Instructions to Authors

The instructions should be read carefully before preparing the manuscript.

A. General

Papers submitted for publication should preferably be written in **English.**

A **summary** for *Zentralblatt für Mathematik* should be attached. Manuscripts **(in duplicate)** must be in their final form and typed on one side of the paper only in double-line spacing with wide margins. The author should also keep a copy of the manuscript. An **abstract** must be included.

Normally, only printer's errors should be corrected in the proofs. A **charge** is made **for extensive changes** not due to typesetting errors, introduced at the proof stage.

Formulae should be typewritten whenever possible.

Special markings should be explained in a "Note to the printer" (see suggestions in section B). Copies produced by matrix printer are not accepted unless clearly legible.

Illustrations and diagrams should be submitted on separate sheets and not included in the text. They should either be good-quality glossy prints in the desired final size (inscriptions 2 mm high are recommended) or be drawn about twice the final size in India ink using clean uniform lines. In the latter case, letters and numbers should be about 4 mm high to allow for 50% reduction. The publisher reserves the right to reduce or enlarge illustrations and diagrams. The author should indicate in the margin of the manuscript where illustrations and diagrams are to be inserted.

Footnotes, other than those referring to the title of the paper, should be avoided. If absolutely necessary, they should be numbered consecutively and placed at the foot of the page on which they occur (not at the end of the article).

On the first page of the manuscript a short **running title** should be provided (not to exceed 70 typewriter strokes, including spaces).

The **list of references** at the end of the paper should always be in alphabetical order and include the names and initials of all authors (see examples below). Names of journals and book series should be abbreviated in accordance with *Zentralblatt für Mathematik.* Whenever possible, please replace all references to papers accepted for publication, preprints or technical reports by the exact name of the journal, as well as the volume, first and last page numbers and year, if the article has already been published or accepted for publication.

When styling the references, the following examples should be observed:

Journal article:

1. **or** [B–G] Tomboulis, E., Yaffe, L.: Finite temperature $SU(2)$ lattice gauge theory. Commun. Math. Phys. **100**, 313–341 (1985)

Complete book:

2. **or** [M] Bratelli, O., Robinson, D.W.: Operator algebras and quantum statistical mechanics, Vol II. Berlin, Heidelberg, New York: Springer 1981

Single contribution in a book:

3. **or** [G] Gromov, M.: Large Riemannian manifolds. In: Shiohama, K., Sakai, T., Sunada, T. (eds.) Curvature and topology of Riemannian manifolds. Proceedings, Katata 1985. Lecture Notes Mathematics, Vol. 1201, pp. 108–121. Berlin, Heidelberg, New York: Springer 1986

Citations in the text should be either **(a)** by numbers in square brackets, e. g., [1], or Bombieri and Giusti [1], referring to an alphabetically ordered and numbered list, or **(b)** by the author's initials in square brackets, e. g., [B–G], or **(c)** by author and year in parentheses, e. g., Bombieri and Giusti (1971). Any one of these styles is acceptable if used *consistently* throughout the paper. In the third system, if there are two authors, both should be named, e. g., Agar and Douglas (1955); if a work with more than two authors is cited, only the first author's name plus "et al." need be given; e. g., Komor et al. (1979); if there is more than one reference by the same author or team of authors in the same year, then a, b, c, etc. should be added after the year both in the text and in the list of references.

One hundred (100) **offprints** of each paper will be supplied free of charge. Additional offprints are available in lots of 100, provided the order form is received with the corrected proof.

B. Color coding

> Manuscripts must be marked according to the following rules unless produced on a golfball/daisy typewriter or on a good-quality printer and the desired fonts (Greek, script, special roman, boldface, etc.) are clearly recognizable. Special letters or symbols should be explained in a "Note to the printer". Unmarked manuscripts may have to be returned to the authors, which may cause a delay in publication.

1. Text

Manuscripts produced by computer typesetting with a daisy wheel or laser printer, or by manual typing with special fonts require marking only of special symbols, and distinguishing between 0 and O, 0 and o, and 1 and l. Special letters or symbols should be explained in a "Note to the Printer." In other cases the following instructions should be followed.

