

Galaxy And Mass Assembly

Simon Driver (Univ. St Andrews), Andrew Hopkins (USyd) and the GAMA team

- What is GAMA?
- Overlap with ASKAP/DEEP?
- GAMA update:
- How to get involved:

GAMA: Team Affiliations and Structure

WORKING GROUPS/HEADS

SCIENCE
Peacock
(ROE)

CATS
Baldry
(LJMU)

DATABASE
Liske
(ESO)

OBS
Driver
(PI, St And)

MOCKS
Norberg
(ROE)

RADIO
Hopkins
(USyd)

SPEC. PIPE.
Loveday
(Sussex)

IMAGE. PIPE.
Bamford
(Nott.)

Bland-Haw'n (U.Syd)
Cameron (StA)
Conselice (Nott'hm)
Couch (Swin.)
Croom (U.Syd)
Cross (ROE)
Frenk (Durham)
Graham (Swin.)
Jones (AAO)

TEAM MEMBERS

Kuijken (Leiden)
Lahav (UCL)
Oliver (Sussex)
Nichol (Ports.)
Phillipps (Bristol)
Popescu (UCLan)
Proctor (Swin)
Sharp (AAO)
Staveley-Smith (UWA)

Sutherland (Camb.)
Tuffs (MPIK)
van Kampen (Innsbruck)
Warren (Imperial)
4 PDRAs pending
4 PhD students

TEAM AFFILIATIONS:

UKIRT/LAS, VST/KIDS, VISTA/VIKING, HERSCHEL-ATLAS, DURHAM ICC

WEBSITE:

