Communications in Mathematical Physics

Volume 96

A. Jaffe, Cambridge, MA

Chief Editor

Editorial Board

Advisory Board

H. Araki, Kyoto M. E. Fisher, Ithaca, NY J. Fröhlich, Zürich R. Haag, Hamburg S. Hawking, Cambridge O. Lanford, Bures-sur-Yvette J. L. Lebowitz, New Brunswick, NJ G. Mack, Hamburg J. Mather, Princeton, NJ L. Nirenberg, New York, NY K. Osterwalder, Zürich G. Parisi, Roma B. Simon, Pasadena, CA Ya. G. Sinai, Moscow T. Spencer, New York, NY S.-T. Yau, LaJolla, CA M. F. Atiyah, Oxford A. Connes, Bures-sur-Yvette G. 't Hooft, Utrecht

1984

I. Singer, Cambridge, MA

C. N. Yang, Stony Brook, NY



Springer-Verlag Berlin Heidelberg New York Tokyo

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publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.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.

Other regulations:

Authors publishing in this journal can, under certain conditions, benefit from library and photocopy fees collected by VG WORT. Authors resident in the Federal Republic of Germany or in West Berlin can apply to Verwertungsgesellschaft WORT, Abteilung Wissenschaft, Goethestraße 49, D-8000 München 2, for detailed information.

Springer-Verlag Berlin Heidelberg New York Tokyo Printers: Brühlsche Universitätsdruckerei, Giessen Printed in Germany — © Springer-Verlag Berlin Heidelberg 1984 Springer-Verlag GmbH & Co KG 1000 Berlin 33

Contents

Abraham, D. B., Chayes, J. T., Chayes, L.: Random Surface Correlation Functions	439
Alvarez, O., Singer, I. M., Zumino, B.: Gravitational Anomalies and the Family's Index	
Theorem	
Applebaum, D. B., Hudson, R. L.: Fermion Ito's Formula and Stochastic Evolutions	473
Balaban, T.: Propagators and Renormalization Transformations for Lattice Gauge Theories. II	223
Benfatto, G., Pulvirenti, M.: Generation of Vorticity Near the Boundary in Planar Navier-Stokes	
Flows	59
Borchers, HJ.: Translation Group and Spectrum Condition	1
Borgs, C.: Translation Symmetry Breaking in Four Dimensional Lattice Gauge Theories	251
Brezis, H., Lieb, E. H.: Minimum Action Solutions of Some Vector Field Equations	97
Bunce, L. J., Wright, J. D. M.: Quantum Logic, State Space Geometry and Operator Algebras	345
Chayes, J. T., see Abraham, D. B., et al	
Chayes, L., see Abraham, D. B., et al.	
Coninck, J. De: Infinitely Divisible Distribution Functions of Class L and the Lee-Yang	
Theorem	373
d'Antoni, C., Fredenhagen, K.: Charges in Spacelike Cones (Erratum)	
Donaldson, S. K.: Nahm's Equations and the Classification of Monopoles	
Fannes, M., Verbeure, A.: On Solvable Models in Classical Lattice Systems	
Fredenhagen, K., see d'Antoni, C.	
Fröhlich, J., Imbrie, J. Z.: Improved Perturbation Expansion for Disordered Systems: Beating	500
	1 1 5
Griffiths Singularities	
Galloway, G. J.: Splitting Theorems for Spatially Closed Space-Times	423
Grossman, B., Kephart, T. W., Stasheff, J. D.: Solutions to Yang-Mills Field Equations in Eight	421
Dimensions and the Last Hopf Map	
Horváthy, P. A., Rawnsley, J. H.: Topological Charges in Monopole Theories	
Hudson, R. L., see Applebaum, D. B.	
Imbrie, J. Z., see Fröhlich, J.	
Keller, G.: On the Rate of Convergence to Equilibrium in One-Dimensional Systems	
Kephart, T.W., see Grossman, B., et al.	431
Lanford III, O. E.: A Shorter Proof of the Existence of the Feigenbaum Fixed Point	
Lieb, E. H., see Brezis, H.	
Murray, M. K.: Non-Abelian Magnetic Monopoles	539
Olivieri, E., Picco, P.: On the Existence of Thermodynamics for the Random Energy Model	
Picco, P., see Olivieri, E.	
Pulvirenti, M., see Benfatto, G.	59
Rawnsley, J. H., see Horváthy, P. A.	
Rosly, A. A., Schwarz, A. S.: Geometry of $N = 1$ Supergravity II	285
Schwarz, A. S., see Rosly, A. A.	285
Singer, I. M., see Alvarez, O., et al.	409
Stasheff, J. D., see Grossman, B., et al.	
Verbeure, A., see Fannes, M.	
Wayne, C. E.: The KAM Theory of Systems with Short Range Interactions, I	
Wayne, C. E.: The KAM Theory of Systems with Short Range Interactions, II	
Wolfram, S.: Computation Theory of Cellular Automata	
Wright, J. D. M., see Bunce, L. J.	
Yajima, K.: The Surfboard Schrödinger Equations	
Zamolodchikov, A. B.: Conformal Symmetry in Two Dimensions: An Explicit Recurrence	517
Formula for the Conformal Partial Wave Amplitude	419
Zegarliński, B.: Uniqueness and the Global Markov Property for Euclidean Fields: The Case of	11)
General Exponential Interaction	105
Zisook, A. B.: The Complete Set of Hamiltonian Intermittency Scaling Behaviors	261
Zumino, B., see Alvarez, O., et al.	409

