

Journal of MATHEMATICAL PHYSICS

John R. Klauder, Editor

Editorial Board

Term ending 31 December 1979

Joseph L. Birman (NYU)
Cecile DeWitt-Morette (U. of Tex., Austin)
Hermann Flaschka (U. of Ariz.)
Victor Twersky (U. of Ill.)
Jefferey Winicour (U. of Pittsburgh)
Daniel Zwanziger (NYU)

Term ending 31 December 1980

Fritz Coester (Argonne Natl. Lab.)
Peter G.O. Freund (U. of Chic.)
Jerome K. Percus (NYU)
Paul Roman (SUNY Plattsburgh)
Rainer K. Sachs (U. of Calif., Berk.)
Hugo D. Wahlquist (Jet Prop. Lab)

Term ending 31 December 1981

Brian De Facio (U. of Mo., Columbia)
John Dollard (U. of Tex., Austin)
Joseph Ford (U. of Ga.)
Karel Kuchar (U. of Utah)
C.W. Misner (U. of Md.)
Barry Simon (Princeton)

AIP EDITORIAL STAFF: Anke Junge, *Senior Editorial Supervisor*; William Payne, *Assistant Editorial Supervisor*;
Jean Chee, *Senior Copy Editor*; John Lauder, *Copy Editor*

The *Journal of Mathematical Physics* is published monthly by the American Institute of Physics (AIP). Its purpose is to form a medium of publication of highly mathematical physics articles and papers on branches of mathematics that are currently or potentially useful for the development of theoretical physics. Mathematical manuscripts should be written in a manner that is understandable to theoretical physicists. Although most papers appearing in this journal are original, occasionally reviews of mathematical topics of interest to physicists will be published.

Information for Contributors

Submit manuscripts to John R. Klauder, Editor, *Journal of Mathematical Physics*, Bell Laboratories, Murray Hill, N.J. 07974. Submission is a representation that the manuscript has not been published previously nor currently submitted for publication elsewhere. The manuscript should be accompanied by a statement transferring copyright from the authors (or their employers—whichever holds the copyright), to AIP; a form for copyright transfer is occasionally printed in the back of this journal and is available from the Editor's office or AIP. This written transfer of copyright, which previously was assumed to be implicit in the act of submitting a manuscript, is necessary under the new (1978) U.S. copyright law in order for AIP to continue disseminating physics research results as widely as possible. Further information may be obtained from AIP.

Index the article according to AIP's *Physics and Astronomy Classification Scheme-1977* (PACS)—see Phys. Rev. Lett. **37** (29 Nov. 1976) or Bull. Am. Phys. Soc. **22** (Feb. 1977). Choose up to four PACS numbers and type them in order of importance after the abstract.

Publication Charge: To support the cost of wide dissemination of research results through publication of journal pages and production of a data base of articles, the author's institution is requested to pay a page charge of \$70 per page (with a one-page minimum) and an article charge of \$20 per article. The page charge (if honored) entitles the author to 100 free reprints. For Errata the minimum page charge is \$10, with no article charge and no free reprints. Non-payment of the publication charge may lead to delays in publication.

Manuscripts should be typewritten in black ink on durable white paper, and on one side only. They should be double-spaced (including abstracts and references) with wide margins, and an original submitted to the Editor. Authors should retain a copy of their manuscript and whenever possible submit a copy with the original. The *Style Manual* (\$7.50 prepaid) of AIP will be most helpful in the preparation of manuscripts.

References should appear as consecutively numbered footnotes. Literature citations of technical journals should be in the form indicated in the *Style Manual* of AIP.

Tables must be typewritten on sheets separate from the running text. Each table must have a caption that will make the data in the table intelligible without reference to the text. Avoid complicated column headings.

Equations should be neatly typed or written in ink, punctuated and aligned to bring out their structure and numbered on the right. To indicate continuity of mathematical expressions use \times rather than a centered dot, except for scalar products of vectors. Use "exp" for complicated exponents.

Notation must be legible, clear, compact, and consistent with standard usage. All unusual or handwritten symbols whose identity may not be obvious must be identified in the margin the first time they appear, and at all subsequent times when confusion might arise.

Figures should, whenever practicable, be planned for reproduction in one-column width (8.5 cm). Line drawings should be India ink on white paper or tracing cloth. The original drawing or a high-quality glossy print should be submitted. Lettering, preferably drawn with a mechanical set, should be of a size so that when reduced the smallest lower-case letters will not be less than about 1.5 mm. Avoid gross disparities in lettering size on a drawing.

AIP's Physics Auxiliary Publication Service (PAPS) is a low-cost depository for material which is part of and supplementary to a published paper, but is too long to be included in the journal; inquire of the Editor.

Proof and all correspondence concerning papers in the process of publication should be addressed to: Editorial Supervisor, *Journal of Mathematical Physics*, American Institute of Physics, 335 East 45th Street, New York, N.Y. 10017. In all correspondence reference should be made to title, author, journal, and scheduled date of issue. A limited number of **alterations in proof** are unavoidable, but the cost of making extensive alterations after the article has been set in type will be charged to the author.

Copyright 1979, American Institute of Physics. Individual readers of this journal, and nonprofit libraries acting for them, are freely permitted to make fair use of the material in it, such as to copy an article for use in teaching or research. (For other kinds of copying see "Copying Fees.") Permission is granted to quote from this journal in scientific works with the customary acknowledgment of the source. To reprint a figure, table, or other excerpt requires, in addition, the consent of one of the original authors and notification of AIP. Republication or systematic or multiple reproduction of any material in this journal (including abstracts) is permitted only under license from AIP; in addition, AIP may require that permission also be obtained from one of the authors. Address inquiries and notices to Director, Publications Division, AIP.

