

Communications in

Mathematical Physics

Volume 84 1982

Chief Editor A. Jaffe, Cambridge, MA

Editorial Board H. Araki, Kyoto
J. Fröhlich, New York, NY
J. Glimm, New York, NY
R. Haag, Hamburg
S. Hawking, Cambridge, MA
O. Lanford, Berkeley, CA
J. L. Lebowitz, New Brunswick, NJ
E. Lieb, Princeton, NJ
J. Moser, Zürich
K. Osterwalder, Zürich
B. Simon, Pasadena, CA
Ya. G. Sinai, Moscow
T. Spencer, New York, NY
R. Stora, Geneva
S.-T. Yau, Princeton, NJ

Advisory Board M. F. Atiyah, Oxford
A. Connes, Bures-sur-Yvette
G. 't Hooft, Utrecht
I. Singer, Berkeley, CA
C. N. Yang, Stony Brook, NY



Springer-Verlag
Berlin Heidelberg New York

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 or implied, with respect to the material contained herein.

Special Regulations for the USA

The Article Fee Code on the first page of an article in this journal indicates the copyright owner's consent that in the USA copies may be made for personal or internal use, provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid through the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA

If a code does not appear, copies of the article may be made without charge, provided permission is obtained from the publisher.

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.

Die in der Zeitschrift veröffentlichten Beiträge sind urheberrechtlich geschützt. Alle Rechte, insbesondere das der Übersetzung in fremde Sprachen, vorbehalten. Kein Teil dieser Zeitschrift darf ohne schriftliche Genehmigung des Verlages in irgendeiner Form — durch Fotokopie, Mikrofilm oder andere Verfahren — reproduziert oder in eine von Maschinen, insbesondere von Datenverarbeitungsanlagen verwendbare Sprache übertragen werden. Auch die Rechte der Wiedergabe durch Vortrag, Funk- und Fernsehsendung, im Magnettonverfahren oder ähnlichem Wege bleiben vorbehalten.

Fotokopien für den persönlichen und sonstigen eigenen Gebrauch dürfen nur von einzelnen Beiträgen oder Teilen daraus als Einzelkopien hergestellt werden. Jede im Bereich eines gewerblichen Unternehmens hergestellte und benutzte Kopie dient gewerblichen Zwecken gemäß § 54 (2) UrhG und verpflichtet zur Gebührenzahlung an die VG WORT, Abteilung Wissenschaft, Goethestraße 49, D-8000 München 2, von der die einzelnen Zahlungsmodalitäten zu erfragen sind.

