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End-state of gravitational collapse of scalar and vector fields: Strong naked singularities

In this presentation, I will discuss about the unhindered gravitational collapse of spatially homogeneous (SH) scalar fields ϕ with a potential $V_s(\phi)$, as well as vector fields $\tilde{A}$ with a potential $V_v(B)$ where $B = g(\tilde{A}, \tilde{A})$ and g is the metric tensor. If the past end-point of a causal geodesic is a singularity, then this singularity is said to be naked. Such a singularity is strong if the volume of an object vanishes when it approaches the singularity. I will discuss our results that for both scalar and vector fields, classes of potentials exist that give rise to black holes or naked singularities. I will also discuss about the classes of potentials, as well, for which the resultant singularities are strong. There is a non-zero subset of such potentials where the resultant singularities are both naked and strong. This talk is based on Phys. Rev. D **108**, 044049, 2023.

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