

**NIR galaxies
in the highly obscured region
around PKS1343-601**

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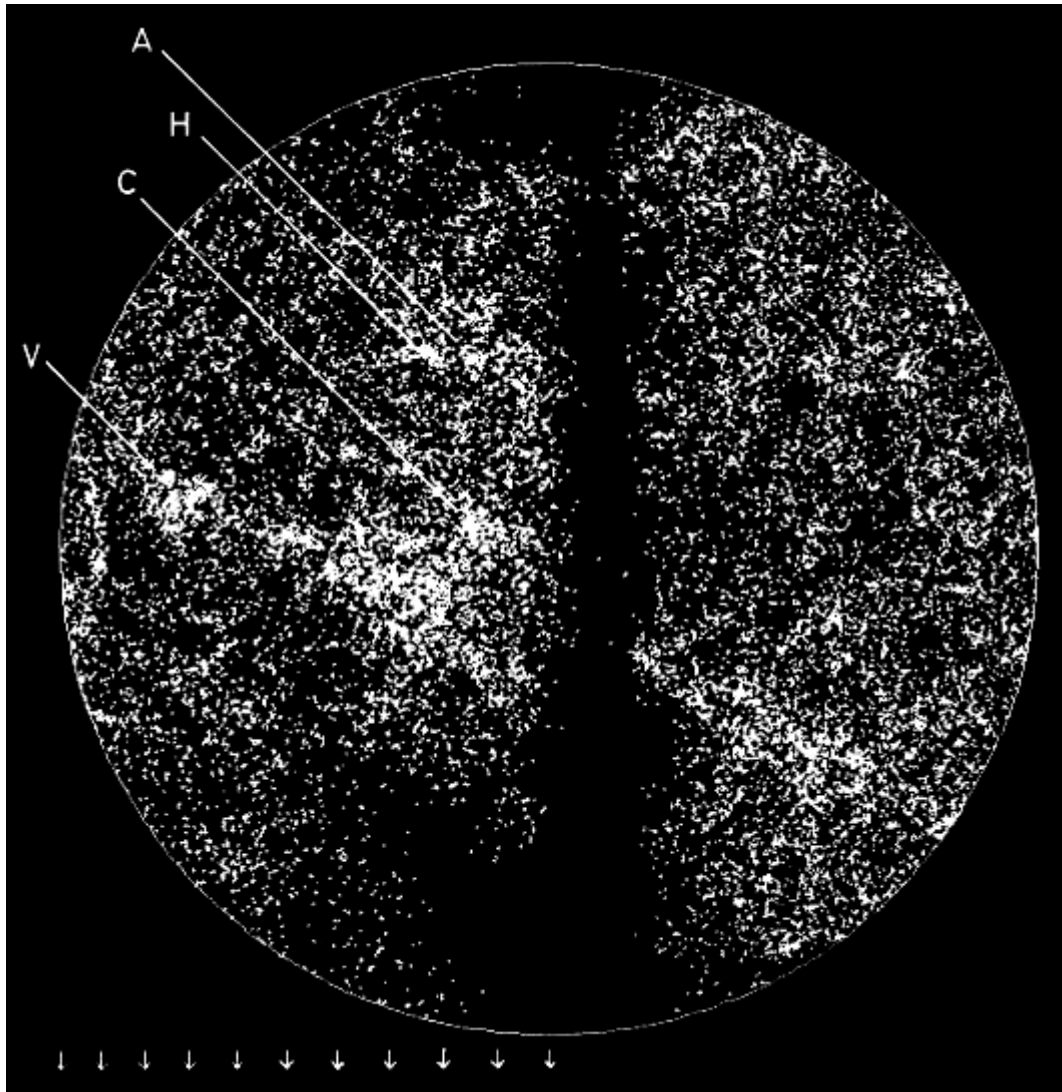
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Patrick Woudt, Univ of Cape Town, ZA

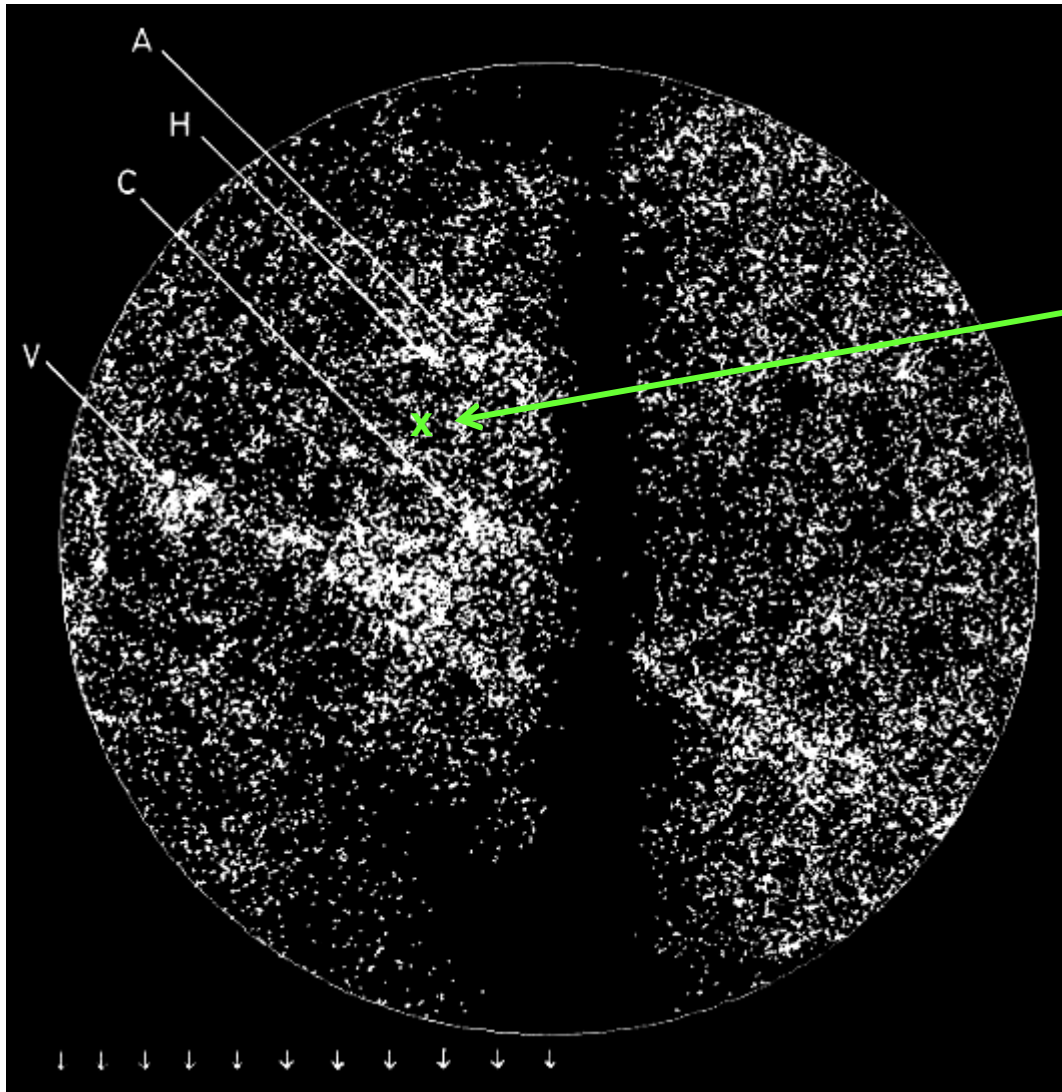
Outline

- Introduction: large scale structures behind the Galactic plane
- DENIS objects in the searched area
- NIR colours and extinctions
- Velocity distribution
- Outlook

