Communications in Mathematical Physics

Volume 173 1995

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board
H. Araki, Kyoto
D. Brydges, Charlottesville, VA
A. Connes, Bures-sur-Yvette
R. Dijkgraaf, Amsterdam
G. Felder, Chapel Hill, NC
M. E. Fisher, College Park, MD
M. Herman, Palaiseau
M. Jimbo, Kyoto
A. Kupiainen, Helsinki
J. L. Lebowitz, New Brunswick, NJ
B. Simon, Pasadena, CA
Ya. G. Sinai, Princeton, NJ
S.-T. Yau, Cambridge, MA

Advisory Board
M. F. Atiyah, Oxford
L. Faddeev, St. Petersburg
F. Hirzebruch, Bonn
R. Schrieffer, Santa Barbara, CA
I. Singer, Cambridge, MA
C. N. Yang, Stony Brook, NY

Springer

Copyright
Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.
All articles published in this journal are protected by copyright, wich covers the exclusive rights to reproduce and distribute the article (e. g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.
The use of general descriptive names, trade names, trademarks, etc., in this publikation, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.
While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Special regulations for photocopies in the USA:
Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0010-3616, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

The Canada Institute for Scientific and Technical Information (CISTI) provides a comprehensive, worldwide document delivery service for all Springer-Verlag journals. For more information, or to place an order for a copyright-cleared Springer-Verlag document, please contact Client Assistant, Document Delivery, Canada Institute for Scientific and Technical Information, Ottawa K1A 0S2, Canada (Tel.: 613-993-9251; Fax: 613-952-8243; e-mail: cisti.docdel@nrc.ca).

Springer-Verlag Berlin Heidelberg New York Tokyo Hong Kong Barcelona Budapest
Printers: Saladruck, Berlin
Printed in Germany – © Springer-Verlag Berlin Heidelberg 1995
Springer-Verlag GmbH & Co KG, Berlin, Germany

Contents

Berndl, K., Dürr, D., Goldstein, S., Peruzzi, G., Zanghi, N.: On the Global Existence of Bohmian Mechanics 647
Birmingham, D., Rakowski, M.: State Sum Models and Simplicial Cohomology 135

Chicone, C., Latushkin, Y., Montgomery-Smith, S.: The Spectrum of the Kinematic Dynamo Operator for an Ideally Conducting Fluid 379

Dürr, D. → Berndl, K. 647

Epstein, A., Keen, L., Tresser, C.: The Set of Maps $F_{a,b}$: $x \mapsto x + a + \frac{b}{2\pi} \sin(2\pi x)$ with any Given Rotation Interval is Contractible 313
Eskin, G., Ralston, J.: Inverse Scattering Problem for the Schrödinger Equation with Magnetic Potential at a Fixed Energy 199

Freunds, P. G. O., Zabrodin, A. V.: The Spectral Problem for the q-Knizhnik – Zamolodchikov Equation and Continuous q-Jacobi Polynomials 17
Fröhlich, J., Götschmann, R., Marchetti, P. A.: The Effective Gauge Field Action of a System of Non-Relativistic Electrons 417
Funar, L.: On the Quotients of Cubic Hecke Algebras 513

Gaberdiel, M. R.: An Explicit Construction of the Quantum Group in Chiral WZW-Models 357
Gannon, T., Walton, M. A.: On the Classification of Diagonal Coset Modular Invariants 175
Götschmann, R. → Fröhlich, J. 417
Goldstein, S. → Berndl, K. 647
Graczyk, J., Jonker, L. B., Swiatek, G., Tangerman, F. M., Veerman, J. J. P.: Differentiable Circle Maps with a Flat Interval 599

Greene, B. R., Morrison, D. R. Plesser, M. R.: Mirror Manifolds in Higher Dimension 559

Gutkin, E., Katok, A.: Caustics for Inner and Outer Billiards 101

Helffer, B., Kerdelhué, P.: On the Total Bandwidth for the Rational Harper's Equation 335

Jonker, L. B. → Graczyk, J. 599

Katok, A. → Gutkin, E. 101
Keen, L. → Epstein, A. 313
Kerdelhué, P. → Helffer, B. 335
Klapper, I., Young, L. S.: Rigorous Bounds on the Fast Dynamo Growth Rate Involving Topological Entropy 623
Kuniba, A., Suzuki, J.: Analytic Bethe Ansatz for Fundamental Representations of Yangians 225

