathcal{E}^* and \mathcal{E}_{Π}	3023
Michael Aschbacher, Michael K. Kinyon, and J. D. Phillips, Finite Bruck loops	3061
Trevor Irwin and Sławomir Solecki, Projective Fraïssé limits and the pseudo-arc	3077
Selby Jose and Ravi A. Rao, A structure theorem for the elementary unimodular vector group	3097
Laszlo Fuchs, William Heinzer, and Bruce Olberding, Commutative ideal theory without finiteness conditions: Completely irreducible ideals	3113
Jan O. Kleppe, Maximal families of Gorenstein algebras	3133
Shangbing Ai, Xinfu Chen, and Stuart P. Hastings, Layers and spikes in non-homogeneous bistable reaction-diffusion equations	3169
Gilberto Bini and Claudio Fontanari, Moduli of curves and spin structures via algebraic geometry	3207
William F. Rulla, Effective cones of quotients of moduli spaces of stable n -pointed curves of genus zero	3219

Martin Scharlemann and Jennifer Schultens, 3-manifolds with planar presentations and the width of satellite knots	3781
F. J. López, Francisco Martin, and Santiago Morales, Complete nonorientable minimal surfaces in a ball of \mathbb{R}^3	3807
Ian Agol, Joel Hass, and William Thurston, The computational complexity of knot genus and spanning area	3821
Athanassios G. Kartsatos and Igor V. Skrypnik, On the eigenvalue problem for perturbed nonlinear maximal monotone operators in reflexive Banach spaces	3851
Nitsan Ben-Gal, Abby Shaw-Krauss, Robert S. Strichartz, and Clint Young, Calculus on the Sierpinski gasket II: Point singularities, eigenfunctions, and normal derivatives of the heat kernel	3883
Pisheng Ding, Topological obstructions to certain Lie group actions on manifolds	3937
Alejandro Adem and Jianzhong Pan, Toroidal orbifolds, gerbes and group cohomology	3969
Marcel Bökstedt and Iver Ottosen, An alternative approach to homotopy operations	3985
Roger Bielawski, Manifolds with an $SU(2)$ -action on the tangent bundle ..	3997
Qing Han, Jia-Xing Hong, and Chang-Shou Lin, On the Cauchy problem of degenerate hyperbolic equations	4021
Thomas Mattman, Katura Miyazaki, and Kimihiko Motegi, Seifert-fibered surgeries which do not arise from primitive/Seifert-fibered constructions	4045
Teruhiko Soma, Scott's rigidity theorem for Seifert fibered spaces; revisited	4057
Jacob S. Christiansen and Mourad E. H. Ismail, A moment problem and a family of integral evaluations	4071
Michael T. Lacey and Xiaochun Li, Maximal theorems for the directional Hilbert transform on the plane	4099
Jürgen Herzog, Takayuki Hibi, and Xinxian Zheng, The monomial ideal of a finite meet-semilattice	4119
Jerald J. Kovacic, Geometric characterization of strongly normal extensions	4135
Anton Cox and Alison Parker, Homomorphisms between Weyl modules for $SL_3(k)$	4159
Corran Webster and Adam Winchester, Busemann points of infinite graphs	4209

Vol. 358, No. 10

Whole No. 857

October 2006

Marcel de Jeu, Paley–Wiener theorems for the Dunkl transform	4225
Rob Schneiderman, Whitney towers and gropes in 4-manifolds	4251
Mark Behrens, Root invariants in the Adams spectral sequence	4279
Hidehiko Mishou and Hirofumi Nagoshi, Functional distribution of $L(s, \chi_d)$ with real characters and denseness of quadratic class numbers	4343
Min Kyu Kim, Frankel's theorem in the symplectic category	4367
Mohammad Ghomi and Marek Kossowski, h-principles for hypersurfaces with prescribed principle curvatures and directions	4379

Daniel J. Miller, A preparation theorem for Weierstrass systems	4395
Óscar Ciaurri and Krzysztof Stempak, Transplantation and multiplier theorems for Fourier-Bessel expansions	4441
Marc-Olivier Czarnecki and Ludovic Rifford, Approximation and regularization of Lipschitz functions: Convergence of the gradients	4467
Howard Jacobowitz, Generic systems of co-rank one vector distributions	4521
Jason Fulman, Martingales and character ratios	4533
William Chin and Leonid Krop, Spectra of quantized hyperalgebras ...	4553
Roberto J. Miatello and Ricardo A. Podestá, The spectrum of twisted Dirac operators on compact flat manifolds	4569
Cai Heng Li, Finite edge-transitive Cayley graphs and rotary Cayley maps	4605
Jeremy Rouse, Vanishing and non-vanishing of traces of Hecke operators	4637
Goran Muić, On the non-unitary unramified dual for classical p-adic groups	4653

