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# Flash talk: A Potential Black Hole Mimicker From Curvature-Matter Coupled Theory of Gravity

*Thursday, 19 November 2026 15:04 (2 minutes)*

I wish to give a presentation, in which I will talk about a class of horizonless, regular ultra-compact objects which may arise in a theory of gravity where fluid variables may couple to the curvature scalar of the spacetime. This kind of non-minimal interaction between fluid variables and the Ricci scalar generates a vacuum-like equation of state in the interior, while the exterior remains exactly Schwarzschild. The interior and exterior spacetimes are glued through a infinitesimally thin-shell at the boundary of the spacetimes. The interior metric is regular everywhere and the shell has given a stiff-matter equation of state, and near-horizon compactness can potentially mimic black-hole phenomenology without a event horizon. Unlike the Mazur-Mottola gravastar and its variants, the present model predicts a typical ultra-compact mass-radius window, with masses in the range  $1.4 - 2.1M_{\odot}$  and radii in the range  $5 - 7$  km. In addition, this framework also predicts a unique geometric-thermodynamic shell temperature in the ultra-compact limit distinctly different from the Hawking temperature.

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