MAR08-2007-004429

Abstract for an Invited Paper
for the MAR08 Meeting of
the American Physical Society

Entanglement in non-inertial frames and curved spacetime

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The insight that the world is fundamentally quantum mechanical inspired the development of quantum information theory. However, the world is not only quantum but also relativistic, and indeed many implementations of quantum information tasks involve truly relativistic systems. In this talk I consider relativistic effects on entanglement in flat and curved spacetimes. I will emphasize the qualitative differences to a non-relativistic treatment, and demonstrate that a thorough understanding of quantum information theory requires taking relativity into account. The exploitation of such relativistic effects will likely play an increasing role in the future development of quantum information theory. The relevance of these results extends beyond pure quantum information theory, and applications to foundational questions in cosmology and black hole physics will be presented.