
BOOK REVIEWS

Annual Review of Nuclear and Particle Science. (ed.) J. D. Jackson (Published by Annual Reviews Inc., 4139, El Camino Way, Palo Alto, California, 94306, USA), Vol. 34, 1984, Price: \$30 in USA. Elsewhere \$33.

This is yet another excellent volume in this well known series. The editor deserves to be congratulated for his fine choice of reviewers and topics. There is a well balanced mixture of articles which deal on the one hand with progress in firmly established aspects of the subject while others describe attempts to look for new phenomena and concepts. The article on Hyperon Beta Decays by Gaillard and Sauvage describes the recent work especially at CERN with improved statistics and accuracy, which has established standard weak interaction theory on a firm footing. One of the urgent needs in particle physics is to go beyond the standard model. The masterly review by Perkins concludes with the statement "Nucleon decay if ever discovered will have to be based on unimpeachable evidence from several independent experiments using different techniques. We are a long, long way from such a goal". The experimental situation with regard to neutrino mass is reviewed by Boehm and Vogel, two of the leading physicists in this field.

The beautiful idea of a magnetic monopole was introduced by Dirac in 1931. Much elegant mathematical development has taken place in recent years especially in the context of unified gauge theories. These and the astrophysical implications as well as experimental searches are summarized by Preskill. The future of particle physics depends very much on advances in experimental techniques as well as progress in the field of high energy accelerators. Charpak and Sauli deal with high-resolution electronic particle detectors both of the gaseous type and the solid state type. Lawson and Tigner in their lucidly written article

review the physics of particle accelerators. The new concepts if yet untested, hold much promise for the future. The superconducting magnets technology for the next generation of accelerators is reviewed by Palmer and Tollestrup.

One of the most exciting fields of research to emerge in the last decade is the interface between particle and nuclear physics, the role of quark and gluon degrees of freedom and the dual role of the pion, both as a Goldstone particle and as a quark-antiquark pair. Mannque Rho who has contributed a great deal to our understanding of this area deals with pion interaction in nuclei. Precise theoretical calculations are needed to compute the properties of He^3 and H^3 for us to be able to answer the question whether there are many body forces present in nuclei or not. Frior, Gobson and Payne describe recent progress in this area.

Experiments on nuclear collisions at energies of the order of GeV per nucleon are reviewed by Nagamiya, Randrup and Symons. Heavy ion collisions have now become a standard part of nuclear physics. The role of rotational degrees of freedoms is the subject of Moretto and Wozniak's article. A critical discussion of various mechanisms of nucleosynthesis is given by Truran. The very impressive and fruitful use of low energy nuclear reactions as an analytical tool in the study of materials forms the subject of the review by Amsel and Lanford.

This volume should be in every library and is unreservedly recommended to the reader.

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