

Putting the neutral hydrogen in and around early type galaxies in a cosmological context (also part of the Ubbo Emmius scholarship from the Groningen University)

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The project aims to investigate what the observed variety of HI structures tells us about the various evolution paths of early-type galaxies. This is done by parametrising the HI properties, as observed for the ATLAS3D sample, and comparing these results with a large set of numerical simulations of the evolution of early-type galaxies.

Circumnuclear disks and HI in low luminosity radio galaxies

This project aims at investigating the characteristics of the gas in the central regions of radio galaxies (mainly using 21cm-HI observations) in connection with understanding the nature of the accretion process and therefore explain the difference between e.g. low and high luminosity radio galaxies.

HI absorption in radio galaxies selected from the SDSS

AGN activity is thought to be merging/accretion related. However, there are indications that the picture is more complicated. We propose to investigate this issue using HI observations of a sample of sources selected from the Sloan Digital Sky Survey. The proposed study aims to investigate, for the first time, whether FR type2 (i.e. edge-brightened) radio galaxies contain large amount of HI, and compare them with the content in compact radio sources, that so far have represented the most HI-rich radio sources. Observations for 10 objects are already available.

Short projects

1. Study of the HI in two compact steep spectrum radio sources using the wide band of the WSRT: 4C31.04 (or B2 0116+31). This project can be considered as a follow up of the work presented in Morganti et al. 2005 (A&A 444, L9 and other papers we have published on the same topic). In this source, HI absorption was detected already by Mirabel 1990 (ApJ 352, L37) and Conway (1996). We have observed it with the WSRT to see whether any broader component of the HI is visible. The source is nearby enough that we should also look for HI emission. Interesting CO observations exists and can be compared with neutral hydrogen.
2. Serendipitous HI in deep fields like Lockman Hole and or Spitzer First Look (full field). We have observed a number of deep fields in continuum with the WSRT . However the observations are always done in spectral line mode so we can also look for "serendipitous" HI (in emission or absorption) in the range of velocity covered by the frequency of the observations. This was already done for the very central region of the First Look Field (see Morganti et al. 2004, A&A424, 371) . We found 4 detections and it would be interesting to expand this to a larger region. The First Look mosaic is also available if we want to think of any other project that can make use of this image. Software knowledge would be useful, we may need some to write some script to search the cube for possible detections.
3. Look for HI emission around nearby FR II radio galaxies. We have WSRT data that we have used to look for broad HI absorption in nearby powerful radio galaxies (Morganti et al. 2005, Morganti et al. 2003 ApJ 593, L69) but the same data can be used to look to investigate whether HI in emission is also present around these galaxies (or put an upper limit to it). In particular we could have a look at the data of 3C305 (see also Morganti et al. 2005, A&A 439, 521 to read more about this radio galaxy)