

Quantum field simulator for dynamics in curved spacetime

Friday, 1 September 2023 09:30 (1 hour)

Quantum fields in curved spacetimes have many tantalizing theoretical properties, for example particles are being produced by the time-dependence of the geometry. I will describe how quantum fields in geometries with spacetime curvature and different cosmologies can be quantum-simulated with Bose-Einstein condensates in specifically designed trapping potentials and with time-dependent interaction strengths. Analytical results for relativistic scalar fields in cosmologies with 2+1 spacetime dimensions will be compared with recent experimental results obtained in Heidelberg laboratories.

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Session Classification: Morning session 1