



## Geometry of Minkowski Space-Time (SpringerBriefs in Physics)

*Francesco Catoni, Dino Boccaletti, Roberto Cannata, Vincenzo Catoni, Paolo Zampetti*

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This book provides an original introduction to the geometry of Minkowski space-time. A hundred years after the space-time formulation of special relativity by Hermann Minkowski, it is shown that the kinematical consequences of special relativity are merely a manifestation of space-time geometry.

The book is written with the intention of providing students (and teachers) of the first years of University courses with a tool which is easy to be applied and allows the solution of any problem of relativistic kinematics at the same time. The book treats in a rigorous way, but using a non-sophisticated mathematics, the Kinematics of Special Relativity. As an example, the famous "Twin Paradox" is completely solved for all kinds of motions.

The novelty of the presentation in this book consists in the extensive use of hyperbolic numbers, the simplest extension of complex numbers, for a complete formalization of the kinematics in the Minkowski space-time.

Moreover, from this formalization the understanding of gravity comes as a manifestation of curvature of space-time, suggesting new research fields.



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