Vol. 358, No. 11

Whole No. 858

November 2006

Mara D. Neusel, Inseparable extensions of algebras over the Steenrod algebra with applications to modular invariant theory of finite groups	4689
Jean-Louis Tu, Groupoid cohomology and extensions	4721
G. C. Bell and A. N. Dranishnikov, A Hurewicz-type theorem for asymptotic dimension and applications to geometric group theory	4749
Rubén Hidalgo and Bernard Maskit, On neoclassical Schottky groups	4765
Eduardo Chappa, On the characterization of the kernel of the geodesic X-ray transform	4793
A. Alexandrou Himonas and Gerson Petronilho, On C^∞ and Gevrey regularity of sublaplacians	4809
R. Magnanini, J. Prajapat, and S. Sakaguchi, Stationary isothermic surfaces and uniformly dense domains	4821
Cristian E. Gutiérrez and Federico Tournier, $W^{2,p}$-estimates for the linearized Monge–Ampère equation	4843
Andrea Pascucci and Sergio Polidoro, Harnack inequalities and Gaussian estimates for a class of hypoelliptic operators	4873
Ron Aharoni and Eli Berger, The intersection of a matroid and a simplicial complex	4895
L. Godinho, Semifree symplectic circle actions on 4-orbifolds	4919
David B. Chandler, Peter Sin, and Qing Xiang, The invariant factors of the incidence matrices of points and subspaces in $PG(n, q)$ and $AG(n, q)$	4935
Christel Rotthaus and Liana M. Şega, Open loci of graded modules ..	4959
Teresa Bigorajska and Henryk Kotlarski, Partitioning α-large sets: Some lower bounds	4981
Alexander Blokh, Lex Oversteegen, and E. D. Tymchatyn, On almost one-to-one maps	5003
Mircea Mustață, Multiplier ideals of hyperplane arrangements	5015
Tadeusz Kulczycki and Bartłomiej Siudeja, Intrinsic ultracontractivity of the Feynman-Kac semigroup for relativistic stable processes	5025
Pierre Collet, Servet Martinez, and Jaime San Martín, Ratio limit theorem for parabolic horn-shaped domains	5059

Frédéric Bayart and Sophie Grivaux , Frequently hypercyclic operators	5083
Radu Saghin and Zhihong Xia , Partial hyperbolicity or dense elliptic periodic points for C^1 -generic symplectic diffeomorphisms	5119
Raúl E. Curto and Jasang Yoon , Jointly hyponormal pairs of commuting subnormal operators need not be jointly subnormal	5139
Miklós Horváth , Inverse scattering with fixed energy and an inverse eigenvalue problem on the half-line	5161

Vol. 358, No. 12

Whole No. 859

December 2006

V. V. Bludov and A. M. W. Glass , On the variety generated by all nilpotent lattice-ordered groups	5179
John Douglas Moore , Bumpy metrics and closed parametrized minimal surfaces in Riemannian manifolds	5193
Robert J. Daverman and Thomas L. Thickstun , The 3-manifold recognition problem	5257
Dorin Ervin Dutkay , Low-pass filters and representations of the Baumslag Solitar group	5271
M. Schechter and W. Zou , Sign-changing critical points from linking type theorems	5293
Mishio Kawashita, Wakako Kawashita, and Hideo Soga , Scattering theory for the elastic wave equation in perturbed half-spaces	5319
Vladimir Derkach, Seppo Hassi, Mark Malamud, and Henk de Snoo , Boundary relations and their Weyl families	5351
Sudhir R. Ghorpade and K. N. Raghavan , Hilbert functions of points on Schubert varieties in the symplectic Grassmannian	5401
Seiichi Kamada, Shin Satoh, and Manabu Takabayashi , The braid index is not additive for the connected sum of 2-knots	5425
Wendy Lowen and Michel Van den Bergh , Deformation theory of abelian categories	5441
Antonio Laface and Luca Ugaglia , On a class of special linear systems of \mathbb{P}^3	5485
Leonardo Colzani , Fourier expansions of functions with bounded variation of several variables	5501
Massimiliano Mella , Singularities of linear systems and the Waring problem	5523
Markus Kiderlen , Blaschke- and Minkowski-endomorphisms of convex bodies	5539
Antonio Lanteri and Roberto Muñoz , Varieties with small discriminant variety	5565
Zdzisław Brzeźniak and Yuhong Li , Asymptotic compactness and absorbing sets for 2D stochastic Navier-Stokes equations on some unbounded domains	5587
Sergey Antonyan , Corrigendum to “West’s problem on equivariant hyperspaces and Banach-Mazur compacta”	5631
Bo Chen and Zhi Lü , Corrections to “Involutions fixing $\mathbb{R}\mathbb{P}^{\text{odd}} \sqcup P(h, i)$, II”	5635

Editorial Information

To be published in the *Transactions*, a paper must be correct, new, nontrivial, and significant. Further, it must be well written and of interest to a substantial number of mathematicians. Piecemeal results, such as an inconclusive step toward an unproved major theorem or a minor variation on a known result, are in general not acceptable for publication.

