Preparing old and recent radio source lists for the VO age: Current Status
Heinz Andernach, AIfA Bonn, Germany/ DA-UGTO Mexico

- PRA2009 is about future, but ... we are neglecting the PAST!
- Radio Astronomy: digital from the outset, but behind in safeguarding
- Since ~1990: NED/Simbad/ADS provide our bibliography but DATA ?
- Since 1989 I collected/restored radio source lists from ~1400 papers
  - only 45% of these are in either VizieR or CATS catalog browsers
  - for 35% of them NED does not even know the refcode

Electronic Journal Age since ~1998:
- only 50 - 80% of source tables (depending on journal) flow to CDS
- some e-journals make access to data tables difficult (pdf, ps, etc.)

⇒ Hum. resources at data centers cannot cope with CURRENT data flow
- recovered tables require metadata to qualify for catalog browsers
- many more radio images should populate NED/Simbad
  (anyone wants to help?)
Low column density gas in the halo of the MW

N. Ben Bekhti

Sight lines observed with UVES and Effelsberg. There are observed absorption and corresponding emission lines

Sight lines observed with UVES and Effelsberg. There are only absorption lines in the UVES data

Sight lines observed with UVES, Effelsberg and the VLA or WSRT

Sight lines with absorption lines observed with UVES. No Effelsberg observations are available

Sight lines observed with UVES with no absorption lines.

"Panoramic Radio Astronomy"
Detection of Submillimetre Galaxies in the Lockman Hole using the EVN

Andy Biggs (ESO), Josh Younger (CfA) & Rob Ivison (UK ATC)

2 x 12 h EVN observations at 18 cm in June 08 (rms = 10 μJy/beam)
2 out of 3 SMGs detected
Ongoing project to directly measure AGN fraction in radio-detected SMGs

315 ± 11 μJy
$T_b > 7.5 \times 10^5$ K

104 ± 15 μJy
$T_b > 2.3 \times 10^5$ K
Deep wide field HI imaging of Messier 31

Laurent Chemin (Obs. Paris), C. Carignan (U. Montréal), T. Foster (Brandon U.)

DRAO settings
5 pointings – Texp = 144 h
Resolutions: 280 pc, 5 km/s
Depth: $\sim 1.5 \times 10^{19}$ cm$^{-2}$
Deep, wide-field global VLBI observations of the HDF-N and HFF

Seungyoup Chi
Michael A. Garrett
Peter D. Barthel

Extremely red, dust-obscured AGN population !!!
Properties and short-time evolution of nearby galaxies

- Results of two Q-range VLBA experiments (BW090, BG170) are presented
- Galaxies 3C274 (z=0.004) and NGC315 (z=0.017) were observed correspondingly
- 3C279, and J0136+4751 were used for atmosphere delay calibration necessary for Q-range
- Short-time changes were not revealed for NGC315
- Changes of structure of 3C274 at 0.1 parsec scale in 2008 March – April are demonstrated
- Data processing is still not finished and will be continued
Westerbork ULTRA-DEEP HI imaging of galaxy clusters at z=0.2

B. Deshev1, M. Verheijen1, J. van Gorkom1, A. Szomoru1, K. Dwarkanath1, B. Poggianti2, D. Schiminovich3, A. Chung4, M. Yun5, G. Morrison6

1 Kavli Institute for Astronomy and Astrophysics; 2 Dept. of Astronomy, Columbia University; 3 Joint institute for VLBI in Europe, Dwingeloo; 4 Raman Research Institute, Sadashivanagar; 5 INAF Padova Astronomical Observatory; 6 University of Massachusetts; 7 University of Hawaii

Abstract: We report here on results from our completed ultra-deep blind HI survey of two galaxy clusters at a redshift z=0.2, performed with the Westerbork Synthesis Radio Telescope. The field of the X-ray bright, massive Butcher-Oemler cluster Abell 963 was observed with a total of 170x12hrs integration time. Additionally, Abell 2192 was observed as an example of a more diffuse cluster with a total of 75x12hrs integration time. In both fields, sampling a total volume of 7x10^6 Mpc^3, the expected noise levels were achieved. These HI measurements are part of a multi-wavelength survey including Spitzer, GALEX, optical data and restframe 1.4 GHz radio-continuum. We find in total 99 detections with optical counterparts in our optical data. The space and velocity distribution of the HI detections in both clusters is presented.

