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## Quantum theory of the Lemaître model for gravitational collapse

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In 1933, Georges Lemaître published a solution of Einstein's equation describing spherically symmetric dust clouds. This is nowadays often called the Lemaître-Tolman-Bondi (LTB) solution and used, in particular, to describing the gravitational collapse of a dust cloud. In my talk, I shall discuss the quantization of this model. A full theory of quantum gravity is not yet available, but insights into the quantum behaviour of dust collapse can come from concrete approaches - here, the direct canonical quantization of Einstein's theory is employed. I shall present the essentials of the formalism and focus on two main applications: Hawking radiation and singularity avoidance. I shall show that Hawking radiation can be recovered from the quantum wave functionals and that the classical singularity can be avoided in certain situations, replacing it by a bounce from collapse to expansion. In this way, Lemaître's old model continues to be fruitful for both fundamental physics and astrophysical applications.

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