

# Effective loop quantum gravity black holes: A covariant, improved-dynamics scheme

*Monday 6 May 2024 17:30 (15 minutes)*

We use emergent modified gravity as a covariant, effective framework for obtaining black hole solutions in loop quantum gravity with an arbitrary, scale-dependent holonomy parameter  $\lambda$  in vacuum spherical symmetry. The construction is robust and can be applied in general for any type of triangulation. We obtained vacuum solutions not only for asymptotically flat spacetime but also for dS and AdS backgrounds, where we solved the dynamics in different gauges related by coordinate transformation. In particular, we show that the  $\bar{\mu}$ -scheme resolves several asymptotic pathologies of the alternative  $\mu_0$  scheme where  $\lambda$  is a constant parameter, at the expense of not recovering a flat spacetime in the zero mass limit.

**Authors:** DUQUE, Erick Ivan (The Pennsylvania State University); BELFAQIH, Idrus (The University of Edinburgh); Mr BOJOWALD, Martin (The Pennsylvania State University); BRAHMA, Suddhasattwa (The University of Edinburgh)

**Presenter:** BELFAQIH, Idrus (The University of Edinburgh)

**Session Classification:** Black Holes