<http://www.eso.org/~jliske/gama/>

GAMA I: Contributing Facilities

UKIRT/LAS

14 nights



VISTA/VIKING

30 nights



VST/KIDS

48 nights



AAT/AAO

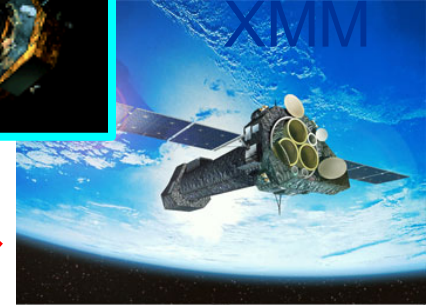
66 nights



HERSCHEL



150hrs



GEMINI



ASKAP



GAMA

OPTICAL

NEAR-IR

z, spectra

Far-IR

X-ray

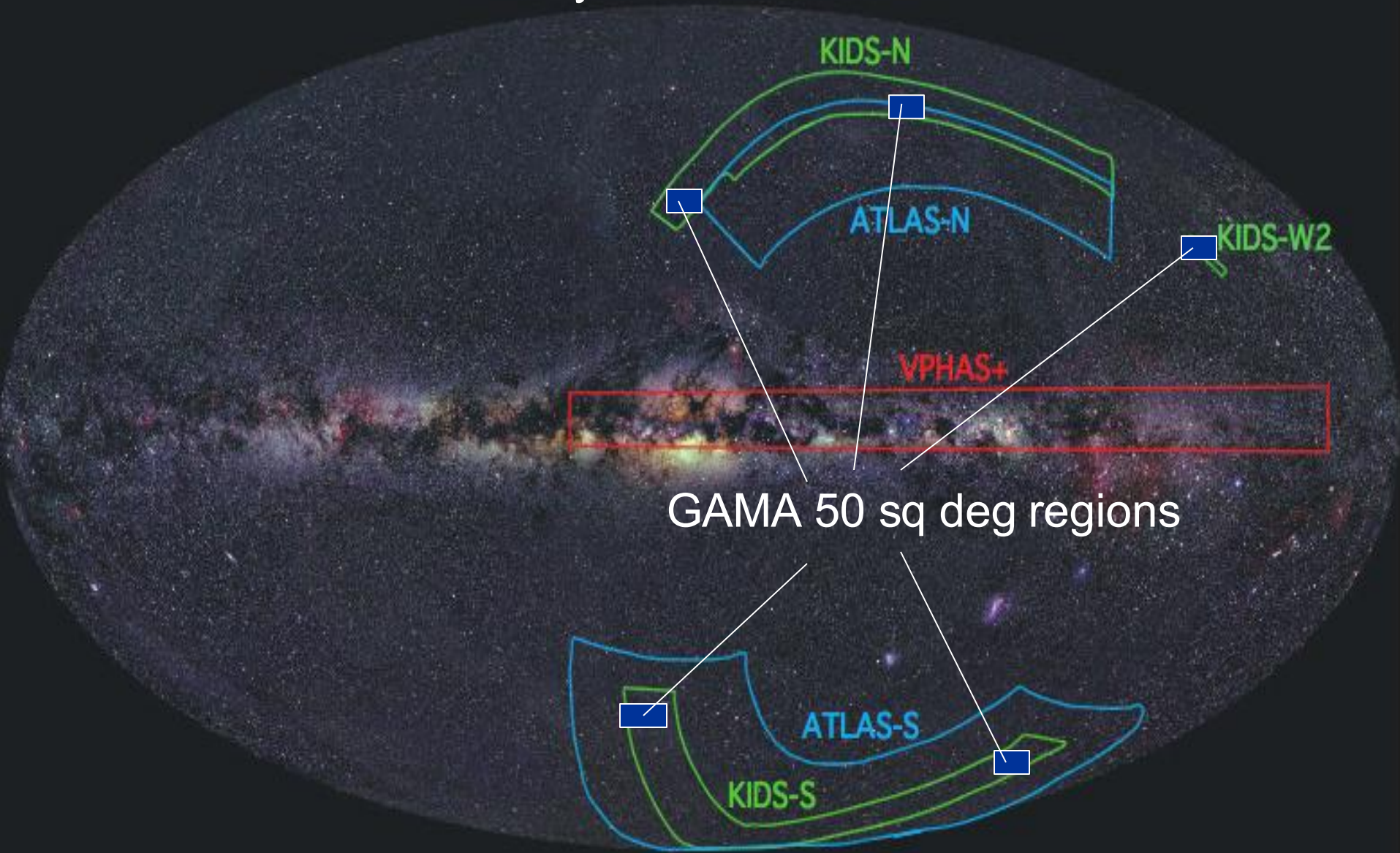
z, LSBGs

HI

