## 第 70 回 RESCEU コロキウム



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- 日 時: 2025 年 6 月 25 日(金) 14:00 ~ 15:30
- 場 所:理学部4号館1階ピロティ RESCEU セミナー室
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## Positive neutrino masses with DESI DR2 via matter conversion to dark energy

## Abstract

The Dark Energy Spectroscopic Instrument (DESI) is a massively parallel spectroscopic survey on the Mayall telescope at Kitt Peak, which has released measurements of baryon acoustic oscillations determined from over 14 million extragalactic targets. We combine DESI Data Release 2 with CMB datasets to search for evidence of matter conversion to dark energy (DE), focusing on a scenario mediated by stellar collapse to cosmologically-coupled black holes (CCBH). In this physical model, which has the same number of free parameters as LambdaCDM, DE production is determined by the cosmic star formation rate density (SFRD), allowing for distinct early- and late-time cosmologies. Using two SFRDs to bracket current observations, we find that the CCBH model: accurately recovers the cosmological expansion history, agrees with early-time baryon abundance measured by BBN, reduces tension with the local distance ladder, and relaxes constraints on the summed neutrino mass. For these SFRDs, we find a peaked positive summed mass < 0.149 eV (95% confidence) and summed mass equal to 0.106 +0.050 -0.069 eV respectively, in good agreement with lower limits from neutrino oscillation experiments. A peak in positive summed neutrino mass results from late-time baryon consumption in the CCBH scenario and is expected to be a general feature of any model that converts sufficient matter to dark energy during and after reionization.

興味をお持ちの方の聴講を歓迎致します。