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.)

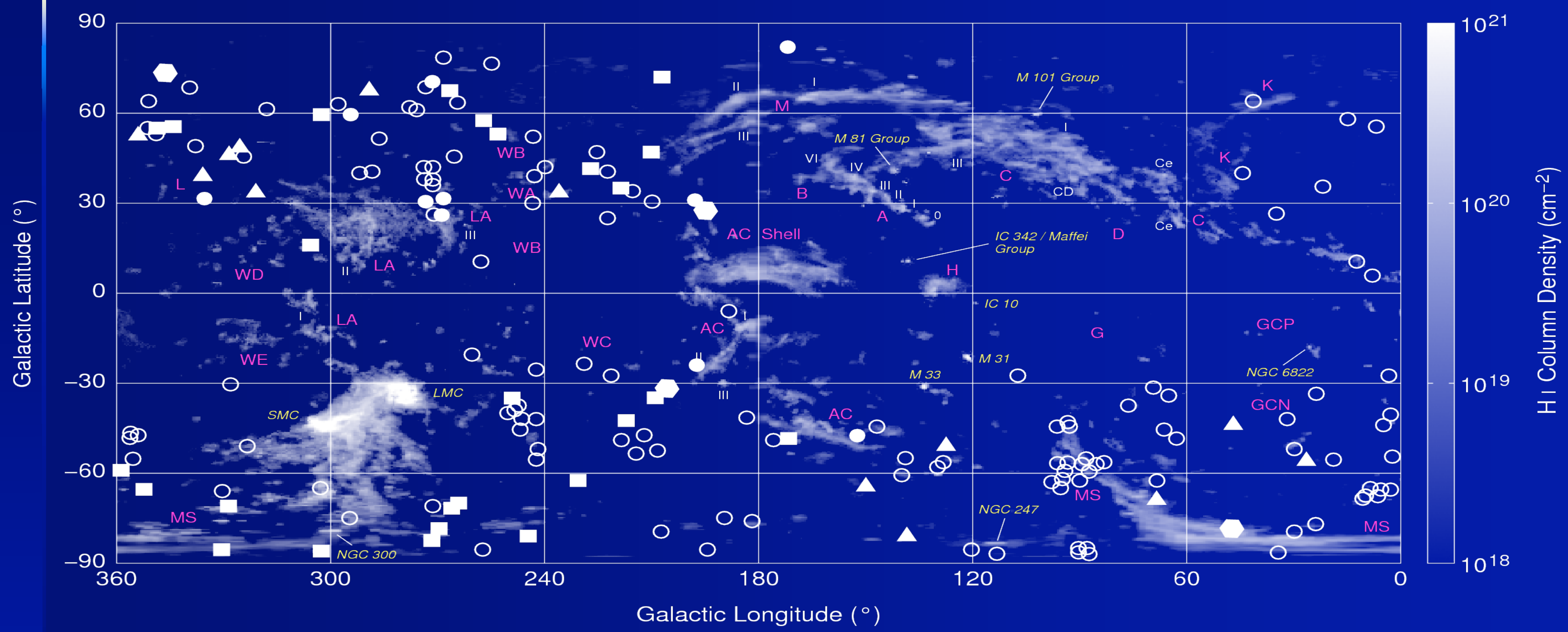
➔Hum. resources at data centers cannot cope with CURRENT data flow

