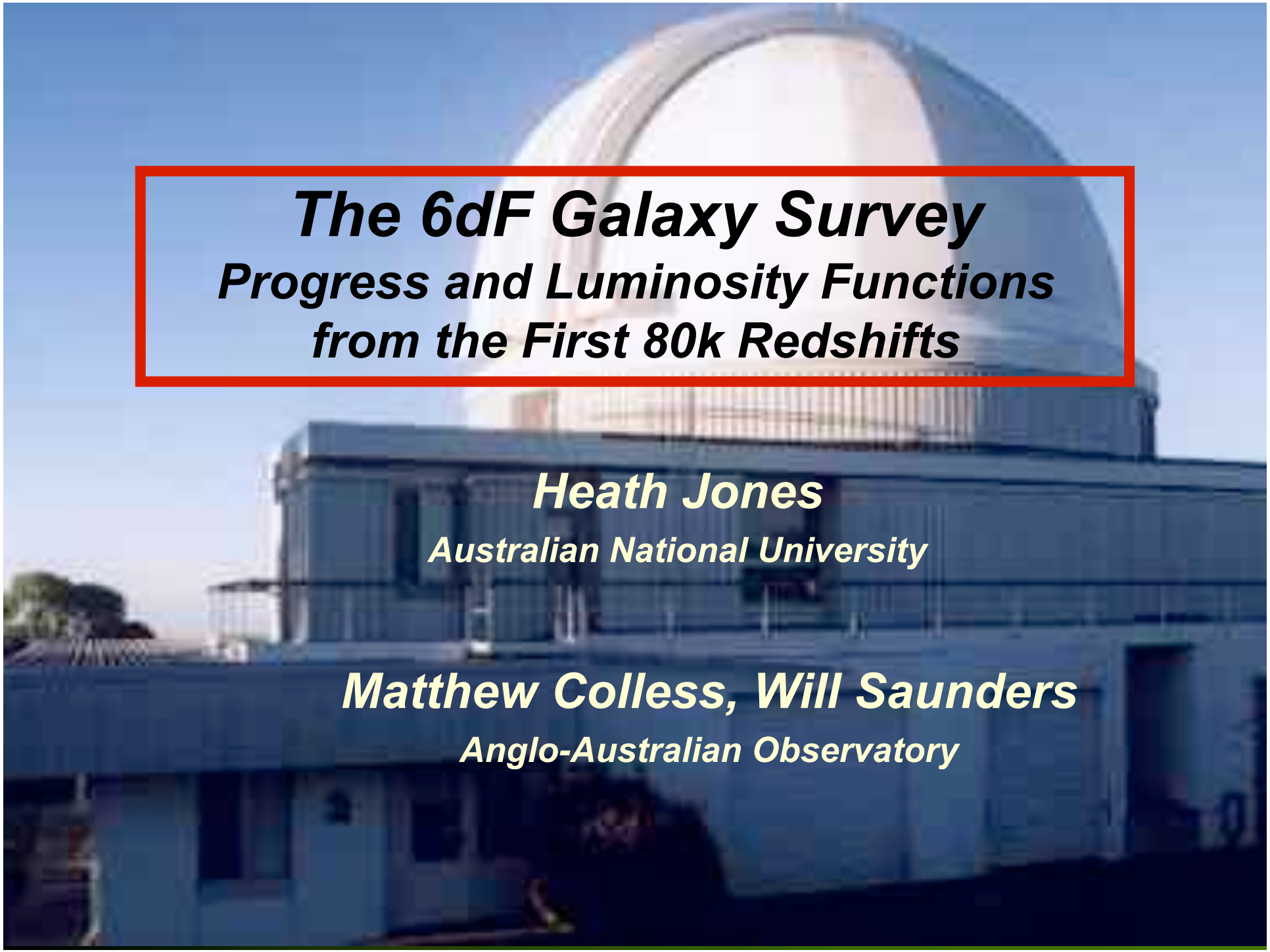

# The 6dF Galaxy Survey
## Progress and Luminosity Functions from the First 80k Redshifts


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## *The 6dF Galaxy Survey:*

- The 6dFGS is designed to be the first of a new generation of combined *z*+*v*-surveys, combining…
  - → NIR-selected redshift survey of the local universe
  - → Peculiar velocity survey using FP distances
  - → Additional redshift surveys of other ‘interesting’ source samples.

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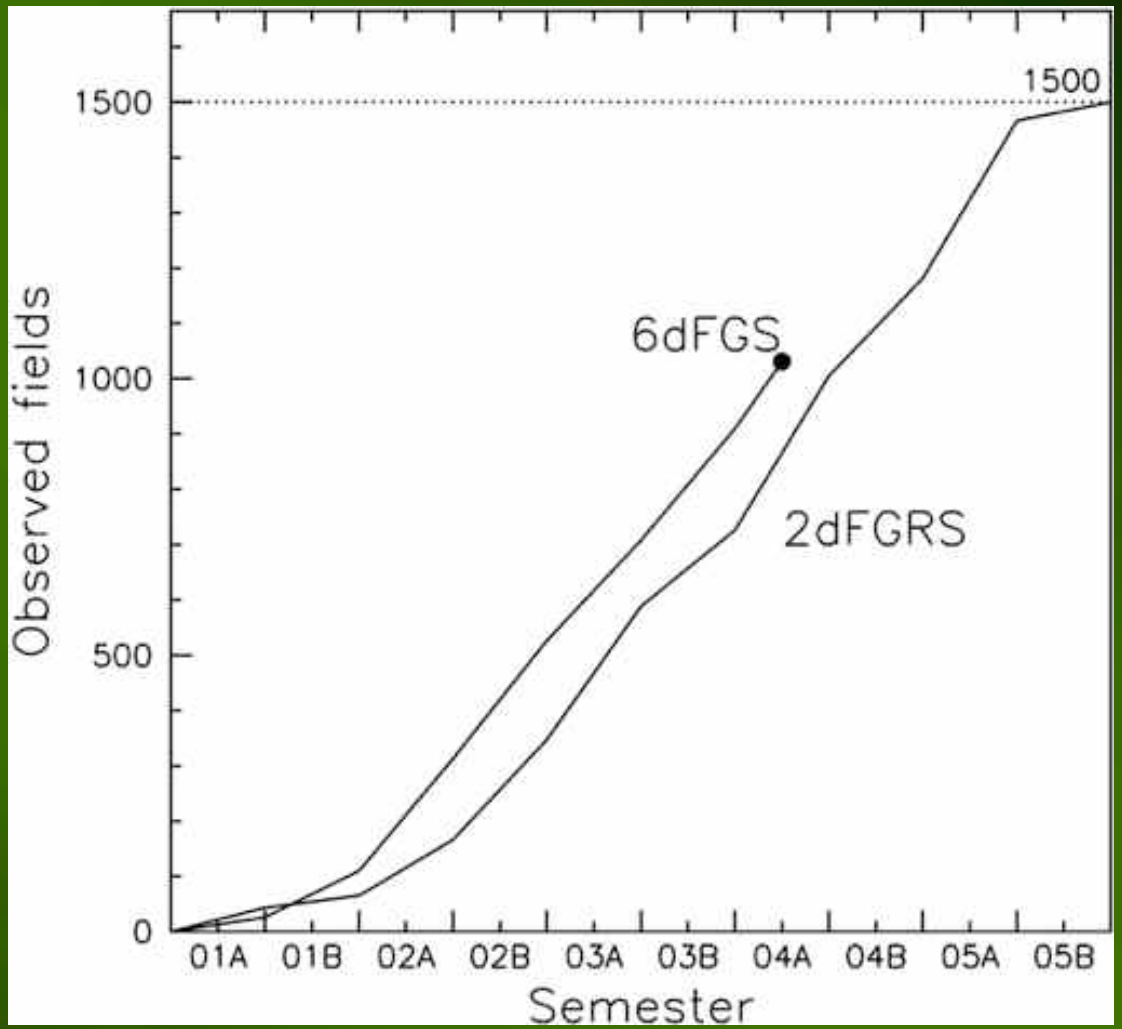
- Survey strategy…
  - survey whole southern sky with |b|>10°
  - primary *z*-survey: 2MASS galaxies to $K_{tot}$<12.75
  - secondary samples: H<13, J<13.75, r<15.6, b<16.75
  - 11 additional samples: radio, X-ray, IRAS…
  - *v*-survey: ~15,000 brightest early-type galaxies