The origin of the motion of the Local Group



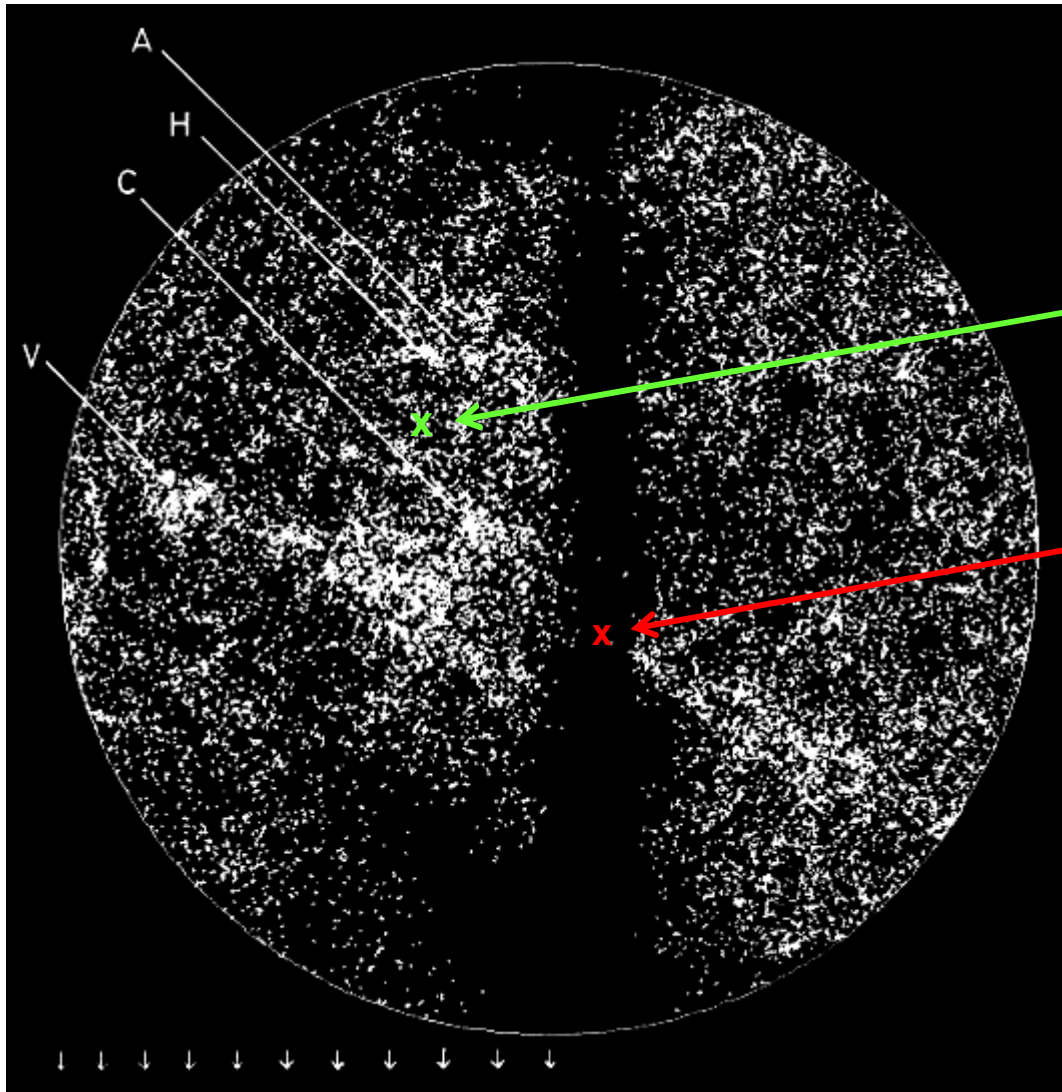
The origin of the motion of the Local Group



CMB:

$v_{LG} = \sim 600 \text{ km/s}$
 $l=268^\circ, b=27^\circ$

The origin of the motion of the Local Group



CMB:

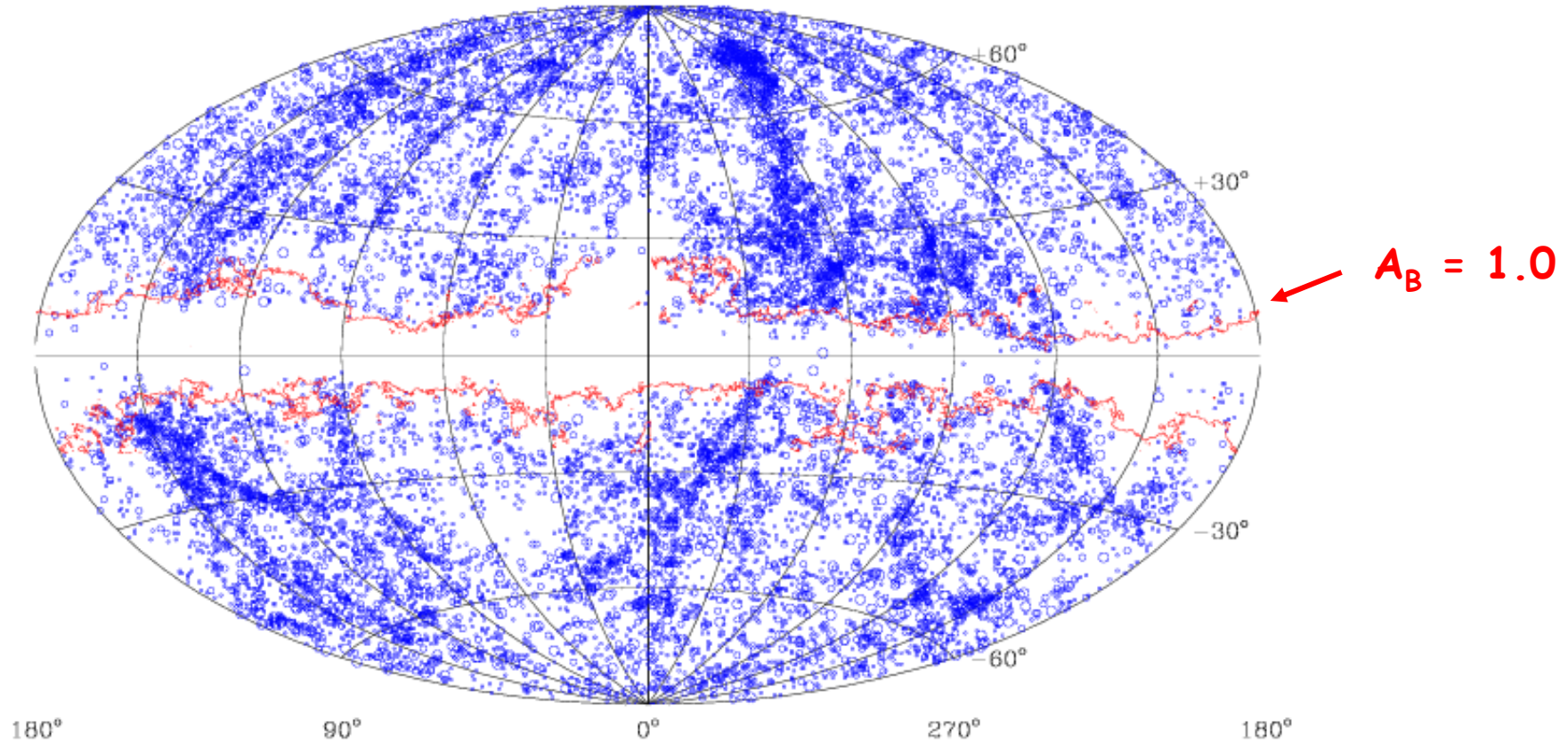
$v_{LG} = \sim 600 \text{ km/s}$
 $l=268^\circ, b=27^\circ$

Great Attractor:

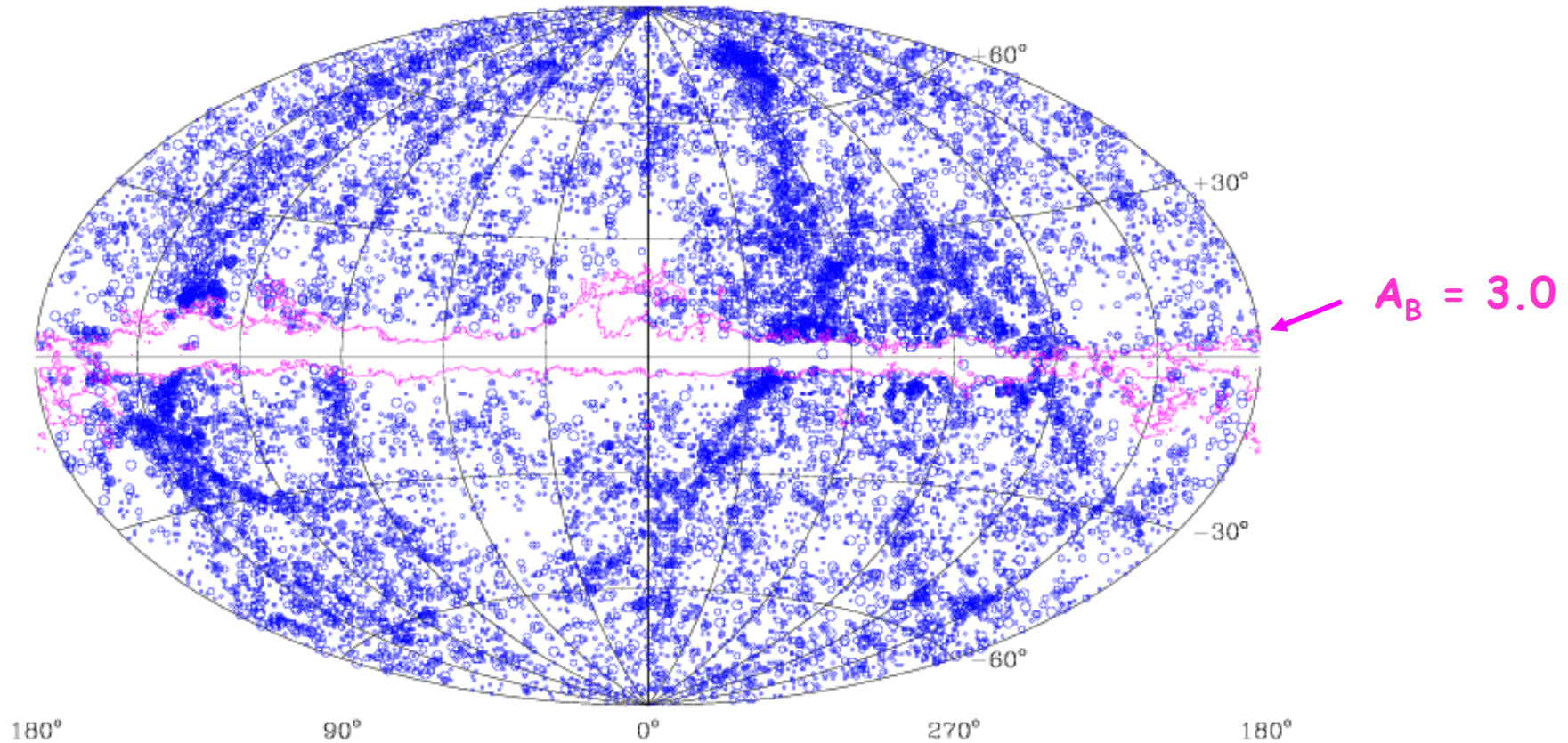
$v_{LG} = \sim 4000 \text{ km/s}$
 $l=320^\circ, b=0^\circ$

