PDF versions of previous colloquia and more information can be found in “events” at http://gcosmo.bao.ac.cn/

国台学术报告 NAOC COLLOQUIUM

2012 年 第 52 次 / Number 52, 2012

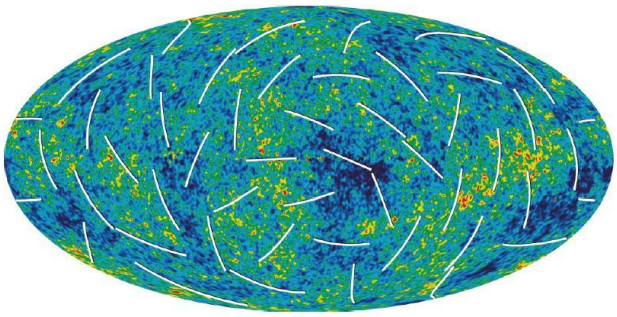
TIME: Wednesday, 3:00 PM, Sep 19, 2012 LOCATION: A601 NAOC

Second Order CMB Perturbations

Dr. Christian Fidler (ICG Portsmouth)

Christian Fidler is a postdoc working on second order CMB perturbations with Prof. David Wands at the Institute of Cosmology and Gravitation (ICG), University of Portsmouth in the UK. He did his phd at the RWTH Aachen with Prof. Dr. M. Beneke working on second order CMB perturbations and Leptogenesis. He derived the full second order polarised Boltzmanneqautions for Photons and wrote a Code to compute the second order B–polarisation induced from second order scattering effects. In the meantime He did also work on Leptogenesis in the CTP formalism, which allows for a natural treatment of the different Lepton flavours which are important if Leptogenesis happens while one of the Lepton Yukawa’s freezes out. After He finished my PHD in December 2011 he moved to the ICG Portsmouth to work with Prof. David Wands. He continued his studies on second order CMB perturbations with the goal to release a full second order CMB Code able to compute polarised CMB spektra and bispektra.

Abstract



The CMB provides detailed information about processes in the early Universe. Temperature anisotropies and E–mode polarisation have been measured and provide insight into the composition and evolution of our Universe. The amplitudes of these fluctuations are linked to the primordial scalar perturbations. B–mode polarisation is especially interesting, as it can only be induced by tensor metric perturbations at first order in cosmological perturbation theory, constraining possible inflation models. Because it is still undetected, primordial tensor perturbations must be small and second order effects to B–polarisation might be equally important. Primordial non–gaussianity is amongst the most important unknown parameters of inflation, but second order effects naturally contaminate the primordial non–gaussianity and need to be computed as a background for future measurements of non–gaussianity. The numerical evaluation of these effects is complicated since the source term includes convolutions of first order quantities. In contrast to first order, which is linear in the statistical initial perturbations and a separation of these is possible, at second order one has to deal with stochastical equations. This problem can be solved in an elegant way by a combination of the well known line of sight ansatz and a Green’s function method.

All are welcome! Tea, coffee, biscuits will be served at 2:45 P.M.

You are welcome to nominate speakers to Shude Mao (shude.mao@gmail.com), Licai Deng (licai@bao.ac.cn), Xuelei Chen (xuelei@cosmology.bao.ac.cn).