# Observing Progress of 6dFGS

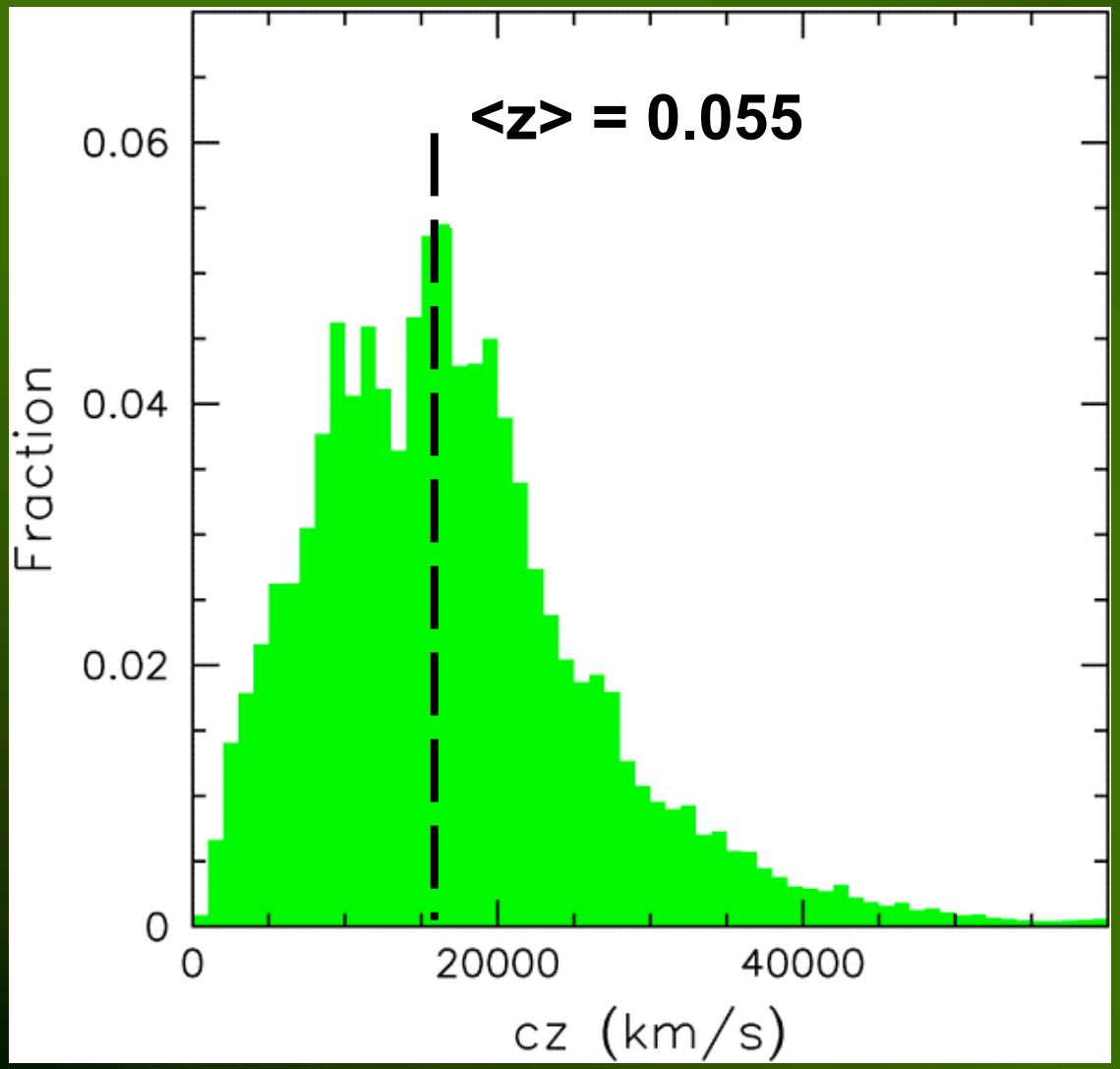
- 1031 fields have been observed to mid-2004.
  (99114 spectra)

| Year | Observed # of fields | Cumulate fields |
|---|---|---|
| 2001 | 98 | 98 |
| 2002 | 387 | 485 |
| 2003 | 396 | 881 |
| 2004 | 150 | 1031 |

- 524 fields have contributed to 1st Data Release
  (52048 spectra)



# The redshift-space distribution




- First Data Release: 52048 spectra yielding 46474 unique redshifts
- Breakdown of spectra
  - galaxy redshifts (85 %)
  - stellar (3 %)
  - HII regions, PNe (1 %)
  - failures (11 %)

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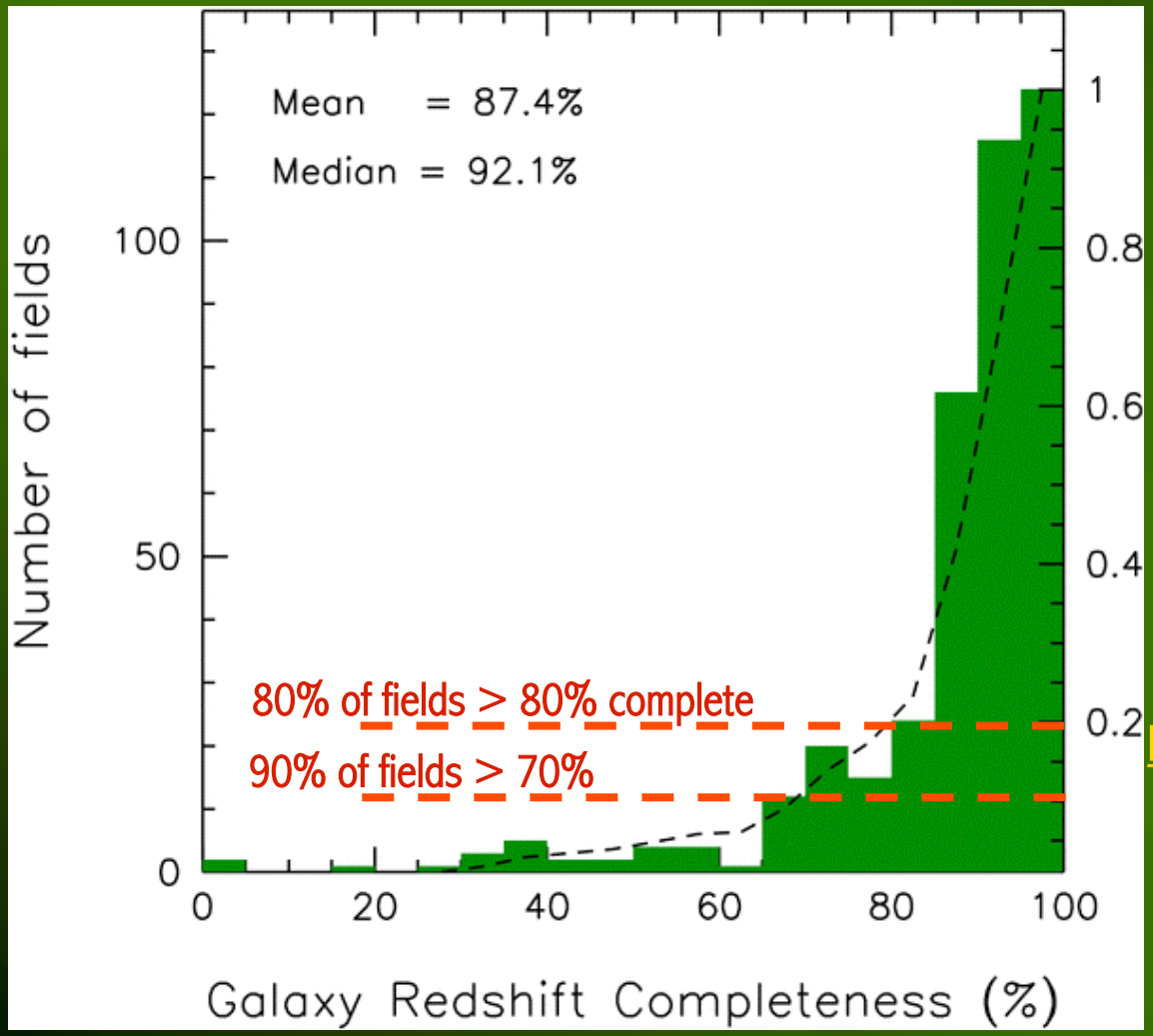