(Kolatt et al. 95)

The ZOA: ESO/UGC/MCG surveys



The ZOA: ... + deep optical searches

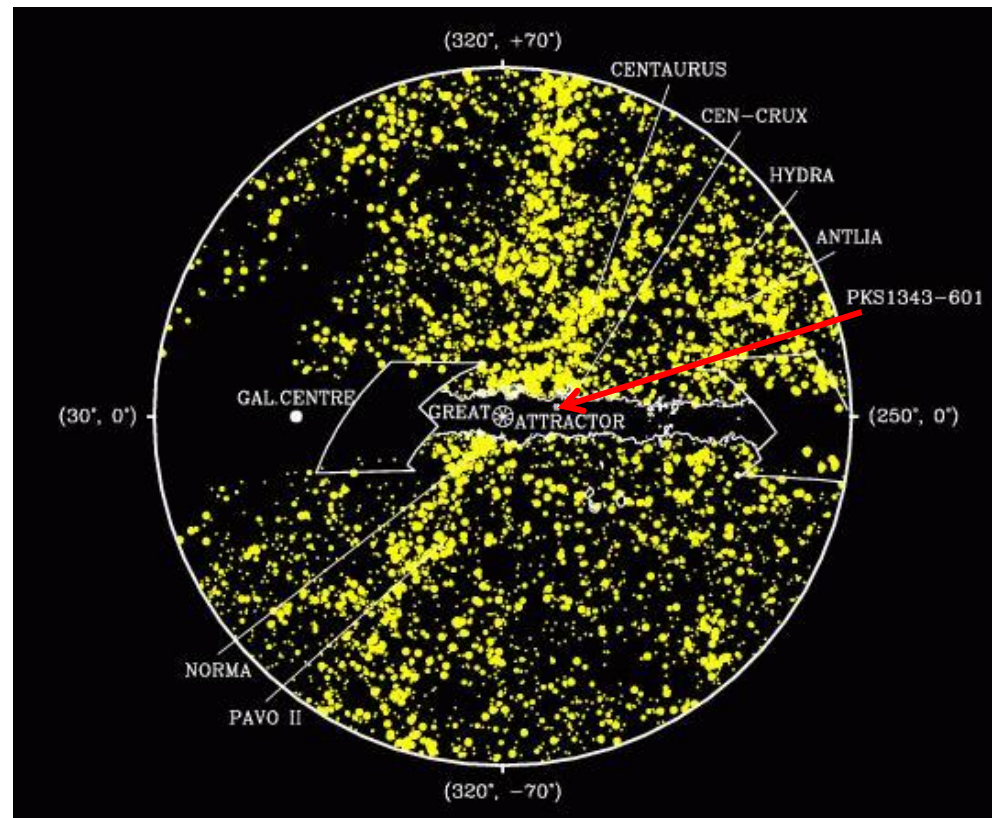


The ZOA in other wavelengths

- 21 cm HI surveys:
 - no extinction
 - HI rich galaxies
 - e.g. HIZOA
- Far IR:
 - no extinctions
 - spirals and star burst galaxies
 - IRAS
- Near IR:
 - little extinction
 - sensitive to ellipticals
 - DENIS, 2MASS
- X-ray:
 - no extinction at hard X-rays
 - galaxy clusters and AGNs
 - e.g. CIZA

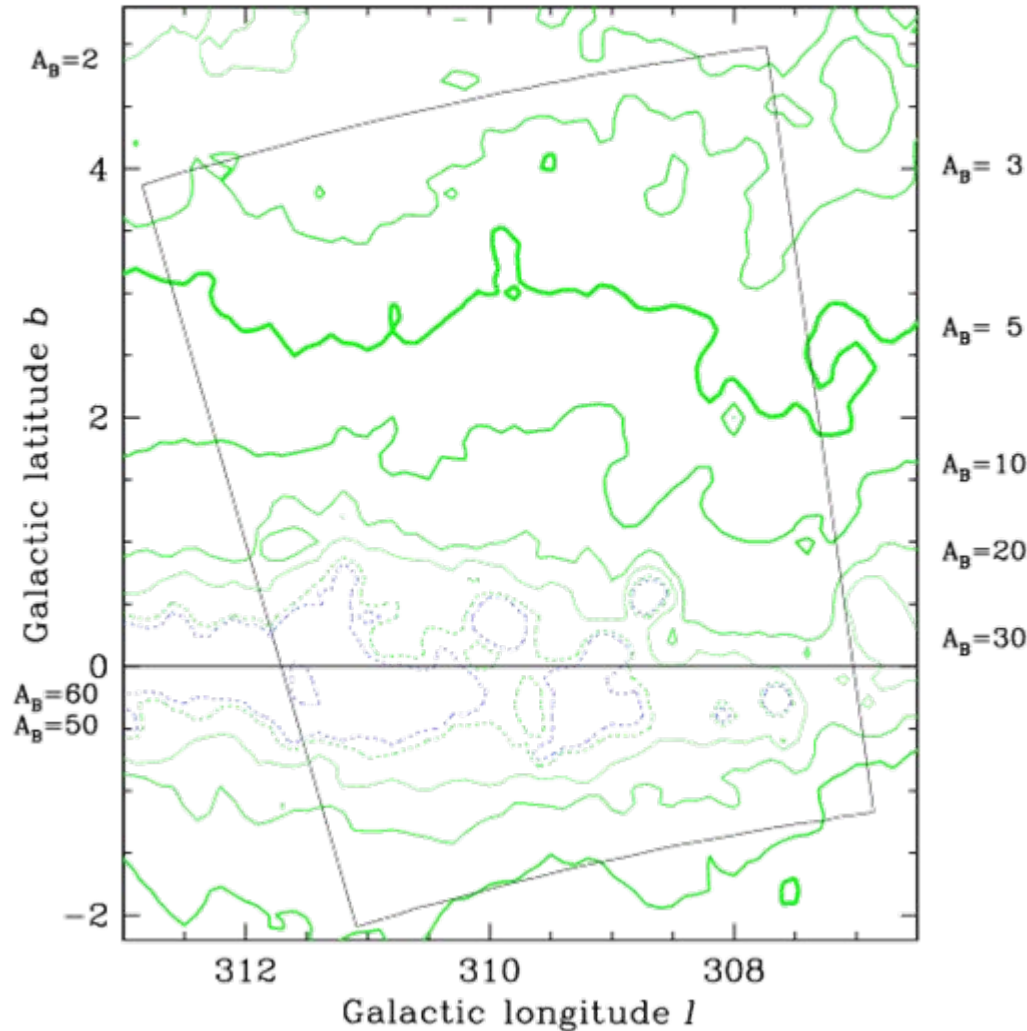
PKS1343-601

- fifth brightest radio galaxy in the sky -> Centaurus B
- at $A_B \sim 12$ mag:
NIR: giant elliptical
- 10° from the GA
($l=309^\circ.7$, $b=1^\circ.8$,
 $v=3872$ km/s)