Latushkin, Y. → Chicone, C. 379
Lehmann, D.: A Microscopic Derivation of the Critical Magnetic Field in a Superconductor 155
Levstein, F., Liberati, J. I.: Branching Rules for Conformal Embeddings 1
Liberati, J. I. → Levstein, F. 1

Marchetti, P. A. → Fröhlich, J. 417
McKean, H. P.: Statistical Mechanics of Nonlinear Wave Equations (4): Cubic Schrödinger *(Erratum)* 675
Montgomery-Smith, S. → Chicone, C. 379
Morrison, D. R. → Greene, B. R. 559
Müller, B.: On Generalized Quantum Stochastic Counting Processes 453

Peruzzi, G. → Berndl, K. 647
Plesser, M. R. → Greene, B. R. 559

Rakowski, M. → Birmingham, D. 135
Ralston, J. → Eskin, G. 199
Robinson, D. W. → ter Elst, A. F. M. 475

Sá Barreto, A., Zworski, M.: Existence of Resonances in Three Dimensions 401

Sadov, V.: On Equivalence of Floer's and Quantum Cohomology 77
Scott, S. G.: Determinants of Dirac Boundary Value Problems over Odd-Dimensional Manifolds 43
Suzuki, J. → Kuniba, A. 225
Swiatek, G. → Graczyk, J. 599

Tangerman, F. M. → Graczyk, J. 599
Teleman, C.: Lie Algebra Cohomology and the Fusion Rules 265
ter Elst, A. F. M.: Reduced Heat Kernels on Nilpotent Lie Groups 475
Tresser, C. → Epstein, A. 313

Veerman, J. J. P. → Graczyk, J. 599

Walton, M. A. → Gannon, T. 175

Young, L. S. → Klapper, I. 623

Zabrodin, A. V. → Freund, P. G. O. 17
Zanghi, N. → Berndl, K. 647
Zworski, M. → Sá Barreto, A. 401

Indexed in *Current Contents*
Abstracted/Indexed in
MATH Database,
Zentralblatt für Mathematik
Evaluated and abstracted for PHYS on STN

A 20414 D

Communications in Mathematical Physics

Volume 173 Number 3 1995

B. Müller — On Generalized Quantum Stochastic Counting Processes 453

A. F. M. ter Elst, D. W. Robinson — Reduced Heat Kernels on Nilpotent Lie Groups 475

L. Funar — On the Quotients of Cubic Hecke Algebras 513

B. R. Greene, D. R. Morrison, M. R. Plesser — Mirror Manifolds in Higher Dimension 559

J. Graczyk, L. B. Jonker, G. Świątek, F. M. Tangerman, J. J. P. Veerman — Differentiable Circle Maps with a Flat Interval 599

I. Klapper, L. S. Young — Rigorous Bounds on the Fast Dynamo Growth Rate Involving Topological Entropy 623

K. Berndl, D. Dürr, S. Goldstein, G. Peruzzi, N. Zanghi — On the Global Existence of Bohmian Mechanics 647

H. P. McKean — Statistical Mechanics of Nonlinear Wave Equations (4): Cubic Schrödinger *(Erratum)* 675

Contents of Volume 173 I

Indexed in *Current Contents*
Abstracted/Indexed in
MATH Database
Zentralblatt für Mathematik,
Evaluated and abstracted for *PHYS* on *STN*

CMPHAY 173 (3) 453–676
November (I) 1995

Springer

Springer LaTeX and plain-TeX macros

We can use your TeX files directly for phototypesetting if you have used our macros. Makropackages are available for the following journals:

LJour1 LaTeX styles for Acta Informatica, Applicable Algebra in Engineering, Communication and Computing, Archive for Mathematical Logic, Astronomy & Astrophysics Reviews, Calculus of Variations, Communications in Mathematical Physics, Continuum Mechanics and Thermodynamics, Economic Theory, Inventiones mathematicae, Journal of Evolutionary Economics, Journal of Mathematical Biology, Manuscripta mathematica, Mathematische Annalen, Mathematische Semesterberichte, Mathematische Zeitschrift, Numerische Mathematik, Probability Theory and Related Fields, Statistical papers, Theoretica Chimica Acta

PJour1g global plain TeX packages for all journals mentioned above; ***PJour 1*** may also still be used. All packages are available via mailserver, FTP server or on DOS diskettes.

Mailserver

Send an e-mail message to svserv@vax.ntp.springer.de
which must contain one (several) of the following commands:

LJour1 get /tex/latex/ljour1.zip
PJour1g get /tex/plain/pjour1g.zip

In order to be transmitted ungarbled via the net, the files are pkzipped and uunencoded. The line get /tex/help-tex.txt in your e-mail to svserv will send you a file explaining how to unpack the files you receive.
Please do not send regular e-mail to this address.