Motivation

The morphological mix of galaxies in the Universe is known to depend strongly on environment. Dense environments are dominated by early-type galaxies, while spiral galaxies form the majority of the field population. This dependence evolves over cosmological time scales. Since redshift 0.5 the fraction of spirals in clusters has dropped significantly, while a bulk of 50 galaxies has appeared. This raises the question whether it is the field population that evolves with redshift, and hence changes the morphological mix in clusters as it is being accreted, or whether it is the cluster environment that forces morphological transitions during the accretion process. The HI content of galaxies plays an important role in their morphological transformations as it represents the reservoir of fuel for star formation and is easily affected by tidal interactions and ram-pressure stripping. Until recently, the limited sensitivity and bandwidth of synthesis imaging radio telescopes prohibited the observation of HI emission at intermediate redshifts. However, the new receiver system on the Westerbork Synthesis Radio Telescope has made such an observation practically possible for the first time and allows us to study the HI content of galaxies in and around the nearest Butcher-Oemler clusters at z=0.2.

Targets

Abell 963 is a massive and unusually relaxed (less than 5% substructure), X-ray detected, lensing cluster with a velocity dispersion of 1370 km/s. Abell 2192, at z=0.188, has a velocity dispersion of 650 km/s. So far it hasn’t been detected in X-rays and the fraction of blue galaxies has not been determined. By observing these very different clusters and the large scale structure in which they are embedded, a variety of environments can be blindly and uniformly surveyed, ranging from voids to cluster cores (Figure 1).

Observations

With a continuous frequency coverage between 1160 and 1220 MHz, the observed velocity range is 49,246 - 57,300 km/s, corresponding to a depth of 326 Mpc (Figure 1). At 1190 MHz the FWMQ of the WSRT primary beam is 11.6 Mpc at the distance of these clusters. The total surveyed volume with a single pointing is 35x10^6 Mpc^3, which is equivalent to the volume of the entire Local Universe out to a distance of 25 Mpc.

Results

The results showed in the plots are based on 75% of the total bandwidth of the survey in its high redshift part. The spacial resolution of the survey at 1190MHz is 54x86 kpc and the velocity resolution is 10 km/s, which we smooth further down to 44 km/s. Careful visual inspection of the data cubes revealed in total 157 tentative detections were found in both fields. 101 in the field of Abell 963 and 56 in the field of Abell 2192. Based on a optical images collected with INT (La Palma) we found optical counterparts for 99 of those detections. The redshift and space distributions of those detections are shown in figures 2 and 3. The tendency of gas rich galaxies to avoid the central parts of the clusters is clearly seen in the case of Abell 963.
Kevin's Poster

- Observer: $T_b(\alpha, \delta, v_r)$
- Models: $\rho_H(x, y, z)$
A panoramic view of the Milky Way HI gas

Peter M.W. Kalberla, Argelander-Institut für Astronomie

- ISM studies need HI data with high spatial resolution and good sensitivity
  - Only Milky Way surveys can currently satisfy the requirements

- Major advances only possible by combining single dish surveys with large telescopes (Parkes, Effelsberg) and wide field interferometers (ASKAP)

- The Galactic All Sky Survey (GASS) is presented
  - See poster 10 and the GASS movie
HIZOA J0836-43, one of the most massive spiral galaxies (Donley et al. 2006), relatively nearby

- $M_{HI} = 7.5 \times 10^{10} \, M_\odot$
- $V_{hel} = 10,689 \, km \, s^{-1}$
- $D_{HI} = 130 \, kpc$
- with a dominant bulge

NOT a giant low surface brightness galaxy

These galaxies are very scarce --> ill-constrained high end of HIMF, little known

→ A detailed investigation will provide valuable local probe to be put into context with the forthcoming numerous higher redshift ones the forthcoming SKA pathfinder surveys will find

Questions to answer
-- What is happening in this unusual galaxy?
  AGN/starburst?
-- What is its environment? Will it provide clues about its origin/formation?
  merger/accretion?

