# Mathematical Physics

### Volume 89 Number 4 1983

A. Matsumura, T. Nishida

R. T. Glassey, W. A. Strauss

J. L. Friedman, R. D. Sorkin

J. L. Friedman, R. D. Sorkin C. Gerhardt

N. S. Manton, M. Nauenberg

T. Bałaban

Initial Boundary Value Problems for the Equations of Motion of Compressible Viscous and Heat-Conductive Fluids 445

The Scattering of Certain Yang-Mills Fields 465

Kinematics of Yang-Mills Solitons 483

Statistics of Yang-Mills Solitons 501

H-Surfaces in Lorentzian Manifolds 523

Universal Scaling Behaviour for Iterated Maps in the Complex

Plane 555

Regularity and Decay of Lattice Green's Functions 571

Indexed in Current Contents
Evaluated for Physics Briefs and INKA-PHYS data base



## Springer-Verlag Berlin Heidelberg New York Tokyo

### Communications in Mathematical Physics

Copyright. It is a fundamental condition that submitted manuscripts have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature, and translations. Photographic reproduction, microform, or any other reproduction of text, figures, or tables from this journal is prohibited without permission obtained from the publisher.

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 nor the editors nor the publisher can accept legal responsibility for errors or omissions that may have been made. The publisher makes no warranty, express of implied, with respect to the material contained herein.

Special Regulations for the USA. Photocopies may be made for personal or internal use beyond that permitted by Section 107 or 108 of the U.S. Copyright Law, provided a fee is paid. This fee is \$ 0.20 per page or a minimum of \$ 1.00 if an article consists of less than five pages. Please pay this fee to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0010-3616 volume, and first and last page numbers of each article copied.

The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

# Authors should mark manuscripts according to the "Instructions to Authors." They should be aware that manuscripts which are not properly marked require additional time for publication. Manuscripts should be sent to:

Prof. H. Araki, Research Institute for Mathematical Sciences, Kyoto University, Kyoto, 606, Japan

Prof. J. Fröhlich, ETH-Hönggerberg, CH-8093 Zürich, Switzerland

Prof. R. Haag, II. Institut für Theoretische Physik, Luruper Chaussee 149, D-2000 Hamburg 50, Federal Republic of Germany

*Prof. S. Hawking*, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, Silver Street, Cambridge CB3 9EW, England *Prof. A. Jaffe*, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, USA

Prof. O. Lanford, I. H. E. S., F-91440 Bures-sur-Yvette, France

*Prof. J. Lascoux,* Physique Théorique, Ecole Polytechnique, F-91120 Palaiseau, France

Prof. J. L. Lebowitz, Department of Mathematics, Rutgers University, New Brunswick, NJ 08903, USA

Prof. G. Mack, II. Institut für Theoretische Physik, Luruper Chaussee 149, D-2000 Hamburg 50, Federal Republic of Germany

*Prof. J. Mather,* until September 1, 1983: I. H. E. S., F-91440 Bures-sur-Yvette, France; after September 1, 1983: Department of Mathematics, Fine Hall, Princeton University, Princeton, NJ 08544, USA

*Prof. L. Nirenberg,* Courant Institute, New York University, 251 Mercer Street, New York, NY, 10012, USA

Prof. K. Osterwalder, E.T.H. Zentrum, CH-8092 Zürich, Switzerland

*Prof. B. Simon,* Department of Mathematics, California Institute of Technology, Pasadena, CA 91125, USA

*Prof. Ya. G. Sinai,* L. D. Landau Institute for Theoretical Physics, Academy of Sciences, Vorobyevskoe Shosse, 2, SU-117334 Moscow, USSR

*Prof. T. Spencer,* Courant Institute, New York University, 251 Mercer Street, New York, NY 10012, USA

*Prof. R. Stora,* CERN, Theory Division, CH-1211 Geneva 23, Switzerland *Prof. S.-T. Yau,* School of Mathematics, The Institute for Advanced Study, Princeton, NJ 08540, USA

Mathematical methods with direct relevance to physics

Equilibrium statistical mechanics

Conceptual structure

Gravitation and field theories

Chief Editor

Dynamical systems

Nonequilibrium statistical mechanics

Quantum field theory and statistical mechanics

Classical dynamical systems

Partial differential equations

Constructive quantum field theory and general theory of quantized fields

Schrödinger operators and atomic physics

Statistical physics and dynamical systems

Disordered systems

Lagrangian quantum field theory Relativity; geometry and physics

100 offprints of each article will be supplied to the author free of charge and additional copies may be obtained at cost price if ordered before the issue goes to press.

Subscription Information. Vols. 87-91, (4 issues each) will appear in 1983. The price of each volume is DM 370.00 or approx. US \$ 154.00. Prices for back volumes are available on request. Correspondence concerning subcriptions should be addressed to the publisher. North America. Annual subscription rate: US \$ 794.00, including carriage charges. Subscriptions are entered with prepayment only. Orders should be addressed to: Springer-Verlag New York Inc., Journal Sales Department, 44 Hartz Way, Secaucus, NJ 07094, USA, Telephone (201) 348-4033, Telex 0023 125994. Members of the International Association of Mathematical Physics (IAMP) are entitled to receive the journal strictly for their own personal use at a special reduced rate. The orders must be placed through the IAMP. All Other Countries. Annual subscription rate: DM 1850.00, plus carriage charges. Airmail delivery on request only. For Japan, carriage charges (Surface Airmail Lifted) are DM 183.00; for India DM 107.00. Single issue price DM 111.00 plus carriage charges. — Orders for all countries except North America can either be placed with your bookdealer or sent directly to: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33. Tel. 0 30/82 07-1, Telex 01 83 319. Changes of Address: Allow six weeks for all changes to become effective. All communications should include both old and new addresses (with Postal Codes) and should be accompanied by a mailing label from a recent issue. Microform: Microform editions are available from: University Microfilms International, 300 N. Zeeb Road, Ann Arbor, MI 48106, USA.

### Production

Journal Production Department I, Springer-Verlag, Postfach 10 52 80, D-6900 Heidelberg 1, Federal Republic of Germany, Tel. 0 62 21/4 87-3 26, Telex 04 61 723