Astronomy & Astrophysics Division Seminar

Title : Cold gas in high redshift galaxies

Speaker : Dr. J.N.H.S. Aditya (IUCAA, Pune)

Date : 16.07.2018 (Monday)

Time : 16:00 Hrs

Venue : Seminar Room # 113/114 (Thaltej Campus)

Abstract:
Cold HI gas at high redshifts can be probed using HI 21 cm absorption against background radio-loud Active Galactic Nuclie (AGN). The distribution and kinematics of this gas, present in the vicinities of the AGN, can be studied using this technique. A large number of surveys in last 50 years have reported nearly 140 detections of such `associated' HI 21 cm absorbers. However, most of these studies are limited only to low redshifts ($z < 1$). Using GMRT we have carried out a search for associated HI 21 cm absorption in a large and uniformly selected sample of 76 flat-spectrum radio AGN that inclues 50 sources at $z > 1$. For the first time, we find a statistically significant evidence (~3-sigma) that the strength of associated HI 21 cm absorption in the high-z sub-sample is lower than that of the low-z sub-sample. Also, we detect four new HI 21 cm absorbers at $z > 1$, increasing the total number of known absorbers at $z > 1$ to eight. The possible causes for the low absorption strength at higher redshifts can be : (1) redshift evolution in the AGN environments, (2) high UV and/or radio luminosity of high-z AGN, and (3) low gas covering factor in high-z AGN. These plausibilities are further investigated in Giga-Hertz Peaked Spectrum (GPS), High-Frequency Peaker (HFP) and other AGN with compact radio-jets. I shall present the details of our surveys and the studies of individual cases of newly-detected HI 21 cm absorbing systems.
