

Physics > Classical Physics

Understanding the special theory of relativity

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This paper constitutes a background to the paper 'Quantum mechanics as "space-time statistical mechanics"?', [arXiv:quant-ph/0501133](https://arxiv.org/abs/quant-ph/0501133), presented previously by the author. But it is also a free-standing and self-contained paper. The purpose of this paper is to give the reader an increased and a deeper understanding of the special theory of relativity, and the spacetime ideas lying behind the above mentioned paper. We will here consider, discuss, define, analyse, and explain things such as, e.g., the constancy of the speed of light, synchronization, simultaneity, absolute simultaneity, absolute space and time, the ether, and spacetime. Albert Einstein's original version of the special theory of relativity is fundamentally an operational theory, free from interpretation. But the old "Lorentzian interpretation" and the standard "spacetime interpretation" of the special theory of relativity will also be considered. This paper also discusses and analyses aspects of the philosophy of science that in my opinion are relevant for an understanding of the special theory of relativity.

Comments: 83 pages, 16 figures. V2: Minor changes: New title, added a footnote, corrected typos

Subjects: **Classical Physics (physics.class-ph)**; Quantum Physics (quant-ph)

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