- 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

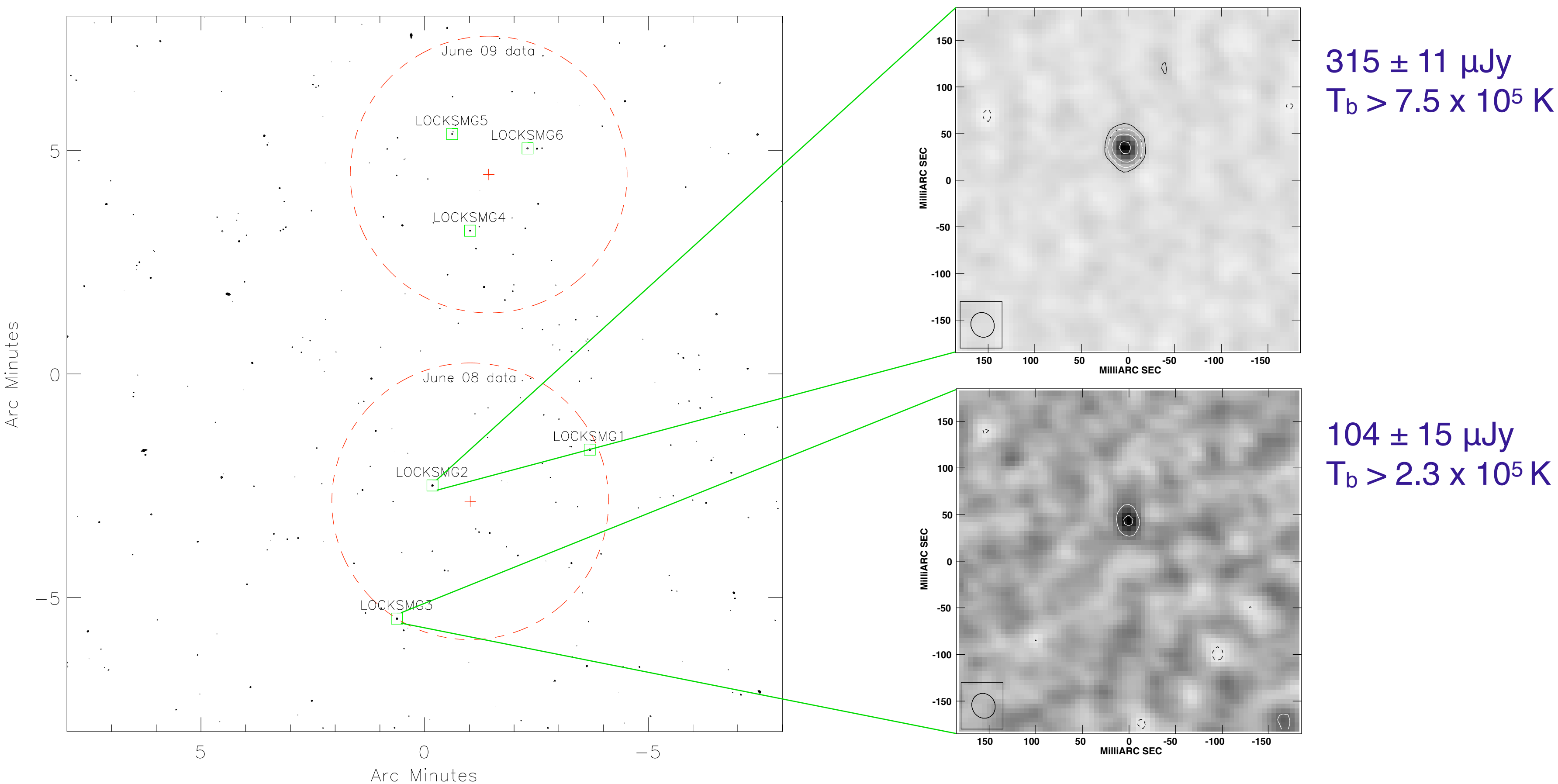
Argelander-
Institut
für
Astronomie



● 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 .

Detection of Submillimetre Galaxies in the Lockman Hole using the EVN

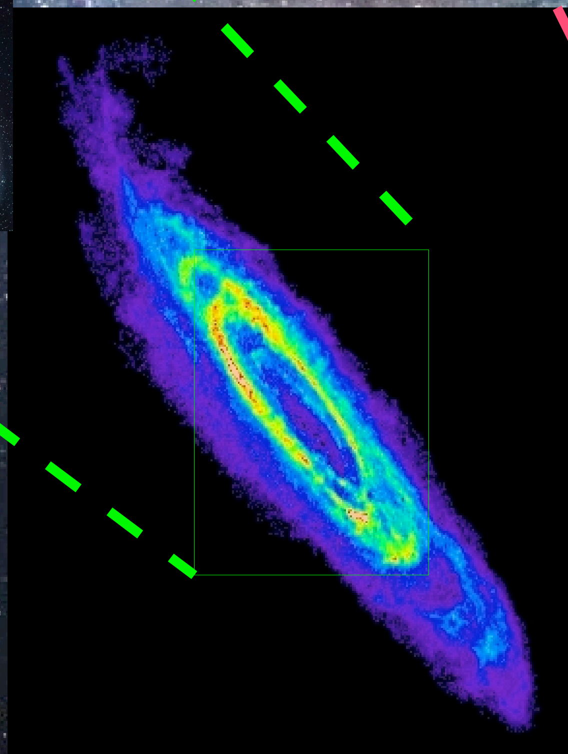
Andy Biggs (ESO), Josh Younger (CfA) & Rob Ivison (UK ATC)

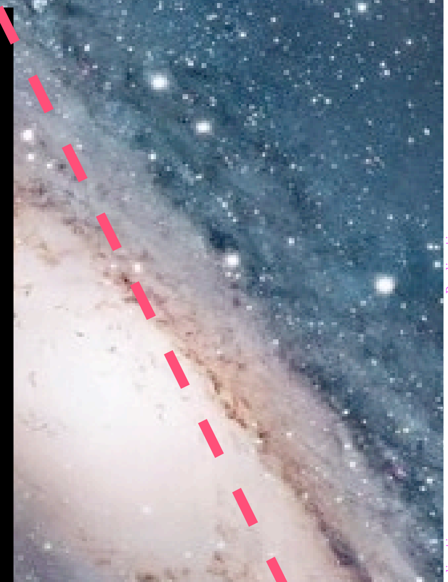


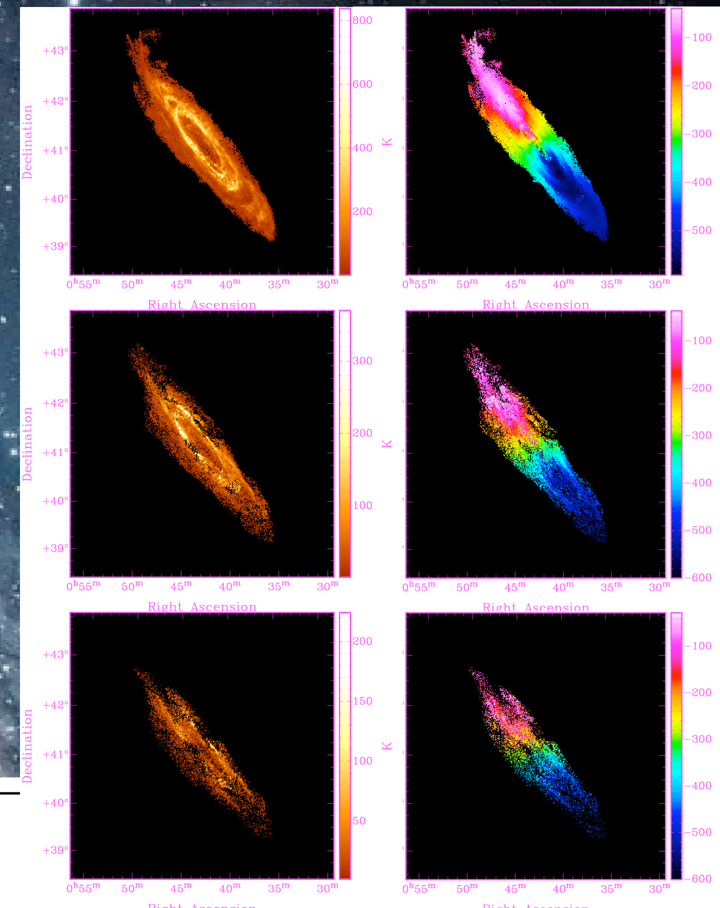
2 x 12 h EVN observations at 18 cm in June 08 (rms = 10 μJy/beam)
2 out of 3 SMGs detected
Ongoing project to directly measure AGN fraction in radio-detected SMGs

