NOTES ON EVOLUTIONARY COSMOLOGY

GONÇALO BRAGA

Regarding black hole cosmology, and evolutionary cosmology for that matter, and considering our universe (observable universe) to be an analog of a black hole inside a parent universe, we would have for Schwarzschild radius

$$r_s = \frac{2GM}{c^2}$$

where M is to be taken as the mass of the universe (only baryonic or ordinary one), as

$$r_s \simeq 2.22 \times 10^{26}\, m\,.$$

Regarding the Hawking temperature at which it radiates

$$T_H = \frac{\hbar c^3}{8\pi G M k_B}$$

and the Bekenstein bound for the its entropy

$$S = \frac{4\pi k_B G M^2}{\hbar c}$$

we have

$$T_H \simeq 8.15 \times 10^{-31}\, K$$

and

$$S \simeq 8.27 \times 10^{99}\, J/K\,.$$

A further concern would be that the evolution of this universe would essentially depend on the mass distribution of the parent universe, and on the initial conditions of collapse (of the mass that originated this universe) - a good portion of state-evolution would be "externally" imposed or constrained. As such, fundamental constants would presumably evolve over time, and not be fixed (although locally, both spatially and temporally, it might look like they are).

As for the matter of cosmological selection, any type of progeny universe that has fundamental constants that promote the emergence of other black holes would supposedly be selected for. Although, fundamental constants values would essentially be environmentally constrained (depending on where in the parent universe, the progeny universe is, and on the mass distribution around it).
Regarding the anthropic principle in general, in this scenario, it would only be valid if we one day would be able to become "cosmic architects", in the sense of promoting black hole formation. If this isn't the case, the emergence of life would essentially be a neutral trait in universe generation.