

EDITORS

WILLIAM F. AMES

School of Mathematics Georgia Institute of Technology Nonlinear partial differential equations Numerical analysis for partial

differential equations Fax: 404-894-4409

E-mail: ames@math.gatech.edu

STEVEN G. KRANTZ

Washington University in St. Louis* Real and complex analysis Partial differential equations

Fax: 314-935-6839

E-mail: sk@math.wustl.edu

Founding Editor: RICHARD BELLMAN Editor 1985–1991: R.P. BOAS

Honorary Editor: GEORGE LEITMANN

EDITORIAL OFFICE

Journal of Mathematical Analysis and Applications 525 B Street, Suite 1900, San Diego, California 92101-4495

E-mail: jmaa@elsevier.com

ASSOCIATE EDITORS

RAVI P. AGARWAL

Florida Institute of Technology* Difference equations Inequalities

TAKAO AKAHORI

Himeji Institute of Technology* Complex geometric analysis CR geometry

RICHARD M. ARON

Kent State University* Functional analysis

Infinite-dimensional function theory

ZHIVKO S. ATHANASSOV

Institute of Mathematics Bulgarian Academy of Sciences Ordinary differential equations

JOSEPH A. BALL

Virginia Polytech Institute*
Operator and control theory

CATHERINE BANDLE

University of Basel*

Nonlinear elliptic and parabolic differential equations

Qualitative properties

*Department of Mathematics

Publication information: *Journal of Mathematical Analysis and Applications* (ISSN 0022-247X) is published semimonthly at Elsevier B.V., Molenwerf 1, 1014 AG Amsterdam, The Netherlands, by Elsevier Inc., 525 B Street, Suite 1900, San Diego, CA 92101-4495, USA. For 2004, Volume(s) 289–300, 24 issues are scheduled for publication. Subscription prices are available upon request from the Publisher, from the Regional Sales Office nearest you, or via the Elsevier Web site at www.elsevier.com. Subscription orders are entered for the calendar year and are payable in advance. **POSTMASTER:** Send changes of address to Elsevier, Customer Service Department, 6277 Sea Harbor Drive, Orlando, FL 32887-4900, USA. Periodical postage paid at Jamaica, NY 11430, USA. Air freight and mailing in the USA by Publications Expediting, Inc., 200 Meacham Avenue, Elmont, NY 11003, USA.

Orders, claims, and journal inquiries: Please contact the Customer Service Department at the Regional Sales Office nearest you. Orlando: Elsevier, Customer Service Department, 6277 Sea Harbor Drive, Orlando, FL 32887-4800, USA; phone: (+1) (877) 8397126 [toll-free number for US customers] or (+1) (407) 3454020 [customers outside US]; fax: (+1) (407) 3631354; e-mail: usjcs@elsevier.com. Amsterdam: Elsevier, Customer Service Department, PO Box 211, 1000 AE Amsterdam, The Netherlands; phone: (+31) (20) 4853757; fax: (+31) (20) 4853432; e-mail: nlinfo-f@elsevier.com. Tokyo: Elsevier, Customer Service Department, 4F Higashi-Azabu, 1-Chome Bldg., 1-9-15 Higashi-Azabu, Minato-ku, Tokyo 106-0044, Japan; phone: (+81) (3) 5561 5037; fax: (+81) (3) 5561 5047; e-mail: jp.info@elsevier.com. Singapore: Elsevier, Customer Service Department, 3 Killiney Road, #08-01 Winsland House I, Singapore 239519; phone: (+65) 63490222; fax: (+65) 67331510; e-mail: asiainfo@elsevier.com. [Note Latin America: For orders, claims, and help desk information, please contact the Regional Sales Office in Orlando as listed above.]

Printed in Meppel, The Netherlands, by Krips bv.

ASSOCIATE EDITORS

T.D. BENAVIDES

Facultad de Matematicas Universidad de Sevilla Nonlinear functional analysis

BRUCE C. BERNDT

University of Illinois* Analytic number theory Classical analysis Special functions

FRANCOIS BERTELOOT

Université P. Sabatier Laboratoire E. Picard Several complex variables

GEORGE BLUMAN

University of British Columbia* Differential equations

BENEDETTO BONGIORNO

Dipartimento di Matematica ed Appl. University of Palermo Real analysis

PHILIP BROADBRIDGE

Department of Mathematical Sciences University of Delaware Applied partial differential equations

PETER G. CASAZZA

University of Missouri-Columbia* Banach space theory Hilbert space frames

ARRIGO CELLINA

Dipartimento di Matematica e Applicazioni Università di Milano Bicocca Calculus of variations Differential inclusions

GOONG CHEN

Texas A & M University
Applied and computational PDEs
Control, nonlinear and chaotic systems
Engineering mathematics
Quantum computation

LARRY CHEN

Oregon State University Harmonic analysis Real analysis

SO-CHIN CHEN

National Tsing-Hua University Several complex variables

CHARLES E. CHIDUME

International Centre for Theoretical Physics Nonlinear functional analysis

J. CONWAY

University of Tennessee Operator theory Function theory Functional analysis

RAUL CURTO

University of Iowa*
Single and multivariable operator theory
C*-algebras
Classical theory of moments