DENIS galaxies

$29 \times 37 = 1073$ images
 $= 29.8^\circ$



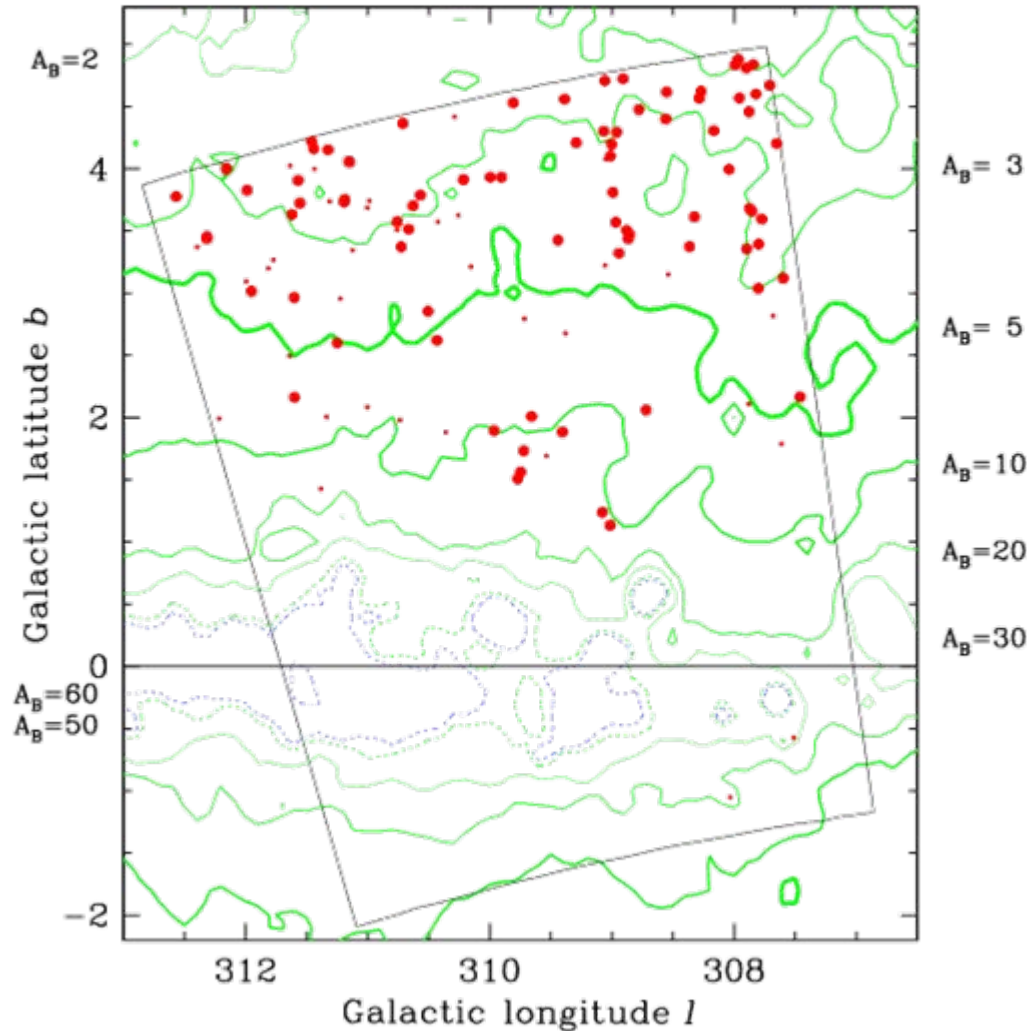
Extinction in A_B :

IRAS/DIRBE maps
(Schlegel et al. 1998)

$$A_B = 4.14 E(B-V)$$

DENIS galaxies

$29 \times 37 = 1073$ images
 $= 29.8^\circ$



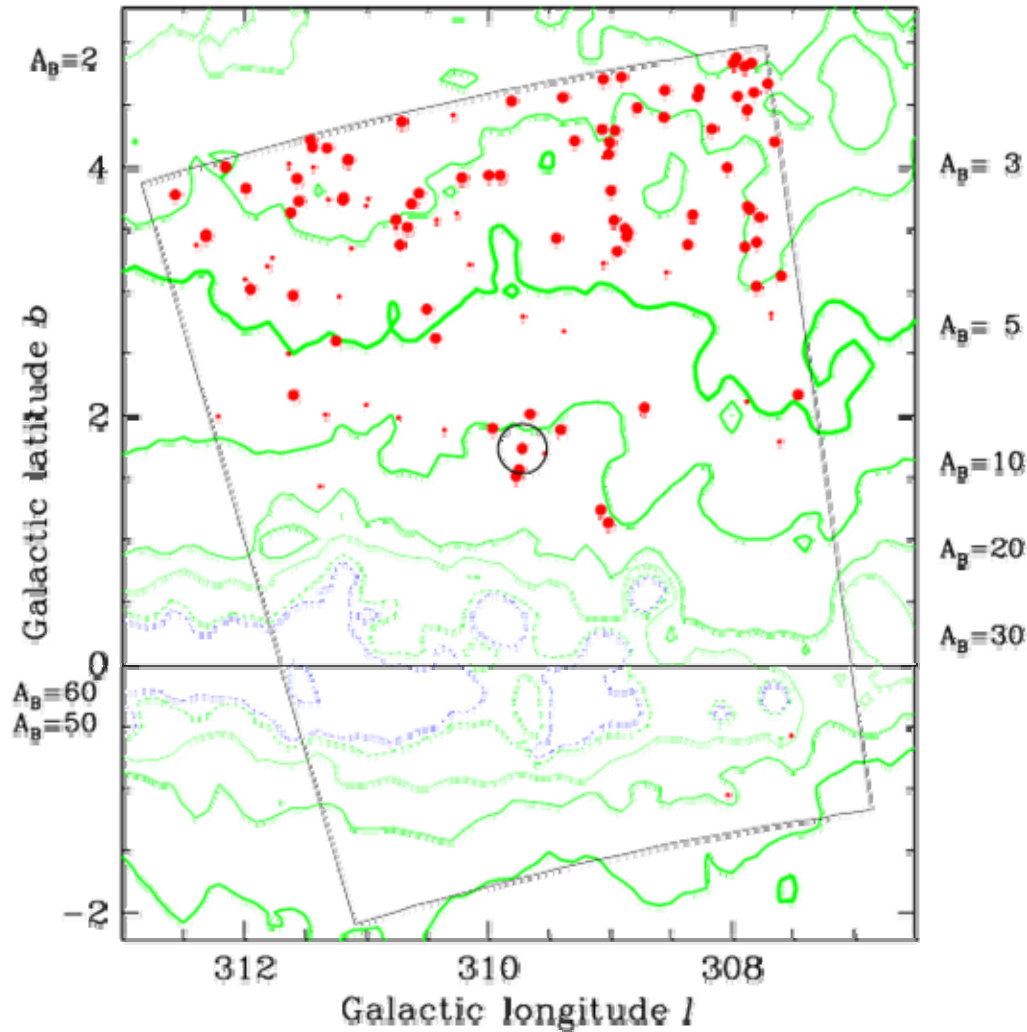
	I	J	K	total
gal	78	79	64	81
unc	32	34	21	38

Extinction in A_B :

