

# Phenomenology 2022 Symposium: From Virtual to Real



Contribution ID: 46

Type: **not specified**

## Cosmological Constraints on First-Order Phase Transitions

Monday 9 May 2022 18:00 (15 minutes)

First-order phase transitions exist in many models beyond the Standard Model and can generate detectable stochastic gravitational waves for a strong one. Using the cosmological observables in big bang nucleosynthesis and cosmic microwave background, we derive constraints on the phase transition temperature and strength parameter in a model-independent way. For a strong phase transition, we find that the phase transition temperature should be above around 2 MeV for both reheating photon and neutrino cases. For a weak one with a temperature below 1 MeV, the phase transition strength parameter is constrained to be smaller than around 0.1. Implications for using a first-order phase transition to explain the NANOGrav observed gravitational wave signal is also discussed.

**Authors:** KORWAR, Mrunal; BAI, Yang (University of Wisconsin, Madison)

**Presenter:** KORWAR, Mrunal

**Session Classification:** Cosmology II