

Perugia Advanced Physics Seminars

A journey to the frontiers of knowledge

April 16, 2021 - 15:00

The black hole guide to the quantum theories of gravity

One sometimes hears that “we don’t know anything about quantum gravity”, but this is far from true. Even if certainly we do not understand everything about quantum theories of gravity, in the last two decades we have learned several of their most crucial and striking features. I will develop a line of argument that starts by taking at face value the known properties of black holes, and leads to explicit complete formulations of quantum theories of gravity that incorporate them. They imply a radical departure from the conventional view of fundamental physics as the physics of ever-shorter distances, and indicate how gravity and space (but not time) are not fundamental but emerge as quantum holograms.



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