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The Philosophy Of Space And Time (Dover Books On Physics)



Synopsis

With unusual depth and clarity, it covers the problem of the foundations of geometry, the theory of time, the theory and consequences of Einstein's relativity including: relations between theory and observations, coordinate definitions, relations between topological and metrical properties of space, the psychological problem of the possibility of a visual intuition of non-Euclidean structures, and many other important topics in modern science and philosophy. While some of the book utilizes mathematics of a somewhat advanced nature, the exposition is so careful and complete that most people familiar with the philosophy of science or some intermediate mathematics will understand the majority of the ideas and problems discussed.

Partial CONTENTS: I. The Problem of Physical Geometry. Universal and Differential Forces. Visualization of Geometries. Spaces with non-Euclidean Topological Properties. Geometry as a Theory of Relations. II. The Difference between Space and Time. Simultaneity. Time Order. Unreal Sequences. III. The Problem of a Combined Theory of Space and Time. Construction of the Space-Time Metric. Lorentz and Einstein Contractions. Addition Theorem of Velocities. Principle of Equivalence. Einstein's Concept of the Problems of Rotation and Gravitation. Gravitation and Geometry. Riemannian Spaces. The Singular Nature of Time. Spatial Dimensions. Reality of Space and Time.

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Customer Reviews

Hans Reichenbach (1891-1953) was a leading philosopher of science, educator and proponent of logical empiricism (he was the founder of the ["Berlin Circle"](#)); he wrote other books such as *The*

Rise of Scientific Philosophy. He wrote in the Introduction to this 1927 book, "The path of the present philosophical work led therefore through the natural sciences. It is hoped to give an account of the superiority of a philosophical method closely connected with the results of empirical science. Modern scientific epistemology therefore justifies discoveries of such far-reaching consequences as would, in former times, have been merely empty speculation. This book has been written in the knowledge that solutions are attainable. It is intended to present in a comprehensive fashion the treasure of philosophical results that has become the common property of scientific philosophy and also to go beyond it on new paths that were opened through a persistent analysis of mathematical physics one may see as the noblest aim of scientific philosophy the establishment of the concept of objective truth as the ultimate criterion of all philosophical knowledge." He says in the first chapter, "Non-Euclidean geometry is a logically constructible system---this was the first and most important result established by its inventors." (Pg. 4) He adds, "there exists no one geometry but a plurality of geometries. With this mathematical discovery, the epistemological problem of the axioms was given a new solution. This apparently unsolvable problem turns out to be a pseudo-problem. The axioms are not true or false, but arbitrary statements."

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