Papers submitted to the *Transactions* should exceed 10 published journal pages in length. Shorter papers may be submitted to the *Proceedings of the American Mathematical Society*. Published pages are the same size as those generated in the style files provided for $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ or $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{T}\mathcal{E}\mathcal{X}$.

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

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 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. The AMS uses Centralized Manuscript Processing for initial submissions. Authors should submit a PDF file using the Initial Manuscript Submission form found at www.ams.org/cgi-bin/peertrack/submission.pl, or send one copy of the manuscript to the following address: Centralized Manuscript Processing, TRANSACTIONS OF THE AMS, 201 Charles Street, Providence, RI 02904-2294 USA. If a paper copy is being forwarded to the AMS, indicate that it is for *Transactions* and include the name of the corresponding author, contact information such as email address or mailing address, and the name of an appropriate Editor to review the paper (see the list of Editors below).

The first page of an article 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* should be at least one complete sentence, and at most 300 words. 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/.

Electronically prepared manuscripts. The AMS encourages 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, 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. $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$

papers also move more efficiently through the production stream, helping to minimize publishing costs.

$\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ is the highly preferred format of $\mathcal{T}\mathcal{E}\mathcal{X}$, but author packages are also available in $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{T}\mathcal{E}\mathcal{X}$. 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 $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ 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 $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$.

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 tech-support@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 $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{L}\mathcal{A}\mathcal{T}\mathcal{E}\mathcal{X}$ or $\mathcal{A}\mathcal{M}\mathcal{S}\text{-}\mathcal{T}\mathcal{E}\mathcal{X}$ and the publication in which your paper will appear. Please be sure to include your complete email address.

After acceptance. 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 to the Editor, who will forward a copy to the Providence office. Accepted electronically prepared manuscripts can be submitted via the web at www.ams.org/submit-book-journal/, sent via email to pub-submit@ams.org (Internet), or sent on diskette to the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. When sending a manuscript electronically via email or diskette, 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. 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 tran-query@ams.org.

T_EX files available upon request. T_EX files are available upon request for authors 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 tran-query@ams.org or directly to the Electronic Prepress Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA.

Editors

The AMS uses Centralized Manuscript Processing for initial submissions to AMS journals. Authors should follow instructions listed on the Initial Submission page found at www.ams.org/tran/transubmit.html.

Algebra, ALEXANDER KLESHCHEV, Department of Mathematics, University of Oregon, Eugene, OR 97403-1222 USA; e-mail: ams@noether.uoregon.edu

Algebra and its applications, MINA TEICHER, Emmy Noether Research Institute for Mathematics, Bar-Ilan University, Ramat-Gan 52900, Israel; e-mail: teicher@macs.biu.ac.il, with cc to eni@macs.biu.ac.il

Algebraic geometry, DAN ABRAMOVICH, Department of Mathematics, Brown University, Box 1917, Providence, RI 02912 USA; e-mail: amsedit@math.brown.edu

Algebraic number theory, V. KUMAR MURTY, Department of Mathematics, University of Toronto, 100 St. George Street, Toronto, Ontario, Canada M5S 3G3; e-mail: murty@math.toronto.edu

Algebraic topology, ALEJANDRO ADEM, Department of Mathematics, University of British Columbia, Room 121, 1984 Mathematics Road, Vancouver, British Columbia, Canada V6T 1Z2; e-mail: transactions@math.ubc.ca

Combinatorics, JOHN R. STEMBRIDGE, Department of Mathematics, University of Michigan, Ann Arbor, MI 48109-1043 USA; e-mail: jrs@umich.edu

Complex analysis and harmonic analysis, ALEXANDER NAGEL, Department of Mathematics, University of Wisconsin, 480 Lincoln Drive, Madison, WI 53706-1313 USA; e-mail: nagel@math.wisc.edu

Differential geometry and global analysis, LISA C. JEFFREY, Department of Mathematics, University of Toronto, Bahen Centre for Information Technology, 40 St. George Street 6th Floor, Toronto, Ontario, Canada M5S 2E4; e-mail: jeffrey@math.toronto.edu

Dynamical systems and ergodic theory, AMIE WILKINSON, Department of Mathematics, Northwestern University, 2033 Sheridan Road, Evanston, IL 60208-2730 USA; e-mail: transactions@math.northwestern.edu

