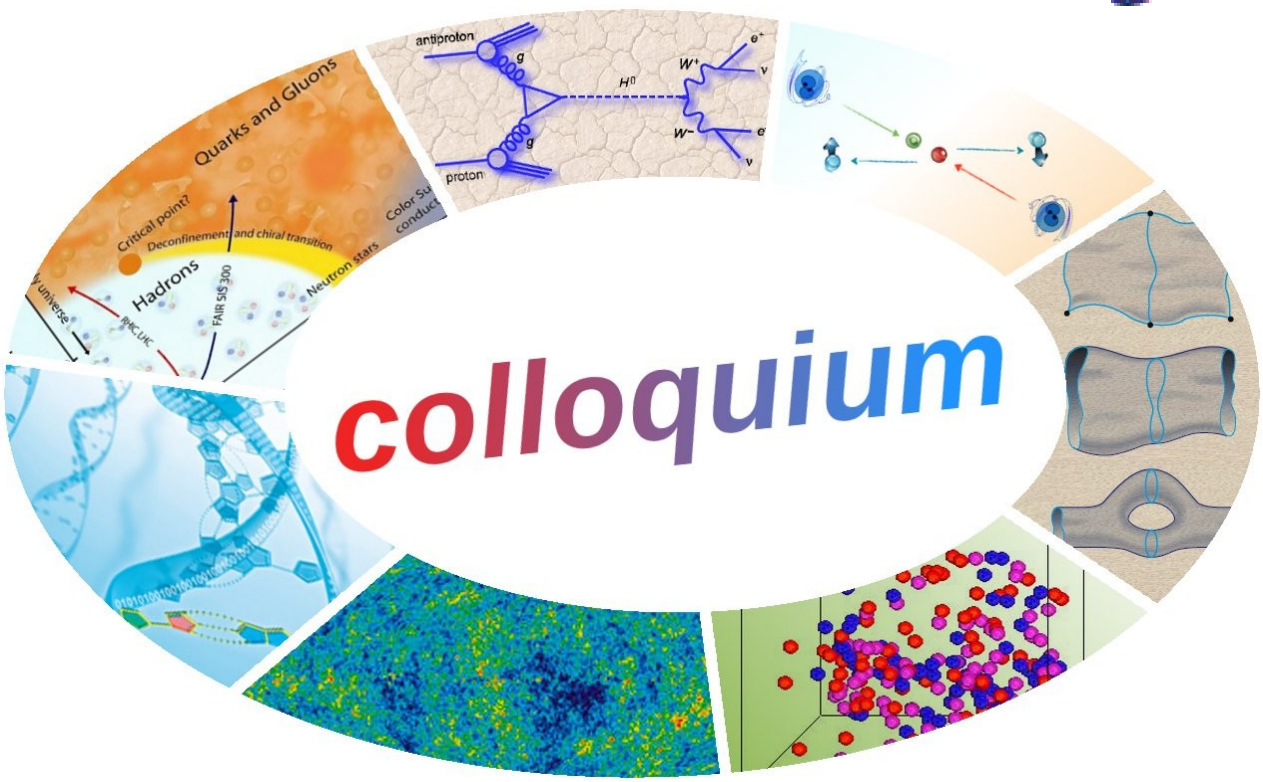
Dipartimento di Fisica e Sezione INFN di Torino



Mercoledì 25 Maggio 2016, ore 14:30, Aula Magna

Craig Hogan (Fermilab)

Quantum Twists of Space: Exotic Rotational Correlations from Quantum Geometry, Their Effects on Interferometer Signals and Their Possible Connection with Cosmic Acceleration

Estimates are presented of exotic correlations of rotation on large scales that could emerge from effects of quantum geometry at the Planck length. Extrapolation of standard quantum theory and gravity suggests that a constant direction in the inertial frame fluctuates relative to distant space by an amount that decreases on larger scales. Exotic correlations in the phase of propagating fields are estimated using a statistical model based on Planck scale elements correlated on causal boundaries around an observer. Projection of exotic correlation onto an interferometer signal correlation function is estimated, and shown to vanish unless the light path sweeps out a nonzero spatial area. It is conjectured that exotic rotational correlations could resolve conflicts of field theory with gravity on large scales, and that entanglement with the Standard Model field vacuum might account for the value of the cosmological constant.