

# Book Reviews



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## ***The Theory of Almost Everything: The Standard Model, the Unsung Triumph of Modern Physics***, Robert Oerter, Pi Press, New York (2006), 317 pp., \$24.95

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Robert Oerter's new book strives to cure what Oerter sees as an injustice to the marvelous feats that particle physicists have accomplished in the past century. Much of the public fascination with high-energy particle physics focuses on the bizarre and unknown. While many high school students have heard of string theory, a model that may never be directly tested by mankind, the words "Standard Model of particle physics" will probably not ring a bell. Most people are not aware that we have in our possession a theory that encapsulates almost all known phenomena at the fundamental level with just 18 numbers. In *The Theory of Almost Everything*, Oerter lays out in nontechnical terms the microscopic structure of the universe as currently understood by particle physicists.

Rather than focus on the minutia of the Standard Model, Oerter takes on the considerably more ambitious task of explaining the physics principles underlying this framework. He begins with a description of the program of unification and reductionism that has proved so successful in fundamental physics. He goes on to discuss symmetry principles, the quantum effects that become important at short distance scales, and

Einstein's theory of special relativity. This comes to a climax with the unification of special relativity and the principles of quantum mechanics to form the mathematical foundation of the Standard Model, relativistic quantum field theory. Oerter goes on to build the Standard Model, outline its limitations, and give some hints as to what may lie beyond this fantastically successful framework.

The writing style of the book is quite enjoyable, as are the numerous quotes from famous architects of the Standard Model. The one issue that perhaps deserved more attention from the author is the use of illustrations. They are somewhat unprofessionally done and at times seem difficult to comprehend for the uninitiated.

Overall, Oerter has done a thorough job of giving the reader precisely what is needed to gain a rough understanding of nature through a physicist's eyes. Quite a high level of abstract thinking is required of the reader, however. As such, this book seems best suited to the scientifically inclined university student. The highly gifted high school student who shows strong interest in physics may also find this book a source of inspiration. Advanced particle physicists will enjoy the historical details in the text.

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### **MicroReviews by the Book Review Editor**

- *Einstein's Other Theory: The Planck-Bose-Einstein Theory of Heat Capacity*, by Donald W. Rogers, published by Princeton University Press, Princeton, NJ (2005), xiii+181 pp., \$49.50 (hardback).

A very good supplementary text at the upper undergraduate level for a variety of courses dealing with thermodynamics, statistical physics, physical chemistry, introductory quantum, or modern physics.

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- *Physics Demonstrations: A Sourcebook for Teachers of Physics*, by Julien Clinton Sprott, published by The University of Wisconsin Press, Madison, WI (2006), 290 pp., \$45.00 (hardback), including 2 DVDs with 85 demonstrations by the author.

I have watched him in action and use his video, "The Wonders of Physics," and I strongly recommend this book to teachers from middle school through university for themselves as demonstrations to mimic and their students to enjoy. (Available from AAPT; <http://www.aapt.com/store>.)

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