The words **"Theorem", "Lemma", "Corollary", "Proposition"** etc. are normally printed in **boldface,** followed by the formulation in *italics* (to be underlined in the manuscript), the end of which should be clearly indicated. The words *"Proof", "Remark", "Example", "Note"* etc. are printed in *italics* with the formulation in ordinary (roman) typeface, and **Definition** in boldface. The text of the definition itself should be in roman except for the concept defined, which should be in *italics*. Words or sentences to be set in italics should be marked by single underlining. If the material underlined in the manuscript is to be typeset with underlining (and not set in italics), this must be explained to the printer.

2. Formulae

Letters in formulae are printed in *italics* and figures in roman, if not marked otherwise. It will help the printer if in doubtful cases the position of indices and exponents is marked thus: $h_\wedge$, $a^\vee$. Spacing of indices and exponents must be specially indicated ($A_m{}^n{}_n{}^m$) otherwise they will be set (A_{mn}^{nm}).

Underlining for special alphabets and typefaces should be done according to the following code:

Violet: Letters in formulae (l, O, o) to be distinguished from numerals (1, 0)
Brown: boldface (headings, boldface letters in formulae)
Yellow: roman (abbreviations e. g. Re, Im, log, sin, ord, id, lim, sup, etc.)
Red: Greek
Green: script
Orange: special roman
Blue: Gothic
Encircled: sanserif

The following are frequently confused and should be made unambiguous:

∪, U, ⊔, U;   ∘, o, O, 0;   ×, x, X, χ, κ;   ∨, v, ν;
θ, Θ, φ, φ, Φ, ∅, ∅;   ψ, Ψ;   ε, ∈;
a', a^1; the symbol a and the indefinite article a;

also the handwritten letters:

c, C; e, l; I, J; k, K; o, O; p, P; s, S; u, U; v, V; w, W; x, X; z, Z

Please take care to distinguish these capital letters by double underlining.

C. Examples

1. Special alphabets or typefaces

Boldface   **A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z**

Greek   Γ, Δ, Θ, Λ, Ξ, Π, Σ, Φ, Ψ, Ω
α, β, γ, δ, ε, ζ, η, θ, ϑ, ι, κ, λ, μ, ν, ξ, ο, π, ϱ, σ, τ, υ, φ, ϕ, χ, ψ, ω

Script   𝒜, ℬ, 𝒞, 𝒟, ℰ, ℱ, 𝒢, ℋ, ℐ, 𝒥, 𝒦, ℒ, ℳ, 𝒩, 𝒪, 𝒫, 𝒬, ℛ, 𝒮, 𝒯, 𝒰, 𝒱, 𝒲, 𝒳, 𝒴, 𝒵
a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z

Special roman   𝔸, 𝔹, ℂ, 𝔻, 𝔼, 𝔽, 𝔾, ℍ, 𝕀, 𝕁, 𝕂, 𝕃, 𝕄, ℕ, 𝕆, ℙ, ℚ, ℝ, 𝕊, 𝕋, 𝕌, 𝕍, 𝕎, 𝕏, 𝕐, ℤ, 𝟙

Gothic   𝔄, 𝔅, ℭ, 𝔇, 𝔈, 𝔉, 𝔊, ℌ, ℑ, 𝔍, 𝔎, 𝔏, 𝔐, 𝔑, 𝔒, 𝔓, 𝔔, ℜ, 𝔖, 𝔗, 𝔘, 𝔙, 𝔚, 𝔛, 𝔜, ℨ
𝔞, 𝔟, 𝔠, 𝔡, 𝔢, 𝔣, 𝔤, 𝔥, 𝔦, 𝔧, 𝔨, 𝔩, 𝔪, 𝔫, 𝔬, 𝔭, 𝔮, 𝔯, 𝔰, 𝔱, 𝔲, 𝔳, 𝔴, 𝔵, 𝔶, 𝔷

Sanserif   A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z
a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z

> **Final check:**
> - All formula characters unambiguous?
> - Information on title page complete (title, name(s) of author(s), institute(s), complete address(es)?
> - All figures enclosed?
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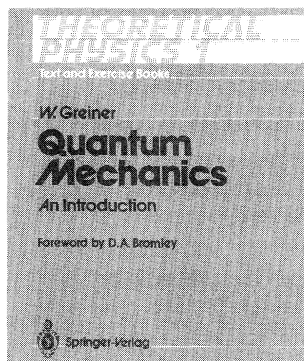
1989. XV, 347 pp. 57 figs.
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ISBN 3-540-18755-3

