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Time in General Relativity and Quantum Mechanics

Thursday, 8 July 2021 18:45 (20 minutes)

Within the formalism of General Relativity it is possible to operationally define or characterize a distinguished clock and time. This is the so-called standard clock providing proper time. Also within Quantum Mechanics it is possible to define a clock and the corresponding time. This clock is an atomic clock and it provides time in the unit of the second. Both clocks are compatible though they are based on completely different notions. This compatibility breaks down in strong gravitational fields and also in generalized theories of gravity. In this contribution the principal operational foundations of these two types of clocks are discussed as well as possible causes leading to a different time provided by these two types of clocks.

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