

The Institute of Physics

has engaged the distribution services of International Scholarly Book Services, Inc. in the United States and Canada.

Important new titles now available through **ISBS** include:

- **Padé Approximates**
Edited by P.R. Graves-Morris
- **Cosmic Rays at Ground Level**
Edited by Arnold Wolfendale
- **Research Fields in Physics at United Kingdom Universities and Polytechnics**
Compiled by the Institute of Physics
- **Reports on the Progress of Physics, Volume 37, Part 1**
Edited by J.M. Ziman FRS

Address inquiries and orders to:

ISBS

P.O. Box 4347
Portland, Oregon 97208
(503) 645-4425

Librarians attending the SLA: The Institute of Physics' books will be on display at the ISBS booth #216.

Circle No. 31 on Reader Service Card

tions of general relativity, but obviously his own research experience and thinking are centered primarily on special-relativistic theories and models. Models of quantum space-time are discussed, and very lucidly; but here also one feels that the author's heart is not quite in this type of approach.

Blokhintsev himself appears to have thought primarily in terms of models in which the isotropy of space-time, that is to say the complete Lorentz invariance, is modified at the microscale by the introduction of a local preferred time-like vector, which might be either internal to a given process or externally contributed by the large-scale-structure of the universe. We know that the actual universe in which we live involves everywhere such a preferred time direction—that is to say the prevailing state of motion of the galaxies in our cosmic vicinity. It is not entirely clear how the motion of these very large (but very distant) masses affects processes at the level of elementary-particle reactions, but one ought not to exclude such possibilities merely on the grounds that right now they appear un-intuitive.

The present English version of the book is marred by poor mechanics. There are many evidences of careless translation and poor editing, including sentences with incomprehensible grammatical structures. There is no index, an omission that is particularly disappointing in a book that surveys other people's work. There is, however, a list of references, amounting to almost 150 items. This list might provide access to articles written by Soviet authors that might otherwise have escaped the attention of a Western reader.

PETER G. BERGMANN
Syracuse University
Syracuse, New York

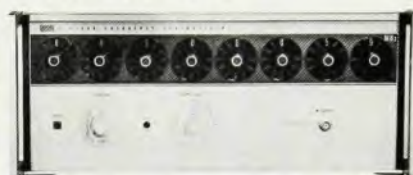
Crystallographic Groups

T. Janssen
281 pp. Elsevier, New York, 1973.
\$21.00

Group theory has always had a special esthetic appeal to the theoretical physicist. This appeal arises from the fact that its subject matter is exact, perfect and flawless. It makes no concessions and does not allow any approximation, either subtle or gross, to creep into its "crystal"-pure material.

The study of the basic symmetries of nature is one of the main pillars of theoretical physics; in particular, solid-state physics involves a "great variety of very rich symmetries" that have challenged the imagination of many a writer for several centuries. In the

ARE YOU DOING NMR?



THEN YOU SHOULD BE USING THE QUIET SOURCE.

With the best signal-to-phase noise ratio available and a spurious content of better than -83dB , the new Fluke Model 6160B Frequency Synthesizer offers you a very pure signal source for NMR and microwave spectroscopy studies. At a price of only \$4995, it's easily the outstanding buy on the market today.

Other standard features include

- Range of 1 to 160 MHz with 1 Hz resolution
- BCD programmable frequency control
- Switching speeds less than a millisecond
- Modular construction so that we can tailor your instrument to your exact needs for very little extra
- Sales and fast turnaround service throughout the world

ASK FOR A DEMONSTRATION. WRITE OR CALL FOR DATA.

FLUKE

P.O. Box 7428, Seattle, WA 98133

For data out today, dial our toll-free hotline 800-426-0361. For immediate application help, dial (collect) 206-774-2491 and you'll get the on-duty frequency and time engineer.

Circle No. 32 on Reader Service Card

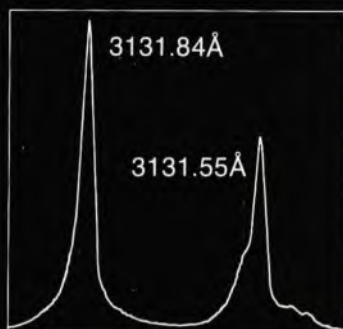
When is Coma Free?

Coma is never free in a spectrometer. You always pay for it in lost energy, lost information, and distorted line-shapes. Some spectrometers have been claimed to be coma-free, but in actual fact, they are not. Coma can, however, be corrected (not eliminated, but reduced), and our CT 103 corrects it better than any other $\frac{3}{4}$ - or 1-meter spectrometer.

The result? A marked improvement in image quality that provides better resolution of spectral detail (such as hyperfine structure), plus increased energy at the detector (better signal-to-noise ratio) when working at high resolution.

How do we back up our claim to the best coma correction? Look at the spectrum (3131Å, Natural Mercury, Pen-ray lamp, 1200 gr/mm grating, second order). Note the hyperfine structure, associated with the 3131.55Å line, which is often obscured by coma. Ask our customers what they think. And, ask us for a reprint of two papers on which we've based our coma correction.*

* A. B. Shafer, L. R. Megill, and L. Droppleman, *J. Opt. Soc. Am.*, 54, 879-87 (1964)
J. Reader, *J. Opt. Soc. Am.*, 59, 1189-96 (1969)



chromatix interactive
technology

1145 Terra Bella Ave., Mountain View, CA 94040
Phone: (415) 969-1070. Telex: 910-379-6440

present day, group theory, as applied to the solid state, is no longer a developing subject. It is rather a well defined and well understood tool that has become a useful "part of the physicist's luggage."

The foundations of applied group theory, the so-called abstract mathematical theory of groups and their representations, can be presented in a closed form consisting of an almost endless succession of definitions, propositions, lemmas and theorems. This, in one of its most detailed versions I have seen recently anywhere, takes T. Janssen (The Catholic University, Nijmegen, The Netherlands) through 69 very dense pages of *Crystallographic Groups*; these pages are full of complicated notations and rigorous proofs.

The definition and study of those groups of interest to the solid-state physicist, the crystallographic point groups, the space groups and spin- and time-reversal symmetry require 107 pages more, this time slightly less algebraic but much more geometrical. Physical applications to electron bands, lattice vibrations, electron dynamics and magnetic groups take only 56 pages.

The book is rather short and very dense. The notation is very mathematical and the style "stiff" and rigorous. No appeal is made to intuitive ideas; everything is either defined, derived or proved. But it also is a complete book in its field: no loose ends are left hanging, no theorem is left unproven.

The small type and crowded printing contribute in no small way to the impression of heaviness given by this book. It is not easy reading, but for those interested in the subject matter, it is nice to know that the information is all there; it is possible to have all you ever wanted to know about crystallographic groups on your bookshelves with this single volume.

L. M. FALICOV
University of California
Berkeley

Theory of the Earth's Gravity Field

M. Pick, J. Picha, V. Vyskočil
538 pp. Elsevier, New York 1973. \$34.00

The study of the Earth's gravitational field has always been an area of investigation of interest to geodesists and geophysicists. In the past fifteen years such interests have intensified because of needs in such areas as the precise determination of positions on the surface of the Earth, the accurate computation of missile and satellite trajectories and the potential for gaining in-