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What happens at the end of the evaporation of a black hole?

Saturday 26 September 2020 10:00 (45 minutes)

What happens at the evaporation of a black of a black hole is not only still unclear, but also – contrary to what is sometimes claimed – relevant for the issue of unitarity in blackhole physics. I illustrate what we know about this physics. I show that the problem breaks into three distinct processes, to some extent independent: the quantum physics of the matter reaching the black hole center, the quantum physics of the spacetime region approaching the singularity itself, and quantum the physics of the horizon, as it shrinks towards the Planck scale. We have interesting indications on the first two, and tools to address the third, in particular using covariant loop quantum gravity. I describe the possibility of a quantum tunnelling across the classical singularity into a white hole region, the matter-bounce at the stage called "Planck star" and the tunnelling of the horizon from black to white. I explain why there is no reason to expect Hawking radiation's entropy to follow a Page curve, and how information can be trapped in the large interior volume of a hole and reemitted at the white-hole/remnant stage.

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