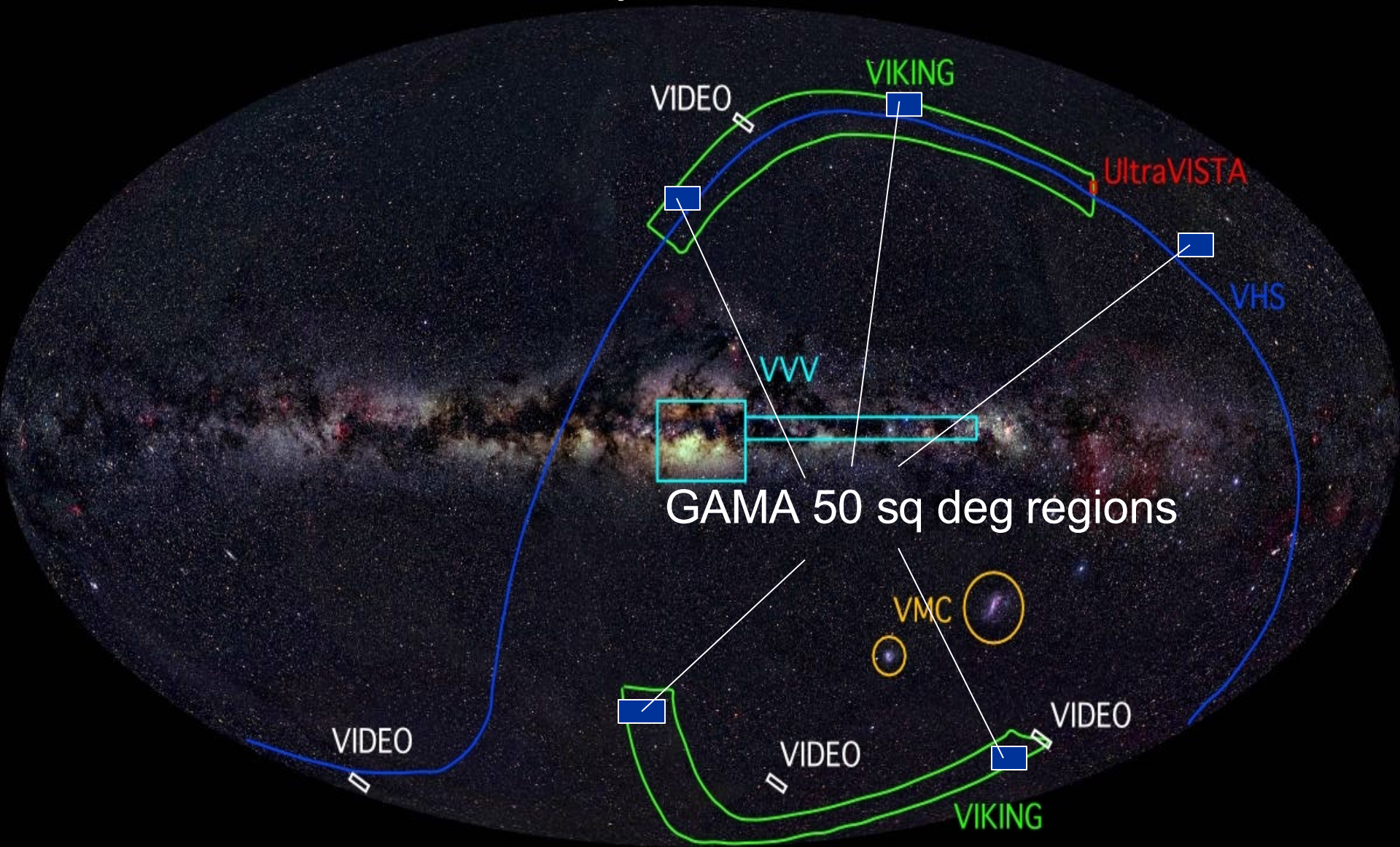
SCIENCE



Planned VST surveys to commence March 2009

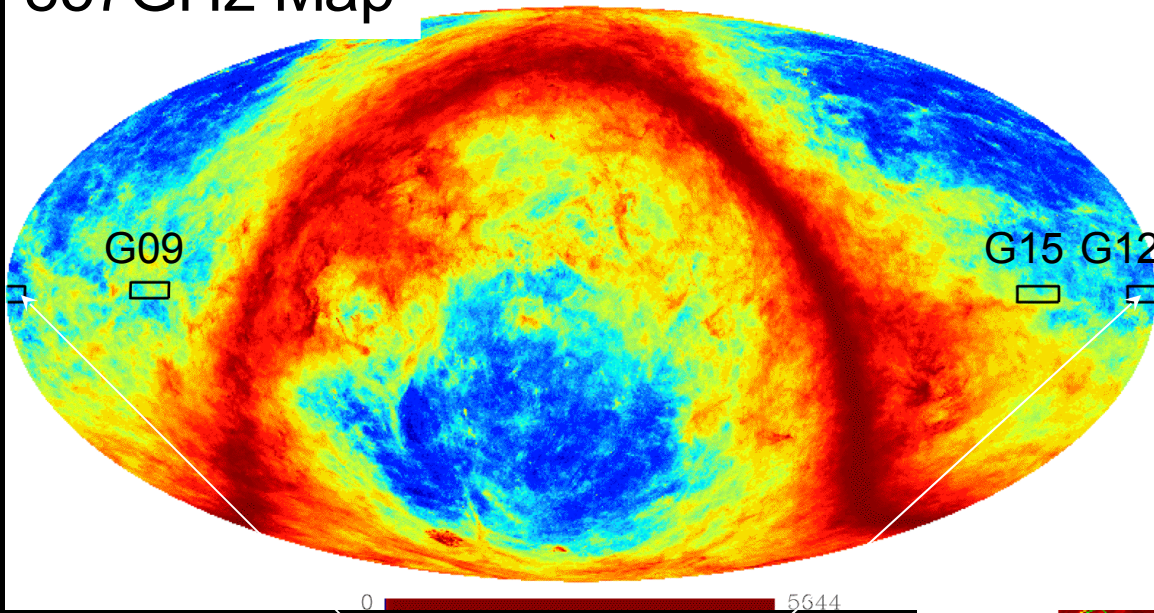


Planned VISTA surveys to commence March 2009



857GHz Map

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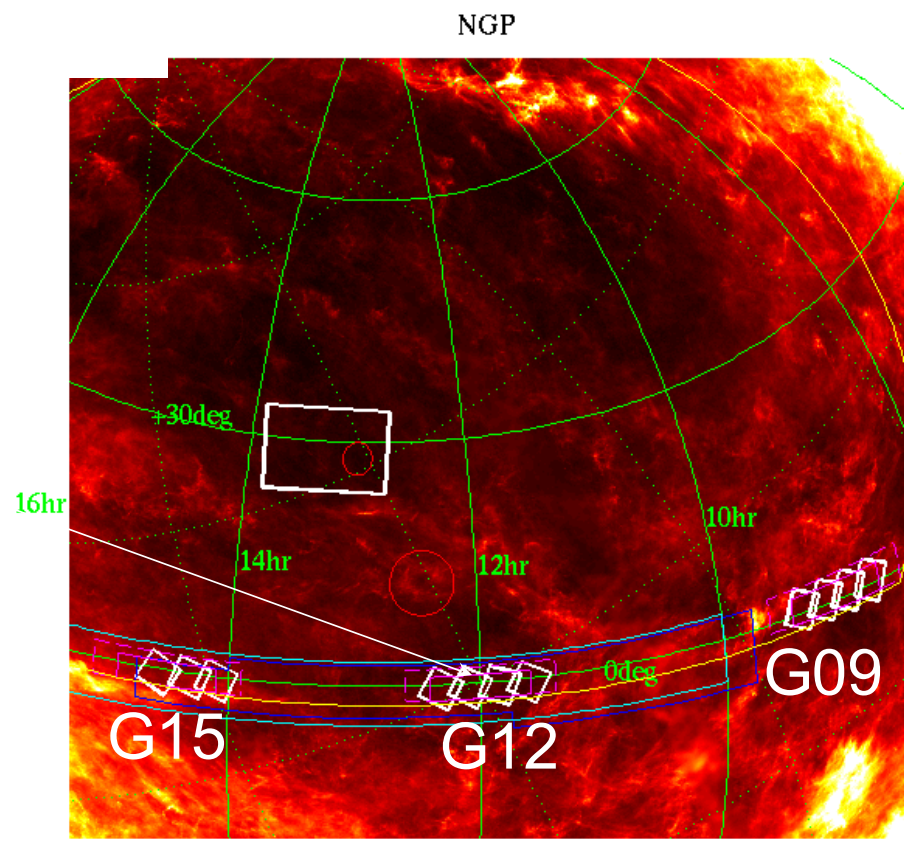






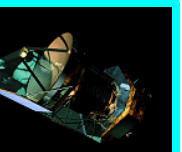
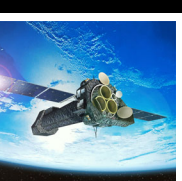

