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国台学术报告 NAOC COLLOQUIUM

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Time: Wednesday 2:30 PM, Dec. 14 Location: A601, NAOC

Cosmic Mammoth - Mapping

the Most Massive Large-scale Structures in the early Universe

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Dr. Zheng Cai is a Hubble Fellow at UCO/Lick observatory and University of California at Santa Cruz. He graduated from University of Science and technology of China in 2008, and get his Ph.D. at University of Arizona, Steward Observatory at 2015. Recently, he got the scholarship award (1 out of 86 Ph.D.) at University of Arizona, College of Science in 2015, and the Hubble + IMPS + Morrison Fellowship at University of California at Santa Cruz in 2016. He is a member of the optical design team of TMT/WFOS and plays an important role in recent China -- UCO discussions of 12m telescope.

Abstract

In this talk, I will present a novel survey of the most massive overdensities of galaxies in the peak of cosmic star formation and QSO activities ($z=2-4$). These structures are traced by the strongest intergalactic Hi (Lyman-alpha) absorption on large scales of 10-30 Mpc. Our cosmological simulations show a strong correlation between the optical depth of Ly-alpha absorption and mass overdensities. I will present the survey of the strong Hi absorption due to intergalactic medium (IGM) overdensities, and further present our discovery of a sample of extremely massive overdensities at $z\sim 2.3$ by utilizing LBT, Keck, KPNO-4m, and CFHT. I will further discuss the discovery of largest Lyman alpha nebulae in these fields, which are unique laboratories to study the IGM-galaxy interactions. In the end, I will talk about the future prospects. I will stress how novel instruments, especially the imager-slicer integral field spectrograph and TMT/WFOS, will solve fundamental questions in galaxy/structure formation. I will further talk about a few exciting science/instrumentation opportunities that can be achieved by collaborating with NAOC's experts.

All are welcome! Tea, coffee, biscuits will be served at 2:15 PM.