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Presente e futuro del CMB (Invited review)

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The cosmic microwave background (CMB) represents a unique window on the early universe as it directly probes the gravitational seeds from which cosmic structure formed. Fifty years after its discovery, the CMB has transformed cosmology into a high-precision science. Following a series of highly successful ground based, balloon-borne and space-borne experiments, the ESA Planck mission has recently measured the CMB fluctuations in temperature and polarization over the whole sky with an unprecedented combination of angular resolution (5-33 arcmin), sensitivity (916;T/T = 2 x 10-6), frequency range (30 to 857 GHz), and calibration accuracy (0.1%). The data from Planck and from other CMB experiments provide an amazing confirmation of the basic LCDM model and yield estimates of the main cosmological parameters with sub-percent accuracy. A joint analysis of the BICEP2 and Planck data currently set the best limits to primordial B-mode polarization predicted by inflationary models. Far from having completed its extraordinary discovery potential, the CMB will continue to be a key target of future cosmology experiments, including high precision polarisation measurements and extensive arcmin-resolution surveys of the SZ effect.

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