

Communications in
**Mathematical
Physics**

Volume 133 1990

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, Cambridge, MA
B. Simon, Pasadena, CA
Ya. G. Sinai, Moscow
T. Spencer, Princeton, NJ
S.-T. Yau, Cambridge, MA

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publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.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

Springer-Verlag Berlin Heidelberg New York Tokyo Hong Kong Barcelona
Printers: Brühlsche Universitätsdruckerei, Giessen
Printed in Germany — © Springer-Verlag Berlin Heidelberg 1990
Springer-Verlag GmbH & Co KG, 1000 Berlin 33, Federal Republic of Germany

Contents

- Alekseev, A., Shatashvili, S.: Quantum Groups and WZNW Models 353
- Balabane, M., Cazenave, T., Vázquez, L.: Existence of Standing Waves for Dirac Fields with Singular Nonlinearities 53
- Burroughs, N.: Relating the Approaches to Quantised Algebras and Quantum Groups 91
- Cazenave, T. → Balabane, M., et al. 53
- Chemin, J. Y.: Remarques sur L'Apparition de Singularités dans les Ecoulements Euleriens Compressibles 323
- Contreras-Barandiarán, G.: Rate of Escape of Some Chaotic Julia Sets 197
- Coquereaux, R., Frappat, L., Ragoucy, E., Sorba, P.: Extended Super-Kac-Moody Algebras and Their Super-Derivation Algebras 1
- Frappat, L. → Coquereaux, R., et al. 1
- Friedrich, T., Kath, I.: 7-Dimensional Compact Riemannian Manifolds with Killing Spinors 543
- Fritz, J.: On the Diffusive Nature of Entropy Flow in Infinite Systems: Remarks to a Paper by Guo-Papanicolau-Varadhan 331
- Grosche, Ch.: Selberg Supertrace Formula for Super Riemann Surfaces, Analytic Properties of Selberg Super Zeta-Functions and Multiloop Contributions for the Fermionic String 433
- Hurtubise, J., Murray, M. K.: Monopoles and Their Spectral Data 487
- Kaidi, N., Rouleux, M.: Multiple Resonances in the Semi-Classical Limit 617
- Kashiwara, M.: Crystalizing the q -Analogue of Universal Enveloping Algebras 249
- Kath, I. → Friedrich, T. 543
- Lott, J.: Torsion Constraints in Supergeometry 563
- Marshall, I.: A Lie Algebraic Setting for Miura Maps Related to an Energy Dependent Linear Problem 509
- Moore, G.: Geometry of the String Equations 261
- Moroz, A.: Summability Method for a Horn-Shaped Region 369
- Murray, M. K. → Hurtubise, J. 487
- Ragoucy, E. → Coquereaux, R., et al. 1
- Rouleux, M. → Kaidi, N. 617
- Ruelle, Ph.: Dimension of the Commutant for the $SU(N)$ Affine Algebras 181
- Ruelle, Ph., Thiran, E., Weyers, J.: Modular Invariants for Affine $\widehat{SU}(3)$ Theories at Prime Heights 305
- Ruijsenaars, S. N. M.: Relativistic Toda Systems 217
- Shatashvili, S. → Alekseev, A. 353
- Singer, M. A.: Flat Twistor Spaces, Conformally Flat Manifolds and Four-Dimensional Field Theory 75
- Soffer, A., Weinstein, M. I.: Multichannel Nonlinear Scattering for Nonintegrable Equations 119
- Soga, H.: Asymptotic Solutions of the Elastic Wave Equation and Reflected Waves near Boundaries 37
- Sorba, P. → Coquereaux, R., et al. 1

IV

- Størmer, E., Voiculescu, D.: Entropy of Bogoliubov Automorphisms of the Canonical Anticommutation Relations 521
- Strominger, A.: Special Geometry 163
- Thiran, E. → Ruelle, Ph., et al. 305
- Vázquez, L. → Balabane, M., et al. 53
- Voiculescu, D. → Størmer, E. 521
- Weinstein, M. I. → Soffer, A 119
- Wenzl, H.: Quantum Groups and Subfactors of Type B, C, and D 383
- Weyers, J. → Ruelle, Ph., et al. 305
- Zegarliniski, B: Log-Sobolev Inequalities for Infinite One Dimensional Lattice Systems 147
- Indexed in *Current Contents*
Evaluated and abstracted for *PHYS* on *STN*

