

## Mini-course: Quantum Field Theory on black hole spacetimes

*mercredi 20 mars 2024 09:30 (1 heure)*

I will outline the algebraic formulation of linear quantum field theories on globally hyperbolic spacetimes. A characterization of the physically allowed states (Hadamard states) is provided in terms of their short-distance behavior as well as in terms of wave

front sets. The latter concept requires certain notions from microlocal analysis/distribution theory, which are provided in a concise manner. The notion of KMS state is introduced and the relevance of this notion for the Unruh-effect in Rindler spacetime, and its counterparts in various other spacetimes with bifurcate Killing horizons, is explained. I will discuss physically relevant states on black hole spacetimes such as the Unruh- and Boulware states, including their Hadamard property, and derive the presence of a steady, thermal flux of quantum-stress-energy in the Unruh state

(Hawking effect). Time permitting, I will outline the algebraic formulation of interacting quantum field theories on globally hyperbolic spacetimes, in the sense of formal power series.

(part 1)

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