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Buchdahl's limit in theories with regular black holes

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It has been recently shown that the Schwarzschild black hole singularity is generically resolved in $D \geq 5$ spacetime dimensions by introducing an infinite tower of higher-curvature corrections to the Einstein-Hilbert action. In such theories, Birkhoff's theorem holds, and the collapse of matter has been shown to lead to the formation of regular black holes.

In my talk, I will explain how the maximum compactness limit for perfect-fluid stars—i.e., Buchdahl's limit— is modified by these higher-curvature corrections, under the same assumption originally made by Buchdahl. I will also present plots for constant-density configurations, showing Buchdahl's limit together with other new bounds that appear within this framework.

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