JERALD P. DAUER

University of Tennessee at Chattanooga* Control theory Optimization

L. DEBNATH

University of Texas-Pan American* Applied analysis Applied functional analysis Linear and nonlinear waves Fluid dynamics

JOE DIESTEL

University of Missouri* Functional analysis Banach space theory Measure theory

JERZY A. FILAR

School of Mathematics University of South Australia Optimization Operations research Markov decision processes Game theory Singular perturbations Application

A.M. FINK

Iowa State University* Inequalities

THANASIS FOKAS

Department of Mathematics and Computer Science Clarkson University Integrable nonlinear equations Inverse problems Symmetries and Hamiltonian systems

HÉLÈNE FRANKOWSKA

CREA École Polytechnique
Set-valued, nonsmooth, convex and
nonlinear analysis
Viability theory
Differential inclusions, control problems, and
differential games with state constraints
Regulation of systems evolving under
nonstochastic uncertainty

ASSOCIATE EDITORS

AVNER FRIEDMAN

Ohio State University*

Partial differential equations and their applications

THOMAS C. GARD

University of Georgia* Ordinary differential equations

Stochastic differential equations

Mathematical biology

HERVE GAUSSIER

Centre de Mathématiques et Informatique

Complex variables

Partial differential equations

JEFFREY GERONIMO

Georgia Tech*

Orthogonal polynomials

Wavelets

Difference equations

FRITZ GESZTESY

University of Missouri-Columbia*

Spectral theory

Completely integrable systems

JEROME A. GOLDSTEIN

Department of Mathematical Sciences

University of Memphis

Partial differential equations

Quantum theory

Semigroups of operators

KONDALSAMY GOPALSAMY

School of Informatics and Engineering

Flinders University

Population dynamics

Neural networks Delay differential equations

RUTH GORNET

Department of Mathematics and Statistics

Texas Tech University

Spectral geometry

SAID R. GRACE

Cairo University*

Functional equations

Difference equations

Oscillation theory

LOUKAS GRAFAKOS

University of Missouri*

Fourier analysis

CHARLES W. GROETSCH

University of Cincinnati* Inverse and ill-posed problems

Approximation methods

MAX D. GUNZBURGER

Florida State University

Numerical analysis

Fluid mechanics

GEORGE A. HAGEDORN

Virginia Tech*

Schrödinger operators

Molecular quantum mechanics

DAVID J. HALLENBECK

Department of Mathematical Sciences

University of Delaware

Complex analysis

One complex variable

Geometric function theory

SEPPO HEIKKILÄ

University of Oulu*

Differential equations and dynamical systems

Equations in ordered spaces

JOHNNY HENDERSON

Baylor University*

Ordinary differential equations

Functional differential equations

Finite difference equations

THEODORE P. HILL

Georgia Tech*

Probability

JOHN HORVÁTH

University of Maryland*

Functional analysis

MIMMO IANNELLI

Università degli Studi di Trento*

Abstract evolution equations

Volterra integral equations

Mathematical population dynamics

NAIL H. IBRAGIMOV

Blekinge Institute of Technology*

Lie group analysis

Differential equations

ALEXANDER V. ISAEV

Centre for Mathematics and its Applications The Australian National University

Complex analysis and geometry

KRZYSZTOF JAROSZ

Southern Illinois University, Edwardsville*

Functional analysis

Spaces of analytic functions of a single variable

STEN KAIJSER

Uppsala University* Functional analysis

Real analysis

Complex analysis

ASSOCIATE EDITORS

ROBERT P. KERTZ

School of Mathematics Georgia Institute of Technology Mathematical finance

Probability and related areas of analysis

DMITRY KHAVINSON

University of Arkansas* Classical analysis

KANG-TAE KIM

Pohang University of Science and Technology* Complex analysis Several complex variables

U. KIRCHGRABER

Swiss Federal Institute of Technology (ETH) Zurich

Dynamical systems and their applications

WILLIAM ART KIRK

University of Iowa* Nonlinear functional analysis

GEN KOMATSU

Osaka University Several complex variables Partial differential equations

TIBOR KRISZTIN

Bolyai Institute University of Szeged Functional differential equations

MIKLÓS LACZKOVICH

Department of Analysis Eötvös Loránd University Real functions Measure theory

GERRY LADAS

University of Rhode Island*
Difference equations and their applications

IRENA LASIECKA

Department of Applied Mathematics University of Virginia Partial differential equations Control theory Optimization

JOHN LAVERY

Computing and Information Sciences Division Army Research Office, Army Research Laboratory Nonlinear partial differential equations Convection-diffusion

P.G.L. LEACH

University of Natal*
Ordinary differential equations
Lie and Noether symmetries
Classical mechanics
Cosmology

HOWARD A. LEVINE

Iowa State University*
Partial differential equations of parabolic, hyperbolic type
Systems of reaction diffusion equations
Improperly posed problems

