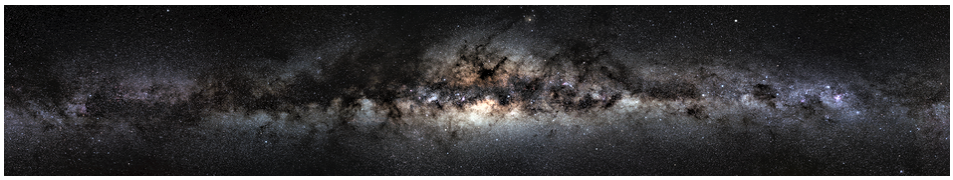

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A New Bound on Primordial Black Hole Abundance Using Interaction with Dust Tori in Active Galactic Nuclei

Tuesday, 7 December 2021 08:20 (30 minutes)

As primordial black holes (PBHs) are one possible candidate for dark matter (DM), various constraints on PBHs have been placed in wide mass ranges. Especially in the mass range above 10^-1 M_sun, the method using gas accretion on PBH has been taken. Here, we newly consider the gas accretion process in dust tori in active galactic nuclei (AGNs). The dust torus region is typically the central ten pc region of a galaxy and contains abundant gas. These conditions are suitable for PBH constraints. As an example, we consider a nearby AGN in NGC 1068 whose gas mass in the dust torus is recently estimated as 10^5 M_sun. By setting PBH radiation do not overheat the gas in the torus, we find \Omega_{PBH}/\Omega_{DM} goes down to 3×10^-3 at ~300 M_sun. This independent constraint is comparable to previous X-ray and gas heating bounds in the literature. Our method applies to a variety of AGN tori with gas measurements.

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Session Classification: Break and Poster Session