



# **From the Universe to the Elementary Particles: A First Introduction to Cosmology and the Fundamental Interactions (Undergraduate Lecture Notes in Physics)**

*Ulrich Ellwanger*

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In this book, the author leads the reader, step by step and without any advanced mathematics, to a clear understanding of the foundations of modern elementary particle physics and cosmology. He also addresses current and controversial questions on topics such as string theory. The book contains gentle introductions to the theories of special and general relativity, and also classical and quantum field theory. The essential aspects of these concepts are understood with the help of simple calculations; for example, the force of gravity as a consequence of the curvature of the space-time.

Also treated are the Big Bang, dark matter and dark energy, as well as the presently known interactions of elementary particles: electrodynamics, the strong and the weak interactions including the Higgs boson. Finally, the book sketches as yet speculative theories: Grand Unification theories, supersymmetry, string theory and the idea of additional dimensions of space-time. Since no higher mathematical or physics expertise is required, the book is also suitable for college and university students at the beginning of their studies. Hobby astronomers and other science enthusiasts seeking a deeper insight than can be found in popular treatments will also appreciate this unique book.

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