345	Particle-boson interactions and the weak coupling limit	E.B. Davies
352	Microscopic theory of superfluid Fermi systems. I. Binary expansion	L.E. Reichl
361	Microscopic theory of superfluid Fermi systems. II. Application to low density hard sphere system	L.E. Reichl
367	Classification and construction of finite dimensional irreducible representations of the graded algebras; application to the $(Sp(2n); 2n)$ algebra	Miroslav Bednář, Vladimír F. Šachl
372	Off-energy-shell results for scattering by a nonlocal potential. I	B. Talukdar, U. Das, S. Mukhopadhyaya
378	Off-energy-shell results for scattering by a nonlocal potential. II	B. Talukdar, U. Das, N. Mallick, M. Sen Gupta
382	Lie algebras associated with motion in axisymmetric electromagnetic fields	Thomas P. Mitchell
385	Extension theorems for operator-valued measures	Mark J. Christensen
390	Representations of a para-Bose algebra using only a single Bose field	R. Jagannathan, R. Vasudevan
393	Computation of a class of $3j$ -coefficients	Martin L. Sage, Kameshwar C. Wali
396	Semiclassical perturbation expansion of the multichannel scattering matrix	S. Bosanac
406	On the diagonalization of the general quadratic Hamiltonian for coupled harmonic oscillators	Yoel Tikochinsky
409	Conformal Killing horizons	C.C. Dyer, E. Honig
413	Linearized analysis of inhomogeneous plasma equilibria: General theory	H. Ralph Lewis, Keith R. Symon
437	Invariants in enveloping algebras under the action of Lie algebras of derivations	L. Abellanas, L. Martínez Alonso
441	Constrained Hamiltonian formulation for interacting fields: Stable particlelike solutions	Gerald Rosen, Oleg Jakubowicz, Vahe Tatoian
443	Linearization stability of gravitational and gauge fields	Judith M. Arms
454	Conservation laws for the classical Maxwell-Dirac and Klein-Gordon-Dirac equations	R.T. Glassey, W.A. Strauss
459	The Cauchy problems in general relativity. III. On locally imbedding a family of null hypersurfaces	J. Smallwood
465	Geometric derivation of the kinetic energy in collective models	D.J. Rowe, G. Rosensteel
469	The quantum harmonic oscillator revisited: A new look from stochastic electrodynamics	L. de la Peña, A.M. Cetto
484	Szegő's theorem for Hankel determinants	J.S. Geronimo

(Continued)

Subscription Prices 1979	Optional air freight			
	U.S.A. & Poss.	Foreign (incl. Can. & Mex.)	Europe, Mideast, N. Africa	Asia and Oceania
Members (affiliated and member societies)	\$18.00	\$ 23.00	\$ 31.00	\$ 42.00
Regular rate	\$95.00	\$100.00	\$108.00	\$119.00

Back-number prices: Single copies: \$10.00.

Subscriptions, renewals, address changes, and single-copy orders should be addressed to: Subscription Fulfillment Division, American Institute of Physics, 335 East 45th Street, New York, N.Y. 10017. Allow at least six weeks advance notice. For address changes please send both old and new addresses, and, if possible, include an address-stencil imprint from the mailing wrapper of a recent issue. For your convenience a **change of address form is included in every issue of *Physics Today*; please use it.** Requests from subscribers for missing journal issues will be honored without charge only if received within six months of the issue's actual date of publication; otherwise, the issue may be purchased at the single copy price.

Reprints of individual articles in this journal may be ordered singly at \$0.50 per article page with a minimum charge of \$2.00 per order. Orders are filled in 24 hours. No postage charge for surface mail if

order is prepaid. Send orders to the American Institute of Physics, *Current Physics Reprints*, 335 East 45th Street, New York, N.Y. 10017.

Copying Fees: The code at the bottom of the first page of each article in this journal gives the fee for each copy of the article made beyond the free copying permitted under the 1978 US Copyright Law. (See also the statement under "Copyright" on the inside front cover of this journal). This fee can be paid to the American Institute of Physics through the *Copyright Clearance Center, Inc., Box 765, Schenectady, N.Y. 12301*. For articles published before 1978 the copying fee is \$0.25 per article.

Microfilm editions of back volumes of *Journal of Mathematical Physics* are available on 16 mm and 35 mm. Volumes 1-10 (1960-1969) are available for \$227.00. The prices for the complete years 1970-1972, Vols. 11-13, are \$45.00 per volume; for the year 1973, Vol. 14, \$47.00; for 1974, Vol. 15, \$65.00; for 1975, Vol. 16, \$75.00; for 1976, Vol. 17, \$85.00; for 1977, Vol. 18, \$95.00. Special discounts for the complete backfile of journals published by AIP are also available. *Journal of Mathematical Physics* also appears on a monthly basis in *Current Physics Microform (CPM) Section I* (domestic lease, \$2100.00 per year; foreign lease slightly higher) along with 20 other journals published by the American Institute of Physics and its member societies. *Journal of Mathematical Physics* is indexed quarterly in *Current Physics Index*, a subject and author index (with abstracts) to all journals published by AIP or its member societies.