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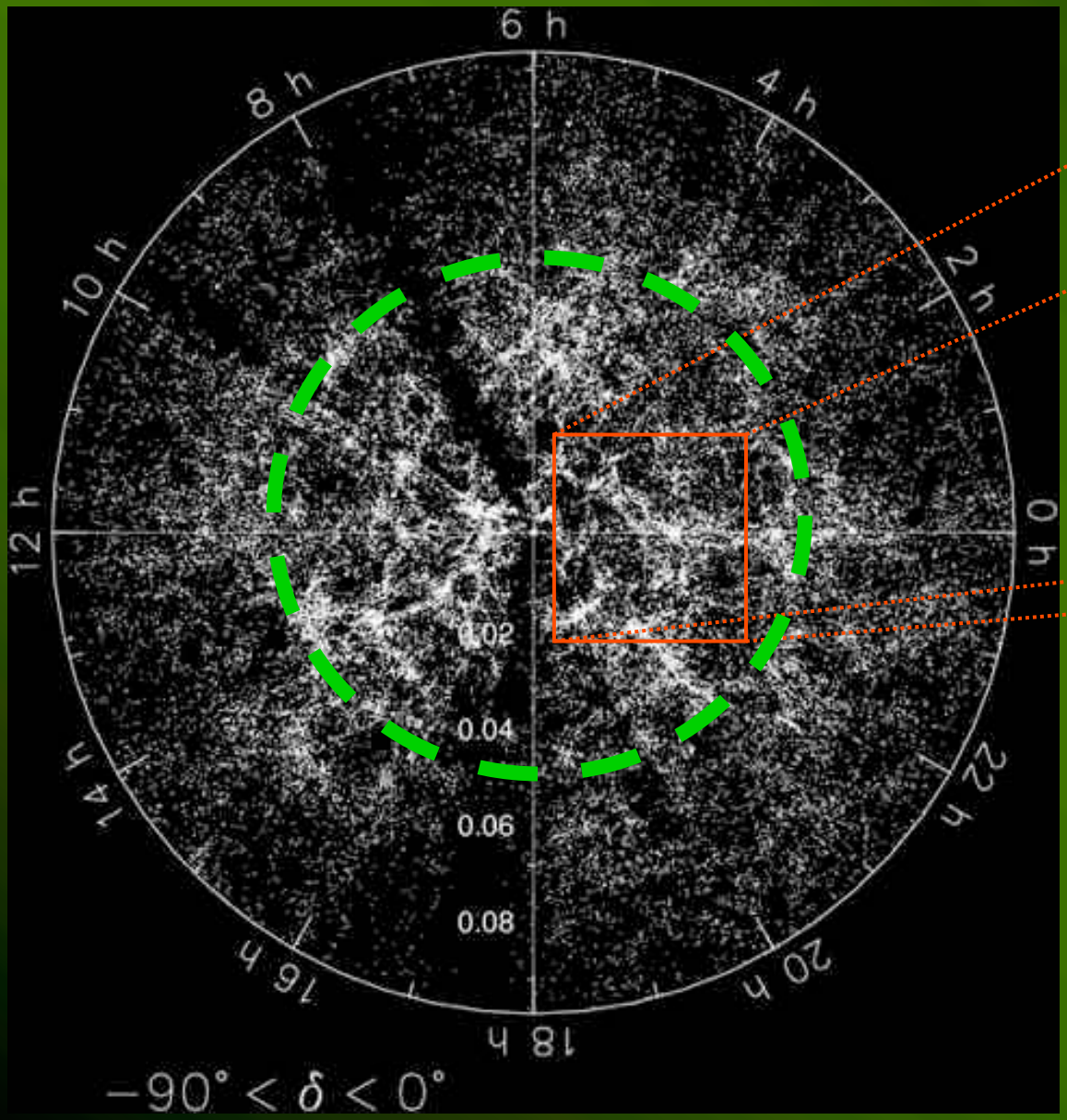
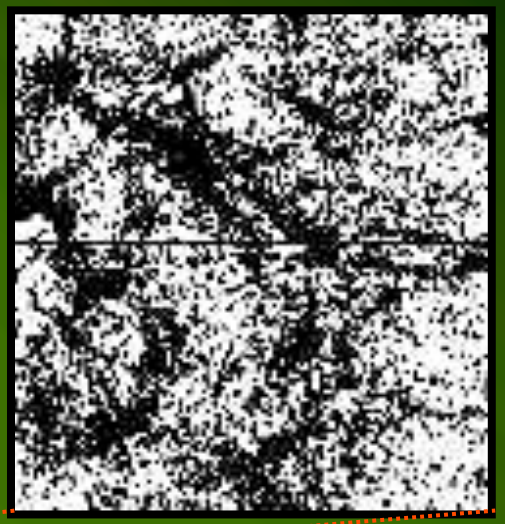
Number of 6dF Galaxy Redshifts per field

