ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

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17:00 -18:00

3rd Floor Seminar Room

"All the X-ray Colors of the Milky Way Baryons "

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Abstract

Baryons are missing at all scales in the Universe. Virialized structures (galaxies, groups and clusters of galaxies), fall short of baryons when their visible baryonic mass is compared to their dynamical mass weighted by the Universal baryon fraction (f_b = Omega_b/Omega_M = 0.157), and the problem is more severe for smaller structures.

The Milky Way is no exception: its visible baryonic mass amounts to 6.5x10^10 Solar masses, and includes stars and cold atomic and molecular gas in the Galactic disk. The Dark-Matter content of the milky way is estimated in 1-2x10^12 solar masses, and therefore the expected baryonic mass should be 2.5-5 times larger than actually observed.

This (1.3-2.6)x1e11 Solar mass of missing baryonic matter could still be bound to the Galaxy and confined within its virial radius, but eluding detection because of e.g. its high temperature and/or low density. Alternatively the matter could have been expelled from the Galaxy during particular stages of its evolution, or even never been accreted in the first place onto the Galaxy's dark mater potential well.

To investigate on these drastically different scenarios and try to discriminate among them, we have conducted an homogenous study of all the possible gaseous metal component of the Milky Way, exploiting the soft X-band where all the ionization states (from neutral to H-like) of oxygen (the most abundant metal in the Universe) are traceable.

Here I will report on the results of this study, present an updated baryon census of our own Milky Way Galaxy and propose a possible explanation to the general problem of the galaxy's missing baryons in terms of interplay between the galaxy and its central supermassive black hole.