

Conditional Entanglement Transfer Via Black Holes

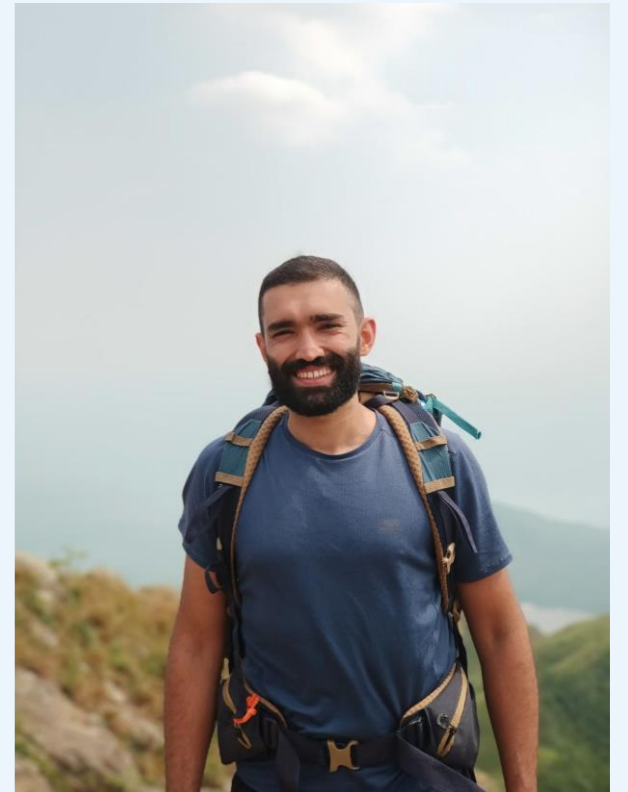
Date 14:00 - 15:30, November 6 (Monday), 2023

Place 1131, Building 9 (Zoom ID: 881 5903 1592)

Speaker

Dr. Ali Akil

The University of Hong Kong (香港大学)



Abstract

We investigate the consistency of Hawking's black hole evaporation process with fundamental physical principles such as unitarity, no-signaling, entanglement monogamy, and the equivalence principle.

We consider two matter particles inside the black hole, in a general, possibly entangled state. We then look at the Hawking pair production, one pair at a time. We assume the interaction between the Hawking negative energy particles and the black hole matter particles. The full evaporation of the black hole will correspond to the full annihilation of the black hole matter by the negative energy particles. We show that upon annihilation of the black hole matter particles, their entanglement will be transferred to the outside partners of the Hawking particles.

Biography

Dr. Ali Akil is a postdoc at the University of Hong Kong, working on the application of tools and concepts from Quantum Information Theory to the Quantization of Gravity. He did his BSc at the Lebanese University, MSc of Theoretical Physics in Durham University, then another Masters, in graph theory and matrix analysis at the Lebanese University. During his PhD at HKUST and SUSTech he did his research under the supervision of professors Henry Tye, Leonardo Modesto, and Yi Wang. His research interests include the black hole information paradox, quantum information theoretic inspired quantum gravity, quantum reference frames, table top experimental tests for the quantumness of gravity, etc... Besides physics, He is interested in philosophy, politics, music, and mountaineering.