Experimental techniques in nuclear and elementary particle physics

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W. R. Leo. *Techniques for Nuclear and Particle Physics Experiments: A How-to Approach.* Springer-Verlag, Berlin; Heidelberg; New York; London; Tokyo; Paris, 1987, Pp. 368.

The book under review provides a brief exposition of the contents of an expanded course of laboratory exercises in nuclear and elementary particle physics which the author presented to students of the third and fourth years of the University of Geneva in 1978–1983. The course was designed to give an introduction to students before they were to choose the subjects of their diploma projects in one of the experimental groups and therefore its structure differs from the usual courses of laboratory exercises by forcing the students to concentrate on some particular chosen direction in order to go more deeply into it including the stages of planning the experiment, choice of methodology, design of apparatus and accumulation of statistics and analysis of the data. In parallel with laboratory exercises of this type lectures were presented on detectors, nuclear electronics, statistics, interactions of radiation with matter, etc.

All these materials are presented in the book which as a result serves as quite a universal guide for a beginning experimentalist, by introducing him into the world of practical experimental work with its specific jargon and subtleties which usually do not find reflection in the literature.

The book consists of three sections. The first four chapters present some necessary fundamentals, which an experimentalist needs, such as the passage of radiation through matter, statistics, radiation protection. The presentation is very condensed, but contains a sufficient number of references and useful formulas. A knowledge of the fundamentals of quantum mechanics and general nuclear physics is assumed.

Chapters 5–10 are devoted to a description of the principles of operation and practical characteristics of detectors used in experiments. Their newest variants are also included, for example, microstreak-detectors and time-projection chambers. Most probably it is just with such apparatus that the young specialist will have to deal.

Finally the remaining chapers 10–18 are devoted to a description of nuclear electronics and logic utilized in organizing experiments. As the standardized systems of the type of NIM and CAMAC become more and more widespread a clear understanding of the logic of experiments has become very essential, frequently determines the success of carrying them out, and is needed by every experimenter.

Even a brief but clear description of the CAMAC standard, of the logical structure of signals, of the organization of procedures for input of information helps to solve the problem of the description of the standard package of subroutines and of examples of organization of readout procedures.

The book is written in clear language and may be useful not only for students, but also for a large number of experimenters-specialists, who for some reason have not encountered in their practical activity the apparatus being discussed or have not had to deal with it recently.

In spite of the fact that an extensive specialized literature and many popular books are devoted to topics in experimental investigations in nuclear and elementary particle physics, the almost "handbook"-like and very modern presentation provided in the book under review appears to be very sensible.

VLSI technology: fundamentals and applications

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Y. Tarui. *VLSI Technology: Fundamentals and Applications*, (Ed.). Y. Tarui, Springer-Verlag, Berlin; Heidelberg; New York; Tokyo, 1986. Pp. 450 (Springer Series in Electrophysics V. 12)

The desire to increase the reliability of electronic devices and to lower their cost by restricting them to a single function to be performed, has led to the development and construction of large and superlarge integrated circuits (VLSI) which combine millions of components in a single crystal. VLSI technology has required widespread investiga-

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