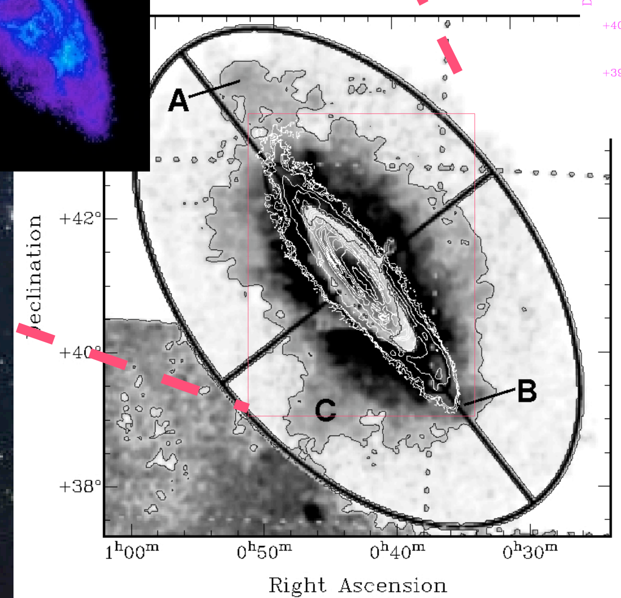
Deep wide field HI imaging of Messier 31

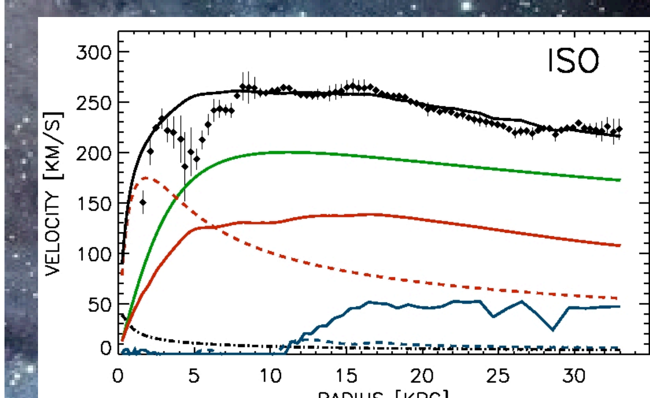
Laurent Chemin (Obs. Paris), C. Carignan (U. Montréal), T. Foster (Brandon U.)











