



Contribution ID: 224

Type: **Talk**

A novel approach to particle production via communication between quantum particle detectors

Monday, 23 June 2025 14:45 (15 minutes)

Recent work has shown that communication channels between Unruh–DeWitt detectors are sensitive not only to the initial particle content of a quantum field but also to the spacetime history prior to the communication protocol. In particular, a cosmological expansion occurring before the protocol begins reduces the channel’s capacity. This implies that the noise experienced by the receiver encodes information about the universe’s past. Additionally, if a thermal particle spectrum is present at the start of the communication, it contributes with noise, as expected. Can these two sources of noise—one from thermal particles and one from spacetime dynamics—be related? If so, this relation allows us to infer particle production resulting from cosmic expansion, even during ongoing expansion and without requiring an asymptotically flat spacetime in the far future, as is necessary in the conventional Bogoliubov coefficient approach.

Primary author: LAPPONI, Alessio (Scuola Superiore Meridionale)

Presenter: LAPPONI, Alessio (Scuola Superiore Meridionale)

Session Classification: Monday Parallel Session C