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The “Missing baryons” in the cosmic web—what is it? Where is it? How much?

Tuesday, 12 December 2023 14:30 (15 minutes)

Previous studies of galaxy formation have shown that only 10 per cent of the cosmic baryons are in stars and galaxies, while 90 per cent of them are missing. In this talk, I will present three observational studies that coherently find significant evidences of the missing baryons. The first is the cross-correlation between the kinetic Sunyaev-Zeldovich maps from Planck with the linear reconstructed velocity field. The second measurement is the cross-correlation between the thermal Sunyaev-Zeldovich effect with gravitational lensing map and we detect the cross-correlation for 13 sigma with RCSLenS and Planck data. The third study is to stack the pairs of luminous red galaxies and subtract the halo contribution, which leads to the detection of gas within the cosmic filaments. These detections coherently brings a picture of how baryons distribute in the cosmic web. I will briefly describe how these studies can be improved with future CMB-S4 and LSST observation data.

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