DRAO settings

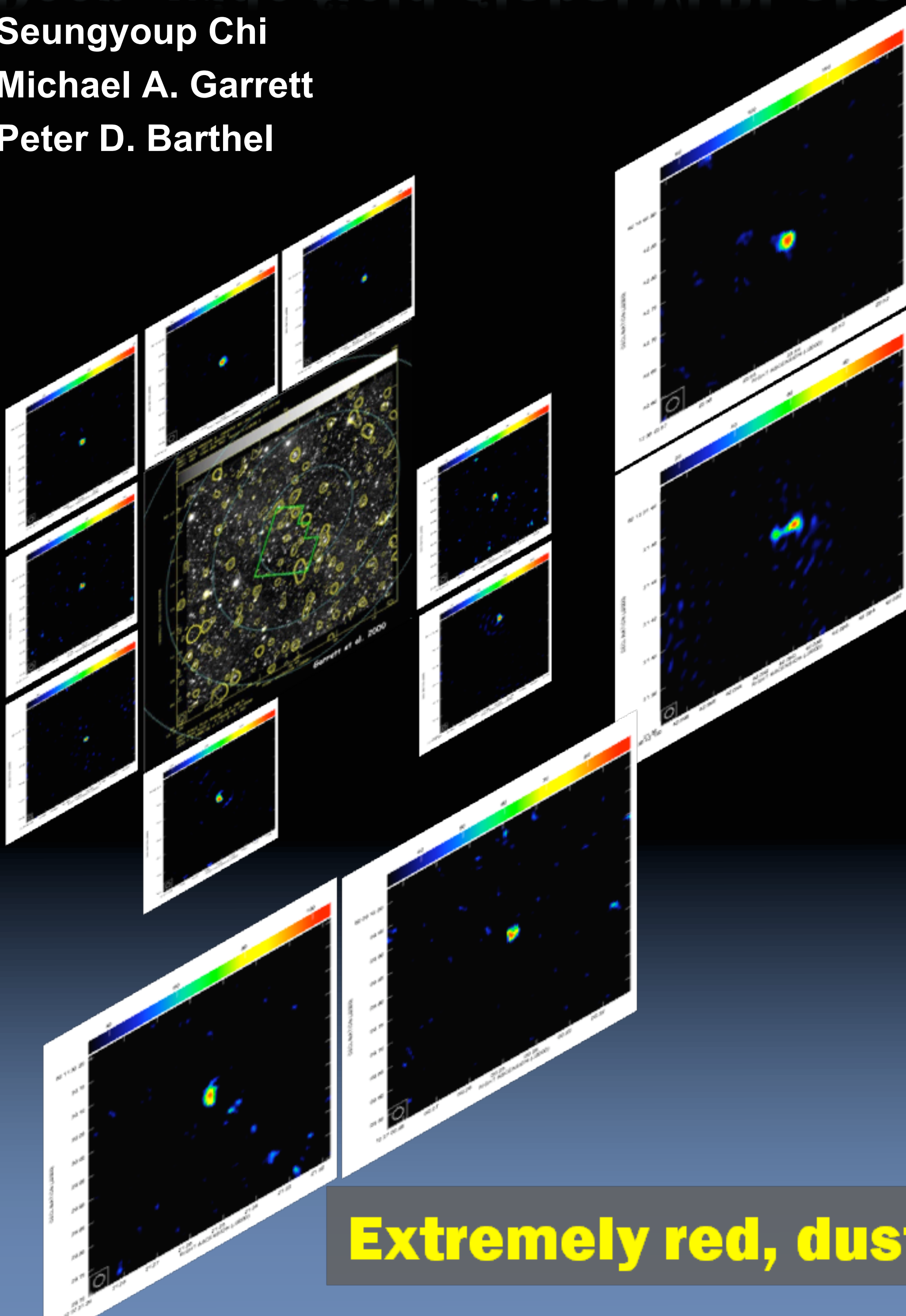
5 pointings – Texp = 144 h

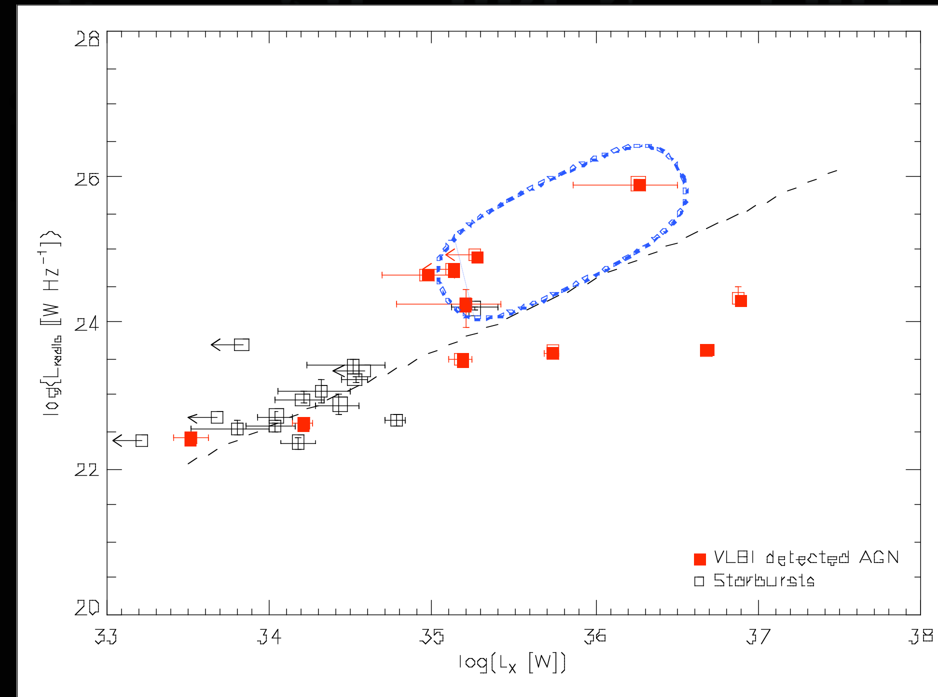
Resolutions : 280 pc, 5 km/s

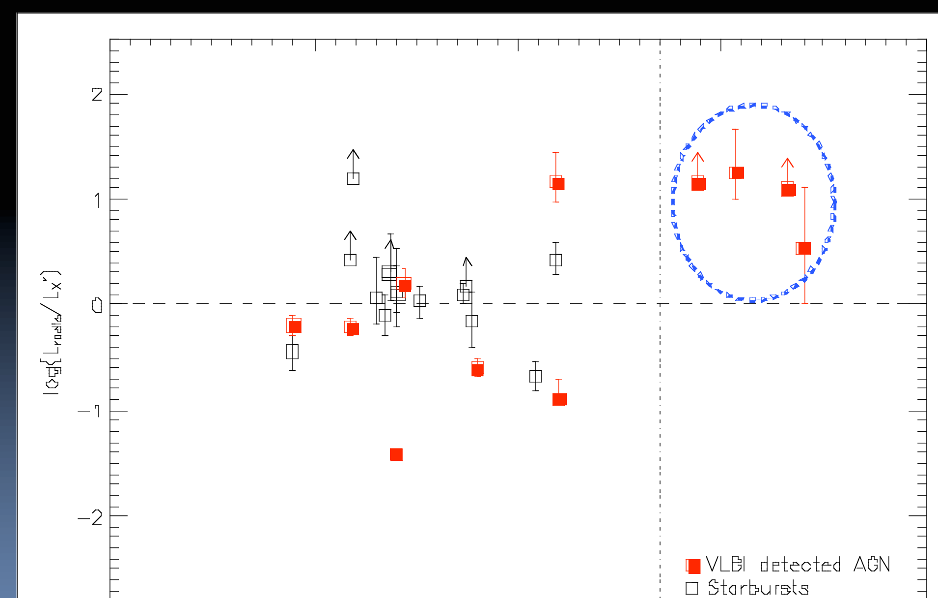
Depth: ~1.5×10^{19} cm^{-2}

Deep, wide-field global VLBI observations of the HDF-N and HFF

Seungyoup Chi
Michael A. Garrett
Peter D. Barthel





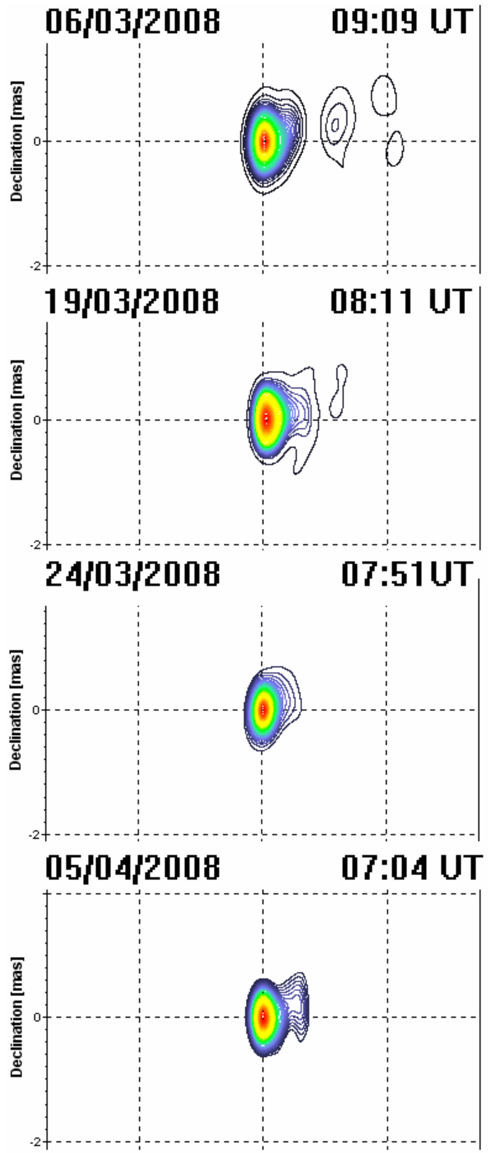


Extremely red, dust-obscured AGN population !!!