Number of 6dF Galaxy Redshifts
+ Redshift Failures per field

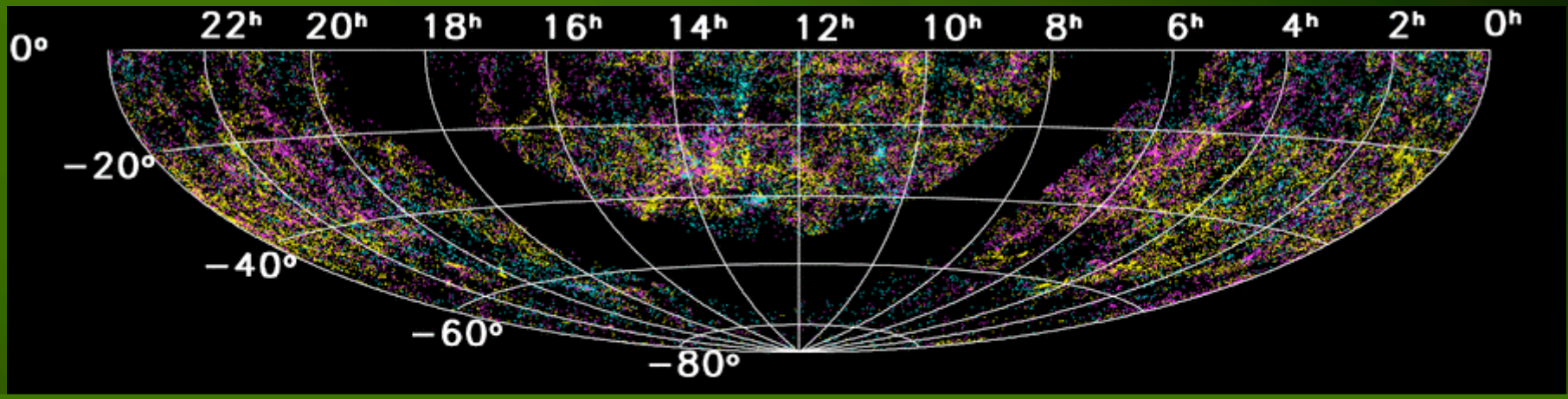
# *Redshift Map: 80k redshifts*

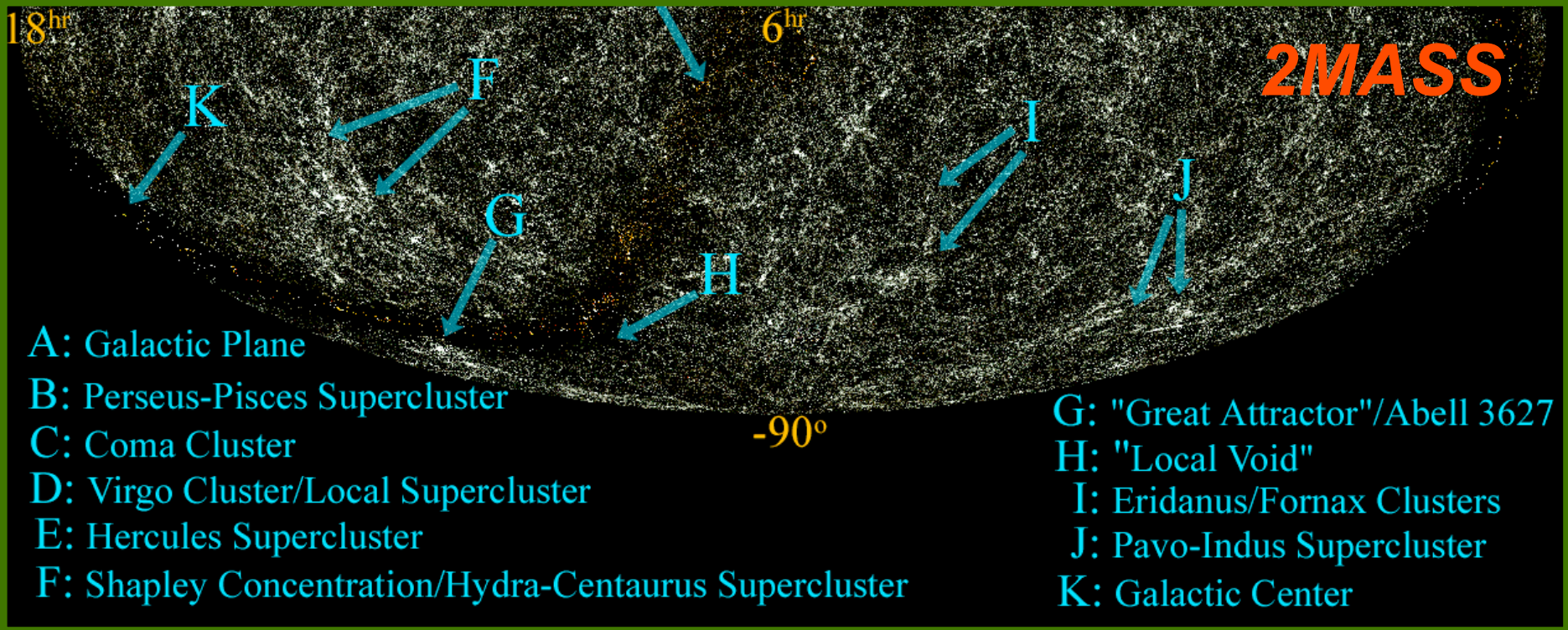


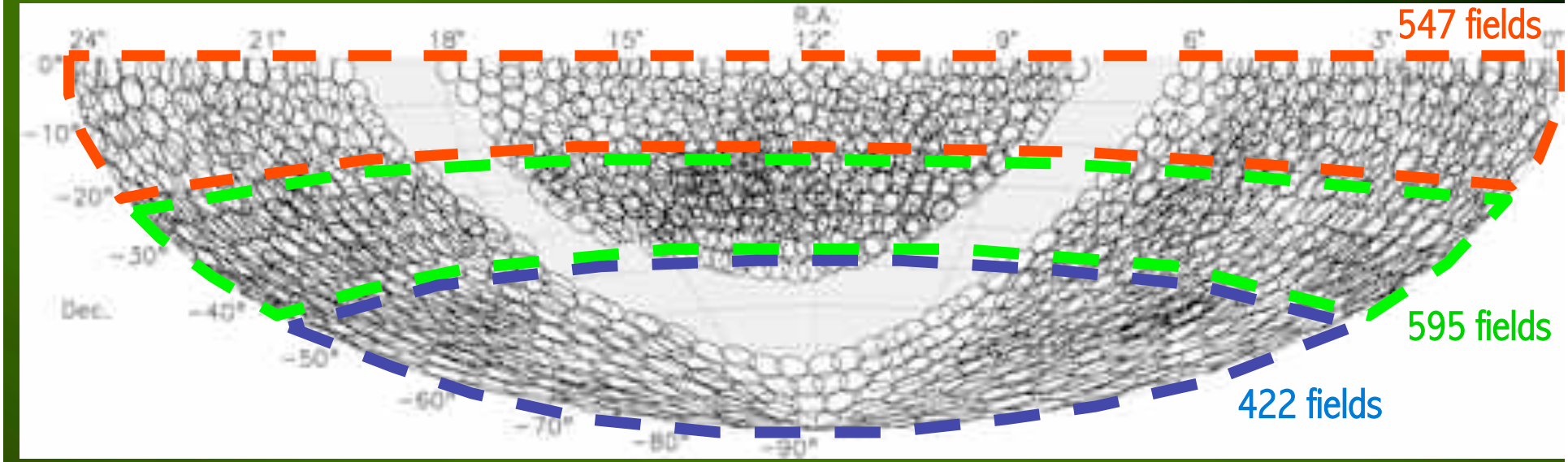
- *50426 6dFGS redshifts*
- *19570 ZCAT redshifts*
  (Huchra et al 1999)
- *8444 2dFGRS redshifts*
  (Colless et al 2001)
- ***TOTAL: 78440 redshifts***