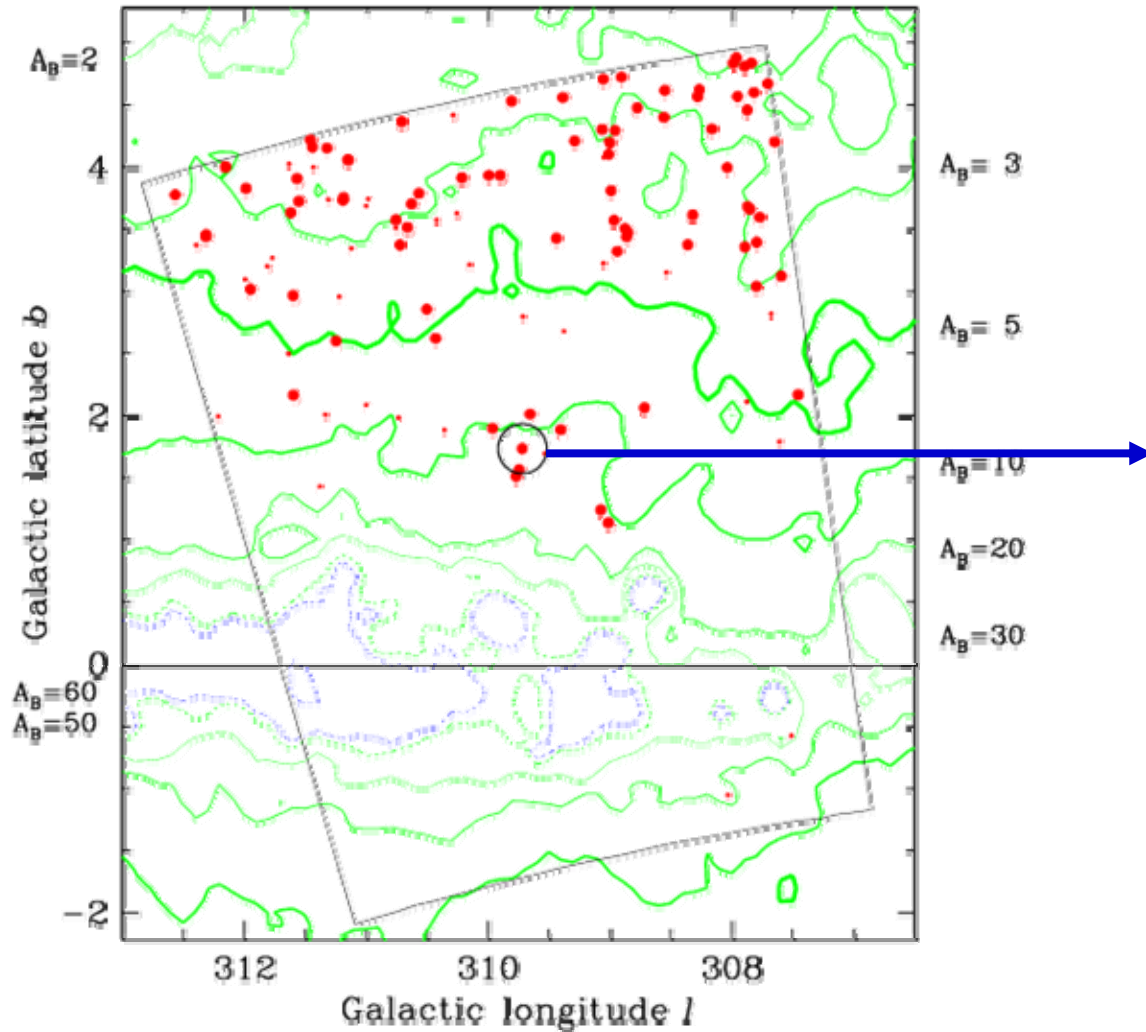
IRAS/DIRBE maps
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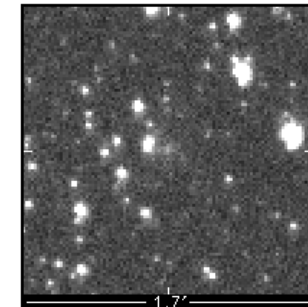
DENIS galaxies - example 'PKS 1343 - 601'



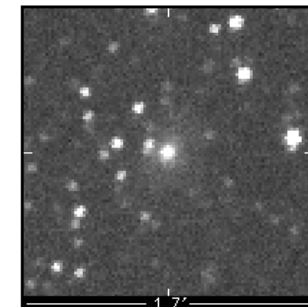
DENIS galaxies - example 'PKS 1343 - 601'