Quantum Mechanics – An Introduction lays the foundations for the rest of the course on advanced quantum mechanics and field theory. Starting from black-body radiation, the photoelectric effect and wave-particle duality, Greiner goes on to discuss the uncertainty relations, spin and many-body systems; he includes applications to the hydrogen atom and the Stern-Gerlach and Einstein-de Haas experiments. The mathematics of representation theory, S matrices, perturbation theory, eigenvalue problems and hypergeometric differential equations are presented in detail, with 84 fully and carefully worked examples and exercises to consolidate the material.
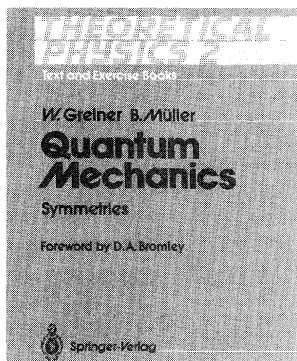
1989. XVI, 368 pp. 81 figs.
Softcover DM 78,–
ISBN 3-540-19201-8

Quantum Mechanics – Symmetries presents a particularly appealing and successful concept in advanced quantum mechanics. After a brief introduction to symmetries in classical mechanics, the text turns to their relevance in quantum mechanics, the consequences of rotation symmetry and the general theory of Lie groups. The isospin group, hypercharge, SU(3) and their applications are all dealt with in depth before chapters on charm, SU(4) and dynamical symmetries lead to the frontiers of research in particle physics This unique text includes almost a hundred detailed, worked examples and problems.
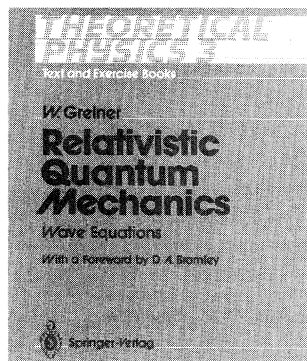
1990. XVI, 345 pp. 62 figs.
Sofcover DM 75,–
ISBN 3-540-50986-0

Relativistic Quantum Mechanics – Wave Equations concentrates mainly on the wave equations for spin-0 and spin-1/2 particles. Chapter 1 deals with the Klein-Gordon equation and its properties and applications. The chapters that follow introduce the Dirac equation, investigate its covariance properties, and present various approaches to obtaining solutions. Numerous applications are discussed in detail, including the two-centre Dirac equation, hole theory, CPT symmetry, Klein's paradox, and relativistic symmetry principles. Chapter 15 presents the relativistic wave equations for higher spin (Proca, Rarita-Schwinger, and Bargmann-Wigner).

The extensive presentation of the mathematical tools and the 62 worked examples and problems make this a unique text for an advanced quantum mechanics course.
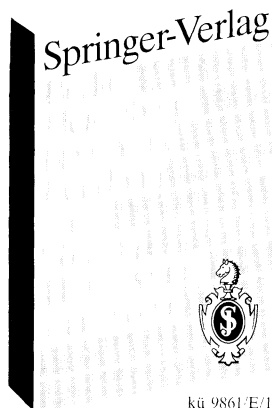
In preparation:

Theoretical Physics 4

Quantum Electrodynamics

ISBN 3-540-52078-3

Theoretical Physics 5

Gauge Theory of Weak Interactions

Springer-Verlag

L. Lam, H.C. Morris,
San Jose State University, San Jose, CA (Eds.)

Nonlinear Structures in Physical Systems

Pattern Formation, Chaos, and Waves

The Second Woodward Conference, held
November 17-18, 1989 at San Jose State
University, brought together pioneers and
experts from a number of different disciplines
to discuss problems involving nonlinear struc-
tures in physical systems, with emphasis on
pattern formation, chaos and waves. These
proceedings contain results of interest to
workers in physics, chemistry, biology, mate-
rials science and mathematics. Topics discussed
include:

- pattern formation of bubbles, viscous
  fingers, electrodeposits, solidifications,
  chemical systems and frustated systems
- chaos, self-organized criticality and complex
  systems
- convection and traveling waves in simple and
  complex liquids
- nonlinear structures in materials such as
  magnetic systems, polymers, fluid disper-
  sions, and glassy and solid thin films
- other nonlinear structures in plasmas,
  premixed flames, biological systems etc.