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.Deshev[1], M.Verheijen[1], J.van Gorkom[2], A.Szomoru[3], K.Dwarakanath[4], B.Poggianti[5], D.Schiminovich[2], A.Chung[2], M.Yun[6], G.Morrison[7]

1 Kapteyn Astronomical Institute; **2** Dept. of Astronomy, Columbia University; **3** joint institute for VLBI in Europe, Dwingeloo; **4** Raman Research Institute, Sadashivanagar; **5** INAF Padova AstronomicalObservatory; **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 117x12hrs integration time. Additionally, Abell 2192 was observed as an example of a more diffuse cluster with a total of 73x12hrs integration time. In both fields, sampling a total volume of $7x10^4$ Mpc^3, the expected noise levels were achieved. These HI measurements are part of a multi-wavelenght 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.

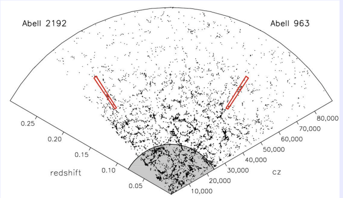


Fig.1 SDSS pie-diagram along the great circle passing through both clusters. Red boxes indicate the volumes surveyed in HI.

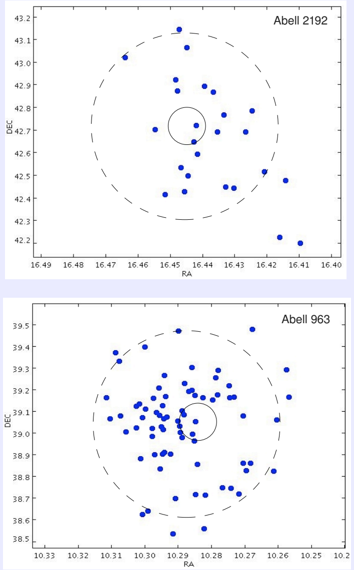


Fig.2 Sky distributions of the HI detections with optical counterparts in the field of A2192(top), and A963(bottom). The dashed line shows the FWQM of WSRT's primary beam. The solid line encircles 1Mpc around the cluster center.

Motivation

The morphological mix of galaxies in the Universe is known to dependent 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 S0 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.

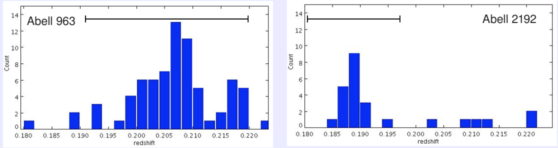


Fig.3 Redshift distribution of the 99 HI detections with optical counterparts in both clusters. The horizontal line shows the velocity range of the clusters.

Targets

Abell 963 is a massive and unusually relaxed (less than 5% substructure), X-ray detected, lensing cluster with a velocity dispersion of 1350 km/s. At z=0.206, it is one of the nearest Butcher-Oemler clusters with a blue fraction of 19%. 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 - 67,300 km/s, corresponding to a depth of 326 Mpc (Figure 1). At 1190 MHz the FWQM of the WSRT primary beam is 11.6 Mpc at the distance of these clusters. The total surveyed volume with a single pointing is $35x10^3$ Mpc^3, which is equivalent to the volume of the entire Local Universe out to a distance of 25 Mpc!

