NUS National University of Singapore | Department of Mathematics
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Research Highlight: Naked Singularity Censoring with Anisotropic Apparent Horizon

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This work advances people's understanding of cosmic censorship about our universe. Using pure math tools, it proves that the self-similar naked singularity constructed by Christodoulou in 1994 is always associated with co-dimensional 2K nonlinear instability, with K being any positive integer. Intuitively, this means that a tiny perturbation of the naked-singularity initial data from any angle would lead to a blue-shift effect and eventually cause an anisotropic apparent horizon (the boundary of the black hole) to cover the naked singularity. Thus, upon a tiny anisotropic perturbation from any angle, the naked singularity would be immediately covered by an emerged black hole region and hence censored from outside observers.

References:

X. An, Naked Singularity Censoring with Anisotropic Apparent Horizon, 90 pages, to appear in Annals of Mathematics