A Neutral Hydrogen Survey of the NGC 7332 Region with the Arecibo L-band Feed Array

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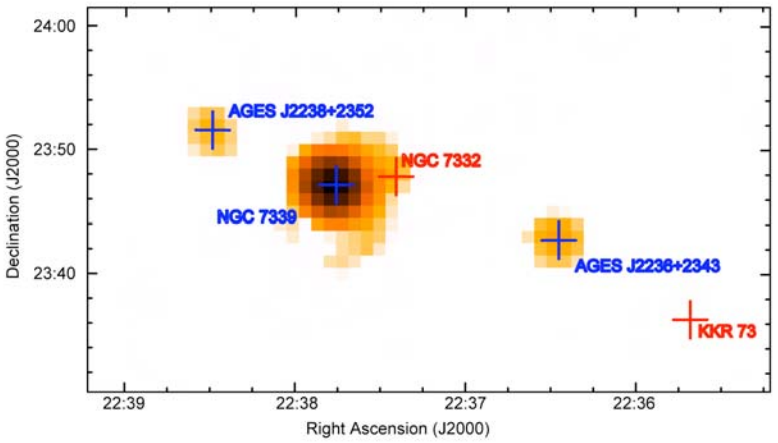
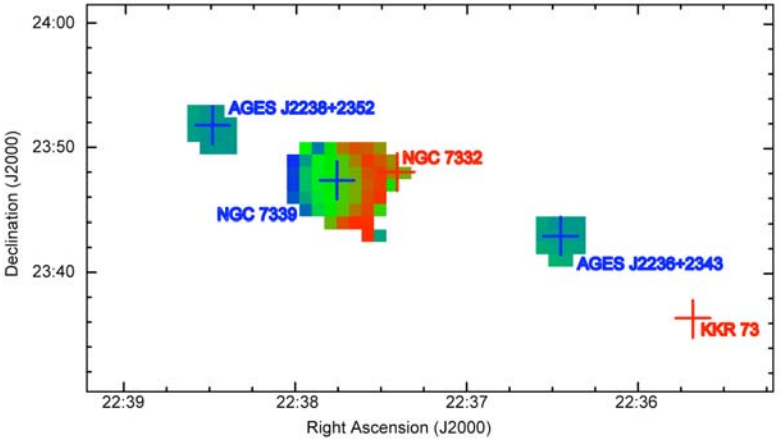
The NGC 7332/9 galaxy pair and the nearby dwarf KKR 73 are now revealed as part of a group of at least five galaxies: NGC 7332, NGC 7339, KKR 73, AGES J2238+2352 and AGES J2236+2344.

The zeroth moment map (right) shows the neutral hydrogen in the region: NGC 7339 and the two new AGES sources are detected.

NGC 7339 appears to show a disturbed HI morphology, with an excess of gas near the position of NGC 7332 and a possible tail to the south. This is probably due to an interaction between the two galaxies.

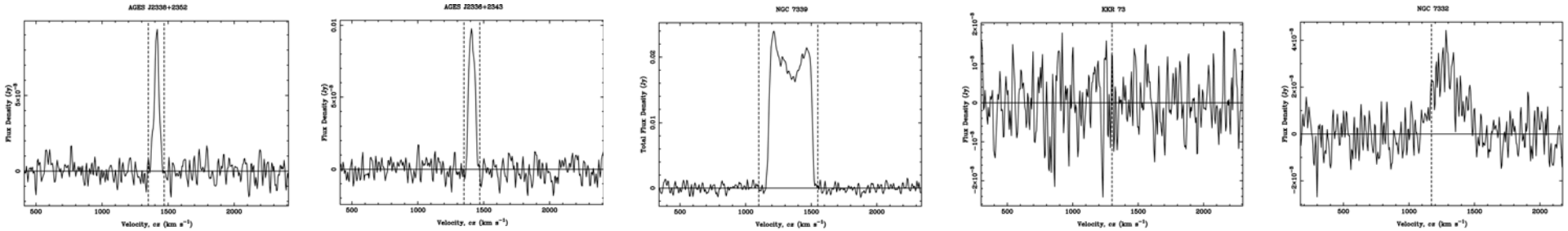




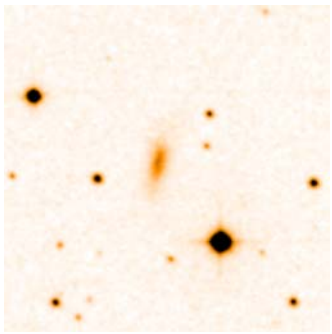
The first moment map (left) shows the systemic velocity of the hydrogen in the group. It can be seen that the disturbed morphology of NGC 7339 is reflected in the disturbed velocity field of this region.