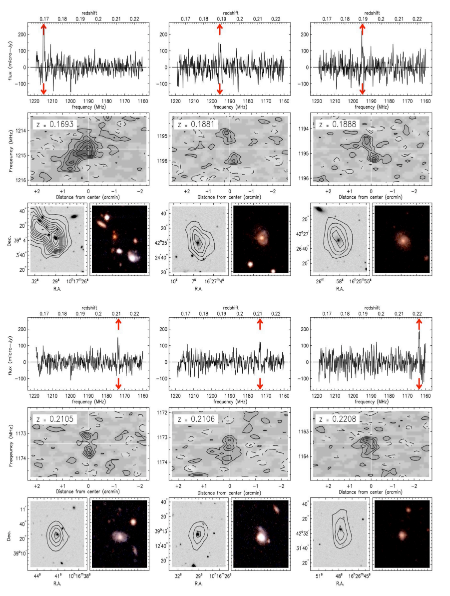


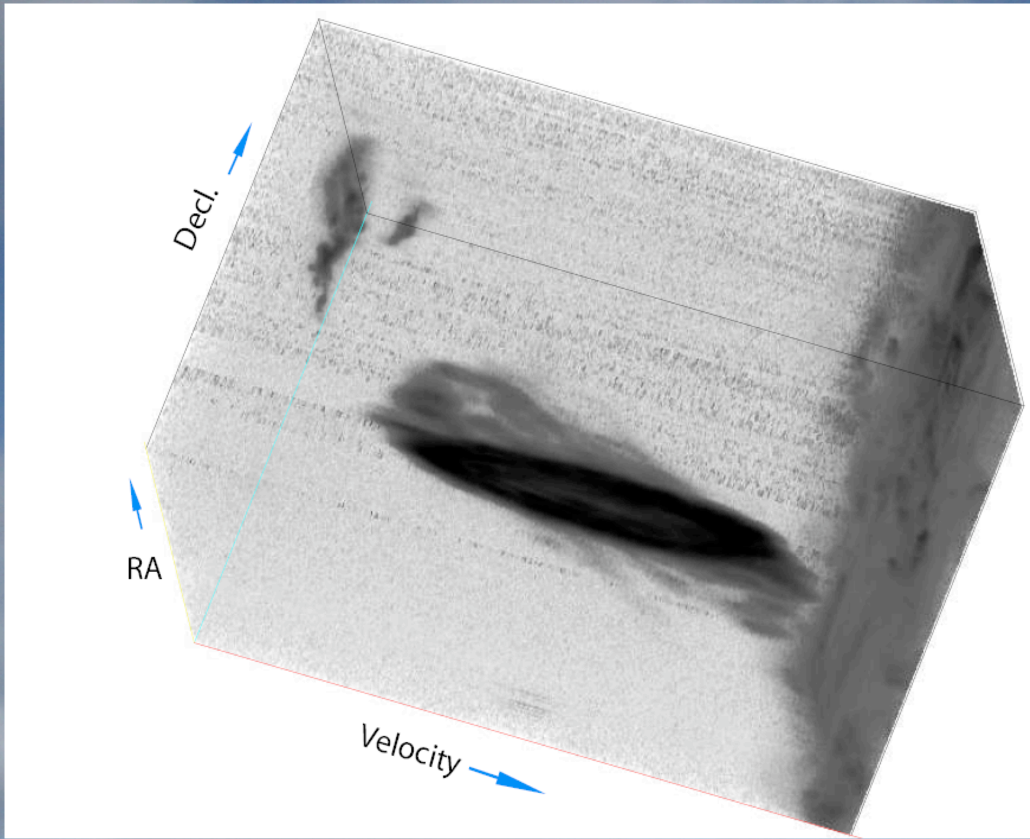
Fig.4 Examples of our HI detections. Top: HI spectrum over the full velocity range. Middle: position-velocity diagram extracted from HI datacube, taken along the major axis of the galaxy. Bottom left: integrated HI map in contours, overlayed on an R-band image in grayscales. Bottom right: blow-up of the optical image.

Results

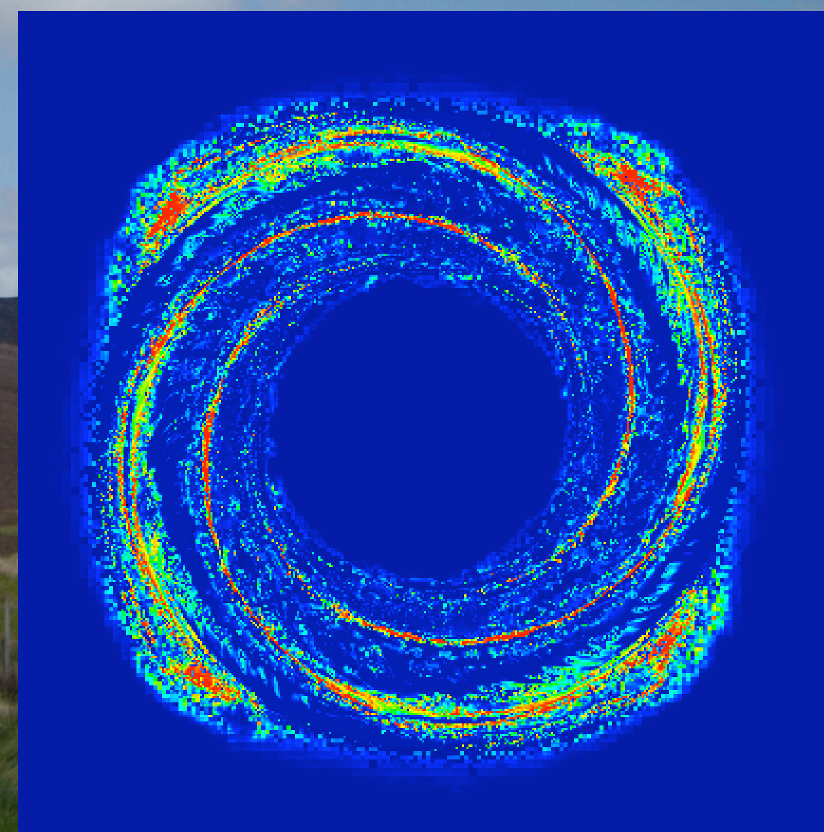
The results showed in the plots are based on 75% of the total bandwidth of the survey in its high redshift part. The spacial resolution of the survey at 1190MHz is 54x86 kpc and the velocity resolution is 10 km/s, which we smooth further down to 44 km/s. Careful visual inspection of the data cubes revealed In total 157 tentative detections were found in both fields. 101 in the field of A963 and 56 in the field of A2192. 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.

university of groningen
faculty of mathematics and natural sciences
kapteyn astronomical institute

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

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Properties of the extremely HI-massive galaxy HIZOA J0836-43

Renée C. Kraan-Korteweg[1], Michelle E. Cluver[2,1], Tom H. Jarrett[2], Patrick A. Woudt[1]
[1]Astronomy Department, University of Cape Town; [2]IPAC, California Institute of Technology

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

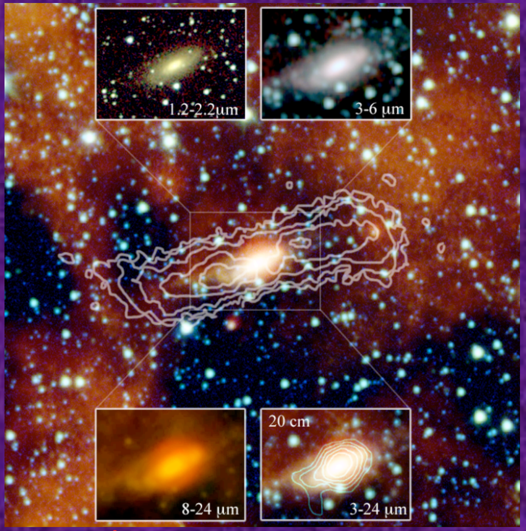
-- What is happening in this unusual galaxy?
AGN/starburst?

