Contribution ID: **132**   Type: **20 minutes talk**

Primordial black hole formation with full numerical relativity

Friday, 17 December 2021 09:15 (30 minutes)

I will talk about studying the formation of black holes from subhorizon and superhorizon perturbations in a matter dominated universe with 3+1D numerical relativity simulations. We find that there are two primary mechanisms of formation depending on the initial perturbation's mass and geometry – via direct collapse of the initial overdensity and via post-collapse accretion of the ambient dark matter. In both cases, the duration of the formation the process is around a Hubble time, and the initial mass of the black hole is M_{BH} $10^{-2}H^{-1}M_{\text{Pl}}$. Post formation, we find that the PBH undergoes rapid mass growth beyond the self-similar limit $M_{BH} \propto H^{-1}$, at least initially. We argue that this implies that most of the final mass of the PBH is accreted from its ambient surroundings post formation.

Could you please give the most relevant category for your talk?

Gravity

Will you be pre-recording your talk?

No

Would you be interested in receiving feedback on your presentation?

Yes

Are you happy for your talk to be recorded?

Yes

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Session Classification: Full-length talks