

# Precision Cosmology using HII Galaxies

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Giant HII regions and HII galaxies follow a tight correlation between their emission-line luminosities ( $L$ ) and the velocity widths of the emission lines ( $\sigma$ ). We have shown that this  $L$ - $\sigma$  relation can be accurately calibrated using local objects to provide a powerful alternative method to estimate distances to objects at cosmological distances.

In particular we have recently used the relation to obtain a value of  $H_0=71\pm 3$  km/s/Mpc for the Hubble parameter, in excellent agreement with the best available determinations in the literature. Since, because of their huge light-to-mass ratios, HII Galaxies can be observed out to redshifts of  $z=3$  or more, we have started a program to measure luminosities and line-widths of HII galaxies at high- $z$  aimed at constraining the equation of state of dark matter, and its possible evolution with look-back time.

In this contribution I will present the status of this work, with particular emphasis on the Hubble constant.