ID de Contribution: **6**   Type: **Non spécifié**

Cosmology with galaxy clusters

mercredi 9 novembre 2022 14:30 (45 minutes)

The concordance model LambdaCDM, which appeared in the late 1990's, has been extremely successful. The model has been confirmed by new and increasingly precise cosmological observations for more than 15 years. But since 2015, measurements from different probes show possible tensions between parameters. Clusters of galaxies contributed to the building of the model since the beginning and provided constraints that improved over time. They now have a key role to play in testing the cosmological model farther and in clarifying the possible tensions. I will review the current cosmological constraints from galaxy clusters, and highlight the challenges that they have to overcome to achieve precision equivalent to that of other probes. I will then talk about on-going and future cluster surveys. Finally, beyond the measurement of cosmological parameters, galaxy clusters constitute ideal laboratories to study structure formation in the Universe, another way to test the LambdaCDM model.

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