

Deep Surveys with FIRST and Cosmology: A Revised Case

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The ESA/FIRST mission, the *first* 4-m class observatory in space, will allow drastic improvements in mapping for faint sources with respect to previous far-IR telescopes, and will provide complementary spectral coverage with respect to major projects like NGST and ALMA. FIRST will be the most powerful tool to investigate crucial phases in the evolution of galaxies at long wavelengths, whose relevance has only recently been fully understood.

The present contribution is aimed at reviewing the scientific case for deep cosmological surveys that will be performed with FIRST, in the light of recent discoveries by the Cosmic Background Explorer, the Infrared Space Observatory and large millimetric telescopes on ground. All these have shown that crucial phases in galaxy formation and evolution at high-redshifts can be only investigated at long wavelengths, in particular phases of enhanced activity of star formation, consequent to merging, bringing to the formation of galaxy spheroids.

FIRST will be the only planned instrument for many years to come working in the far-IR with imaging capabilities comparable to those of optical telescopes on ground, able to accurately measure the bolometric emission of galaxies and active nuclei at any redshifts.