Problem: the Zone of Avoidance
Galaxy lies at low Galactic latitude $(l,b) = (262.48,-1.64)$, is optically invisible due to $A_V = 7.5 \, mag$ of dust extinction!

NIR & MIR observations of HIZOA J0836-43

Spitzer observations
- Imaging (IRAC & MIPS) of ~ 28’x28’ area
- IRS (low & high) of nucleus and disk

Infrared Survey JHK
- imaging of 2.24 sq° (IRSF Sutherland)

Results:
!! See poster !!
ATLAS Release 1
Now in NED!
With ~2000 Sources
7 sq. degrees
With 30 µJy Sensitivity

ATLAS Release 2
New Improved Imaging
VO-interface
Avail. End of Year

ATLAS Release 3
With ~10000 Sources
Cross-ID Pipeline
10 µJy Sensitivity

EMU-Wide
10 µJy Sensitivity
δ < +20°
With ~7×10^7 Sources
Using ASKAP

EMU-Deep
With ~5×10^5 Sources
With 30 µJy Sensitivity
~30 sq. degrees

For more information contact Emil Lenc (ATLAS Team)
Email: Emil.Lenc@csiro.au

Tuesday, 2 June 2009
Expected Evolution in the FIR-radio Correlation:
Probing the Origin and Strength of high-z B-fields
Eric Murphy (Caltech)

![Graph showing the relationship between galaxy B-fields and IR/radio ratios.]

**High IR/radio**
- B = 10 μG

**Low IR/radio**

- Thermal limit:
  - At high-z, IC losses off CMB will suppress a galaxy’s non-thermal (sync.) emission.
- Assumed:
  - \( f^{Th} \sim 0.1 \)
  - \( q_{IR} \sim 2.64 \)
  - \( U_B \sim U_{\text{rad}} \)

- Strong evolution should be observed
  - *So far not seen*

> Deviations in IR/radio ratios with increasing z should help constrain the presence & strength of B-fields in the early Universe.
SFR and dust attenuation at \( z \sim 2 \): galaxies at the dawn of downsizing

M. Pannella (NRAO)


The VLA-COSMOS 1.4Ghz Large Field and the sBzK galaxy sample

The stacking analysis

Probing downsizing with radio SSFR

A model independent dust attenuation law
The Ophiuchus Superbubble: Disk-Halo Interaction at Work
Y. Pidopryhora (JIVE); F. J. Lockman (NRAO), M. P. Rupen (NRAO); J. C. Shields (Ohio Univ.)

- More than 250,000 H I spectra measured with the GBT, more than 450 sq. deg. of the Galactic halo covered
- Hα data from the WHAM survey
- Latest hi-res study with the VLA

REVEALING
- A close-up view of one of the largest superbubbles in our Galaxy
- Direct measurement of many of its properties
- Probing the conditions in the halo itself
- Possible origins of the Galactic halo H I cloud population
- Fascinating physics behind the scenes
MeerKAT Configuration Studies

Problem: an optimal array is only valid for one declination, one observing length, one resolution

• Single-resolution arrays
  - optimizing an array for one declination and observing time
  - evaluating the chosen array for other \((\delta, t)\) combinations: good!
  - evaluating the chosen array for other resolution regimes: not good...

• Multi-resolution arrays
  - hybrid array (two Gaussian arrays)
  - ‘pinched’ Gaussian array

• Final MeerKAT configuration