

# Big Bang Nucleosynthesis in the Era of Precision Cosmology

*Friday 6 June 2025 14:00 (30 minutes)*

Big Bang Nucleosynthesis (BBN) describes the very first nucleosynthesis in the universe. The nuclear network of BBN produces the lightest elements and explains their cosmic abundances. With precision abundance observations, BBN can probe the physics of the early universe and place limits on key cosmological parameters. These key parameters also leave their imprint in the cosmic microwave background (CMB), the afterglow from the baby universe. A recent successful space mission called Planck provides independent precision determinations of their values. The agreement between BBN and the CMB results stands for the success of standard cosmology. Relevant recent work at the precision frontier of BBN will be discussed. In addition, the combined BBN+CMB limits could place important constraints on new physics, a complementary indirect approach to laboratory search. We will close this talk with some BSM scenarios to exemplify the use of BBN in the quest for signs of exotic physics.

**Author:** Dr YEH, Tsung-Han (TRIUMF)

**Presenter:** Dr YEH, Tsung-Han (TRIUMF)

**Session Classification:** Relativity, Gravitation and Cosmology