Introduction to modern physics

THIS SURVEY of twentieth century physics has long been a standard intermediate text – designed, in general, for students at the senior-college or first-year-graduate-school level. It was originally written by the late F. K. Hichtmyer; in subsequent editions, E. H. Kennard, former professor of physics at Cornell University, became co-author with him.

Now, in this fifth edition of the book, which covers advances in the field over the last seven years, a new co-author has been added. Thomas Lauritsen, Caltech professor of physics, has rewritten the final chapters on cosmic rays and nuclear physics, which now include material on some of the newly-discovered fundamental particles, while Professor Kennard has brought the remainder of the book up to date by rewriting, rearangement and abbreviation of older material, to reflect the further change in perspective in the physical scene.

THE ATOMIC NUCLEUS
by Robley D. Evans
McGraw-Hill, 1955 $14.50

Reviewed by Ward Whaling
Assistant Professor of Physics

PROFESSOR Evans has produced a new text book that will be widely used in introductory nuclear physics courses at the graduate level. The book represents a new viewpoint in nuclear physics texts in that it is designed specifically to meet the needs of experimental students who are just beginning their laboratory work. However, it is in no sense a laboratory manual; there is no discussion of experimental technique nor of the apparatus of nuclear physics. The treatment of counters illustrates the aim of this book to supplement concurrent laboratory experience; instead of a description of particular types of counters one finds a thorough discussion of the physical principles of ionization, excitation, scattering, and brehmstrahlung, the basic phenomena which govern operation of all nuclear counters.

In an effort to make the book of maximum utility to beginning students, only the unavoidable minimum of quantum mechanics is employed. The author presumes only a working knowledge of the calculus and some familiarity with atomic physics. Thory is introduced only as it is needed to interpret experiment and the book will not appeal to students whose interest is primarily theoretical.

Starting with the fundamental static properties of nuclei in the first nine chapters, the author proceeds in the next eight chapters to a consideration of nuclear forces and nuclear models, nuclear reactions, radioactive decay, and the conservation laws of nuclear dynamics.

These first seventeen chapters make up the core of most introductory courses in nuclear physics; Professor Evans' treatment of this basic material is much more thorough than that in any previous book attempting to cover this broad field. Experimental students will especially welcome the sections on the interpretation of the results of angular distribution, angular correlation, and excitation experiments. Frequent reference to the historical development of our present picture of the nucleus adds interest to the exposition of this material and helps to orient the student who is making his first introduction to the subject. Abundant references to the original research papers are provided for those who wish to pursue their particular interests further; more than a thousand entries appear in the bibliography. The author's rather discursive style will he popular with students; I have never heard my students object to a text because the ratio of prose to equations was too high.

Following the discussion of the nucleus itself are eight chapters on the interaction of charged particles and electromagnetic radiation with matter. The excellent treatment of this subject which has been Professor Evans' own particular research interest for many years, cannot be found elsewhere and will appeal especially to radiobiologists and radiochemists and others who are interested in the physical effects of nuclear radiation. Another feature that cannot he found in other texts is the extensive treatment of the application of statistical theory to the problem of counting random events; the last three chapters of the book are devoted to this subject.

Caltech alumni will he interested to know that this text is now being used in the graduate nuclear physics course here.Professor Evans, now at M.I.T., is a Caltech alumnus himself, having received his BS here in 1928, his MS in 1929 and his PhD in 1932.

REFLECTIONS OF A PHYSICIST
Second Edition, enlarged
by P. W. Bridgman
Philosophical Library $6

P. W. BRIDGMAN, Higgins Professor at Harvard and winner of the Nobel Prize in physics for 1946, collected most of his non-technical writings for publication in 1950.

In this second edition of "Reflections of a Physicist," ten new papers have been added to the original collection – and slotted neatly into

the various editorial subdivisions which were set up for that collection.

These reflections range over a good many fields, but the essays have one thing in common in that they all reflect Bridgman's now-familiar "operational" approach.

With skill and clarity, Dr. Bridgman brings this experimental attitude to bear, not only on physical concepts, but on such things as the scientist's place in society, cybernetics, politics and the scientific method.
A Tutorial on Introductory Modern Physics: Fission, Fusion and Radioactivity. Target Audience: High School Students, College Freshmen and Sophomores, students preparing for the International Baccalaureate (IB), AP Physics B, AP Physics C, A Level, Singapore/GCE A-Level; Class 11/12 students in India preparing for ISC/ICSE/CBSE and Entrance Examinations like the IIT-JEE/AIEEE. This might also be helpful in studying topics required by Common Core Physics. This compilation of notes has been prepared by Anirud Thyagarajan of IIT Kharagpur. NUCLEAR FISSION. Introduction to Modern Physics. The term recent physics refers to the post-Newtonian beginning of physics. Put purely, modern physics agreements with the fundamental construction of the tiniest particles in nature (‚Äúquantum‚Äù mechanics), as well as a laborious sympathetic of the important communication of atoms, unspoken as forces. Small speeds and large detachments is typically the kingdom of traditional physics. Contemporary physics often involves extreme conditions; quantum effects typically include detachments similar to atoms (roughly 10‚àí9 m), though relativistic belongings typically inclu

2 Introduction to Modern Physics On the other hand, since 1890, there have been enormous advances in physics, some of which have necessitated radical modifications in certain theories that had seemed to be strongly supported by experimental evidence. In particular, the metaphysical assumptions of the nineteenth century proved to be an inadequate foundation for the growing structure of natural philosophy. New ideas were required, differing sharply with the older ones in special areas where the latter failed but still yielding the same predictions where the older ideas had been successful. The e Welcome to Modern Physics. This book has a lot of information, but it also needs a lot of work. Feel free to read all the material that we have, and edit the material that needs editing. If you want to do a lot of work on this book, it is recommended that you read the note for contributors. This book is for an introductory undergraduate study of calculus-based physics. The material covered in this book frequently is spread out over two or three semesters in an average undergraduate curriculum, if not Introduction to Modern Physics. The term recent physics refers to the post-Newtonian beginning of physics. Put purely, modern physics agreements with the fundamental construction of the tiniest particles in nature (â€œquantumâ€ mechanics), as well as a laborious sympathetic of the important communication of atoms, unspoken as forces. Small speeds and large detachments is typically the kingdom of traditional physics. Contemporary physics often involves extreme conditions; quantum effects typically include detachments similar to atoms (roughly 10âˆ’9 m), though relativistic belongings typically inclu