HERSCHEL-ATLAS SURVEY

Launch:
Oct-Dec 2008

GAMA 12hr REGION

GAMA12 region avoids Galactic Cirrus

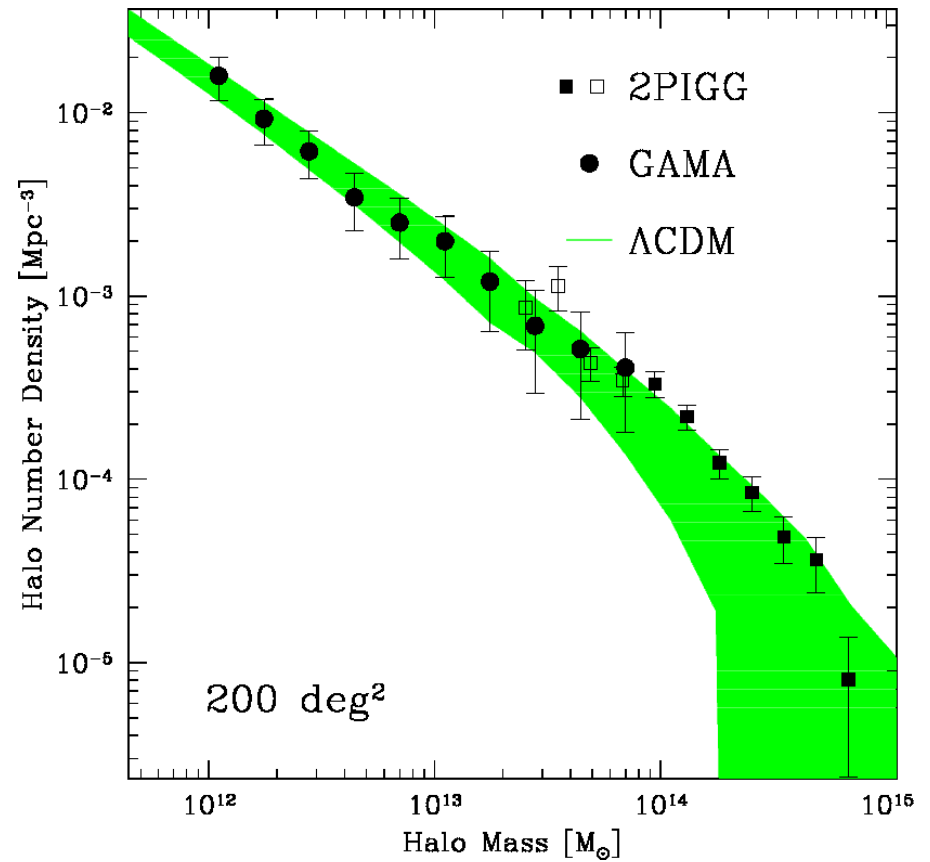
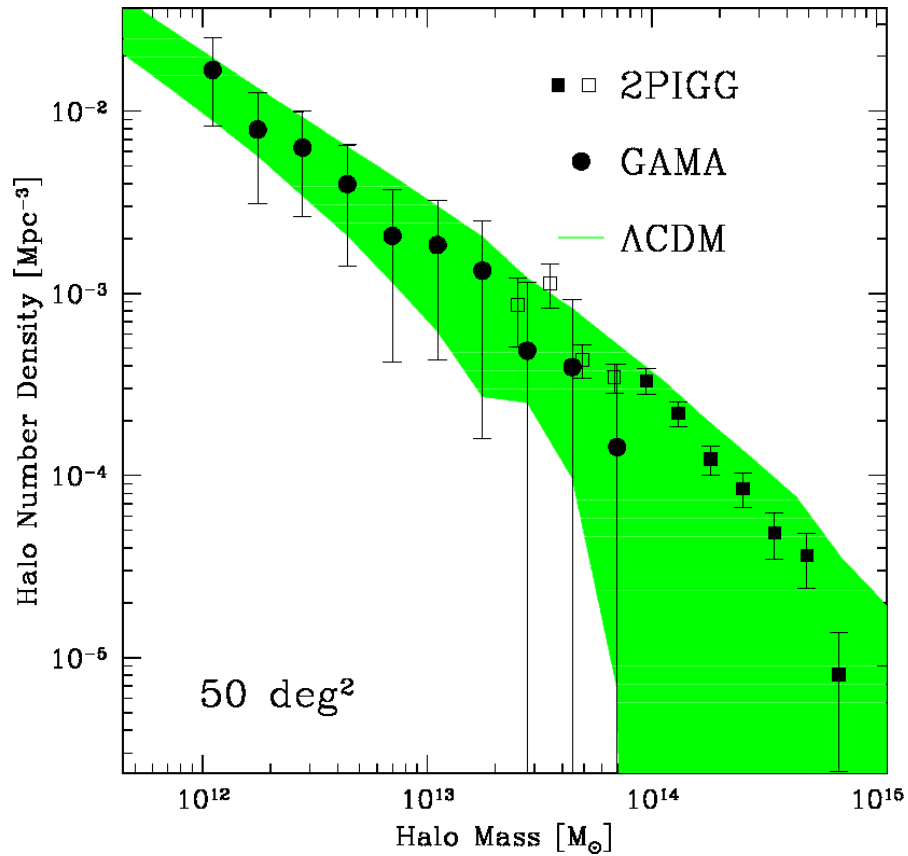


GAMA: Facility	Wavelength	Time (on GAMA)	Depth (5 σ AB)	Status
	AAT/AAO GAMA	Spectra	165nights $r < 19.8$, $K=17.0$ mag	in progress
	UKIRT LAS	Near-IR (YJHK)	35nights $Y=22.0$, $J=20.9$, $H=20.2$, $K=20.4$ in prog.	
	VISTA VIKING	Near-IR (YJHK)	75nights $Z=23.8$, $Y=23.0$, $J=22.8$, $K=21.9$ Mar 09	
	VST VST	Optical (ugriz)	120nights $u=24.8$, $g=25.4$, $r=25.2$, $i=24.2$ Mar 09	
	HERSCHEL ATLAS	Far-IR	200hours 100, 160, 250, 350, 500 microns 67, 94, 45, 62, 53 mJy	Mar 09
	XMM	X-Ray Meeting in Paris April 08 to discuss 100 sq deg survey		?
	ASKAP DEEP	Meeting in Perth (April 08) to discuss SKA Pathfinders		?

