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Graviton propagator from Loop Quantum Gravity

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Loop quantum gravity provides a background independent quantisation of General Relativity, where the microscopical structure of spacetime shows discrete and quantum properties. This microscopical quantum geometry has led to new insights in problems such as the big bang and black hole singularities. However, the study of the semiclassical limit of the theory is still a key open issue. In this talk, I will present recent developments suggesting that the correct low energy physics emerges. In particular, I will describe how the calculations of the graviton propagator in loop quantum gravity agree at large scales with the conventional free propagator of linearised General Relativity, and how the microscopical quantum geometry is likely to provide new and non-trivial quantum corrections to it.