-- 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 = 7.5mag 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

20 cm

7 sq. degrees

With 30 μJy Sensitivity

ATLAS Release 2

New Improved Imaging

Avail. End of Year

VO-interface

ATLAS Release 3

With ~10000 Sources

10 μJy Sensitivity

Cross-ID Pipeline

EMU-Wide + EMU-Deep

10 μJy Sensitivity

$\delta < +20°$

With ~7x10^7 Sources

Using ASKAP

With ~5x10^5 Sources

~30 sq. degrees

1 μJy Sensitivity

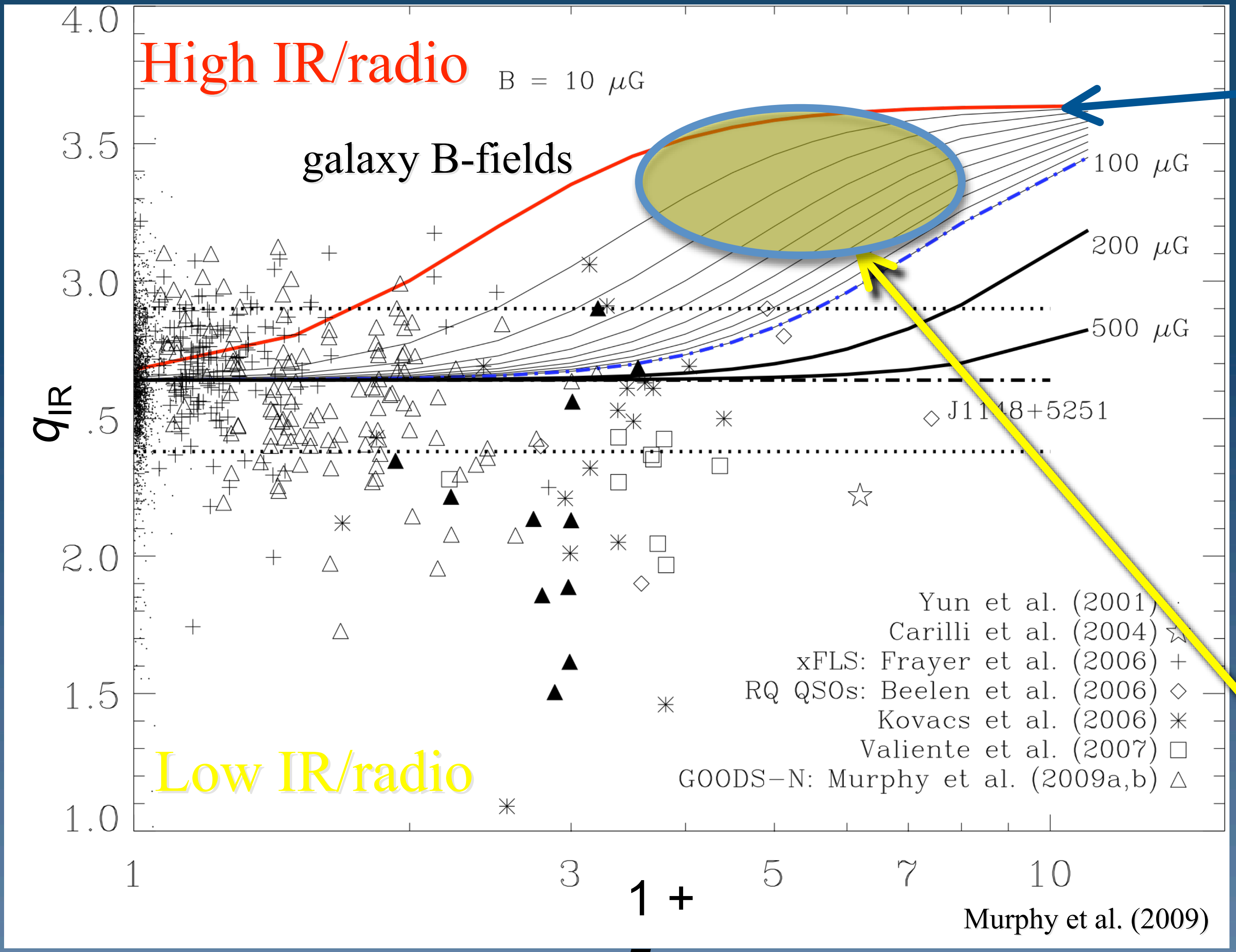
For more information contact Emil Lenc (ATLAS Team)

Email: Emil.Lenc@csiro.au

CSIRO

Expected Evolution in the FIR-radio Correlation:
Probing the Origin and Strength of high-*z* B-fields

Eric Murphy (Caltech)



Thermal limit:

- At high-*z*, IC losses off CMB will suppress a galaxy's non-thermal (sync.) emission.

Assumed:

$f^{\rm Th} \sim 0.1$

$q_{\rm IR} \sim 2.64$

$U_{\rm B} \sim U_{\rm rad}$

z > 2
Strong evolution should be observed
So far not seen

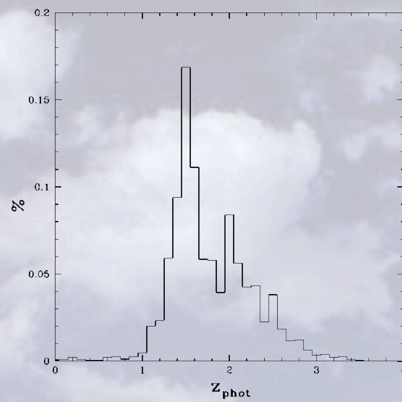
➢*Deviations in IR/radio ratios w/ increasing z should help constrain the presence & strength of B-fields in the early Universe.*

