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国台学术报告 NAOC COLLOQUIUM

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TIME: Wednesday 3:00 PM , Sept. 28, 2011 **LOCATION: A601 NAOC**

The fine-scale structure of dark matter halos

Prof. Simon D. M. White

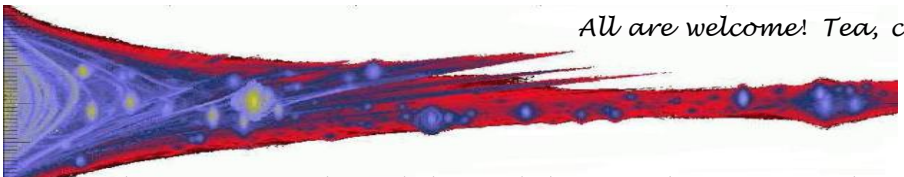
Director at the Max-Planck-Institut fuer Astrophysik

Simon White is one of the most highly cited of all astrophysicists. His more than 300 publications in the refereed professional literature have been cited more than 50,000 times. He earned a degree in Mathematics from Jesus College, Cambridge, in 1972, a Master’s degree in Astronomy from the University of Toronto in 1974, and a Ph.D. in Astronomy from Cambridge in 1977. He has continued working on computer simulations of large-scale structure in the universe, most notably the Millennium Simulation, a model which followed the dark matter and the formation of 20 million galaxies in a cubic region of the universe over 2 billion light-years on a side.

White was elected Fellow of the Royal Society in 1997, of the German National Academy, Leopoldina in 2005, and Foreign Associate of the US National Academy of Sciences in 2007. He has received the Helen B. Warner Prize from the American Astronomical Society, the Dannie Heineman Prize for Astrophysics from the American Institute of Physics and the American Astronomical Society, and a Gold Medal from the Royal Astronomical Society, among numerous other prizes and awards.

Abstract

Cold Dark Matter (CDM) is apparently the dominant component of all structures larger than individual galaxies, and dark matter halos are the basic unit from which all nonlinear objects are built. Simulations of cosmic evolution predict that CDM halos should show a very rich structure which agrees with much (but not all) of the available observational information. Techniques for direct detection of Cold Dark Matter in cooled bolometers (for neutralinos) and resonant cavities (for axions) have advanced to the point where a positive result is within reach. In addition, the next generation of gamma-ray telescopes will be sensitive enough to detect annihilation radiation from many plausible kinds of neutralino. In all these cases, the signal to be detected depends sensitively on how dark matter is structured on meter scales or smaller. Such scales are many orders of magnitude below those that can be studied with conventional N-body methods. I will describe new techniques which allow these issues to be addressed through simulations of evolution from fully general CDM initial conditions.



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

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).