Quantum Optics as Tools to Probe the Spacetime Structure

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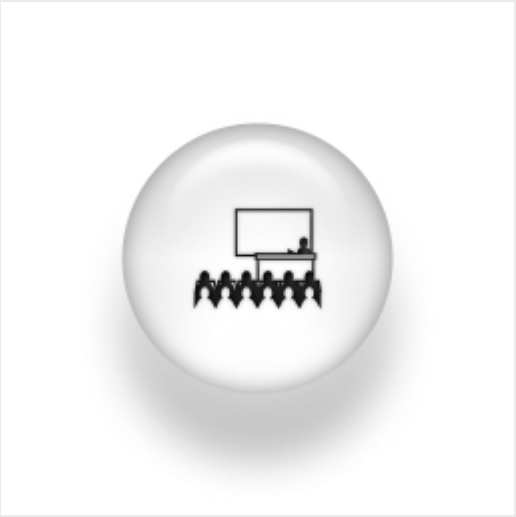

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ABSTRACT:
Relativistic quantum information theory uses well-known tools coming from quantum information and quantum optics to study quantum effects provoked by gravity and to learn information about the spacetime. One can take advantage of our knowledge about quantum optics and quantum information theory to analyse from a new perspective the effects produced by the gravitational interaction. I will present some results and new ideas in this topic: two experimental proposals for the detection of the Unruh and Hawking effects and a quantum simulation of general relativistic settings.