FTP server

The internet address is 192.129.24.12 (trick.ntp.springer.de) The username is FTP or ANONYMOUS and the files are in the directory /pub/tex

Diskettes

To get the macro files and the AMS fonts (when needed) on 3.5″ DOS diskettes please write to:

Springer-Verlag, Journal Production,
Tiergartenstr. 17
D-69121 Heidelberg, Germany
e-mail: springer@vax.ntp.springer.de
FAX number: x 49 6221 487625

Please indicate clearly which macro package you need and the journal for which your paper is intended.

Use our LaTeX and plain-TeX macros to prepare your article for this and for other Springer journals.

Springer Journals Preview Service

List of Journals

Medicine
Abdominal Imaging
Acta Neuropathologica
Der Anaesthesist
Anatomy and Embryology
Annals of Hematology
Archives of Gynecology and Obstetrics
Calcified Tissue International
Cancer Chemotherapy and Pharmacology
Cancer Immunology, Immunotherapy
Cardiovascular and Interventional Radiology
Cell and Tissue Research
Diabetologia
European Journal of Cardio-thoracic Surgery
European Journal of Nuclear Medicine
European Journal of Orthopaedic Surgery and Traumatology (Continuation of Orthopedie-Traumatologie)
European Journal of Pediatrics
European Radiology
Experimental Brain Research
Der Hautarzt
Histochemistry
Inflammation Research (Birkhäuser)
Intensive Care Medicine
International Archives of Occupational and Environmental Health
International Journal of Colorectal Disease
International Orthopaedics
Der Internist
Journal of Cancer Research and Clinical Oncology
Journal of Neurology
Langenbecks Archiv fur Chirurgie
MedR Medizinrecht
Neuroradiology
Nouvelle Revue Française d'Hématologie
Orthopédie-Traumatologie
Der Pathologe
Pediatric Cardiology
Pediatric Nephrology
Pediatric Radiology
PerinatalMedizin
Psychopharmacology
Der Psychotherapeut
Der Radiologe
Revue d'Imagerie Médicale
Der Schmerz
Skeletal Radiology
Surgical Endoscopy
Surgical and Radiologic Anatomy
System Familie
Transplant International
Virchows Archiv
World Journal of Surgery

Biomedical Sciences
Archives of Toxicology
European Journal of Applied Physiology and Occupational Physiology
European Journal of Clinical Pharmacology
Human Genetics
Immunogenetics
Journal of Molecular Medicine
Medical Microbiology and Immunology
Naunyn-Schmiedeberg's Archives of Pharmacology
Pflügers Archiv - European Journal of Physiology
Radiation and Environmental Biophysics
Research in Experimental Medicine
Springer Seminars in Immunopathology

Biology
Applied Microbiology and Biotechnology
Archives of Environmental Contamination and Toxicology
Archives of Microbiology
Behavioral Ecology and Sociobiology
Biological Cybernetics
Biology and Fertility of Soils
Bulletin of Environmental Contamination and Toxicology
Chromosoma
Current Genetics
Current Microbiology
Differentiation
Environmental Management
European Biophysics Journal
European Journal of Biochemistry
Experientia (Birkhäuser)
International Journal of Biometeorology
Irrigation Science
Journal of Comparative Physiology A
Journal of Comparative Physiology B
The Journal of Membrane Biology
Journal of Molecular Evolution
Mammalian Genome
Marine Biology
Microbial Ecology
MGG – Molecular & General Genetics
Mycorrhiza
Naturwissenschaften
Oecologia
Plant Cell Reports
Planta
Polar Biology
Roux's Archives of Developmental Biology
Sexual Plant Reproduction
TAG Theoretical and Applied Genetics
Trees
Zoomorphology

Mathematics
Archive for Mathematical Logic
Calculus of Variations and Partial Differential Equations
Inventiones mathematicae
Journal of Mathematical Biology
Mathematische Annalen
Mathematische Semesterberichte
Mathematische Zeitschrift
Numerische Mathematik
Probability Theory and Related Fields

Chemistry
Fresenius' Journal of Analytical Chemistry
Theoretica Chimica Acta
Zeitschrift für Lebensmittel-Untersuchung und -Forschung

