Qeios

Peer Review

Review of: "A Hollow Black Hole"

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The paper “A Hollow Black Hole” talks about an alternative theoretical model where a massive black hole (MBH)’s structure is defined to be hollow at the center. This framework differs from the traditional idea that at the center of a black hole, there lies a singularity. (In simpler words, a point object with infinite mass– thus, infinite density).

In this updated framework, the MBH is made from a collection of black holes which spans the outer shell of the MBH as shown in the figure. (When you take a cross section of an MBH in this framework, you get a ring which has a series of black holes). At the core, there’s a hollow sphere of radius 2r. These smaller black holes would thus be of diameter, (R-r) as evident from figure 1.

This removes the theoretical boundaries that singularities present and also ties in with the idea that Super-Massive Black Holes (SMBH) (which are at the center of each galaxy) may have different sets of universes, i.e., the entire observable universe might just be inside a much bigger SMBH itself. The idea of information loss for any object falling into black holes is now changed to information transfer to just another universe, rather than being “completely lost” in the traditional sense.

The radius of this “void” inside the black hole can be estimated based on the size of the event horizon. Two frames of reference:

1. From inside the black hole: the distance at which objects move away from us (at the speed of light)
2. From outside: smaller than the radius of the outside (MBH’s) event horizon.

Finally, black holes come from dying stars which become super dense and form the singularity. Plus, each black hole (regardless of size) emits Hawking’s radiation, so how will each of these smaller black holes’ Hawking radiation contribute to the overall Hawking radiation? Or how will that disparity be consolidated?

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Declarations

Potential competing interests: No potential competing interests to declare.