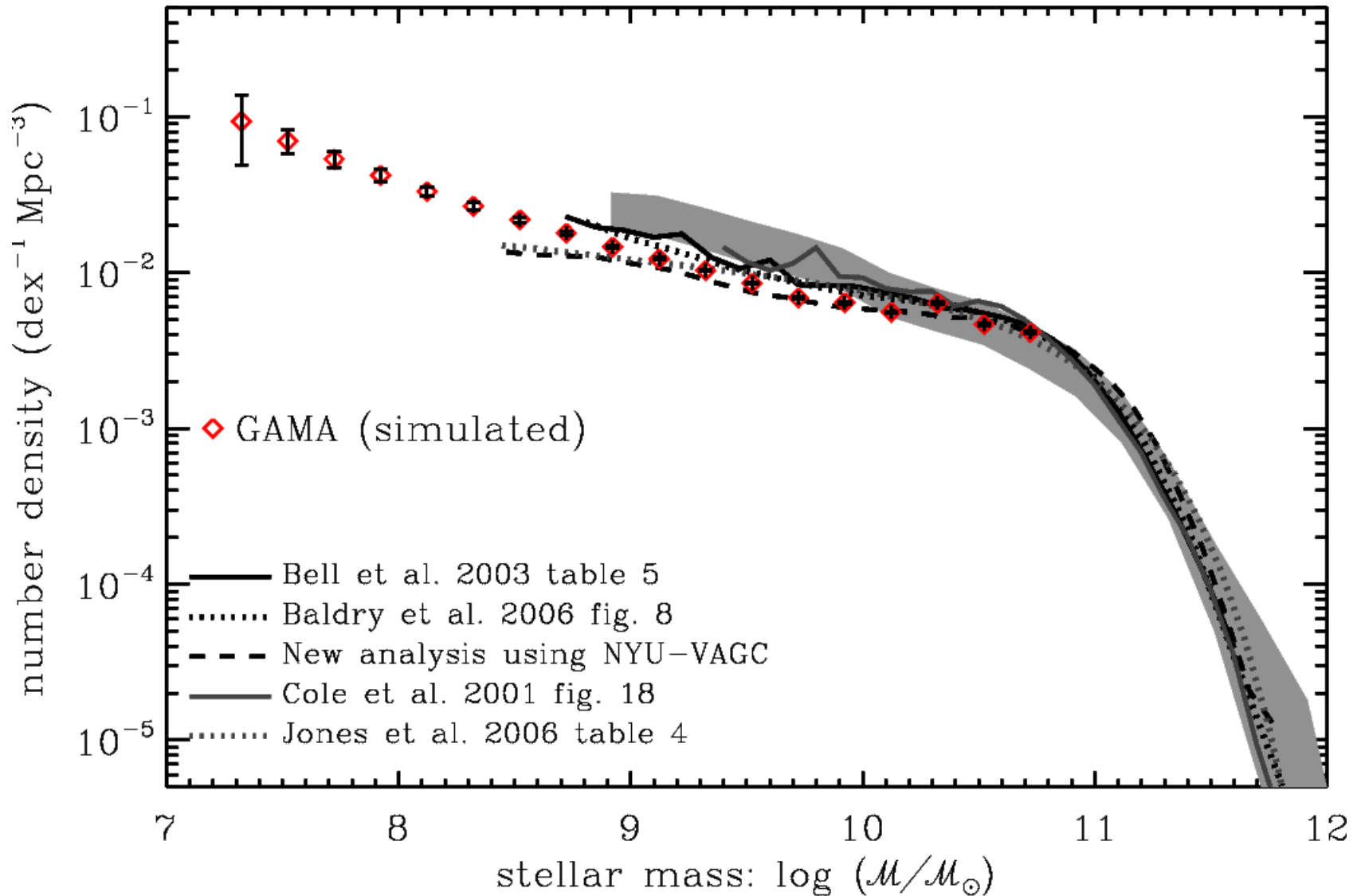
GAMA: Science

- 250 sq deg. (5x50 sq deg. chunks each 4x12.5deg), 250k galaxies $z < 0.4$
- General:
 - **A study of structure on 1kpc-1Mpc scales**, where baryon physics is critical
 - Tracing how mass (stars, dust, gas) follows light
 - Provide a definitive low redshift benchmark for the JWST and the SKA
- Specific goals:
 - **the CDM Halo mass function** from group velocity dispersions
 - the stellar mass function into the dwarf regime
 - the HI mass function and associate gas/stellar mass ratios
 - the baryonic mass function and baryon to dark matter ratios
 - determine the galaxy merger rates as a function of mass ratio
 - individual baryon budget and energy output of 250k galaxies
- Provision of a SDSS/2MASS like public database incorporating:
 - Optical: ugri (VST), spectra (AAT)
 - Near-IR: ZYJHK (VISTA)
 - Far-IR: 100-500 microns (HERSCHEL)
 - **Radio: 21cm (ASKAP/DEEP)**

