Dust collapse and bounce in effective loop quantum gravity

Monday 7 June 2021 12:07 (3 minutes)

Using Loop Quantum Gravity corrections one can study quantum gravity effects for a dust-gravity system, resulting in a Loop Quantum version of Oppenheimer-Snyder collapse. In this talk I will explain how this model is built up and the consequences of adding holonomy corrections to the classical theory. In particular, we see that, in the black hole formation, there is a bounce when the energy density of the dust field reaches the Planck scale and the matter starts expanding. This expansion reaches, eventually, the apparent horizon, at which point the horizon disappears and there is no longer a black hole.

Author: SANTACRUZ, Robert (University of New Brunswick)

Co-authors: WILSON-EWING, Edward (University of New Brunswick); KELLY, Jarod George (University of New Brunswick)

Presenter: SANTACRUZ, Robert (University of New Brunswick)

Session Classification: M1-2 Classical and Quantum Gravity I (DTP) / Gravité classique et quantique I (DPT)

Track Classification: Theoretical Physics / Physique théorique (DTP-DPT)