# *Redshift Map: 80k redshifts*



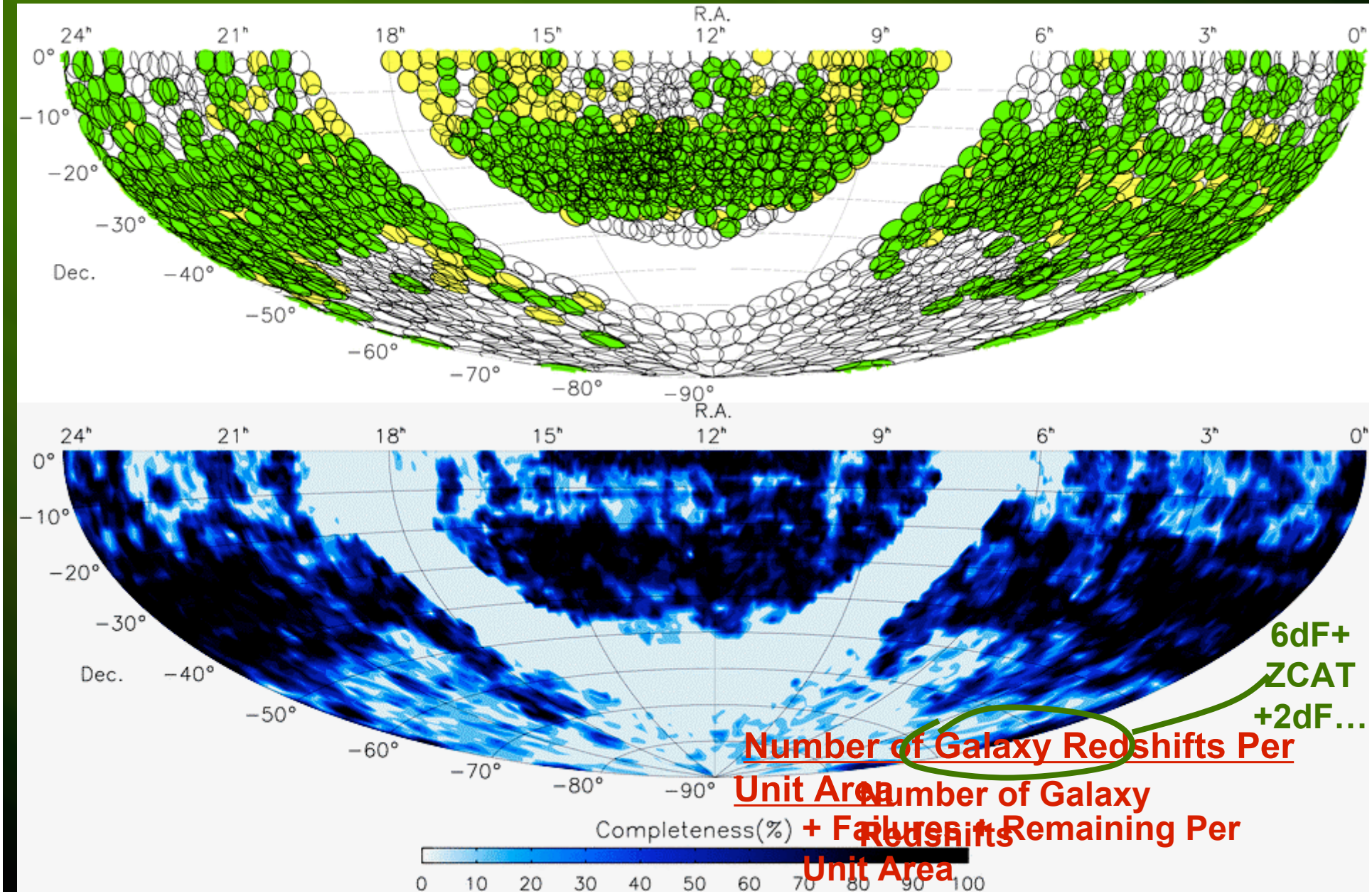



# Survey Sky Coverage




- 1500 fields over southern sky with |b| >10° = 17000□°
- Observing strategy is to cover the sky in thirds: (1) central strip; (2) equatorial strip; (3) southern polar cap.

# Survey Sky Coverage



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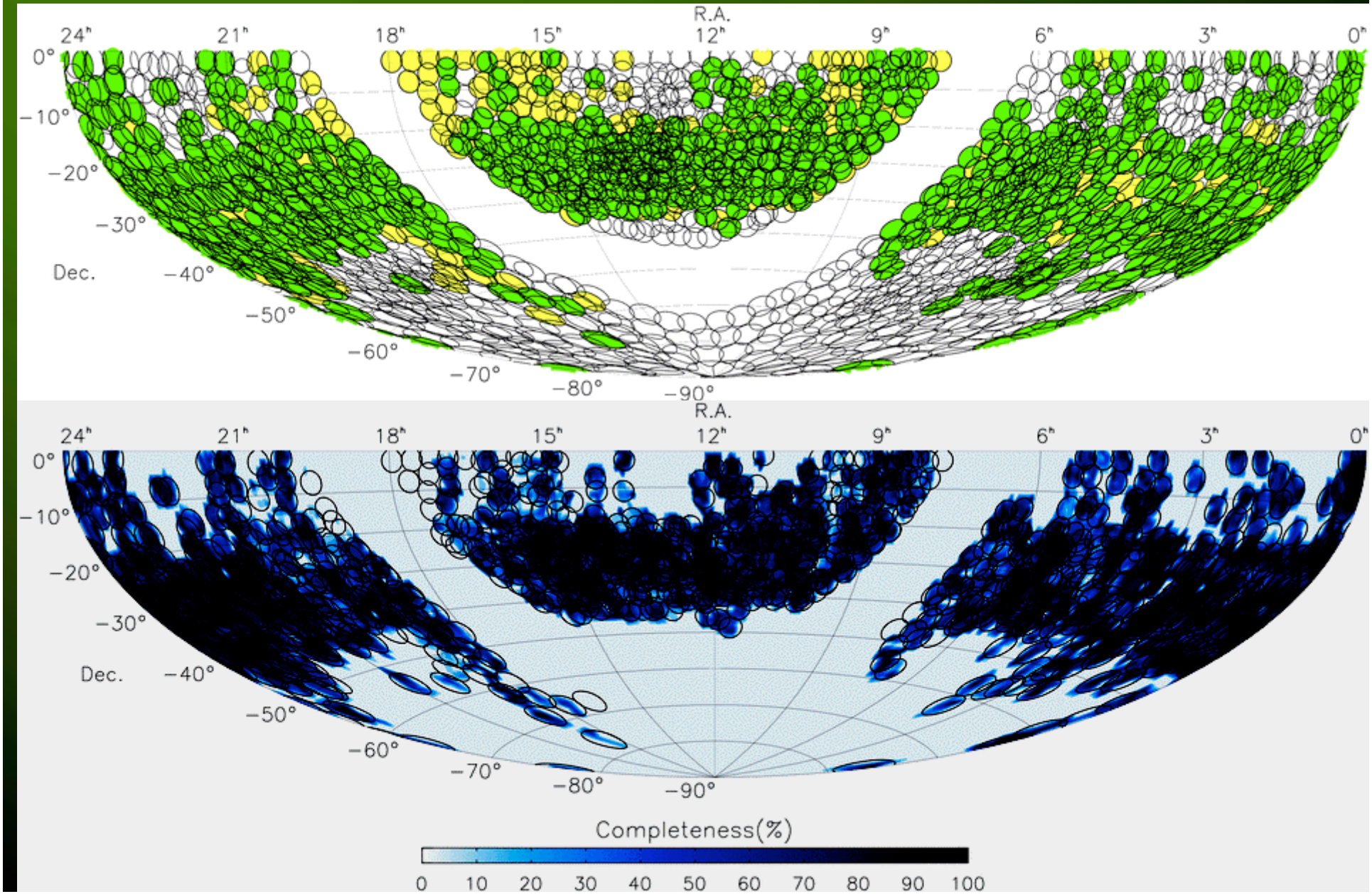


