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国台学术报告 NAOC COLLOQUIUM

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Time: Wednesday 2:30 PM, Sep 15th Location: A601, NAOC

The "Missing baryons" in the cosmic web —What is it? Where is it? How much?

Dr. Yin-Zhe Ma

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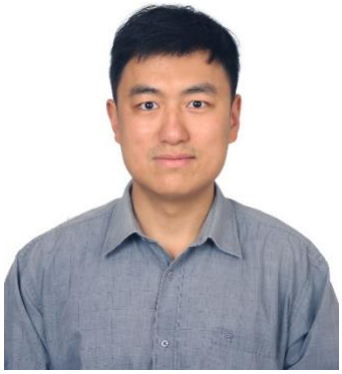
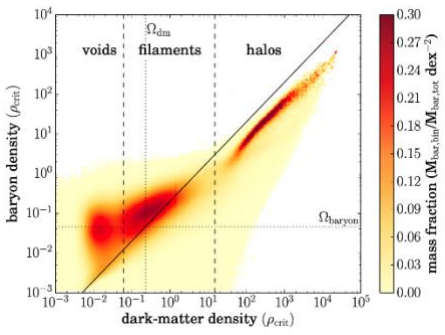


Professor Yin-Zhe Ma obtained his Bachelor degree in Physics from Nanjing University, a master degree from Institute of Theoretical Physics at Chinese Academy of Sciences (supervisor: Prof. Rong-Gen Cai), and a PhD degree in Astronomy from University of Cambridge (supervisor: Prof. George Efstathiou FRS). He conducted CITA National Fellowship at University of British Columbia Canada and a research associate at University of Manchester, and then moved to University of KwaZulu-Natal South Africa as a faculty. He chairs the NAOC-UKZN Computational Astrophysics Centre and Chinese-South African Forum of Astronomy.

His research focusses on observational and theoretical cosmology aimed at understanding the initial condition of Big Bang and subsequent structure formation. He is currently a member of the Square Kilometer Array (SKA) EoR, Cosmology and HI Science Working group, the Planck science team, the Hydrogen Epoch Reionization Array (HERA), CMB Stage-4 experiment and LSST (Vera C. Rubin Observatory). He has published over 100 papers, with total citation exceeded 13000, h-index 42. He also serves as an adjunct professor at the National Astronomical Observatory China and Purple Mountain Observatory China. He was awarded the NSFC Oversea Scholar grant.

Abstract



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 still missing. In this talk, I will present three observational studies that coherently find significant evidences of the missing baryons (Warm-Hot Intergalactic Medium). 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. I will show how these measurements suggest the density, distribution and temperature of WHIM in the cosmic web, and the future prospectives with CMB Stage-4 experiment and LSST (Vera C. Rubin Observatory) survey.