Communications in
Mathematical Physics

Volume 143 1991/2

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board M. Aizenman, Princeton, NJ
H. Araki, Kyoto
A. Connes, Bures-sur-Yvette
J.-P. Eckmann, Genève
M. E. Fisher, College Park, MD
J. Fröhlich, Zürich
K. Gawedzki, Bures-sur-Yvette
M. Herman, Palaiseau
J. L. Lebowitz, New Brunswick, NJ
N. Yu. Reshetikhin, Berkeley, CA
B. Simon, Pasadena, CA
Ya. G. Sinai, Moscow
T. Spencer, Princeton, NJ
S.-T. Yau, Taiwan

Advisory Board M. F. Atiyah, Oxford
F. Hirzebruch, Bonn
G. 't Hooft, Utrecht
R. Schrieffer, Santa Barbara, CA
I. Singer, Cambridge, MA
C. N. Yang, Stony Brook, NY

Springer International

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publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.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 per copy, plus a basic fee of US $ 2.00 per article. 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.

Springer-Verlag Berlin Heidelberg New York Tokyo Hong Kong Barcelona Budapest
Printers: Brühlsche Universitätsdruckerei, Giessen
Printed in Germany — © Springer-Verlag Berlin Heidelberg 1992
Springer-Verlag GmbH & Co KG, 1000 Berlin 33, Federal Republic of Germany

Contents

Barata, J. C. A.: Reduction Formulae for Euclidean Lattice Theories 545
Berger R.: The Quantum Poincaré–Birkhoff–Witt Theorem 215
Bogomolov, F., Braam, P. J.: Instantons and Mirror K3 Surfaces 641
Bona, J. L. , Ponce, G., Saut, J. C., Tom, M. M.: A Model System for Strong Interaction Between Internal Solitary Waves 287
Borchers H. J.: The CPT-Theorem in Two-dimensional Theories of Local Observables 315
Braam, P. J. → Bogomolov, F. 641
Brown, L. G.: Complements to Various Stone-Weierstrass Theorems for C^*-algebras and a Theorem of Shultz 405
Buchholz, D., Wanzenberg, R.: The Realm of the Vacuum 577

Caglioti, E., Lions, P. L., Marchioro, C., Pulvirenti, M.: A Special Class of Stationary Flows for Two-Dimensional Euler-Equations: A Statistical Mechanics Description 501
Chojnacki, W.: A Generalized Spectral Duality Theorem 527

Deift, P., Li, L.-Ch.: Poisson Geometry of the Analog of the Miura Maps and Bäcklund-Darboux Transformations for Equations of Toda Type and Periodic Toda Flows 201

Erdös L, Tuyen, D. q.: Central Limit Theorems for the One-Dimensional Rayleigh Gas with Semipermeable Barriers 451

Forger, M., Kellendonk, J.: Classical BRST Cohomology and Invariant Functions on Constraint Manifolds. I 235
Fukuma, M., Kawai, H., Nakayama, R.: Infinite Dimensional Grassmannian Structure of Two-Dimensional Quantum Gravity 371

Gérard, C., Knauf, A.: Collisions for the Quantum Coulomb Hamiltonian 17
Gervais, J.-L., Rostand, B.: On Two-Dimensional Supergravity and the Quantum Super-Möbius Group 175
Giddings, S. B.: Punctures on Super Riemann Surfaces 355
Golden, K.: Exponent Inequalities for the Bulk Conductivity of a Hierarchical Model 467
Gutkin, E., Simanyi, N.: Dual Polygonal Billiards and Necklace Dynamics 431

Hiai, F., Petz, D.: The Proper Formula for Relative Entropy and its Asymptotics in Quantum Probability 99
Hsiao, L., Liu, T.-P.: Convergence to Nonlinear Diffusion Waves for Solutions of a System of Hyperbolic Conservation Laws with Damping 599

Isopi, M., Newman, Ch. M.: The Triangle Law for Lyapunov Exponents of Large Random Matrices 591

Janowsky, S. A., Weitsman, J.: A Vanishing Theorem for Supersymmetric Quantum Field Theory and Finite Size Effects in Multiphase Cluster Expansions 85

Kawai, H. → Fukuma, M. 371
Kellendonk, J. → Forger, M. 235
Kent, A., Watts, G.: Signature Characters for A_2 and B_2 1
Klein, M., Martinez, A., Seiler, R., Wang, X. P.: On the Born-Oppenheimer Expansion for Polyatomic Molecules 607
Knauf, A. → Gérard, C. 17
Kocharyan A. A.: Instability in Superspace 27
Krichever, I.: The Dispersionless Lax Equations and Topological Minimal Models 415