The CDM halo mass fn



The GAMA Stellar Mass fn

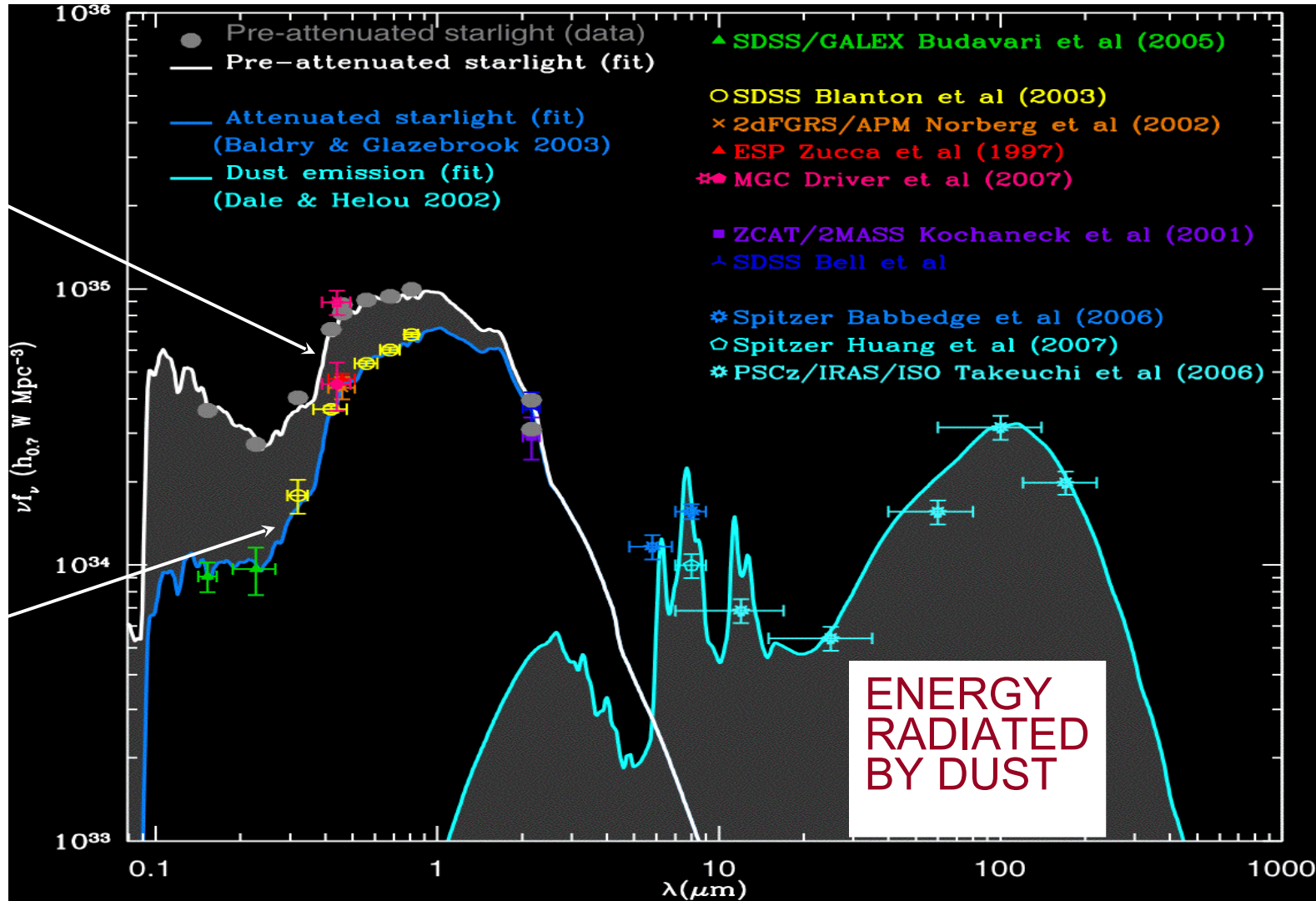


Energy Output

GAMA will measure the individual energy output from 0.3 to 500 micron for ~250k galaxies (c.f. Driver et al. 2008)