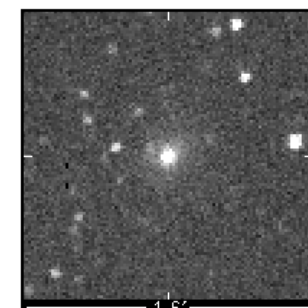
DZOA4652_04



I-band



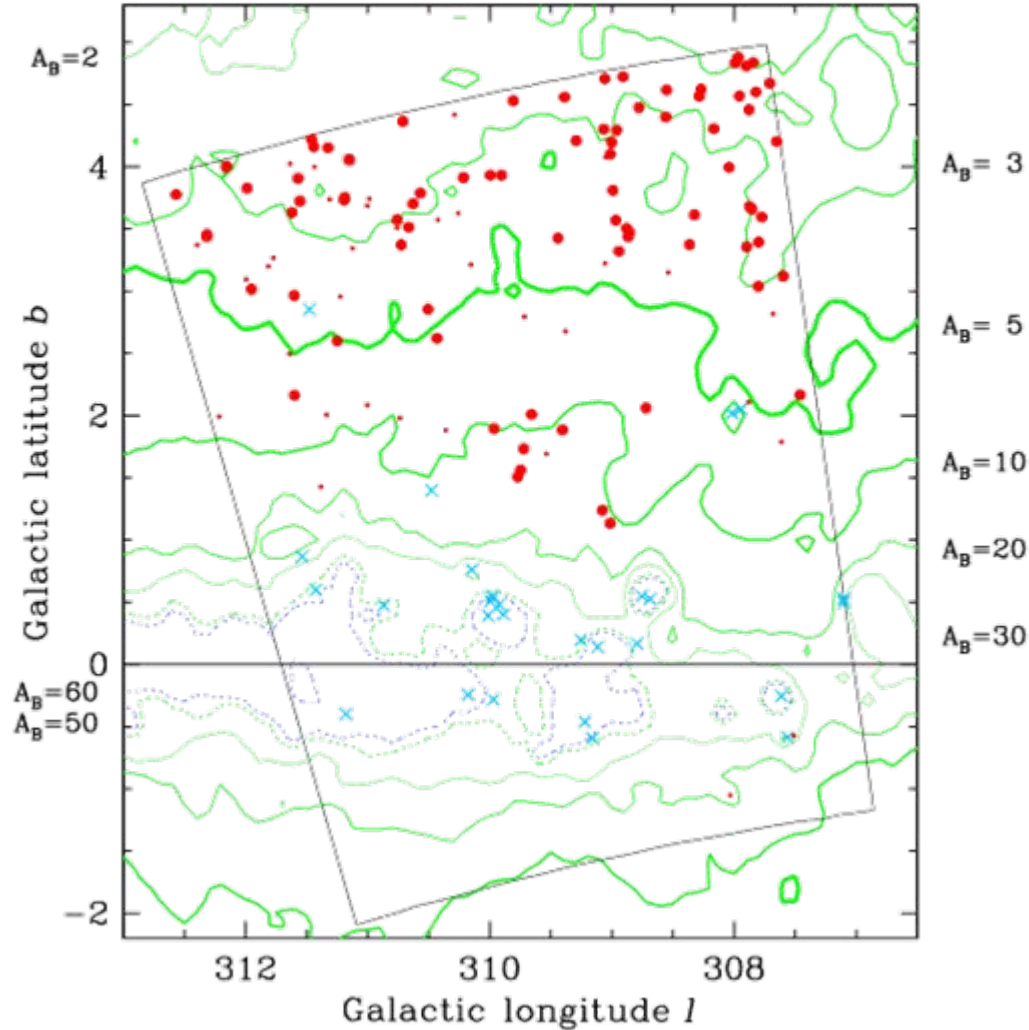
J-band



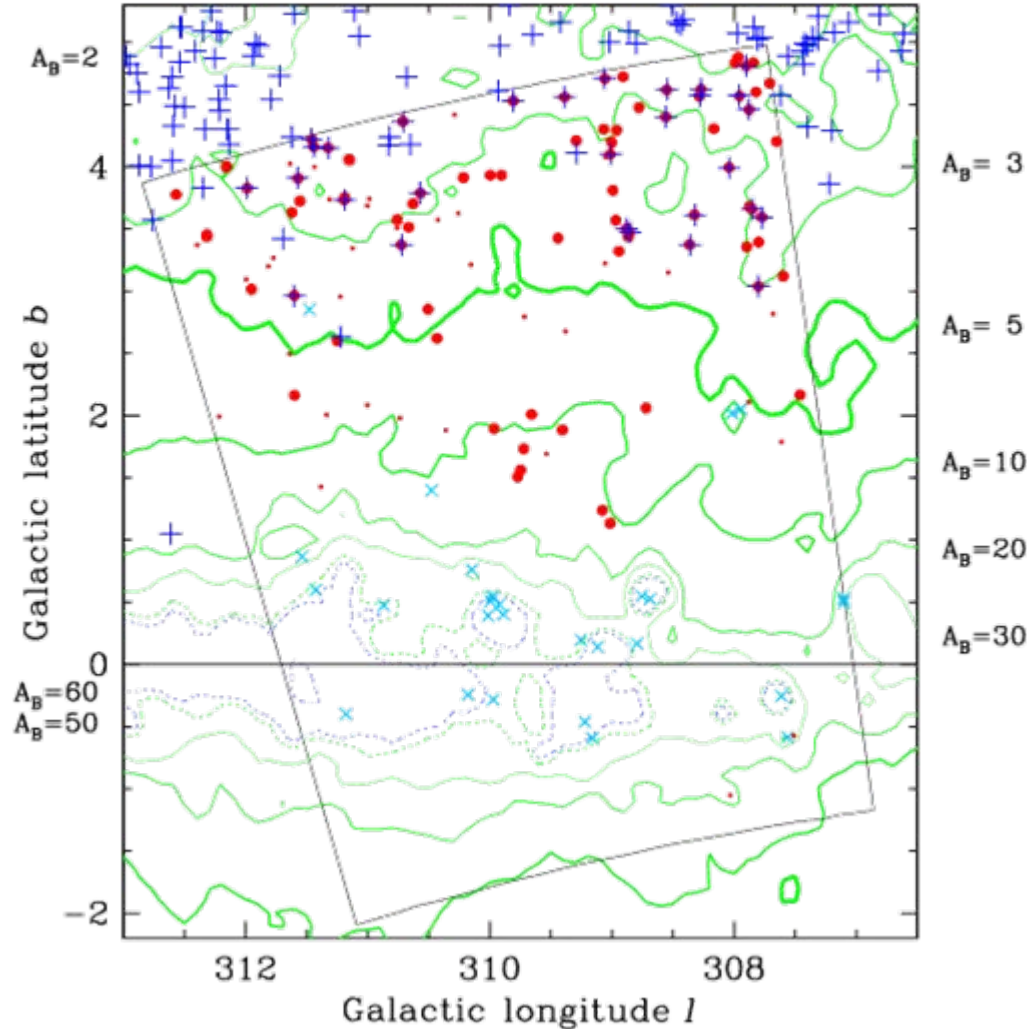
K-band

1.7 arcmin

DENIS galaxies and Galactic objects



DENIS data & B-band data

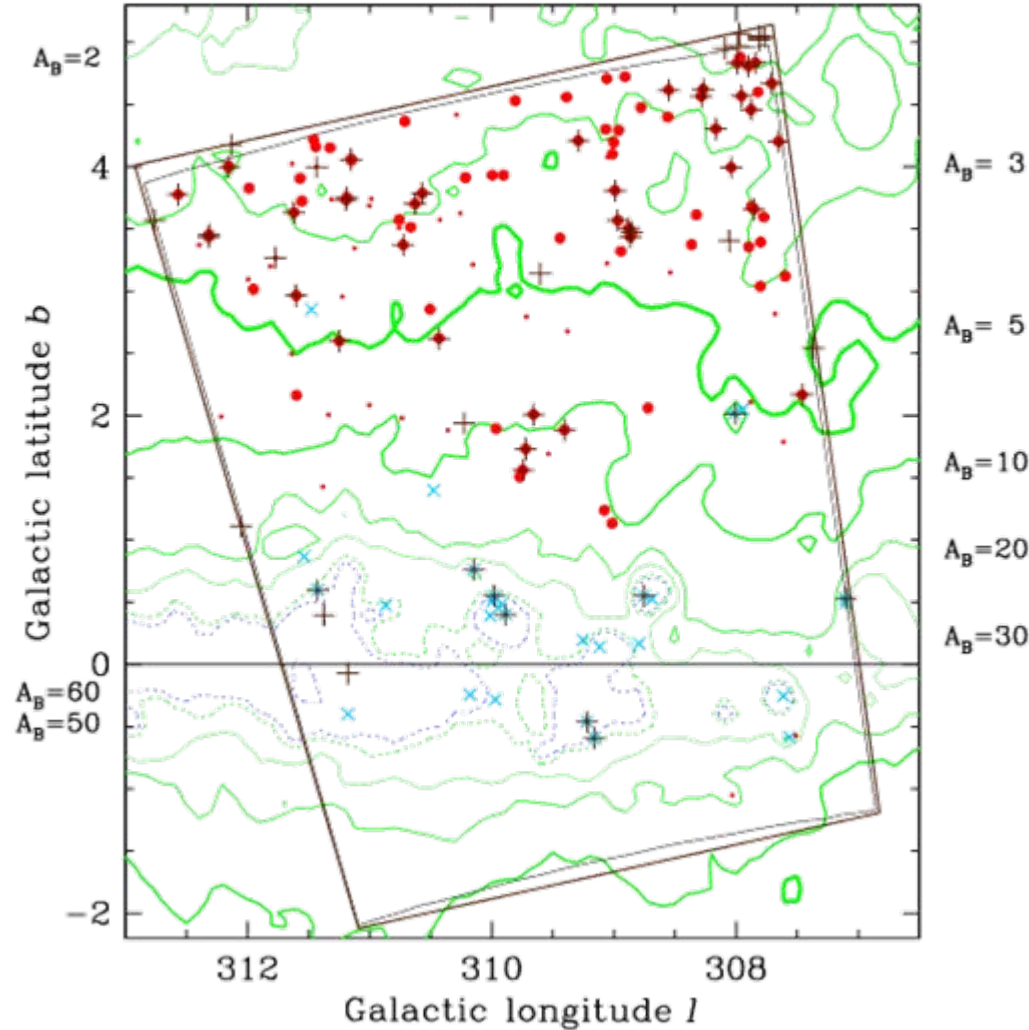


Woudt & Kraan-Korteweg 2002
(IIIaJ ESO/SRC sky survey)

Completeness limit at $A_B = 3^m$:

$$B_J^\circ < 15.^m5 \\ D^\circ > 60''$$

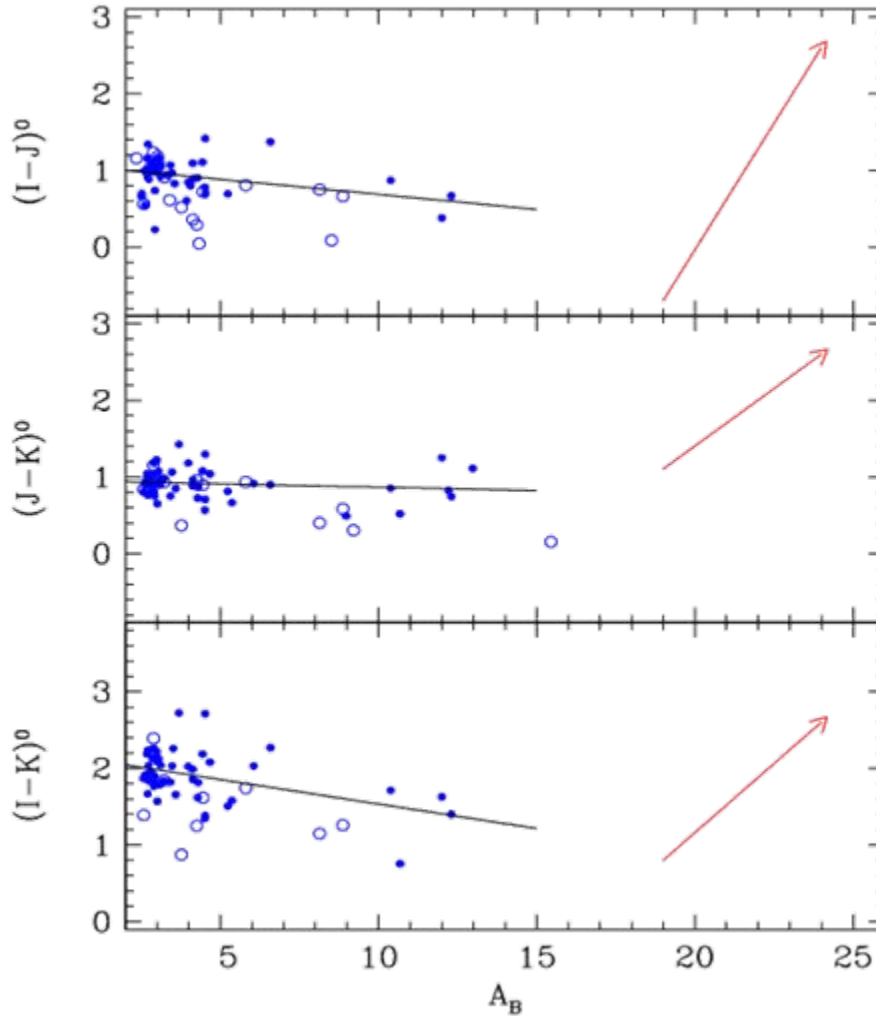
DENIS & 2MASS



2MASS all-sky extended
source catalogue
in JHK

→ 65 objects

NIR colours and extinction



(Schlegel et al 1998)

open circles: uncertain galaxies
(not included in fit)

