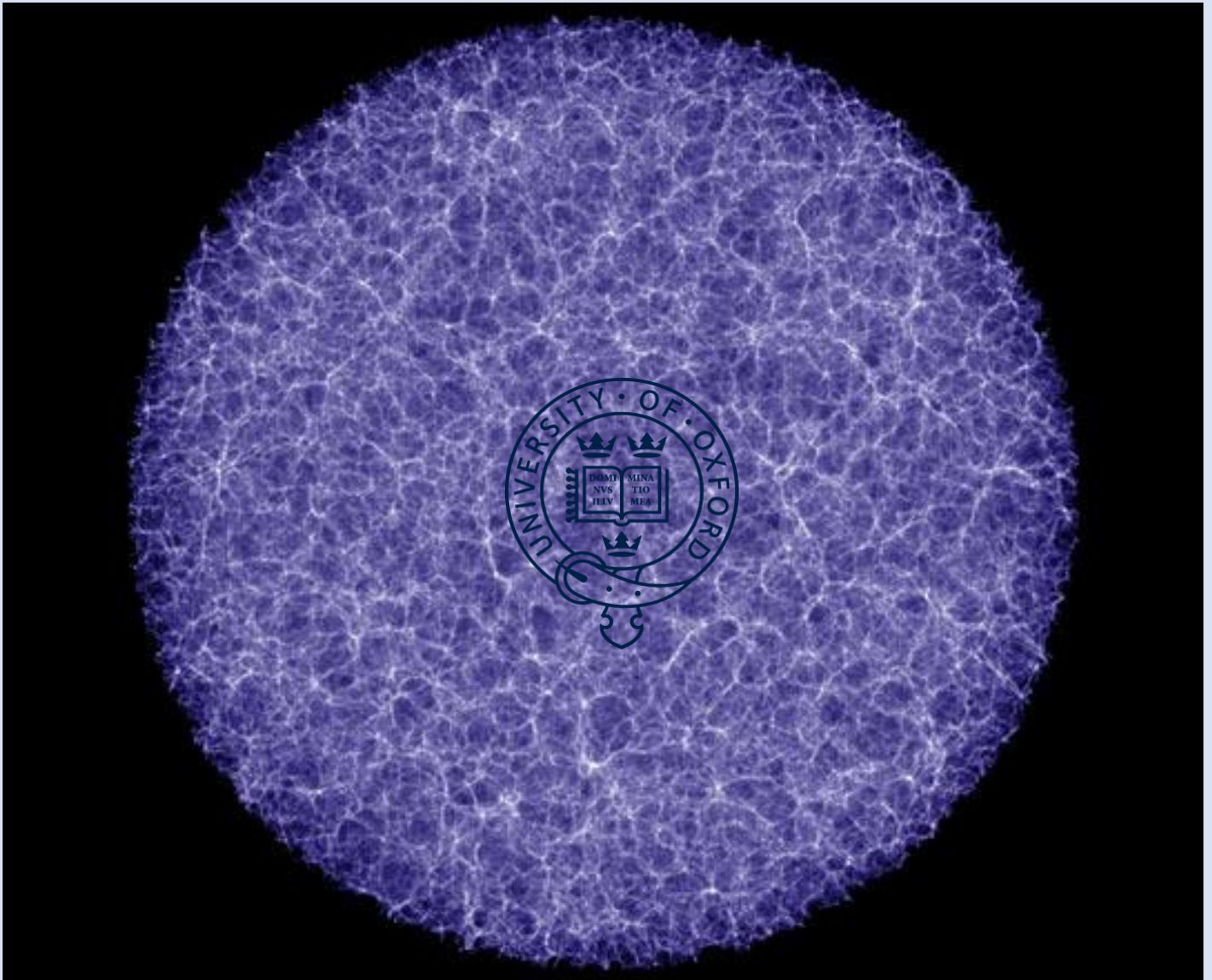


(Re)constructing cosmology

Subir Sarkar



The standard Friedmann-Lemaître-Robertson-Walker model of cosmology is based on the 'Cosmological Principle', namely that the Universe is isotropic and homogeneous on average. Analysis of observations of distant supernovae then leads to the inference that the Hubble expansion rate is accelerating, as if driven by Einstein's Cosmological Constant, which is interpreted as the energy density of the quantum vacuum. However the cosmic microwave background radiation is *not* isotropic as viewed by us - this is ascribed to our local non-Hubble motion due to inhomogeneities. If so, the sky distribution of distant quasars should have a corresponding dipole anisotropy. We find however that the quasar dipole does *not* match this expectation, i.e. the rest frames of matter and radiation do not coincide. This calls into question the Cosmological Principle, and thereby the existence of dark energy dominating the Universe.

Date/time & venue



Subir Sarkar was educated at the Indian Institute of Technology, Kharagpur (1969-74) and obtained his PhD (1982) at the Tata Institute of Fundamental Research, Mumbai where he was a staff member. Since 1990 he has been at the Rudolf Peierls Centre for Theoretical Physics at Oxford University. His research interests are mainly at the interface between cosmology and fundamental physics, and he also participates in several astroparticle experiments such as the *IceCube Neutrino Observatory* and the *Cherenkov Telescope Array*. In 2017 he was awarded the IUPAP Homi Bhabha medal for distinguished contributions to astroparticle physics.

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