



Deep Down Things: The Breathtaking Beauty of Particle Physics

By Bruce A. Schumm

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A useful scientific theory, claimed Einstein, must be explicable to any intelligent person. In *Deep Down Things*, experimental particle physicist Bruce Schumm has taken this dictum to heart, providing in clear, straightforward prose an elucidation of the Standard Model of particle physics -- a theory that stands as one of the crowning achievements of twentieth-century science. In this one-of-a-kind book, the work of many of the past century's most notable physicists, including Einstein, Schrodinger, Heisenberg, Dirac, Feynman, Gell-Mann, and Weinberg, is knit together in a thorough and accessible exposition of the revolutionary notions that underlie our current view of the fundamental nature of the physical world. Schumm, who has spent much of his life emmersed in the subatomic world, goes far beyond a mere presentation of the "building blocks" of matter, bringing to life the remarkable connection between the ivory tower world of the abstract mathematician and the day-to-day, life-enabling properties of the natural world. Schumm leaves us with an insight into the profound open questions of particle physics, setting the stage for understanding the progress the field is poised to make over the next decade or two.

Introducing readers to the world of particle physics, *Deep Down Things* opens new realms within which are many clues to unraveling the mysteries of the universe.

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Editorial Review

Review

A fascinating journey into the bizarre, subatomic world of particle physics.

(*PhysOrg.com*)

Quantum field theory, group theory, Lie algebras, internal symmetry spaces and gauge theory. [Schumm] does a remarkably good job of explaining all this, with a style that is mercifully plain.

(Peter de Groot *New Scientist*)

Explores the world of particle physics in terms laymen can understand.

(*Santa Cruz Sentinel*)

I expect that any physics undergraduate, bewildered by textbooks and lectures, would find this a delight.

(Stephen Battersby *New Scientist*)

One of several recently published books attempting to provide for interested nonphysicists a relatively nonmathematical account of what has come to be called the standard model of particle physics... Schumm's treatment is perhaps more detailed.

(*Choice*)

Bruce Schumm's new book on elementary particle physics, *Deep Down Things*, is an ambitious and very successful non-mathematical description of the nature and significance of the world of elementary particles and forces. The book is for the non-mathematician, the non-scientist interested in elementary particle physics, and the young student who has not yet begun to study physics. The subjects discussed range from the wave-particle duality and basic quantum mechanical ideas, through description of the four fundamental forces, to the inner theoretical world of particle physics's symmetries and gauge theory. The book ends with an exciting discussion of what we don't know including the recently discovered mystery of neutrino oscillations.

(Martin Perl, the 1995 Nobel Laureate in Physics)

The Standard Model is one of the greatest intellectual achievements of the twentieth century. Everything around us is made of particles called quarks and leptons influencing one another by exchanging bosons. Readers who want more than a surface treatment of this modern paradigm of particle physics should turn to Bruce Schumm's fine book on the topic.

(Michael Riordan, author, *The Hunting of the Quark*)

This is definitely a book for your Christmas list, and if it doesn't excite your mathematics colleagues too, they'll miss a treat.

(Rick Marshall *School Science Review*)

This book is beautifully written and is a didactic masterpiece.

(David Watts *Science and Christian Belief*)

About the Author

Bruce A. Schumm is a professor of physics at the University of California at Santa Cruz.

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