



Contribution ID: 52

Type: talk

## Black Holes are Time Machines

*Tuesday, 8 October 2019 11:00 (40 minutes)*

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 distinguishes two characteristic times 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 involves 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.

**Presenter:** Prof. VIDOTTO, Francesca (University of Western Ontario, Canada)

**Session Classification:** Causality preservation and Chronology violation, CTCs