SFR and dust attenuation at z~2: galaxies at the dawn of downsizing

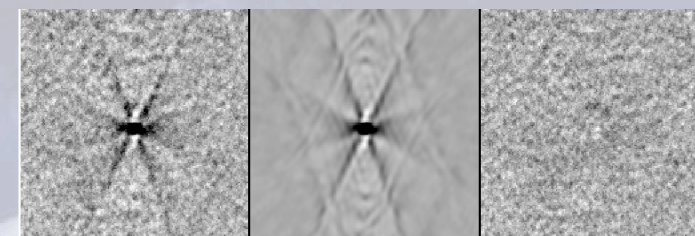
M. Pannella (NRAO)

astro-ph arXiv:0905.1674

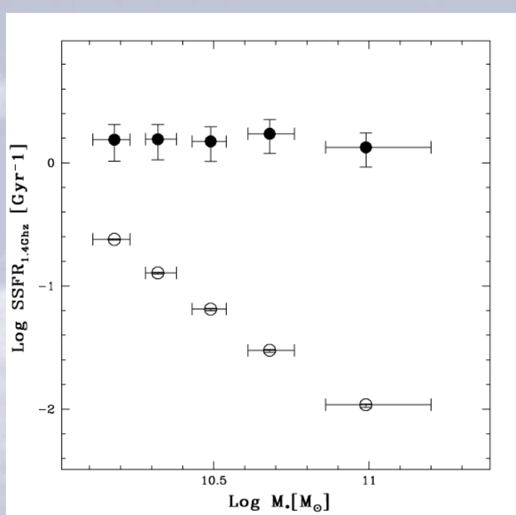
The VLA-COSMOS 1.4Ghz Large Field and the sBzK galaxy sample



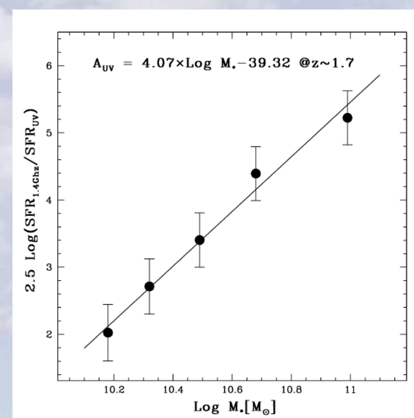
The stacking analysis

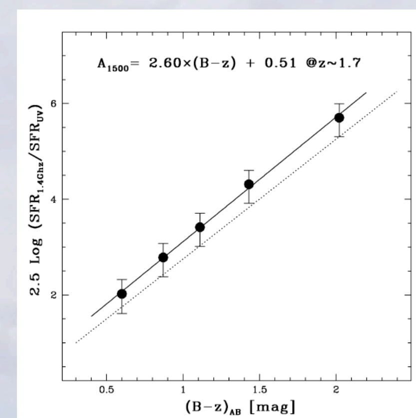


Probing downsizing with radio SSFR



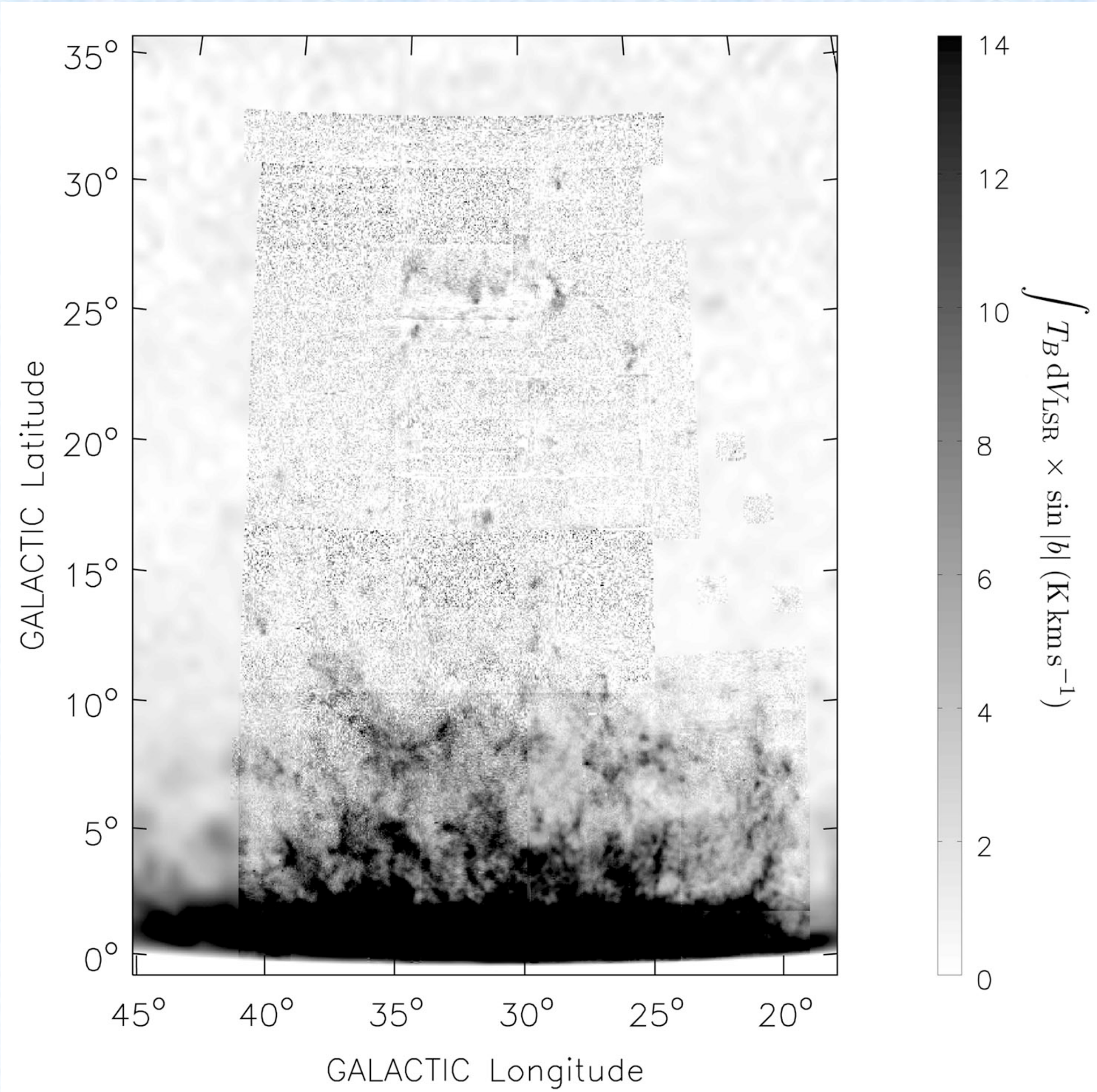
A model independent dust attenuation law





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 (δ,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