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

Communications in Mathematical Physics

Volume 96 Number 4 1984

G. J. Galloway	Splitting Theorems for Spatially Closed Space-Times 423
B. Grossman, T. W. Kephart, J. D. Stasheff	Solutions to Yang-Mills Field Equations in Eight Dimensions and the Last Hopf Map 431
D. B. Abraham, J. T. Chayes, L. Chayes	Random Surface Correlation Functions 439
D. B. Applebaum, R. L. Hudson	Fermion Ito's Formula and Stochastic Evolutions 473
P. A. Horváthy, J. H. Rawnsley	Topological Charges in Monopole Theories 497
O. E. Lanford III	A Shorter Proof of the Existence of the Feigenbaum Fixed Point 521
M. K. Murray	Non-Abelian Magnetic Monopoles 539
C. d'Antoni, K. Fredenhagen	Charges in Spacelike Cones Erratum 566

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



Springer-Verlag Berlin Heidelberg New York Tokyo

220 Commun. Math. Phys. ISSN 0010-3616 CMPHAY 96 (4) 423-566 (1984)

Communications in Mathematical Physics

Prof. H. Araki, Research Institute for Mathematical Sciences, Kyoto Uni-

versity, Kyoto, 606, Japan

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.

Other regulations: Authors publishing in this journal can, under certain conditions, benefit from library and photocopy fees collected by VG WORT. Authors resident in the Federal Republic of Germany or in West Berlin can apply to Verwertungsgesellschaft WORT, Abteilung Wissenschaft, Goethestraße 49, D-8000 München 2, for detailed information.

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:

Statistical 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
General theoretical physics
Schrödinger operators and atomic physics
Statistical physics and dynamical systems
Disordered systems

Prof. S.-T. Yau, Department of Mathematics, University of California at San Diego, La Jolla, CA 92093, USA

Relativity; geometry and physics

Mathematical methods with direct

relevance to 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. 97-101, (4 issues each) will appear in 1985. **North America.** Annual subscription rate: US \$ 797.00, single issue price \$ 48.00 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 0023 125 994. 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 2130.00, plus carriage charges. Volume price: DM 426.00, single issue price: DM 127.80, plus carriage charges. Airmail delivery on request only. Carriage charges for SAL (Surface Airmail Lifted) to Japan, India, Australia and New Zealand are available on request. — 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. **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, D-6900 Heidelberg 1, Federal Republic of Germany, Tel. 0 62 21/4 87-3 25, Telex 04 61 723