red arrow: reddening path

$$(I-J)^{\circ} = -0.04 A_B + 1.08 \quad \sigma = 0.22$$

$(\pm 0.01) \quad (\pm 0.06)$

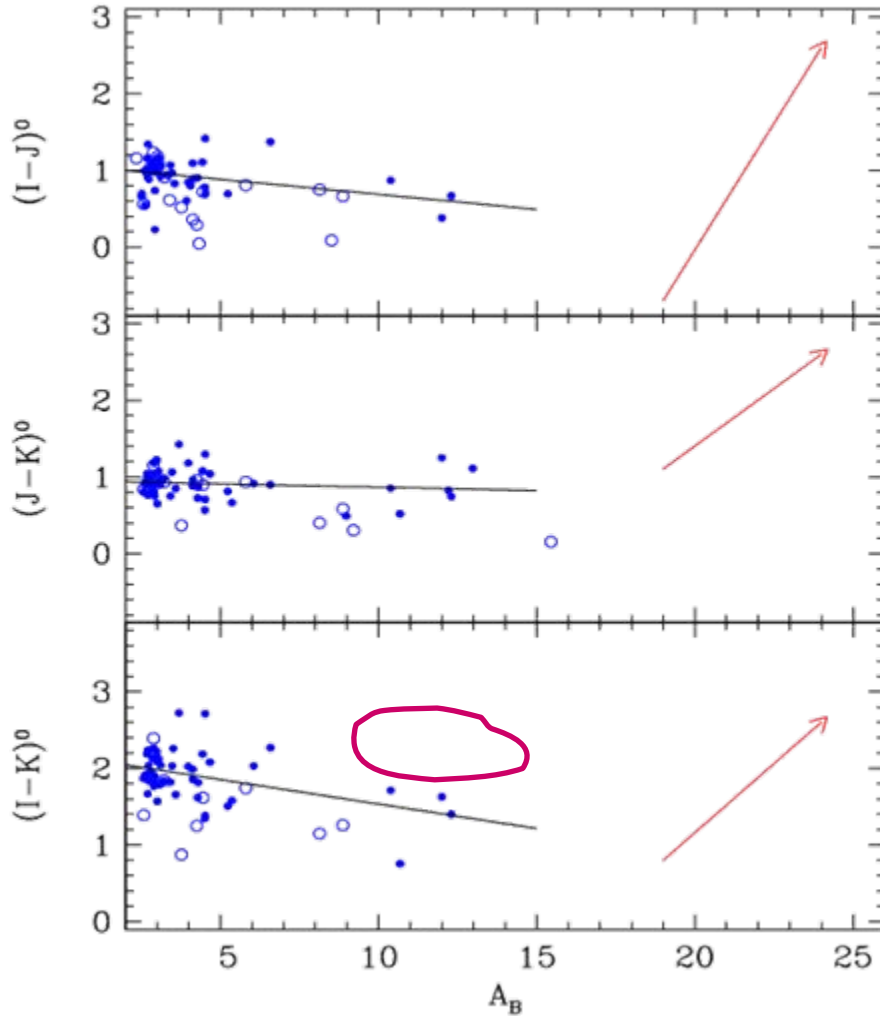
$$(J-K)^{\circ} = -0.01 A_B + 0.96 \quad \sigma = 0.18$$

$(\pm 0.01) \quad (\pm 0.05)$

$$(I-K)^{\circ} = -0.06 A_B + 2.17 \quad \sigma = 0.31$$

$(\pm 0.02) \quad (\pm 0.09)$

NIR colours and extinction



open circles: uncertain galaxies
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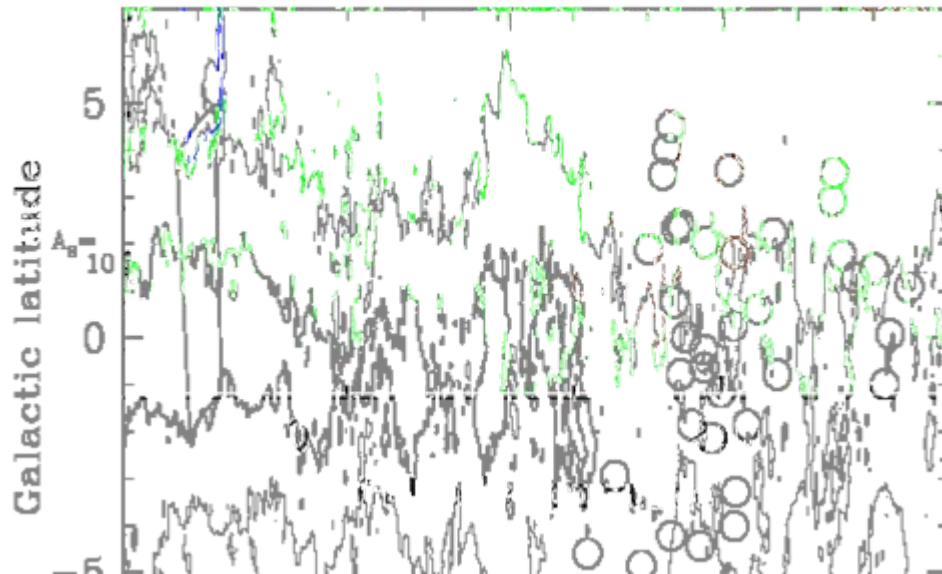
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$$(I-K)^{\circ} = -0.06 A_B + 2.17 \quad \sigma = 0.31$$

$(\pm 0.02) \quad (\pm 0.09)$

NIR colours and extinction: further data



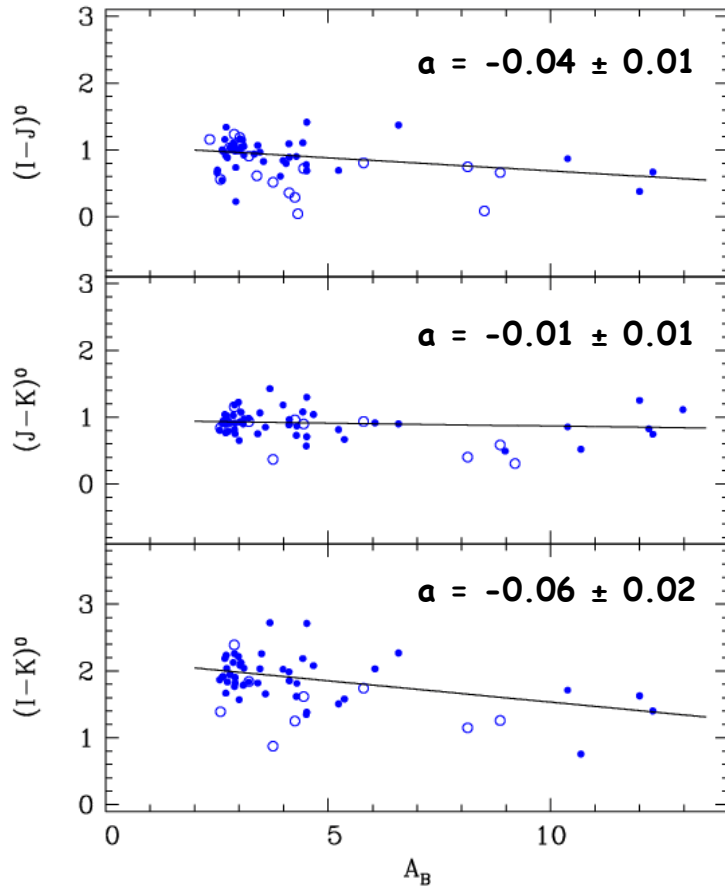
open circles:
HIZOA search areas

blue rectangular:
PKS1343-601 search area

NIR colours and extinctions: 2 surveys

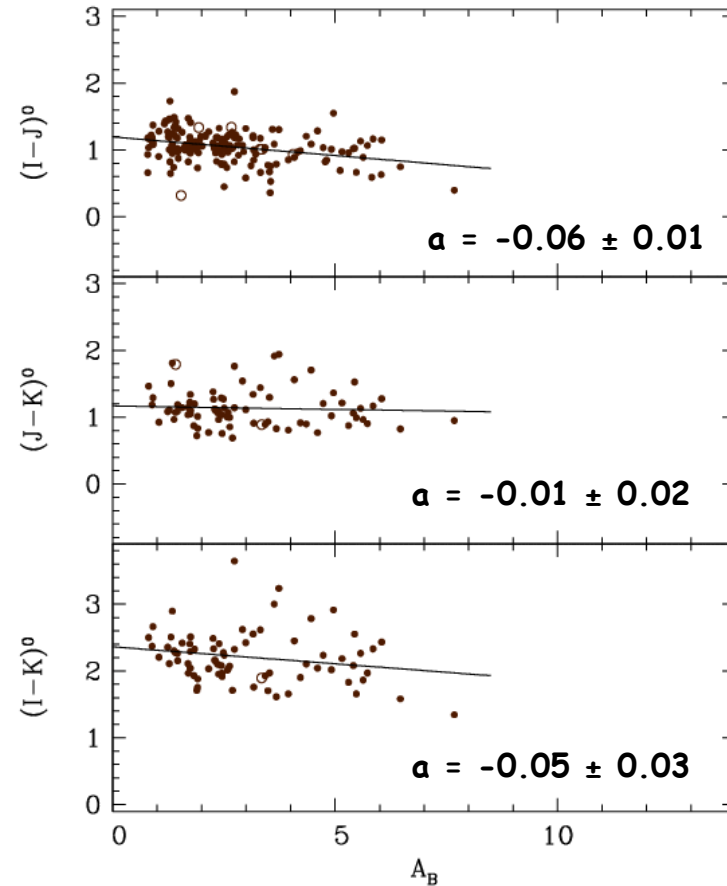
galaxies around PKS1343-601

$l = 307^\circ - 313^\circ, -2^\circ < b < 5^\circ$



galaxies around HIZOA detections

$l = 210^\circ - 260^\circ, |b| < 5.^\circ$



$$Y = ax + b$$

NIR colours and extinctions

our observations:

