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# Black Holes are Time Machines

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What would happen if you could enter inside a black hole? You would travel to the future, coming out of a white hole! In fact, the huge gravitational redshift distinguish two characteristic time for such a process: the one of the infalling observer, that is fast, and the one of an external observer, that is extremely long. I discuss how such a process is allowed by gluing classical metrics without violation of causality. On the other hand, the full process is a characteristic non-perturbative quantum phenomenon, that involve the superposition of different geometries. I discuss the condition for this to happen, including an intriguing realisation in the remnant phase of the black hole.

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