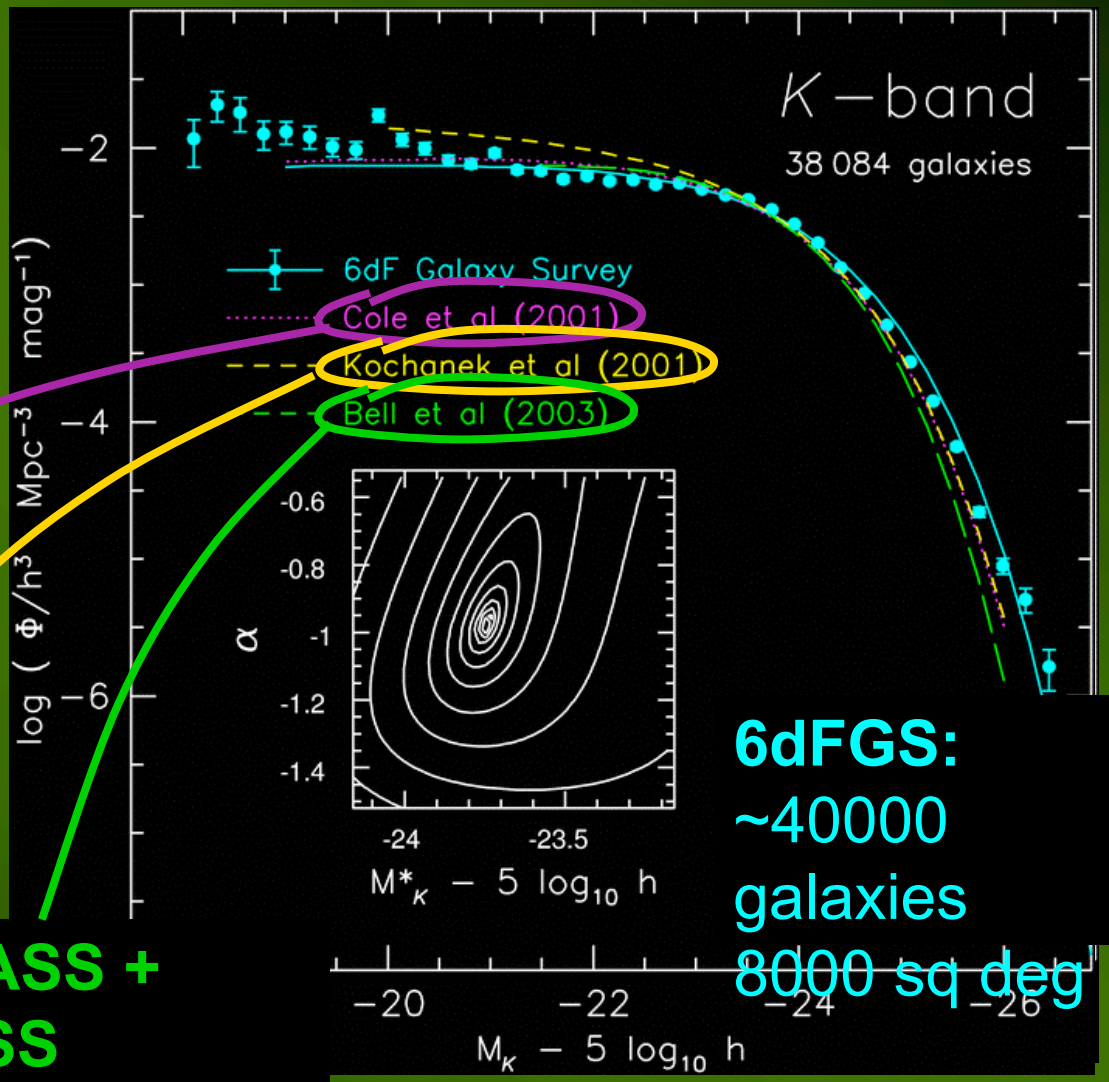
# *K-band Luminosity Function*

Luminosity function of NIR-selected galaxies (i.e. the stellar mass function of collapsed structures)