Engineering
Applicable Algebra in Engineering
Archive of Applied Mechanics
Experiments in Fluids
Bauingenieur
Bioprocess Engineering
Computational Mechanics
Electrical Engineering (bisher: Archiv für Elektrotechnik)
Engineering with Computers
Heat and Mass Transfer
Holz als Roh- und Werkstoff
Konstruktion
Microsystem Technologies
Stahl - Rehabilitation der Lkft
Wood Science and Technology
wt Produktion und Management
ZFW Zeitschrift für Flugwissenschaften und Weltraumforschung
Zeitschrift für Lärmbekämpfung

Physics
Applied Physics A Solids and Surfaces
Applied Physics B. Lasers and Optics
The Astronomy and Astrophysics Review
Communications in Mathematical Physics
Continuum Mechanics and Thermodynamics
Shock Waves
Zeitschrift für Physik A: Hadrons and Nuclei
Zeitschrift für Physik B. Condensed Matter
Zeitschrift für Physik C: Particles and Fields
Zeitschrift für Physik D: Atoms, Molecules and Clusters

Geosciences
Annales Geophysicae
Bulletin Géodésique
Bulletin of Volcanology
Climate Dynamics
Contributions to Mineralogy and Petrology
Coral Reefs
Geologische Rundschau
manuscripta geodaetica
Mineralium Deposita
Physics and Chemistry of Minerals

Economics
The Annals of Regional Science
Economic Theory
Journal of Population Economics
OR-Spektrum

Computer Science
Acta Informatica
Distributed Computing
Informatik - Forschung und Entwicklung
Kognitionswissenschaft
Machine Vision and Applications
The Visual Computer

Tables of Contents are free of charge, all BiblioAbstracts are available for US$ 20,- per year. For details please send an e-mail message containing the command **HELP** to our mailserver
E-mail **SVJPS@ntp.springer.de**

The Tables of Contents are available via
ftp: ftp springer de
in directory: /pub/TOC
gopher gopher.springer de
Springer Journals
Preview Service
www:
http://www springer.de/server/svjps html

For any further information please contact our e-mail address
em-helpdesk@springer.de

Date 17.8.95

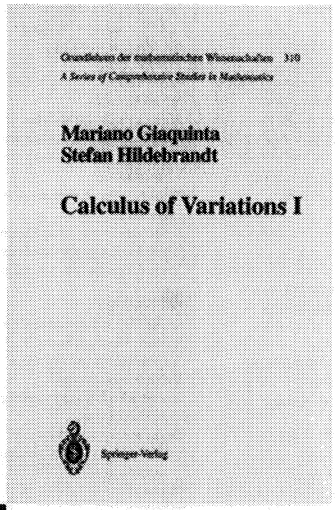
Springer
electronic media

Preisänderungen vorbehalten.

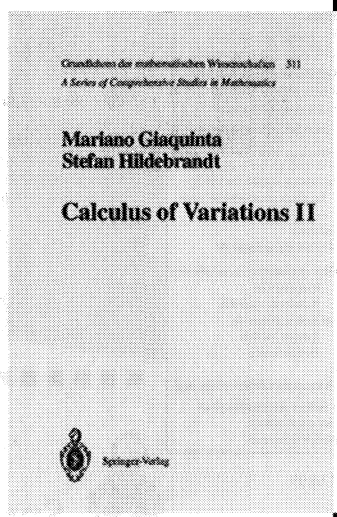
Springer-Verlag, Postfach 31 13 40, D-10643 Berlin, Fax 0 30 / 82 07 - 3 01 / 4 48, e-mail. orders@springer.de d&p.2959.EM/E/1

Calculus of Variations: The standard reference work

This long-awaited book by two of the foremost researchers and writers in the field is the first part of a treatise that will cover the subject in breadth and depth, paying special attention to the historical origins. A variety of aids to the reader are provided: an introduction to each chapter, section and subsection; an overview of the relevant literature (in Vol. 2) plus the references in the Scholia to each chapter, and in the bibliography; and finally an index of the examples used throughout the book.
Later volumes will deal with direct methods and regularity theory. Both individually and collectively these volumes will undoubtedly become standard references.



The Langrangian Formalism
1995. XXII, 350 pages. 73 figures.
Hardcover DM 188,–
ISBN 3-540-50625-X



The Hamiltonian Formalism
1995. Approx. 500 pages. 41 figures.
Hardcover DM 198,– ISBN 3-540-57961-3

Remaining 4 volumes to appear over the next few years.

Springer

Prices are subject to change without notice.
In EU countries the local VAT is effective

Springer-Verlag, P O Box 31 13 40, D-10643 Berlin, Germany. Fax· (0)30/8207-301/448, e-mail orders@springer.de

IMCA 2912/MNT/E/1