

You are welcome to nominate speakers to colloquium@nao.cas.cn. The video and slides of previous colloquia and more information can be found at <http://colloquium.bao.ac.cn/>.

国台学术报告 NAOC COLLOQUIUM

2017年 第14次 / No. 14 2017

Time: Wednesday 2:30 PM, May 3rd **Location: A601 NAOC**

ABS, CMB foreground removal, weak lensing reconstruction by counting galaxies, and beyond

Dr. Pengjie Zhang

The Astronomy Department, Shanghai Jiao Tong University, China



Dr. Pengjie Zhang is a professor at the Astronomy Department of Shanghai Jiao Tong University. He obtained his B.S. from Peking university in 1997 and Ph.D. from University of Toronto in 2003. He then spent 2 years at Fermilab as a postdoc. In 2005, he joined Shanghai astronomical observatory of Chinese Academy of Sciences as a faculty member. In 2012, he became a distinguished professor at Shanghai Jiao Tong University. He works on the large scale structure of the universe and its applications on fundamental cosmology. He built theoretical models of various Sunyaev Zel'dovich (SZ) effects and used the SZ effects to probe missing baryons, cosmic flows, violations of the Copernican Principle, and eternal inflation. He

invented self-calibration methods of systematic errors in cosmic shear measurement, and weak lensing reconstruction through cosmic magnification. He derived the exact mapping between real and redshift space clustering, and studied the halo velocity bias. He solved the linear structure formation in $f(R)$ cosmology, and proposed the EG method to test GR at cosmological scales.

Abstract

We present an Analytical method of Blind Separation (ABS) as a solution to CMB foreground removal, weak lensing reconstruction through cosmic magnification, the thermal Sunyaev Zel'dovich effect measurement, and beyond. We formulate the above questions into the same mathematical structure, for which we have discovered the analytical solution of the desired cosmological signal, free of assumptions of undesired foregrounds/contaminations. We have tested this method against simulated CMB B-mode observations and cosmic magnification in galaxy distribution, and demonstrated its robustness against various observational and astrophysical complexities. We believe that the ABS method should have more general applications. Therefore the major purpose of this talk is to introduce the ABS method and to explore new applications.

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