ENERGY PRODUCED BY STARS

ENERGY WHICH ESCAPES INTO IGM

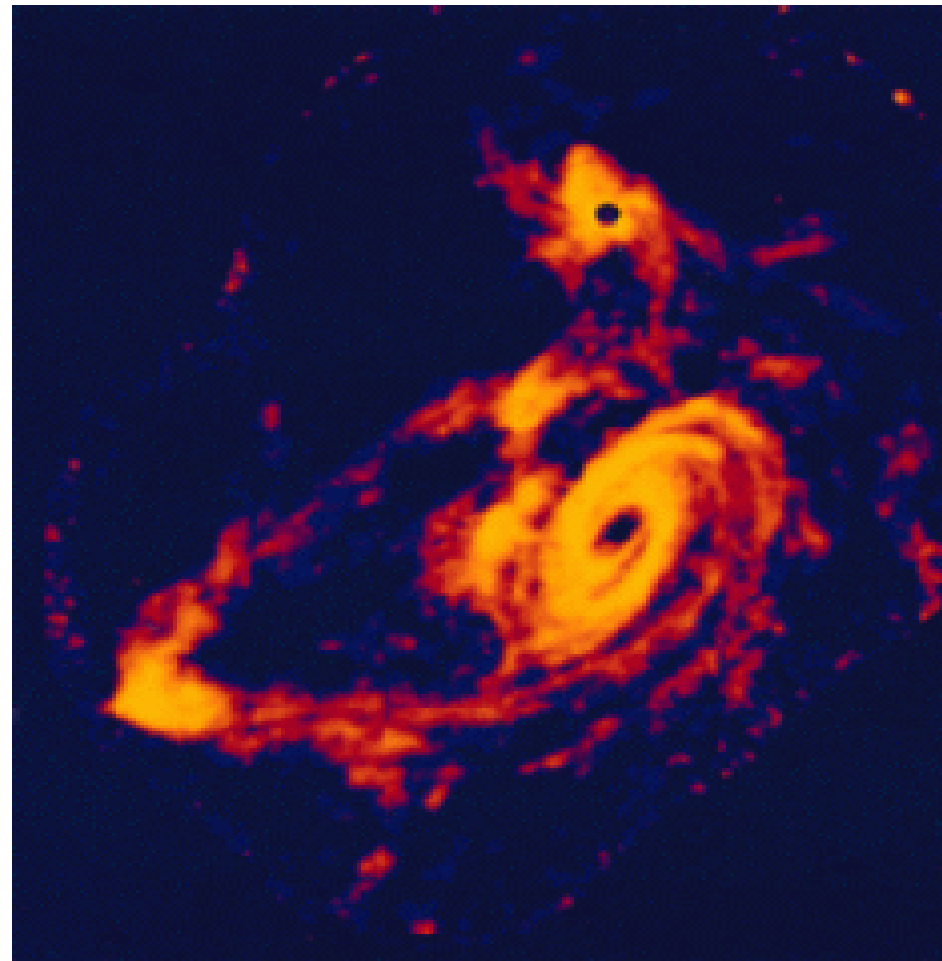


To fully understand galaxy form./evol we need to understand stars, dust AND gas: ==> GAMA+ASKAP/DEEP

Optical image
(Stars)



21cm image
(Gas)



ASKAP/DEEP with a 10" beam
will be unable to resolve all HI
complexes, spectroscopic
confirmation will be important
and optical-far-IR data useful