**2MASS + 2dF**
~17000 galaxies
600 sq deg

**2MASS + ZCAT**
~4000 galaxies
7000 sq deg

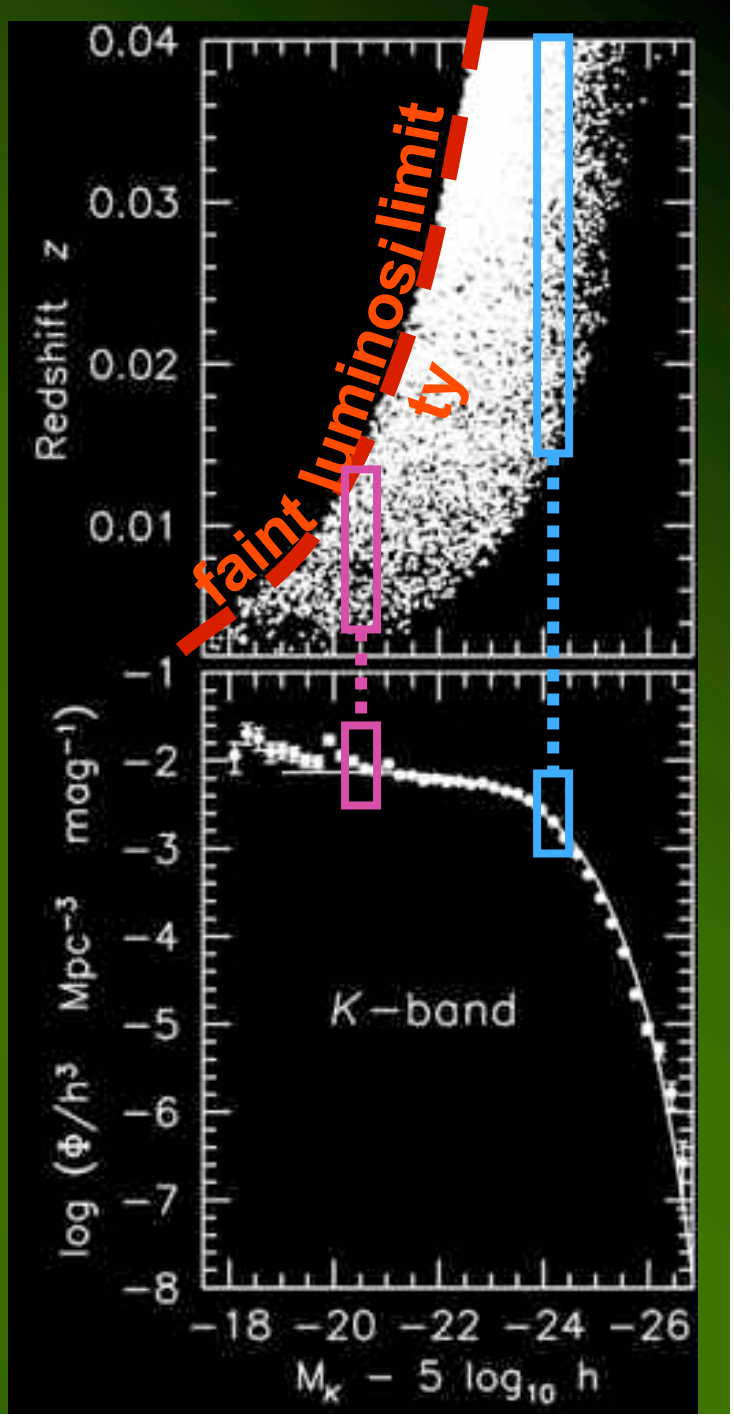
**2MASS + SDSS**
~12000 galaxies




**6dFGS:**
~40000 galaxies
8000 sq deg

## *Luminosity Function*

Relationship between
luminosity and
volume probed



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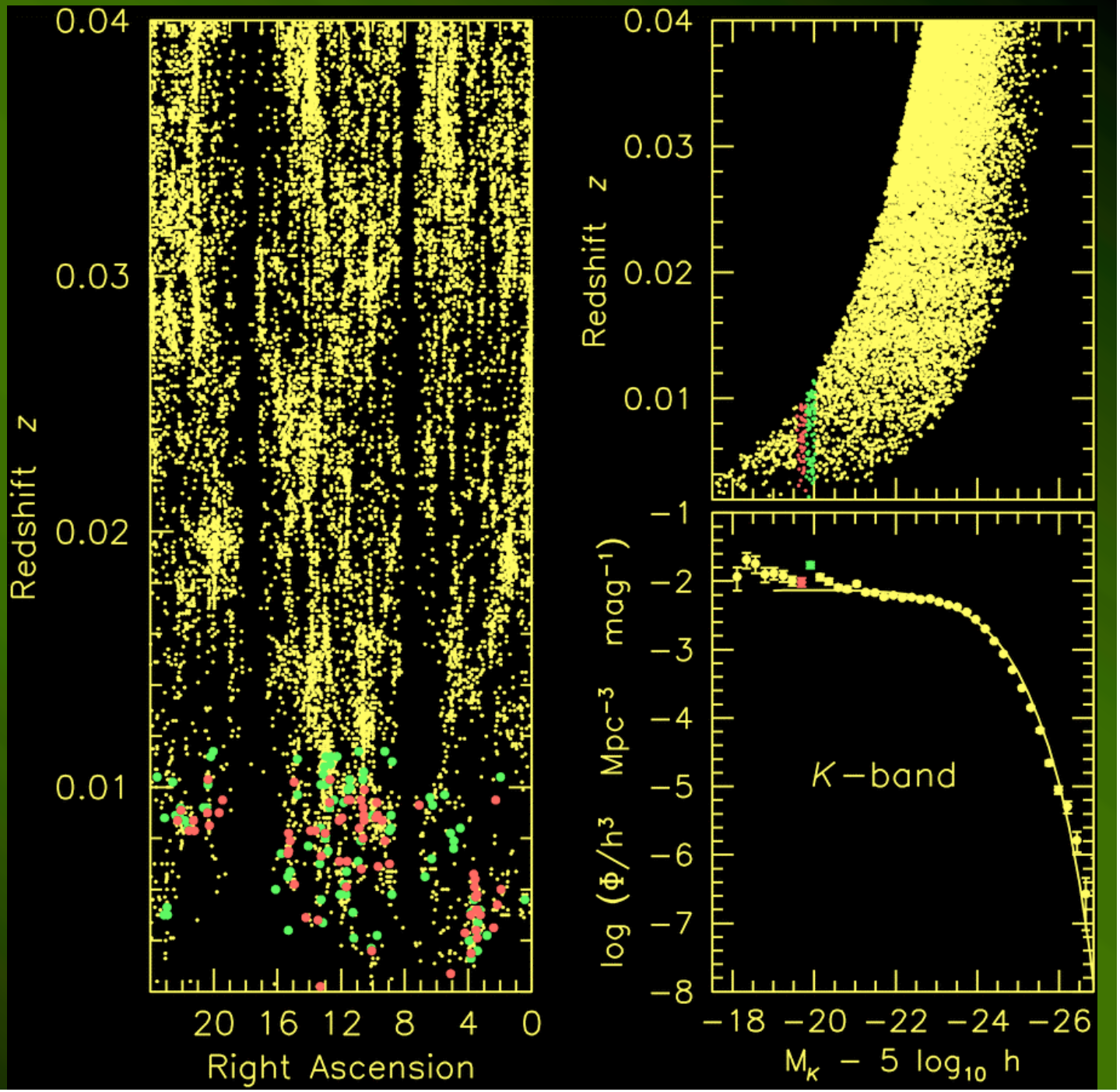
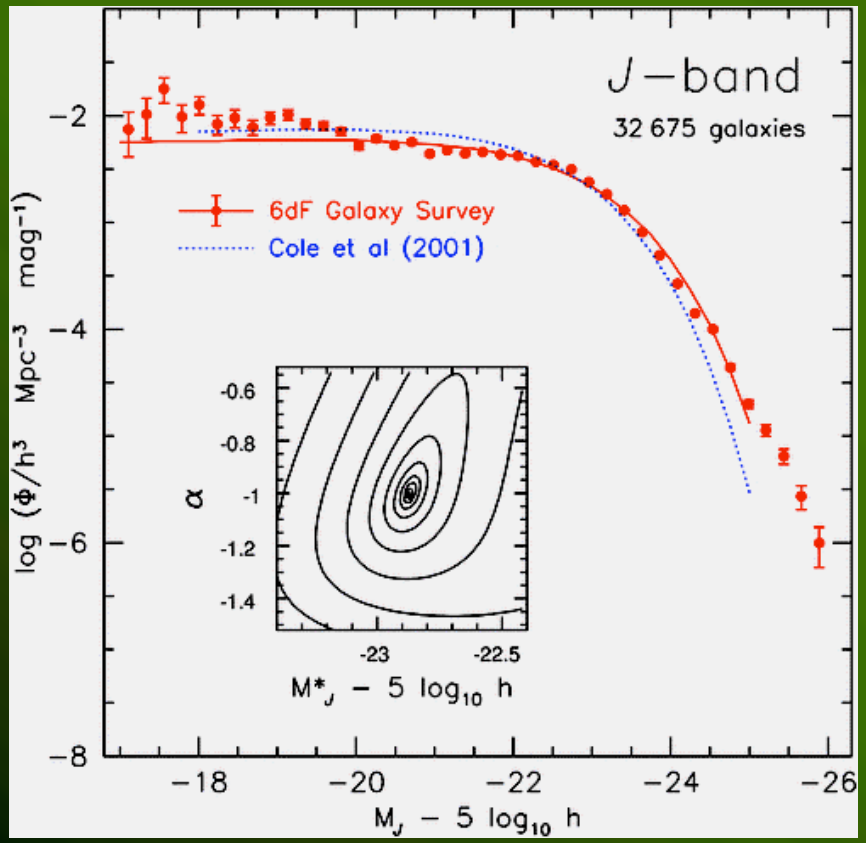
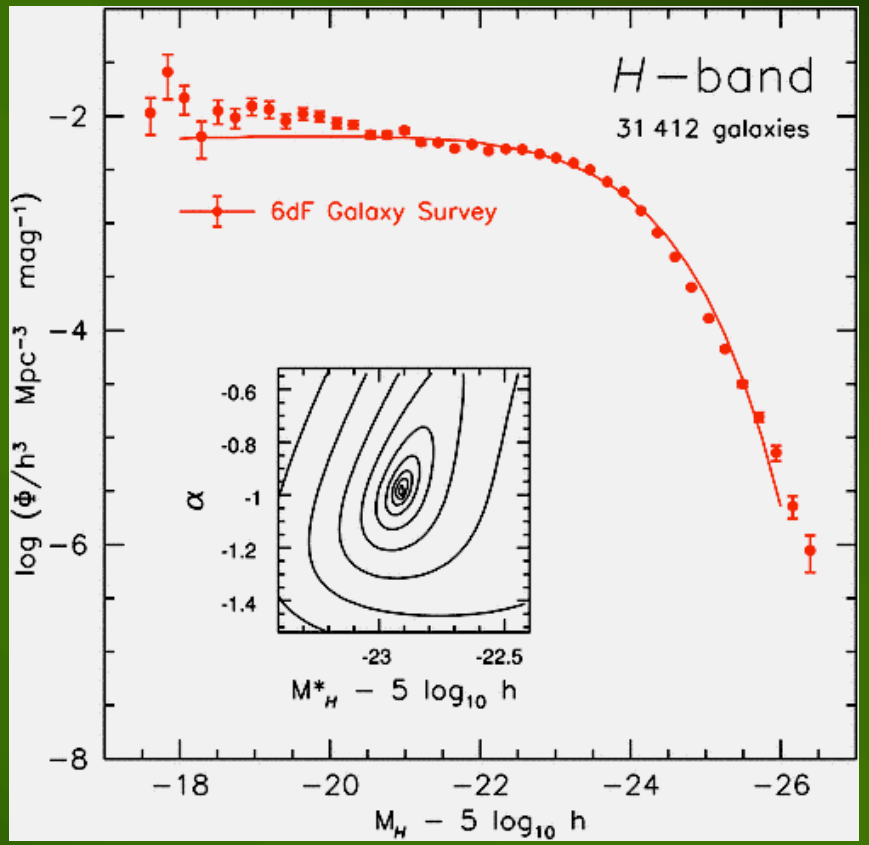