Springer-Verlag Berlin Heidelberg New York

Printers: Brühlsche Universitätsdruckerei, Giessen

Printed in Germany — © Springer-Verlag GmbH & Co KG Berlin Heidelberg 1982

Contents

Auberson, G.: Borel Summability for a Nonpolynomial Potential	531
Barbashov, B. M., Nesterenko, V. V., Chervyakov, A. M.: General Solutions of Nonlinear Equations in the Geometric Theory of the Relativistic String	471
Bashilov, Yu. A., see Pokrovsky, S. V.	103
Bellissard, J., Høegh-Krohn, R.: Compactness and the Maximal Gibbs State for Random Gibbs Fields on a Lattice	297
Billionnet, C., Renouard, P.: Analytic Interpolation and Borel Summability of the $(\frac{1}{N} I \Phi_N I^4)_2$ Models. I. Finite Volume Approximation	257
Bleher, P. M.: Construction of Non-Gaussian Self-Similar Random Fields with Hierarchical Structure	557
Buchholz, D., Fredenhagen, K.: Locality and the Structure of Particle States	1
Cannière, J. De: A Spectral Characterization of KMS States	187
Chervyakov, A. M., see Barbashov, B. M., et al.	471
Clarke, C. J. S.: Local Extensions in Singular Space-Times. II	329
Cohen, J. S., Daniëls, H. A. M., Winnink, M.: On Generalizations of the KMS-Boundary Condition	449
Daniëls, H. A. M., see Cohen, J. S., et al.	449
Dias de Deus, J., Duarte, J. T.: On the Approach to the Final Aperiodic Regime in Maps of the Interval	251
Doplicher, S., Spera, M.: Representations Obeying the Spectrum Condition	505
Duarte, J. T., see Dias de Deus, J.	251
Fredenhagen, K., see Buchholz, D.	1
Fröhlich, J., Spencer, T.: The Phase Transition in the One-Dimensional Ising Model with $1/r^2$ Interaction Energy	87
Galperin, G.: Asymptotic Behaviour of Particle Motion Under Repulsive Forces	547
Gruber, Ch., Martin, Ph. A., Oguey, Ch.: Euclidean Invariance in Statistical Mechanics of Classical Continuous System	55
Gurevich, B. M., Suhov, Yu. M.: Stationary Solutions of the Bogoliubov Hierarchy Equations in Classical Statistical Mechanics. 4	333
Hislop, P. D., Longo, R.: Modular Structure of the Local Algebras Associated with the Free Massless Scalar Field Theory	71
Høegh-Krohn, R., see Bellissard, J.	297
Johnson, R., Moser, J.: The Rotation Number for Almost Periodic Potentials	403
Künsch, H.: Decay of Correlations under Dobrushin's Uniqueness Condition and its Applications	207
Kummer, M.: On the Regularization of the Kepler Problem	133
Longo, R., see Hislop, P. D.	71
Marchioro, C., Pulvirenti, M.: Hydrodynamics in Two Dimensions and Vortex Theory	483
Martin, Ph. A., see Gruber, Ch., et al.	55
Mercer, R.: General Quantum Measurements: Local Transition Maps	239
Moser, J., see Johnson, R.	403
Napolitano, E., Sciuto, S.: A Two Dimensional Lagrangian Model with Extended Supersymmetry and Infinitely Many Constants of Motion	171
Nelson, B., Sheeks, B.: Path Integration for Velocity-Dependent Potentials	515
Nesterenko, V. V., see Barbashov, B. M., et al.	471
O'Carroll, M., see Schor, R.	153
Oguey, Ch., see Gruber, Ch., et al.	55
Parker, T., Taubes, C. H.: On Witten's Proof of the Positive Energy Theorem	223
Pokrovsky, S. V., Bashilov, Yu. A.: Star-Triangle Relations in the Exactly Solvable Statistical Models	103

Powers, R. T., Price, G.: Derivations Vanishing on $S(\infty)$	439
Price, G., see Powers, R. T.	439
Pulvirenti, M., see Marchioro, C.	483
Renouard, P., see Billionnet, C.	257
Sarnak, P.: Spectral Behaviour of Quasi Periodic Potentials	377
Schor, R., O'Carroll, M.: The Scaling Limit and Osterwalder—Schrader Axioms for the Two-Dimensional Ising Model.....	153
Sciuto, S., see Napolitano, E.	171
Sheeks, B., see Nelson, B.	515
Spencer, T., see Fröhlich, J.	87
Spera, M., see Doplicher, S.	505
Suhov, Yu. M., see Gurevich, B. M.	333
Taubes, C. H., see Parker, T.	223
Westwater, J.: On Edwards' Model for Polymer Chains. III. Borel Summability	459
Winnink, M., see Cohen, J. S., et al.	449

Indexed in Current Contents

Communications in
**Mathematical
Physics**

Volume 84 Number 1 1982

D. Buchholz, K. Fredenhagen	Locality and the Structure of Particle States	1
Ch. Gruber, Ph. A. Martin, Ch. Oguey	Euclidean Invariance in Statistical Mechanics of Classical Continuous System	55
P. D. Hislop, R. Longo	Modular Structure of the Local Algebras Associated with the Free Massless Scalar Field Theory	71
J. Fröhlich, T. Spencer	The Phase Transition in the One-Dimensional Ising Model with $1/r^2$ Interaction Energy	87
S. V. Pokrovsky, Yu. A. Bashilov	Star-Triangle Relations in the Exactly Solvable Statistical Models	103
M. Kummer	On the Regularization of the Kepler Problem	133

Indexed in Current Contents



Springer-Verlag
Berlin Heidelberg New York

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 or implied, with respect to the material contained herein.

