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場 所: 理学部 4 号館 1 階ピロティ RESCEU セミナー室

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Towards a new generation of galaxy cluster strong lensing models & cosmology with SN Encore

Abstract

Time-variable sources, such as quasars and supernovae (SNe), that are strongly lensed by galaxy clusters are opening a new and exciting window for cosmology with high-precision, single-step measurements of the Hubble Constant (H_0), fully independent of other cosmological probes. To fully exploit these rare systems for cosmology, a key challenge lies in the development of high-precision strong lensing models. I will first showcase a new generation of cluster-scale lens models by directly modelling the extended surface-brightness distribution of multiply-imaged sources. I will then focus on a once-in-a-lifetime event: the lens cluster MACS J0138.0-2155 strongly lensing not one, but two SNe Ia, Requiem and Encore at $z = 1.949$. This spectacular discovery has provided an excellent opportunity to measure H_0 with a $\sim 14\%$ (statistical+systematic) uncertainty, which is currently dominated by that of the short time delay. I will then briefly discuss current efforts aimed at reducing the current error budget by i) improving the SNe photometry through template imaging and ii) characterising the lens environment.

興味をお持ちの方の聴講を歓迎致します。