MP 2: QFT in Curved Spacetimes

Zeit: Dienstag 11:00–12:05 Raum: Z6 - SR 1.012

Hauptvortrag MP 2.1 Di 11:00 Z6 - SR 1.012

Analytic Hadamard states and Wick rotation on curved spacetimes — •Christian Gérard — Laboratoire de Mathématiques Université Paris-Sud France

Hadamard states are substitutes for vacuum states when one considers for example a free Klein-Gordon field on a globally hyperbolic spacetime. Nowadays Hadamard states are caracterized microlocally by the wavefront set of their two-point function.

If the spacetime is analytic, one can define analytic Hadamard states, obtained using the analytic version of wavefront set, instead of the C^∞ version.

Analytic Hadamard states have the important *Reeh-Schlieder property*, which means that vectors obtained by acting on the ground state with fields localized in any fixed region of spacetime are dense in the physical Hilbert space.

So far the existence of analytic Hadamard states is known only in the very simple situation of static spacetimes. In this talk I will explain a construction of analytic Hadamard states on any analytic spacetime having an analytic Cauchy surface.

The proof uses the Wick rotation in Gaussian normal coordinates and a well-known tool from elliptic boundary value problems, called the *Calderon projectors*.

MP 2.2 Di 11:45 Z6 - SR 1.012

The holographic Hadamard condition on asymptotically AdS spacetimes — •Michał Wrochna — Université Grenoble Alpes, Institut Fourier, 38058 Grenoble, France

Presently, one of the key difficulties in the formulation of QFT on spacetimes that are not globally hyperbolic is the lack of a good substitute of the celebrated Hadamard condition. In settings with a timelike boundary, while it is possible to consider a direct analogue of the Hadamard condition away from the boundary, this does not suffice in applications in holography. A further problem with this idea is that singularities can propagate to the bulk from the boundary, where no control on the regularity is assumed. In this talk, I will focus on asymptotically Anti-de Sitter spacetimes and show that by considering a "holographic Hadamard condition" instead, one can overcome those difficulties and set up a consistent framework for non-interacting scalar quantum fields in the bulk and for the induced conformal fields on the boundary.