

Abstract for an Invited Paper  
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**Hans A. Bethe Prize Lecture: The Primordial Helium Abundance**

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It is generally accepted that the production of the light elements (He, D, and Li) during the early stages of the expansion of the Universe is one of the three pillars of the Big Bang theory. The main results obtained from the observational determination of the primordial helium abundance,  $Y_p$ , and its comparison with the value predicted by Big Bang Nucleosynthesis will be presented, in particular: a) the recognition that galaxies form with  $Y_p$  in the 0.24 to 0.26 range, b) that  $Y_p$  was produced during the Big Bang, c) that  $Y_p$  is fundamental as a critical test for cosmological theories and the baryonic content of the Universe, and d) that the value of  $Y_p$  provides an observational constraint on the number of light neutrino species, which is smaller than four and probably equal to three. In addition, the present status of the observationally determined  $Y_p$  value based on extragalactic H II regions will be discussed.