# *Luminosity Functions in J and H*

Flat faint end in both cases

Agreement with 2MASS+2dF in J

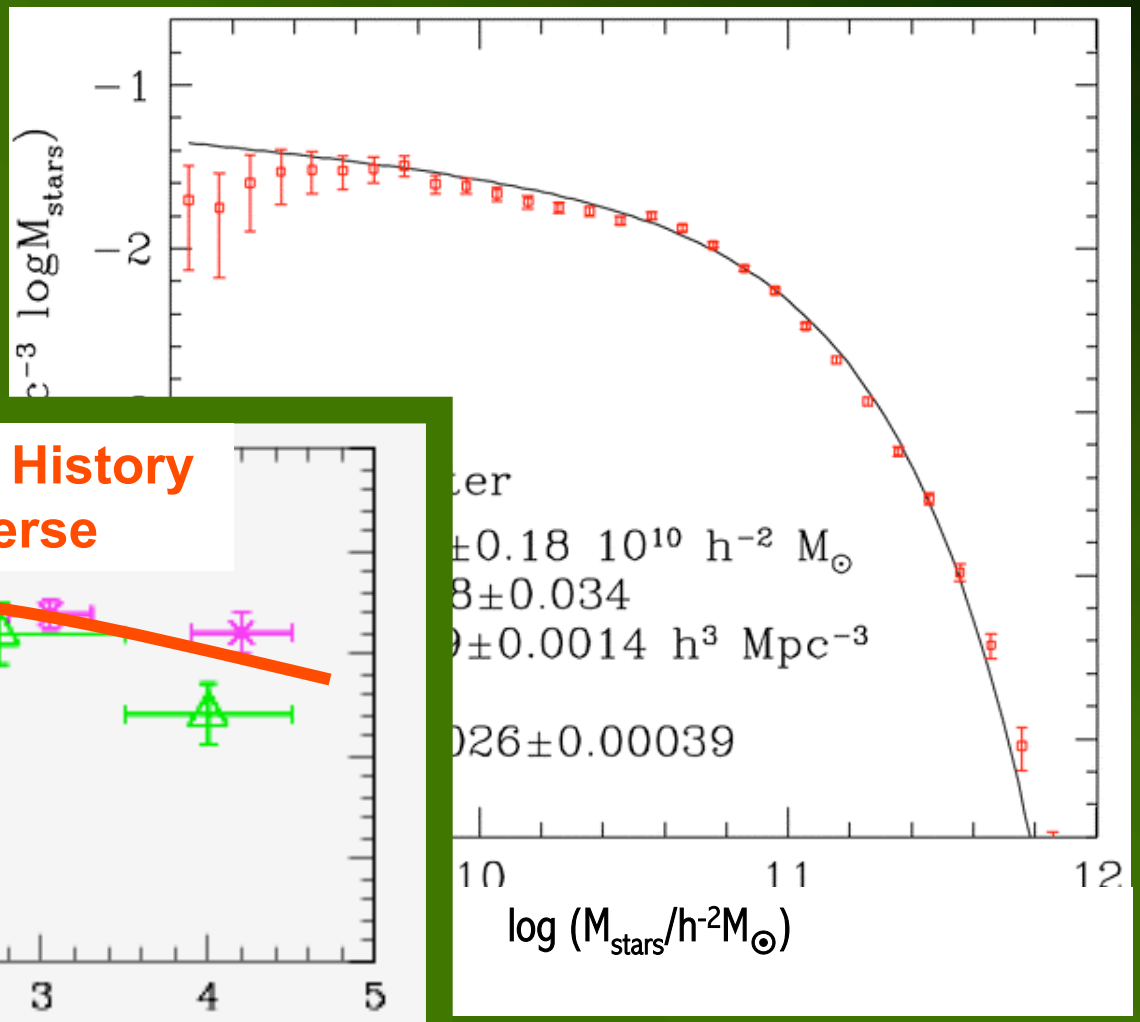


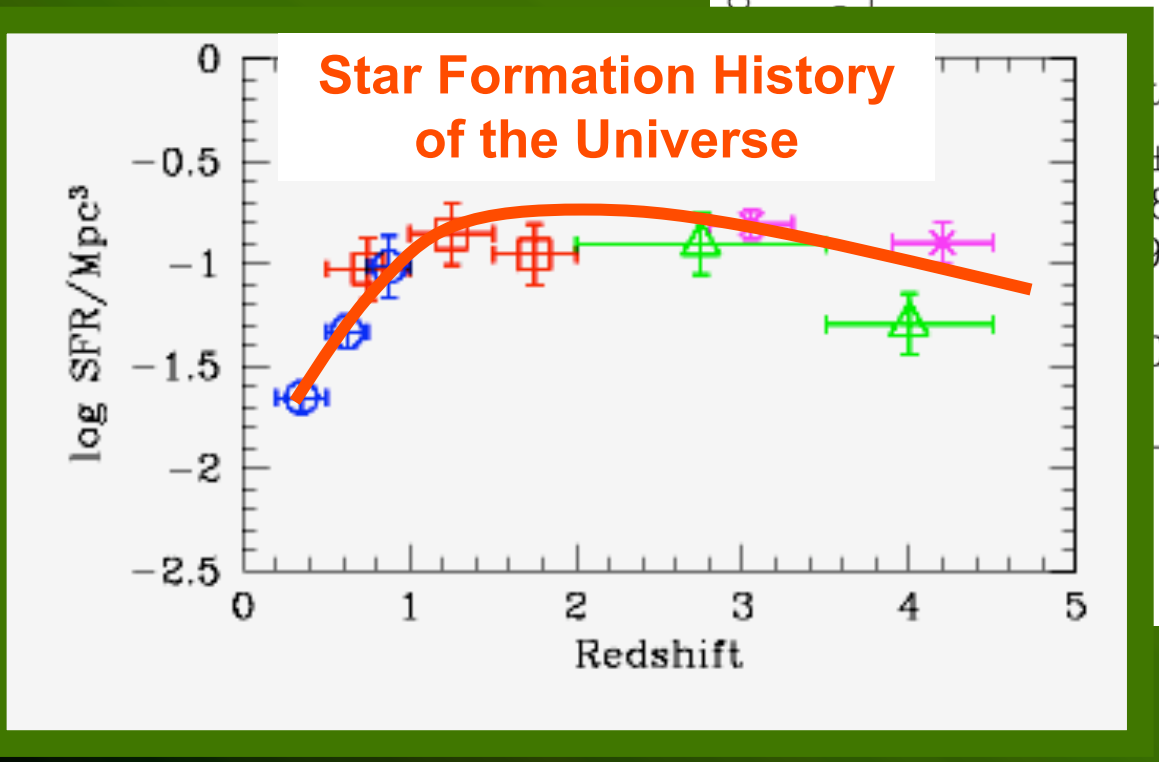



# Stellar Mass Function

Cole et al (2001)

- NIR luminosity is very closely correlated with total stellar mass, and so yields the stellar mass function.



# *6dFGS First Data Release:* March 2004

- **Jan 2002 – July 2003** data made public → 52048 spectra; 46474 unique redshifts; 524 fields across central southern declinations
- **Survey Paper**: Jones et al (2004) → astro-ph/0403501
- **6dFGS Home** → http://www.mso.anu.edu.au/6dFGS
- **6dFGS Database**