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THE HISTORICAL PATH TOWARDS RELATIVITY THEORY AND THE CONCEPTS OF TIME

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The theory of relativity, in its dominant interpretation, has profoundly changed the concepts of space and time – especially by showing that simultaneity, as it is operationally defined, is not an absolute notion. We no longer know, then, what is "the present". There is another interpretation, due to Lorentz and Poincaré, which retains the classical concept of time and considers the "relativistic" effects as absolute, due to a motion relative to a privileged frame of reference or "ether". We recall here that the theory of relativity, in its historical genesis, was first found in this version, by Lorentz, Poincaré and other very talented researchers. This concerns the case where we neglect the effect of the gravitation field ("special relativity"). There is, however, an alternative theory of gravitation that extends this "Lorentz-Poincaré interpretation" to the general case.

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Contents