Plenarvortrag PV II Di 11:45 Audimax

On the topology of the Universe. — •Frank Steiner — Institut fuer Theoretische Physik, Universitaet Ulm, Germany

In the field of "cosmic topology" one investigates the global (spatial) geometry and topology of the universe and thus addresses the question: do we live in a universe that is finite yet has no boundary? To observationally test the possibility of a finite universe, we concentrate in this talk on the measurements of the temperature anisotropy of the cosmic microwave background (CMB) by NASA's satellite Wilkinson Microwave Anisotropy Probe (WMAP). The predictions of finite universes possessing euclidean, spherical, or hyperbolic spatial geometry are discussed and compared with the corresponding ones of the so-called concordance model which assumes a spatially flat and infinite universe. It is shown that a "small universe" having e. g. the shape of a flat 3-torus whose fundamental domain is a cube with side length 17 Gpc describes the WMAP data much better than the best-fit concordance model since it exhibits the suppression of the CMB anisotropy at larges scales already observed by COBE and confirmed by WMAP.