Contents: Pattern Formation. – Chaos. –
Convection and Waves. – Nonlinear Structures
in Materials. – Miscellaneous.

L. Lam, H.C. Morris, San Jose State
University, San Jose, CA (Eds.)

Wave Phenomena

Theoretical, Computational, and Practical Aspects

These are the proceedings of the first Woodward
conference, which brought together experts
from a number of different disciplines to discuss
problems involving wave phenomena. Re-
search papers and review papers contain results
of interest both to workers and graduate
students in electromagnetics, fluid mechanics,
atmospheric science, and the theory of aniso-
tropic media. Topics discussed include:

- the fast Hartley transform
- pseudo-differential operator techniques
- inverse scattering problems
- nonlinear waves in anisotropic media wave
  localisation
- wave propagation in liquid crystals
- solitons
- Saffman-Taylor viscous fingering

Contents: Theoretical Aspects. – Computa-
tional Aspects. – Practical Aspects.

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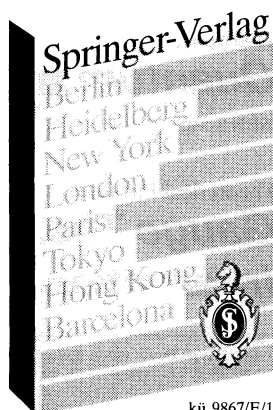
kü.9867/E/1

Inverse Methods in Physics

B.N. Zakhariev, Moscow; **A.A. Suzko,** Minsk

Direct and Inverse Problems

Potentials in Quantum Scattering

1990. Approx. 200 pp. 42 figs. Softcover DM 48,– ISBN 3-540-52484-3

This textbook can almost be viewed as a "how-to" manual for solving quantum inverse problems, that is, for deriving the potential from spectra or scattering data and also, as somewhat of a quantum "picture book" which should enhance the reader's quantum intuition. The formal exposition of inverse methods is paralleled by a discussion of the direct problem. Differential and finite-difference equations are presented side by side. The common features and (dis)advantages of a variety of solution methods are analyzed.
To foster a better understanding, the physical meaning of the mathematical quantities are discussed explicitly. Wave confinement in continuum bound states, resonance and collective tunneling, energy shifts and the spectral and phase equivalence of various interactions are some of the physical problems covered.

P.C. Sabatier, University of Languedoc, Montpellier (Ed.)

Inverse Methods in Action

Proceedings of the Multicentennials Meeting on Inverse Problems, Montpellier, November 27th – December 1, 1989

1990. XIV, 636 pp. 125 figs. Hardcover DM 138,– ISBN 3-540-51994-7

The basic idea of inverse methods is to extract from the evaluation of measured signals the details of the object emitting them.The applications range from physics and engineering to geology and medicine (tomography). Although most contributions are rather theoretical in nature, this volume is of practical value to experimentalists and engineers and as well of interest to mathematicians. The review lectures and contributed papers are grouped into eight chapters dedicated to tomography, distributed parameter inverse problems, spectral and scattering inverse problems (exact theory), wave propagation and scattering (approximations); miscellaneous inverse problems and applications and inverse methods in nonlinear mathematics.

R.G. Newton, Indiana University, Bloomington, IN

Inverse Schrödinger Scattering in Three Dimensions

1989. X, 170 pp. 1 fig. (Texts and Monographs in Physics)
Hardcover DM 68,– ISBN 3-540-50563-6

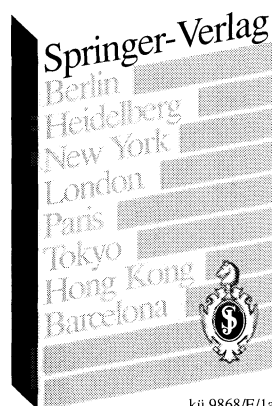**K. Chadan,** Laboratoire de Physique Théorique, Université de Paris-Sud, Orsay; **P.C. Sabatier,** Université des Sciences et Techniques du Languedoc, Montpellier

Inverse Problems in Quantum Scattering Theory

With a Foreword by R.G. Newton

2nd rev. and expanded ed. 1989. XXXI, 499 pp. 24 figs.
(Texts and Monographs in Physics)
Hardcover DM 138,– ISBN 3-540-18731-6

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