Levi, M.: Quasiperiodic Motions in Superquadratic Time-Periodic Potentials 43

Li, L.-Ch. → Deift, P. 201
Lions, P. L. → Caglioti, E. 501
Liu, T.-P. → Hsiao, L. 599

Marchioro, C. → Caglioti, E. 501
Martinez, A. → Klein, M. 607
McLeod, J. B. → Smoller, J. A. 115

Nakayama, R. → Fukuma, M. 371
Newman, Ch. M. → Isopi, M. 591

O'Raifeartaigh, L., Ruelle, P., Tsutsui, I., Wipf, A.: *W*-Algebras for Generalized Toda Theories 333

Petz, D. → Hiai, F. 99
Ponce, G. → Bona, J. L. 287
Pulvirenti, M. → Caglioti, E. 501

Rostand, B. → Gervais, J.-L. 175
Ruelle, P. → O'Raifeartaigh, L. 333

Saut, J. C. → Bona, J. L. 287
Seiler, R. → Klein, M. 607
Simanyi, N. → Gutkin, E. 431
Smit, D.-J.: Summations over Equilaterally Triangulated Surfaces and the Critical String Measure 253
Smoller, J. A., Wasserman, A. G., Yau, S.-T., McLeod, J. B.: Smooth Static Solutions of the Einstein/Yang-Mills Equations 115
Svinolupov, S. I.: Generalized Schrödinger Equations and Jordan Pairs 559

Takama, M.: Super Beltrami Differentials 149
Tom, M. M. → Bona, J. L. 287
Tsutsui, I. → O'Raifeartaigh, L. 333
Tuyen, D. q. → Erdös, L. 451

Wang, X. P. → Klein, M. 607
Wanzenberg, R. → Buchholz, D. 577
Wasserman, A. G. → Smoller, J. A. 115
Watts, G. → Kent, A. 1
Weitsman, J. → Janowsky, S. A. 85
Wipf, A. → O'Raifeartaigh, L. 333

Yau, S.-T. → Smoller, J. A. 115

Indexed in *Current Contents*
Evaluated and abstracted for *PHYS* on *STN*

A 20414 D

Communications in Mathematical Physics

Volume 143 Number 3 1992
Last issue of this volume

E. Gutkin, N. Simanyi — Dual Polygonal Billiards and Necklace Dynamics 431

L. Erdös, D. q. Tuyen — Central Limit Theorems for the One-Dimensional Rayleigh Gas with Semipermeable Barriers 451

K. Golden — Exponent Inequalities for the Bulk Conductivity of a Hierarchical Model 467

E. Caglioti, P. L. Lions, C. Marchioro, M. Pulvirenti — A Special Class of Stationary Flows for Two-Dimensional Euler Equations: A Statistical Mechanics Description 501

W. Chojnacki — A Generalized Spectral Duality Theorem 527

J. C. A. Barata — Reduction Formulae for Euclidean Lattice Theories 545

S. I. Svinolupov — Generalized Schrödinger Equations and Jordan Pairs 559

D. Buchholz, R. Wanzenberg — The Realm of the Vacuum 577

M. Isopi, Ch. M. Newman — The Triangle Law for Lyapunov Exponents of Large Random Matrices 591

L. Hsiao, T.-P. Liu — Convergence to Nonlinear Diffusion Waves for Solutions of a System of Hyperbolic Conservation Laws with Damping 599

M. Klein, A. Martinez, R. Seiler, X. P. Wang — On the Born-Oppenheimer Expansion for Polyatomic Molecules 607

F. Bogomolov, P. J. Braam — Instantons and Mirror K3 Surfaces 641

Contents of Vol 143

Indexed in *Current Contents*
Evaluated and abstracted for *PHYS* on *STN*

Springer International

220 Commun. Math. Phys.
ISSN 0010-3616 CMPHAY 143 (3) 431–646 (1992)
Printed on acid-free paper

January (II) 1992

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 per copy, plus a basic fee of US $ 2.00 per article. 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'Ivoy, 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. Gawedzki, 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, University of California, Berkeley, CA 94720, 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, National Tsing Hua University, Hsinchu, Taiwan, R.O.C.	*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. 142—149, (3 issues each) will appear in 1992. **North America.** Recommended annual subscription rate: US $ 2887.00, single issue price $ 142.00 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) 348-4505. 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 4992.00, plus carriage charges: Federal Republic of Germany: DM 66.77 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 624.00, single issue price: DM 249.60 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, W-1000 Berlin 33. Tel. 0 30/82 07-1, Telex 01 83 319, FAX (0) 30/821 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, Karin Quintes,
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) 6221-487 624