Communications in
**Mathematical
 Physics**

Volume 133 Number 3 1990

- Ch. Grosche Selberg Supertrace Formula for Super Riemann Surfaces,
 Analytic Properties of Selberg Super Zeta-Functions and
 Multiloop Contributions for the Fermionic String 433
- J. Hurtubise, M. K. Murray Monopoles and Their Spectral Data 487
 I. Marshall A Lie Algebraic Setting for Miura Maps Related to an Energy
 Dependent Linear Problem 509
- E. Størmer, D. Voiculescu Entropy of Bogoliubov Automorphisms of the Canonical
 Anticommutation Relations 521
- T. Friedrich, I. Kath 7-Dimensional Compact Riemannian Manifolds with Killing
 Spinors 543
- J. Lott Torsion Constraints in Supergeometry 563
- N. Kaidi, M. Rouleux Multiple Resonances in the Semi-Classical Limit 617

Contents of Vol. 133

Indexed in *Current Contents*

Evaluated and abstracted for *PHYS* on *STN*



Springer International

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 abs 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 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 (as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on film, 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 mean 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 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 01904, 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 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:

<i>Prof. M. Aizenman</i> , Department of Physics, Jadwin Hall, Princeton University, Princeton, NJ 08544, USA	<i>Statistical physics</i>
<i>Prof. H. Araki</i> , Research Institute for Mathematical Sciences, Kyoto University, Kyoto, 606, Japan	<i>Mathematical methods with direct relevance to physics</i>
<i>Prof. A. Connes</i> , I.H.E.S., F-91440 Bures-sur-Yvette, France	<i>Quantum physics and differential geometry</i>
<i>Prof. J.-P. Eckmann</i> , Département de Physique Théorique, Université de Genève, 32, Boulevard d'Ivoy, CH-1211 Genève 4, Switzerland	<i>Dynamical systems</i>
<i>Prof. M. E. Fisher</i> , Institute for Physical Science and Technology, University of Maryland, College Park, MD 20742, USA	<i>Statistical physics</i>
<i>Prof. J. Fröhlich</i> , ETH-Hönggerberg, CH-8093 Zürich, Switzerland	<i>General statistical mechanics</i>
<i>Prof. K. Gawędzki</i> , I.H.E.S., F-91440 Bures-sur-Yvette, France	<i>Quantum field theory and statistical mechanics</i>
<i>Prof. M. Herman</i> , Centre de Mathématiques Pures, Ecole Polytechnique, F-91128 Palaiseau Cedex, France	<i>Classical dynamical systems</i>
<i>Prof. A. Jaffe</i> , Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, USA	<i>Chief Editor</i>
<i>Prof. J. L. Lebowitz</i> , Department of Mathematics, Rutgers University, New Brunswick, NJ 08903, USA	<i>Nonequilibrium statistical mechanics</i>
<i>Prof. N. Yu. Reshetikhin</i> , Department of Mathematics, Harvard University, 1 Oxford Street, Cambridge, MA 02138, USA	<i>Gravitation, field theories and geometry</i>
<i>Prof. B. Simon</i> , Department of Mathematics, California Institute of Technology, Pasadena, CA 91125, USA	<i>Schrödinger operators and atomic physics</i>
<i>Prof. Ya. G. Sinai</i> , L. D. Landau Institute for Theoretical Physics, ul. Kosygina, dom 2, SU-117334 Moscow, V-334, USSR	<i>Statistical physics and dynamical systems</i>
<i>Prof. T. Spencer</i> , School of Mathematics, Institute for Advanced Study, Princeton, NJ 08540, USA	<i>Disordered systems</i>
<i>Prof. S.-T. Yau</i> , Department of Mathematics, Harvard University, 1 Oxford Street, Cambridge, MA 02138, USA	<i>Relativity; geometry and physics</i>

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. 126-133, (3 issues each) will appear in 1990. **North America.** Recommended annual subscription rate: US \$ 2505.00, 1 issue price \$ 128.00 including carriage charges. Subscriptions are entered with prepayment only. Orders should be addressed to: Springer-Verlag New York 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 4560.00, plus carriage charges: [Federal Republic of Germany DM 62.92 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 570.00, single issue price: DM 228.00 plus carriage charges. Orders for all countries except North America can either be placed with your bookdealer or sent direct to: Springer-Verlag, Heidelberger Platz 3, 1000 Berlin 33. Tel. 0 30/82 07-1, Telex 01 83 319, FAX (0)30/821 4091. **Changes of Address:** Allow six weeks' changes to become effective. All communications should include both old and new addresses (with Postal Codes) and should be accompanied by a mailing form from a recent issue. **Back Volumes.** Prices are available on request. **Microform:** Microform editions are available from: University Microfilms International N. Zeeb Road, Ann Arbor, MI 48106, USA.

Production

Journal Production Department I, Springer-Verlag,
Postfach 10 52 80, W-6900 Heidelberg 1, 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;