

Bridging Energy Scales via Hamiltonian Renormalization

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A renowned tool for relating theories at different scales is the famous Renormalization Group (RG). The RG flow enables the connection of theories at varying coarse-grained scales, ultimately aiming to bridge observations on cosmological scales with predictions from quantum theories of general relativity. In this talk, we adapt the RG framework to the Hamiltonian level, a key requirement for rigorous approaches such as loop quantum gravity. We will discuss specific conditions necessary for the continuum limit of operator algebras. Since studying the RG flow is generally complex—not only in quantum gravity—we propose methods to analyze the impact of different coarse-graining maps using emerging quantum computing technologies.

Working Group

WG1 - High Energy QG Theory

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