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First cosmological results from the Planck satellite

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The Planck satellite, selected by ESA in 1996, was launched in 2009 and delivered on March 21st 2013 its first full sky maps of the millimetric emission at 9 frequencies, and maps derived from them, in particular the map of the anisotropies of the Cosmic Microwave Background (CMB). I will briefly recall the characteristics of the Planck instruments, and describe the data processing performed to obtain these high resolution maps.

The CMB anisotropies reveal the primordial fluctuations which initiate the growth of the large scale structures of the Universe transformed by the action of gravitation during the first 370,000 years, until the Universe became transparent, forming the image we record today. The statistical characteristics of these anisotropies allow constraining jointly the physics of the creation of the primordial fluctuations and their evolution and finding the values of the parameters of the models which we confront to data. I will describe the Planck estimates of the density of constituents of the Universe and their implication in terms of derived quantities like the expansion rate or the spatial curvature. I will review what we learnt on the generation of fluctuations (inflation) and will discuss the extensions of the standard cosmological model (neutrinos, cosmic strings, ...). I will also show the results on the matter distribution which slightly distort the CMB image by gravitational lensing.

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