$$C^o = a A_B + b$$

reddening equation:

$$C = C^o + (E/A_B) A_B$$

true extinction:

$$A_B(\text{true}) = f A_B(\text{Schlegel et al. '98})$$

true extinction-corr colour:

$$C^o(\text{true}) = [a + (1 - f) (E/A_B)] A_B + b$$

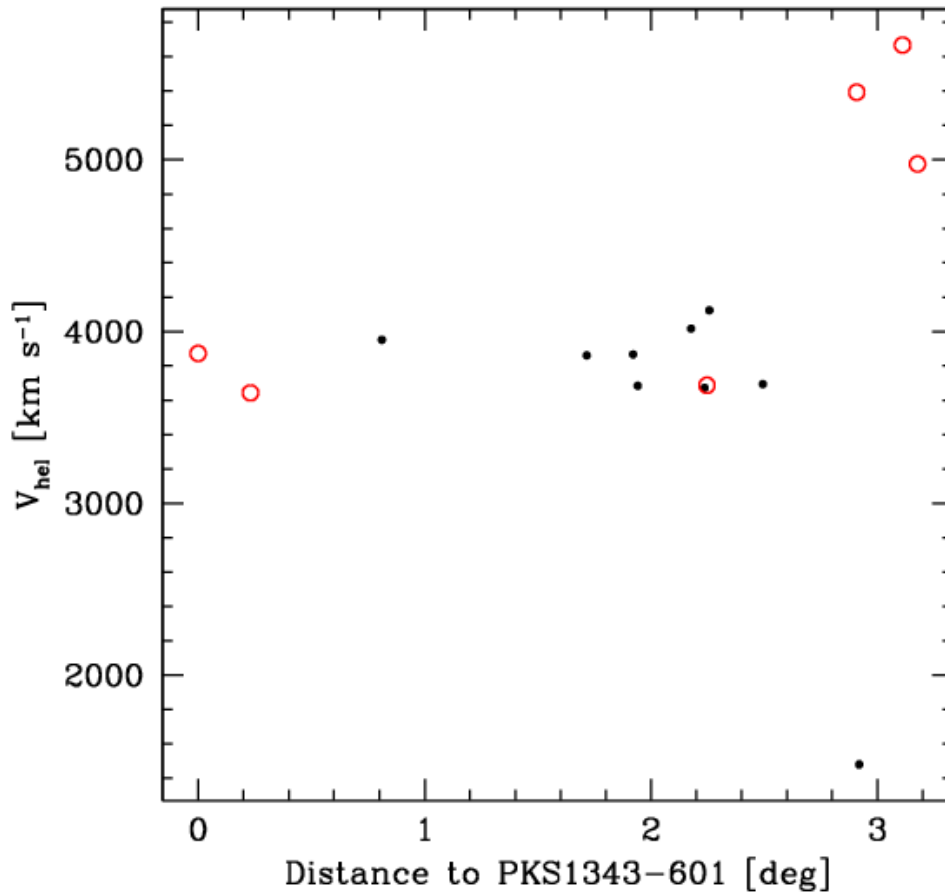
'PKS1343-601 cluster'

$$A_B(\text{true}) = (0.87 \pm 0.04) A_B(\text{Schlegel et al. '98})$$

'HIZAO galaxies'

$$A_B(\text{true}) = (0.79 \pm 0.05) A_B(\text{Schlegel et al. '98})$$

Velocity distribution



black: HI data

red: optical data

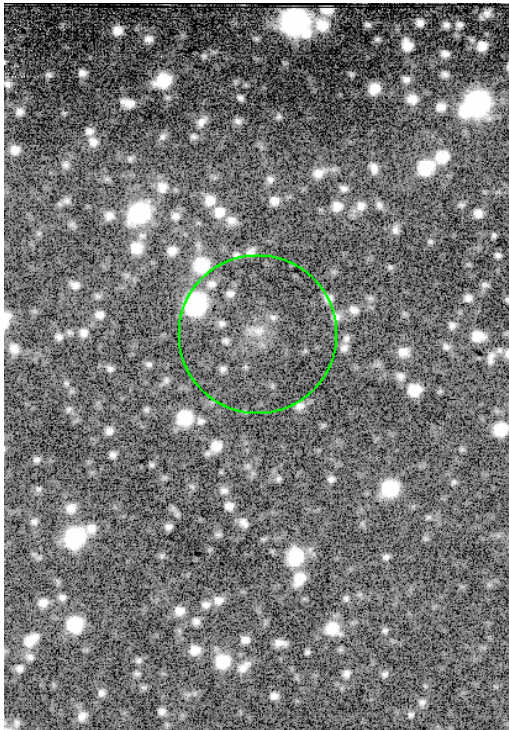
dist < 2.6°, 3000 < v < 4500 km/s

$$\Rightarrow \langle v \rangle = 3825 \text{ km/s}$$
$$\sigma_v = 158 \text{ km/s}$$

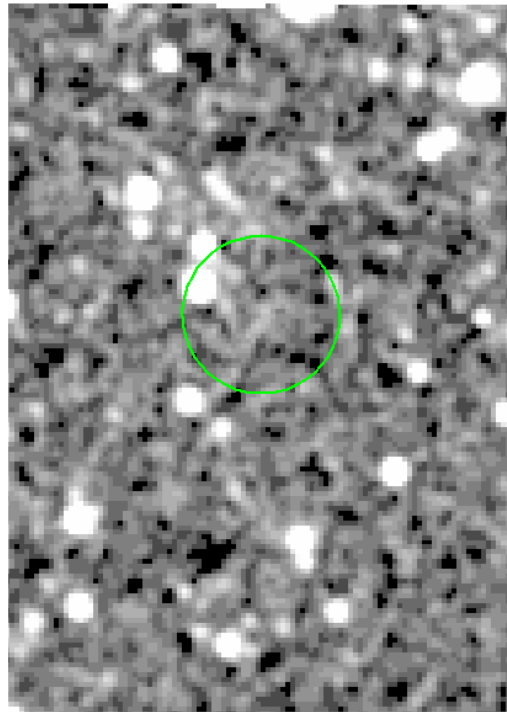
Outlook: UKIDSS and VISTA surveys

$A_B \sim 7$ mag:

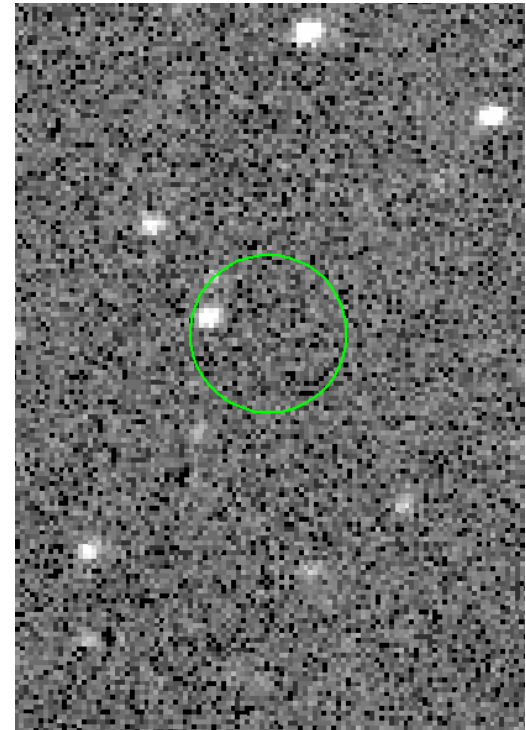
K-band: UKIDSS



2MASS



DENIS



Summary

- giant radio galaxy PKS1343-601 ($\langle A_B \rangle = 12$ mag)
- NIR galaxies in this area indicate a cluster
- Velocity distribution so far implies group or small cluster of galaxies
- NIR extinctions are smaller than extinctions by Schlegel et al. 1998
- UKIDSS and VISTA will close that gap of the ZOA except near the Galactic bulge