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Everything you were eager to know about information relativity theory (but were afraid to ask)

Thursday, 13 September 2018 09:00 (15 minutes)

Information Relativity Theory is a simple, axiom-free, epistemic relativizing of Newtonian physics. It attempts to answer the following question: What information will a proper measurement device in laboratory A, register about an occurrence in another laboratory B, which is in a state of motion relative to A. We assume that information about the respective occurrence (e.g., the start, and end times of an experiment conducted in B) is conveyed to A using an information carrier, which travels with constant and known velocity, V_c, in the medium which connects A and B. We put no restrictions on the nature of the information carrier (wave or matter), nor on its velocity V_c, except for the practical condition: $V_c > v$, where v is the mean velocity of B relative to A during the occurrence. However, to avoid futile conflicts with Einstein's ontological relativity, we unwillingly restrict our theorizing to situations, in which V_c is strictly lower than c, where c is the velocity of light in vacuum.

For the situation described above we derive transformations for predicting the time interval, length, mass, and energy densities, measured in A, as functions of the corresponding physical variables as measured in B, and the normalized velocity $\beta\,(= v/V_c)$. We show that the same set of derived equations is successful for predicting and explaining a multitude of physical phenomena in the fields of small particle physics, quantum mechanics, astrophysics, and cosmology, and in proposing natural and testable answers to key standing questions, including the nature of dark matter and dark energy. We shall also point to the aesthetic beauty of the new theory, and the connectedness it unveils between physics, the rest of sciences, and the arts.

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