

**The 4th Toyama International
Symposium on "Physics at the
Cosmic Frontier"
(PCF2022-2023)**

Report of Contributions

Contribution ID: 1

Type: **not specified**

seminar 1: "First Identification of a CMB Lensing Signal Produced by 1.5 Million Galaxies at $z\sim 4$ "

Wednesday 5 October 2022 13:00 (14h 30m)

We report the first detection of the dark matter distribution around Lyman break galaxies (LBGs) at the redshift of $z\sim 4$ through the cosmic microwave background (CMB) lensing measurements with the public Planck PR3 κ map. The LBG sample consists of 1473106 objects at $z\sim 4$ that are identified in a total area of 305 deg² observed by the Subaru/Hyper Suprime-Cam survey. After careful investigations of systematic uncertainties, such as contamination from foreground galaxies and cosmic infrared background, we obtain the significant detection of the CMB lensing signal at 5.1 σ which is dominated by 2-halo term signals of the LBGs. Fitting a simple model consisting of the Navarro-Frenk-White profile and the linear-bias model, we obtain the typical halo mass of $M_h=2.9\times 10^{11} h^{-1} M_{\text{sun}}$. Combining the CMB lensing and galaxy-galaxy clustering signals on the large scales, we demonstrate the first cosmological analysis at $z\sim 4$ that constrains (Ω_{m0}, σ_8). We find that our constraint on σ_8 is roughly consistent with the Planck cosmology, while this σ_8 constraint is lower than the Planck cosmology over the 1 σ level. This study opens up a new window for constraining cosmological parameters at high redshift by the combination of CMB and high- z galaxies, as well as studying the interplay between galaxy evolution and large-scale structure at such high redshift. In this seminar, we will also discuss the future prospects with ongoing/upcoming observations by large ground-based/space telescopes such as James Webb Space Telescope (JWST).

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Presenter: Dr HARIKANE, Yuichi (ICRR)

Contribution ID: 2

Type: **not specified**

Seminar 2: "Searches for Dark Matter with Cherenkov telescopes: Latest results and a glimpse into the future"

Monday 31 October 2022 14:45 (1 hour)

The quest for Dark Matter is a since long unsolved puzzle of modern physics. Imaging Atmospheric Cherenkov telescopes, like MAGIC located at Roque de los Muchachos Observatory on La Palma, have so far searched almost 1000 hours of their data for gamma-ray signals from annihilating or decaying heavy ($> \text{GeV}$) Dark Matter particles. Also, the next-generation Cherenkov Telescope Array (CTA) is under construction, promising a moment of truth for TeV Dark Matter in the near future. In this seminar, I will introduce how to search for Dark Matter with Cherenkov telescopes. I will present the latest Dark Matter constraints obtained with the MAGIC telescopes, as well as what we can expect to learn with CTA.

Presenter: Dr HÜTTEN, Moritz