Special Regulations for the USA. The Article Fee Code on the first page of an article in this journal indicates the copyright owner's consent that in the USA copies may be made for personal or internal use, provided the stated fee for copying beyond that permitted by Section 107 or 108 of the United States Copyright Law is paid through the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA. If a code does not appear, copies of the article may be made without charge, provided permission is obtained from the publisher.

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:

<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. J. Glimm</i> , The Rockefeller University, 1230 York Avenue, New York, NY 10021, USA	<i>Fluid mechanics</i>
<i>Prof. R. Haag</i> , II. Institut für Theoretische Physik, Luruper Chaussee 149, D-2000 Hamburg 50, Federal Republic of Germany	<i>Conceptual structure</i>
<i>Prof. A. Jaffe</i> , Lyman Laboratory of Physics, Harvard University, Cambridge, MA 02138, USA	<i>Chief Editor</i>
<i>Prof. O. Lanford</i> , Department of Mathematics, University of California, Berkeley, CA 94720, USA	<i>Dynamical systems</i>
<i>Prof. J. L. Lebowitz</i> , Department of Mathematics, Rutgers University, New Brunswick, NJ 08903, USA	<i>Nonequilibrium statistical mechanics</i>
<i>Prof. E. Lieb</i> , Physics Department, Princeton University, P. O. Box 708, Princeton, NJ 08544, USA	<i>Equilibrium statistical mechanics</i>
<i>Prof. J. Moser</i> , Department of Mathematics, E. T. H. Zentrum, CH-8092 Zürich, Switzerland	<i>Classical dynamical systems</i>
<i>Prof. K. Osterwalder</i> , E.T.H. Zentrum, CH-8092 Zürich, Switzerland	<i>Constructive quantum field theory and general theory of quantized fields</i>
<i>Prof. B. Simon</i> , Department of Mathematics, California Institute of Technology, Pasadena, CA 91125, USA	<i>Scattering theory and atomic physics</i>
<i>Prof. Ya. G. Sinai</i> , L. D. Landau Institute for Theoretical Physics, Academy of Sciences, Vorob'evskoe Shosse, 2, 117334 Moscow, USSR	<i>Statistical physics and dynamical systems</i>
<i>Prof. T. Spencer</i> , Courant Institute, New York University, 251 Mercer Street, New York, NY 10012, USA	<i>Disordered systems</i>
<i>Prof. R. Stora</i> , CERN, Theory Division, CH-1211 Geneva 23, Switzerland	<i>Lagrangian quantum field theory</i>
<i>Prof. S.-T. Yau</i> , School of Mathematics, The Institute for Advanced Study, Princeton, NJ 08540, 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. 82-85 (3-4 issues each) will appear in 1982. Information about obtaining back volumes and microform editions available upon request.

Change of address. Six weeks should be allowed for all changes to become effective. All communications should include both old and new addresses (with postal codes) and should be accompanied by an address label from a recent issue.

North America. Annual subscription rate: US\$855.00, including postage and handling. 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 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 1416.00, plus postage and handling. Airmail delivery on request only. For Japan, postage (Surface Airmail Lifted) and handling is DM 134.40.

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.

Offices

Springer-Verlag, Journal Department I, Postfach 105 280, D-6900 Heidelberg 1, Telefon (0 62 21) 487-0, Telex 04-61 723
Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Telefon (0 30) 82 07-1, Telex 01-83 319
Springer-Verlag, New York Inc., 175 Fifth Avenue, New York, NY 10010, Telefon (2 12) 477-8200, Telex 232 235