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Fermions, gravity and chiral symmetry

Friday, March 27, 2015 10:20 AM (50 minutes)

Any quantum degree of freedom that has a simple overlap with
an elementary
degree of freedom has the chance to probe the nature of spacetime at the
fundamental level - simply by means of its inherent quantum fluctuations.
Chiral fermions are a good candidate for such degrees of freedom. Chiral
symmetry is in fact a sensitive probe for interactions on all scales: chiral
symmetry breaking can be triggered by comparatively weak interactions as well
as by specific large-scale structures. The fact that chiral fermions can be
observed in nature hence also represents a probe of spacetime properties. In
this talk, the various connections between fermions, gravity and chiral
symmetry will be discussed, highlighting potential implications for theories
of quantum gravity.

Summary

Presenter: GIES, Holger