Source	Flux (Jy km/s)	Vel (km/s)
KKR 73	Not Detected	1300[1]
J2236+2343	0.54 ± 0.03	1411
NGC 7332	Not Detected	1172[2]
NGC 7339	13 ± 1	1340
J2238+2352	0.42 ± 0.03	1411

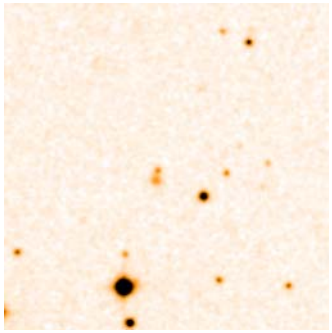
[1] Karachentseva V. E., Karachentsev I. D., Richter G. M., 1999, A&AS, 135, 221
[2] Simien F., Prugniel, P. 1997, A&AS, 126, 519



AGES spectra of the five galaxies in the NGC 7332 group. Three are detected, including two new sources. The dwarf spheroidal galaxy KKR 73 is not detected and the gas at the position of the S0 galaxy NGC 7332 appears to be associated with NGC 7339



AGES J2238+2352



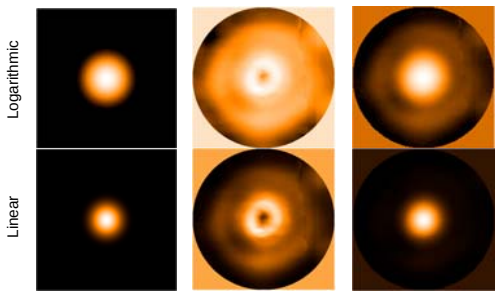
AGES J2236+2343

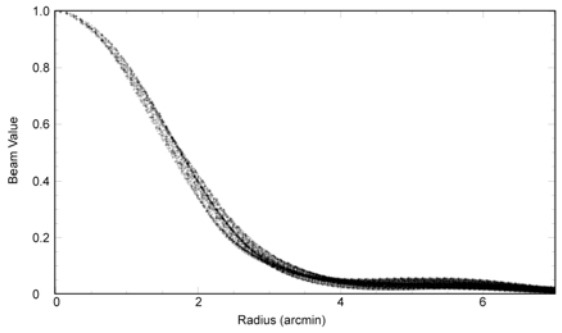
Optical (blue DSS II) images of the two new galaxies. Both images are 3 arcminutes square

Summary

The NGC 7332 group is at a distance of 23 Mpc (Tonry et al., 2001, ApJ, 596, 881) and is dominated by the pair of NGC 7332 and NGC 7339 (M_{HI} = 1.6×10^9 $M_\odot$). It also contains at least three smaller galaxies, one gas-poor spheroidal and two newly-discovered gas-rich galaxies: AGES J2236+2343 (M_{HI} = 6.7×10^7 $M_\odot$) and AGES J2238+2352 (M_{HI} = 5.2×10^7 $M_\odot$). Both have optical counterparts on the DSS.

Analysis of the AGES beam shape





The AGES gridded beam shape was investigated using the DAOPHOT routine PSF within IRAF. This made a model beam using the ten brightest sources on the continuum map of the NGC 7332 region. The gridded beam was found to be within 2% of being round and to have a FWHM of 3.4 arcminutes. The sidelobes are found at a radius of around 5-5.5 arcminutes and have a level of 2 - 6 per cent (12 - 17 dB). The images (left) show both linear and logarithmic views of the best-fit Gaussian from PSF, the Residual of this model, and the combined Beam Map (model + residual). The radial profile (right) shows the beam power vs radius for the combined map.