



“Physics in Canada”

Book Review

“La Physique au Canada”

Critique de livre

“Review of 100 Years of Subatomic Physics”, by Ernest M Henley, Stephen D Ellis, Ernest M. Henley and Stephen D. Ellis, World Scientific, 2013, pp. 560, ISBN 978-981-4425-80-3, price 49.08

When I first saw this title on the list of books available for review on the CAP web site, I immediately sent in a request for a copy. I’ve been working in experimental particle physics for more than 40 years and, like many people in the late stages of their career, I have become increasingly interested in the history of my field. I was hoping for a technical narrative describing the key developments of nuclear and particle physics over the last century that would fill in any gaps in my knowledge and, more importantly, be a source that I could recommend to incoming students to provide them with a context for their research. I was disappointed.

This book is a collection of contributions from leading workers in subatomic physics, edited by Ernest Henley and Stephen Ellis from the University of Washington. There are 19 chapters, starting with a short overview by Steven Weinberg and ending with a review of string theory and M theory by John Schwarz. The articles in between are evenly divided between topics in nuclear and particle physics; some are worth reading and others can be safely passed over.

I enjoyed the too-short history of colliders by Lyn Evans - the man who directed the building of the LHC - and the chapter on large underground detectors for proton-decay searches and neutrino physics by Kate Scholberg. However I am less enthusiastic about the section on 4- π detectors by Christopher Tully. He seems not to have read the instructions - there is nothing about the historical evolution of full-coverage detectors, starting with detectors like the seminal SLAC-LBL Mark I at SPEAR. Instead he has written a comprehensive description of the elements of the ATLAS and CMS detectors at the LHC. It’s a worthwhile contribution and something I can recommend to students but I don’t think it’s what the book is supposed to be about. This is in contrast to the chapter on jets and QCD, nicely written by Stephen Ellis and Davison Soper - they followed the instructions and have provided an excellent account of the evolution of this topic. Rabindra Mohapatra and Lincoln Wolfenstein have provided similarly brief and historically interesting overviews of weak interactions and neutrino physics, respectively. There is also a well-written summary of parity and time-reversal tests in nuclear physics, by David Hertzog and Michael Ramsey-Musolf.

Some topics are completely absent. One example is the search for dark matter particles and

axions. It has been going on for more than a quarter of the last century so it should rightly have a place in this book but somehow has been left off the list.

Despite its shortcomings, the book is a valuable resource. As a collection of review articles it can be a place to get a quick overview of some topics and most of the chapters have excellent bibliographies. Although not for the purpose I originally had in mind, I would definitely recommend it to an incoming graduate student. It seems the book I'm looking for has not yet been written.

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