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Glimmers of a post Geometric Perspective.

Quantum gravitational effects are usually associated with the Planck scale but they could also become important at low energy if the wavefunction of the metric field fails to be peaked around a classical configuration. I try to understand such deviations from classicality within canonical quantum gravity by introducing a "fluid of observers" in the low energy theory and defining a distance operator "at equal time" among them. I find that a locally flat limit is always recovered in the neighbourhood of each observer. However, at larger separations the expectation value of the distance operator behaves differently than a standard Riemannian distance. In particular, it is non-additive and thus cannot be obtained by the integral of a differential line element. This emerging "beyond Riemannian" geometry is a metric space similar to embedded Riemannian manifolds equipped with chord distances that cut through the ambient space. Possible implications for cosmology will be briefly discussed.

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