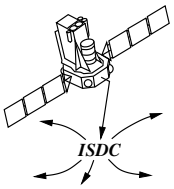

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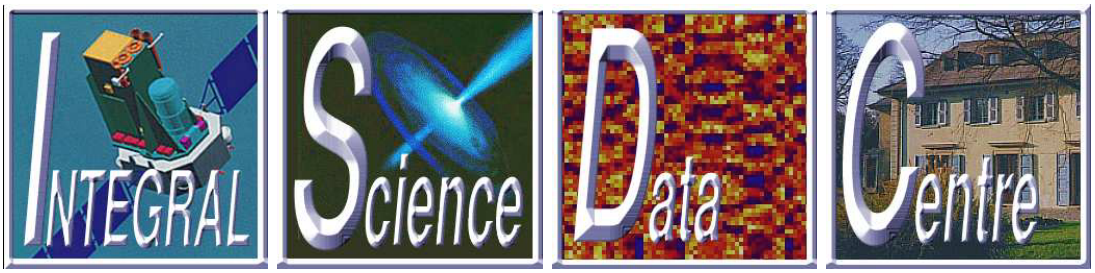
ASTROPHYSICS SEMINAR



Tuesday, October 21, 2003 at 11:00

CMB vs. BBN-guided Helium measurement: an emerging tension ?

Roberto Trotta
(Cosmology Group, Geneva University)

Abstract. Standard Big Bang Nucleosynthesis (BBN) predicts the abundance of the light elements as a function of one free parameter, namely the baryon density. Cosmic microwave background (CMB) anisotropies probe with high accuracy the baryon content of the universe. Combination of CMB-determined baryon density, astrophysical measurements of the light element abundances and standard BBN calculations is a powerful tool to constrain non-standard physics in the early universe.

I review the standard BBN predictions for the light elements as derived using the baryon abundance determined by WMAP and discuss discrepancies with current astrophysical measurements. As the most abundant among the light elements (about 25% in mass), I focus on ^{4}He and I present the first determination of the Helium mass fraction (Yp) using CMB data alone, $0.16 < \mathrm{Yp} < 0.50$ (at 68% cl). I identify degeneracies with other cosmological parameters and show that the uncertainity in the Helium mass fraction will have to be taken into account in order to correctly recover the baryon abundance from Planck-quality data.

Additional Information

The seminars are given in the ISDC "Pavillon" building
Address: INTEGRAL Science Data Centre, ch. d'Écogia 16, CH-1290 Versoix
WWW: ISDC Seminars: `http://isdc.unige.ch/index.cgi?Science+seminars`