Functional analysis and operator algebras, MARIUS DADARLAT, Department of Mathematics, Purdue University, 150 N. University Street, West Lafayette, IN 47907-2067 USA; e-mail: mdd@math.purdue.edu

Geometric analysis, TOBIAS COLDING, Courant Institute, New York University, 251 Mercer Street, New York, NY 10012 USA; e-mail: traneditor@cims.nyu.edu

Geometric topology, MLADEN BESTVINA, Department of Mathematics, University of Utah, 155 South 1400 East, JWB 233, Salt Lake City, UT 84112-0090 USA; e-mail: bestvina@math.utah.edu

Harmonic analysis, representation theory, and Lie theory, ROBERT J. STANTON, Department of Mathematics, Ohio State University, 231 West 18th Avenue, Columbus, OH 43210-1174 USA; e-mail: stanton@math.ohio-state.edu

Logic, STEFFEN LEMPP, Department of Mathematics, University of Wisconsin, 480 Lincoln Drive, Madison, WI 53706-1388 USA; e-mail: lempp@math.wisc.edu

Ordinary differential equations, partial differential equations, and applied mathematics, PETER W. BATES, Department of Mathematics, Michigan State University, East Lansing, MI 48824-1027 USA; e-mail: bates@math.msu.edu

Partial differential equations, GUSTAVO PONCE, Department of Mathematics, South Hall, Room 6607, University of California, Santa Barbara, CA 93106 USA; e-mail: ponce@math.ucsb.edu

Probability and statistics, KRZYSZTOF BURDZY, Department of Mathematics, University of Washington, Box 354350, Seattle, WA 98195-4350 USA; e-mail: burdzy@math.washington.edu

Real analysis and partial differential equations, DANIEL TATARU, Department of Mathematics, University of California, Berkeley, CA 94720 USA; e-mail: tataru@math.berkeley.edu

All other communications to the editors should be addressed to the Managing Editor, ROBERT GURALNICK, Department of Mathematics, University of Southern California, Los Angeles, CA 90089-1113 USA; e-mail: guralnic@math.usc.edu

MEMOIRS OF THE AMERICAN MATHEMATICAL SOCIETY

Memoirs is devoted to research in pure and applied mathematics of the same nature as *Transactions*. An issue consists of one or more separately bound research tracts for which the authors provide reproduction copy. Papers intended for *Memoirs* should normally be at least 80 pages in length. *Memoirs* has the same editorial committee as *Transactions*; authors may choose an Editor from the list above upon submission.

TRANSACTIONS OF THE AMERICAN MATHEMATICAL SOCIETY
 CONTENTS

Vol. 358, No. 12

Whole No. 859

December 2006

V. V. Bludov and A. M. W. Glass , On the variety generated by all nilpotent lattice-ordered groups	5179
John Douglas Moore , Bumpy metrics and closed parametrized minimal surfaces in Riemannian manifolds	5193
Robert J. Daverman and Thomas L. Thickstun , The 3-manifold recognition problem	5257
Dorin Ervin Dutkay , Low-pass filters and representations of the Baumslag Solitar group	5271
M. Schechter and W. Zou , Sign-changing critical points from linking type theorems	5293
Mishio Kawashita, Wakako Kawashita, and Hideo Soga , Scattering theory for the elastic wave equation in perturbed half-spaces	5319
Vladimir Derkach, Seppo Hassi, Mark Malamud, and Henk de Snoo , Boundary relations and their Weyl families	5351
Sudhir R. Ghorpade and K. N. Raghavan , Hilbert functions of points on Schubert varieties in the symplectic Grassmannian	5401
Seiichi Kamada, Shin Satoh, and Manabu Takabayashi , The braid index is not additive for the connected sum of 2-knots	5425
Wendy Lowen and Michel Van den Bergh , Deformation theory of abelian categories	5441
Antonio Laface and Luca Ugaglia , On a class of special linear systems of \mathbb{P}^3	5485
Leonardo Colzani , Fourier expansions of functions with bounded variation of several variables	5501
Massimiliano Mella , Singularities of linear systems and the Waring problem	5523
Markus Kiderlen , Blaschke- and Minkowski-endomorphisms of convex bodies	5539
Antonio Lanteri and Roberto Muñoz , Varieties with small discriminant variety	5565
Zdzisław Brzeźniak and Yuhong Li , Asymptotic compactness and absorbing sets for 2D stochastic Navier-Stokes equations on some unbounded domains	5587
Sergey Antonyan , Corrigendum to “West’s problem on equivariant hyperspaces and Banach-Mazur compacta”	5631
Bo Chen and Zhi Lü , Corrections to “Involutions fixing $\mathbb{R}\mathbb{P}^{\text{odd}} \sqcup P(h, i)$, II”	5635



0002-9947(200612)358:12*;1-E