



Contribution ID: 103

Type: **Invited talk in a parallel session**

## Primordial Black Hole Dark Matter from Warm Natural Inflation

*Tuesday, 9 July 2024 15:00 (20 minutes)*

In recent work [1,2] we have shown that within the natural warm inflationary paradigm (WNI) observational constraints on the primordial power spectrum from the cosmic microwave background (CMB) can be satisfied without going beyond the Planck scale of the effective field theory. Moreover, WNI can inevitably provide perfect conditions for the production of primordial black holes (PBHs) in the golden window of black-hole mass range where it can account for all of the the dark matter content of the universe while satisfying observational constraints. In this talk we review the contributions from this form of dark matter to the gravitational wave background, and the prospects for this PBH dark matter to merge into early seeds of galaxy formation and super-massive black holes at high redshift.

[1] M. Correa, M. R. Gangopadhyay, N. Jaman, G. J. Mathews, Phys. Lett. B835, 137510 (2022).

[2] M. Correa, M. R. Gangopadhyay, N. Jaman, G. J. Mathews, Phys. Rev. D 109, 063539 (2024)

\*Work at the University of Notre Dame supported by the U.S. DOE under nuclear theory grant DE-FG02-95-ER40934

**Primary author:** MATHEWS, Grant (University of Notre)

**Co-authors:** Mr CORREA, Miguel (University of Notre Dame); Prof. GANGOPADHYAY, Mayukh; Dr JAMAN, Nur (IISERKOL)

**Presenter:** MATHEWS, Grant (University of Notre)

**Session Classification:** Black hole formation, evolution and the black hole mass gap

**Track Classification:** Black Holes: Classical and Beyond (BH): Black hole formation, evolution and the black hole mass gap