KONSTANTIN A. LURIE

Department of Mathematical Sciences Worcester Polytechnic Institute Optimal control and design Multidimensional calculus of variations

RAÚL MANÁSEVICH

Departamento de Ingenieria Matemática Universidad de Chile Nonlinear differential equations Nonlinear analysis

JEAN MAWHIN

Université de Louvain, Louvain-la-Neuve* Nonlinear differential equations Nonlinear functional analysis Critical point theory

JOHN McCARTHY

Washington University*
Operator theory

P.J. McKENNA

University of Connecticut
Nonlinear boundary value problems

JOYCE R. McLAUGHLIN

Rensselaer Polytechnic Institute*
Inverse problems
Inverse spectral theory
Parameter identification
Spectral theory for ordinary and partial
differential equations
Eigenvalue problems for discrete and
continuous systems

BORIS S. MORDUKHOVICH

Wayne State University*
Variational analysis and optimization
Generalized differentiation and its applications
Calculus of variations
Optimal control

JUNJIRO NOGUCHI

Graduate School of Mathematical Sciences The University of Tokyo Complex analytic geometry Holomorphic mappings

MUHAMMAD ASLAM NOOR

Eitsalat College of Engineering United Arab Emirates Variational and quasi-variational inequalities Complementarity problems Convex and nonlinear analysis Finite element analysis

ASSOCIATE EDITORS

MARIA CLARA NUCCI

Dipartimento di Matematica e Informatica Università di Perugia Fluid mechanics Mechanics of particles and systems Symmetrics of differential equations

ROBERT E. O'MALLEY, JR.

Department of Applied Mathematics University of Washington Singular perturbations Asymptotic methods

DONAL O'REGAN

National University of Ireland, Galway* Nonlinear analysis

CHIA VEN PAO

North Carolina State University* Nonlinear reaction diffusion equations Finite difference equations Neutron transport equations

HAROLD R. PARKS

Oregon State University* Geometric analysis Calculus of variations

MIKAEL PASSARE

Matematiska Institutionen Stockholms Universitet Complex analysis Analytic geometry

MARCO M. PELOSO

Politecnico Di Torino* Harmonic analysis Several complex variables

ALLAN C. PETERSON

University of Nebraska*
Difference equations
Dynamic equations on measure chains
BVPs for ODEs

COLIN ROGERS

School of Mathematics University of New South Wales Nonlinear partial differential equations and their applications Backlund transformations

LINDA PREISS ROTHSCHILD

University of California, San Diego* Several complex variables

ZHONG-JIN RUAN

University of Illinois*
Operator spaces
Operator algebras
Non-commutative harmonic analysis
Locally compact quantum groups

STEPHAN RUSCHEWEYH

Mathematisches Institut Universität Würzburg Complex analysis Complex approximation Geometric function theory

JOEL H. SHAPIRO

Michigan State University* Complex analysis Operator theory

R.E. SHOWALTER

The University of Texas at Austin* Nonlinear evolution equations Partial differential operators of diffusion Convection Deformation

HAL L. SMITH

Arizona State University* Differential equations Dynamical systems Mathematical biology

PENNY SMITH

Lehigh University* Nonlinear PDE Calculus of variations Geometry

H.M. SRIVASTAVA

Department of Mathematics and Statistics University of Victoria
Real and complex analysis
Fractional calculus and its applications
Integral equations and transforms
Higher transcendental functions and their applications
q-series and q-polynomials
Analytic number theory

ULRICH STADTMUELLER

Abteilung Mathematik III University of Ulm Probability Statistics Classical analysis

BERIT STENSONES

University of Michigan* Several complex variables

EMIL J. STRAUBE

Texas A&M University*
Several complex variables

BRIAN STRAUGHAN

Department of Mathematical Sciences University of Durham Partial differential equations Hydrodynamic stability Flows in porous media

ASSOCIATE EDITORS

HORST R. THIEME

Arizona State University*
Differential and integral equations
Dynamical and evolutionary systems
Population dynamics and epidemics

BRIAN S. THOMSON

Simon Fraser University* Real variables

RODOLFO H. TORRES

University of Kansas*

Harmonic analysis and its applications

ROBERTO TRIGGIANI

University of Virginia*
Partial differential equations
Control theory
Semigroup theory
Functional equations

NEIL S. TRUDINGER

Centre for Mathematics and Its Applications Australian National University Partial differential equations

DANIEL WATERMAN

Florida Atlantic University* Real analysis

Fourier series & orthogonal series

C. EUGENE WAYNE

Boston University*
Dynamical systems
Partial differential equations

G.F. WEBB

Vanderbilt University*
Functional differential equations
Population dynamics
Biomathematics

WOLFGANG L. WENDLAND

Universität Stuttgart* Integral equations Partial differential equations Numerical analysis

JAMES S.W. WONG

City University of Hong Kong*
Ordinary and functional differential equations

J.D. MAITLAND WRIGHT

University of Reading* Measure theory Operator algebras