

Communications in Mathematical Physics

Volume 136 Number 1 1991

- | | | |
|-----------------------------|---|-----|
| J. Patera, H. Zassenhaus | The Higher Rank Virasoro Algebras | 1 |
| E. Frochaux | Zero-Time One-Particle States in Quantum Field Theory | 15 |
| W.-M. Wang | Exponential Decay of Green's Functions for a Class of Long Range Hamiltonians | 35 |
| M. Gorzelańczyk | Phase Transition in Gas of Hard Core Spheres | 43 |
| P. Šťovíček | On the Initial Condition for Instanton Solutions | 53 |
| B. Zwiebach | How Covariant Closed String Theory Solves a Minimal Area Problem | 83 |
| T. Yanagisawa, A. Matsumura | The Fixed Boundary Value Problems for the Equations of Ideal Magneto-Hydrodynamics with a Perfectly Conducting Wall Condition | 119 |
| M. Zworski | Shift of the Shadow Boundary in High Frequency Scattering | 141 |
| S. Wu | Topological Quantum Field Theories on Manifolds with a Boundary | 157 |
| T. C. Dorlas | Renormalization Group Analysis of a Simple Hierarchical Fermion Model | 169 |
| Y. Cheng, M. L. Ge, K. Xue | Yang-Baxterization of Braid Group Representations | 195 |

Indexed in *Current Contents*

Evaluated and abstracted for *PHYS* on *STN*



Springer International

220 Commun. Math. Phys.
ISSN 0010-3616 CMPHAY 136 (1) 1–208 (1991)
Printed on acid-free paper

February (I) 1991

Communications in Mathematical Physics

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publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.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, which 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 publication, 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. This fee is US \$ 0.20 per page, or a minimum of US \$ 1.00 if an article contains fewer than five pages. 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.

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. M. Aizenman, Department of Physics, Jadwin Hall, Princeton University, Princeton, NJ 08544, USA

Statistical physics

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

Mathematical methods with direct relevance to physics

Prof. A. Connes, I.H.E.S., F-91440 Bures-sur-Yvette, France

Quantum physics and differential geometry

Prof. J.-P. Eckmann, Département de Physique Théorique, Université de Genève, 32, Boulevard d'Ivroy, CH-1211 Genève 4, Switzerland

Dynamical systems

Prof. M. E. Fisher, Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, USA

Statistical physics

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

General statistical mechanics

Prof. K. Gawędzki, I.H.E.S., F-91440 Bures-sur-Yvette, France

Quantum field theory and statistical mechanics

Prof. M. Herman, Centre de Mathématiques Pures, Ecole Polytechnique, F-91128 Palaiseau Cedex, France

Classical dynamical systems

Prof. A. Jaffe, Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, USA

Chief Editor

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

Nonequilibrium statistical mechanics

Prof. N. Yu. Reshetikhin, Department of Mathematics, Harvard University, 1 Oxford Street, Cambridge, MA 02138, USA

Gravitation, field theories and geometry

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

Schrödinger operators and atomic physics

Prof. Ya. G. Sinai, L. D. Landau Institute for Theoretical Physics, ul. Kosygina, dom 2, SU-117334 Moscow, V-334, USSR

Statistical physics and dynamical systems

Prof. T. Spencer, School of Mathematics, Institute for Advanced Study, Princeton, NJ 08540, USA

Disordered systems

Prof. S.-T. Yau, Department of Mathematics, Harvard University, 1 Oxford Street, Cambridge, MA 02138, USA

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 134-141, (3 issues each) will appear in 1991. **North America.** Recommended annual subscription rate. US \$ 3046.00, single issue price \$ 152.00 including carriage charges. Subscriptions are entered with prepayment only. Orders should be addressed to: Springer-Verlag New York Inc., Service Center Secaucus, 44 Hartz Way, Secaucus, NJ 07094, USA, Telephone (201) 348-4033, Telex 023 125 994, FAX (201) 348-45 05. 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.** Recommended annual subscription rate. DM 4752.00, plus carriage charges: (Federal Republic of Germany DM 64.20 incl value added tax, all other countries DM 103.20 except for the following countries to which SAL delivery (Surface Airmail Lifted) is mandatory Japan DM 232.80, India DM 175.20, Australia/New Zealand DM 264.00. Airmail delivery to all other countries is available upon request. Volume price. DM 594.00, single issue price: DM 237.60 plus carriage charges. Orders for all countries except North America can either be placed with your bookdealer or sent directly to Springer-Verlag, Heidelbergberg Platz 3, 1000 Berlin 33. Tel. 0 30/82 07-1, Telex 01 83 319, FAX (0130/821 4091. **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. **Back Volumes.** Prices are available on request. **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, W-6900 Heidelberg, Federal Republic of Germany,
Tel. 0 62 21/4 87-5 25, Telex 04 61 723, FAX (0)6221/4 39 82; FAX (0)6221-487 624