

New Horizons in Primordial Black Hole physics (NEHOP)



Contribution ID: 55

Type: **Talk**

Should we care about cosmological black holes?

Tuesday, 20 June 2023 17:00 (20 minutes)

When primordial black holes (PBHs) form in the early universe, their environment is dominated by the radiation bath and the not-very-distant cosmological horizon. There are a wide number of cosmological black hole metrics which describe such objects—locally black-hole like objects which are asymptotically FLRW. However, pretty much all of these metrics have various flaws, such as physical singularities or pressure conditions which require matter-dominated backgrounds. I will briefly discuss some of these solutions, and the formalism we use to study them more clearly. I will also argue that the choice of such metric may have large phenomenological consequences, specifically regarding PBHs as a dark matter candidate. It is not easy to find an entirely convincing candidate, but I will use a somewhat generic framework and onetoy' metric—the Thakurta metric—to demonstrate how the constraints on PBH dark matter might depend heavily on the early-universe cosmological black hole metric. Based partly on: <https://arxiv.org/abs/2008.10743>, <https://arxiv.org/abs/2103.02815>, <https://arxiv.org/abs/2112.13921>.

Primary author: PICKER, Zachary (UCLA)

Presenter: PICKER, Zachary (UCLA)

Session Classification: Session 8