

# Lecture: Quantum entanglement and black holes

*Wednesday, 30 June 2021 14:30 (1h 30m)*

Quantum entanglement plays an important role in two seemingly distinct areas of physics: For studying the quantum properties of black holes as well as for quantum information theory. Quantum entanglement and computational complexity may be mapped to geometric quantities. This provides a new link between theoretical concepts for black holes and quantum information. A central role in this context is played by the holographic principle, according to which the information stored in a volume is encoded on its surface, as is the case for black holes. In the talk I will describe the essential new concepts that relate quantum entanglement to geometry and gravity. I will explain how these relations may be used to obtain both a further understanding of quantum black holes, as well as further advances for the theoretical foundations of quantum computing.

**Presenter:** ERDMENGER, Johanna (Würzburg University)

**Session Classification:** Wednesday Afternoon