$z=0.20213$

$z=0.16586$

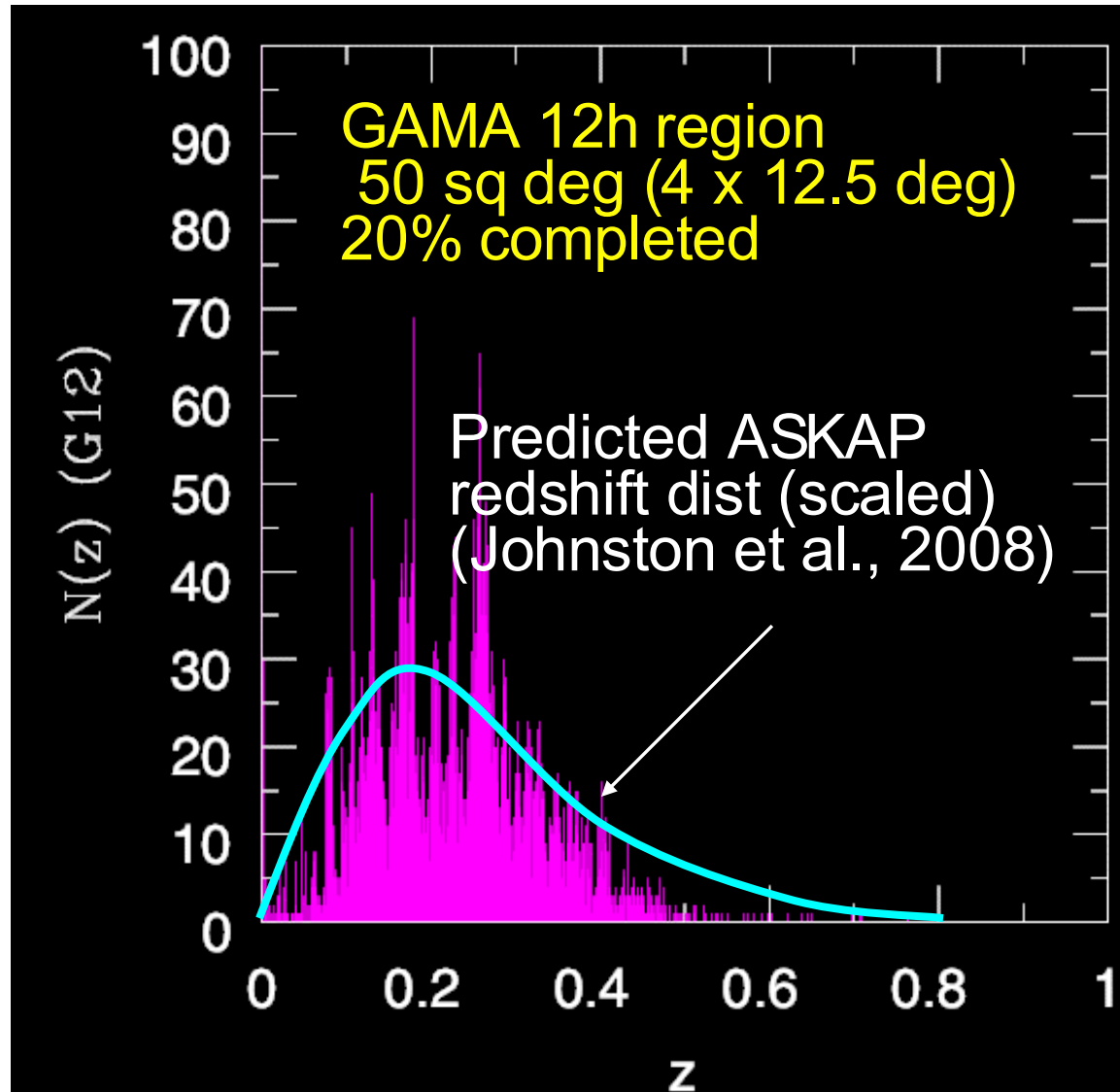
$z=0.20311$

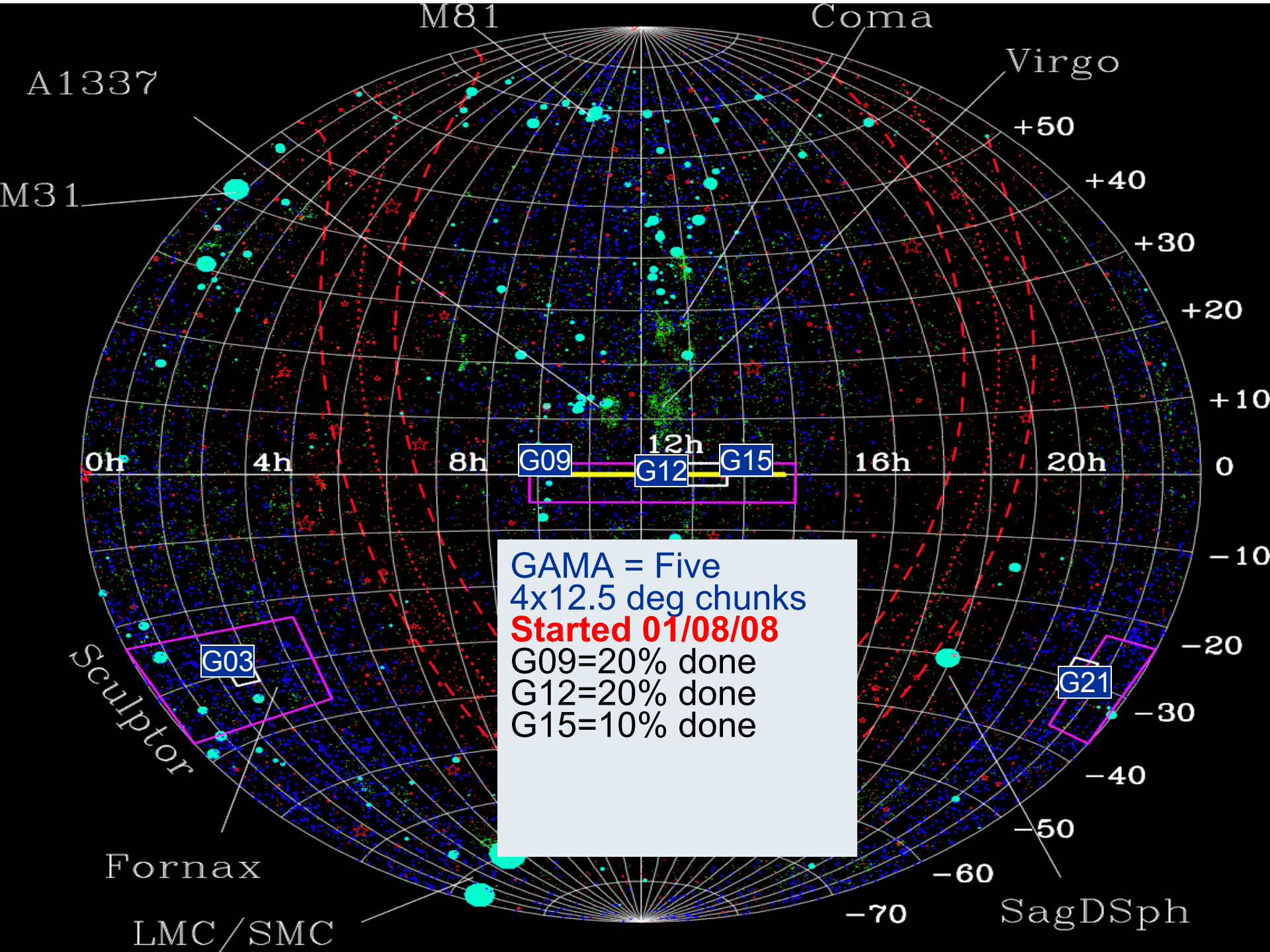
MGC FIELD
062_2
 $b_{\text{lim}} \sim 24 \text{ mag}$

10 arcmin

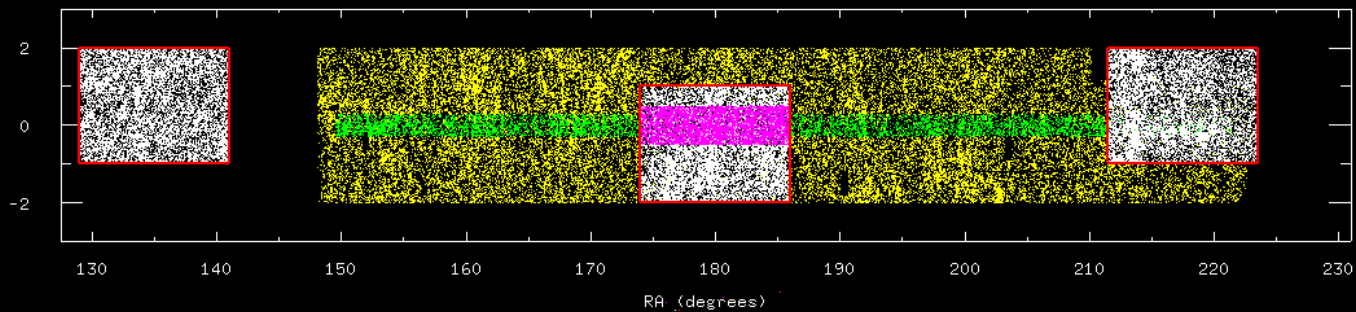
GAMA12h proposed for ASKAP Deep Observation

- GAMA depth and area well matched to the proposed ASKAP deep field.



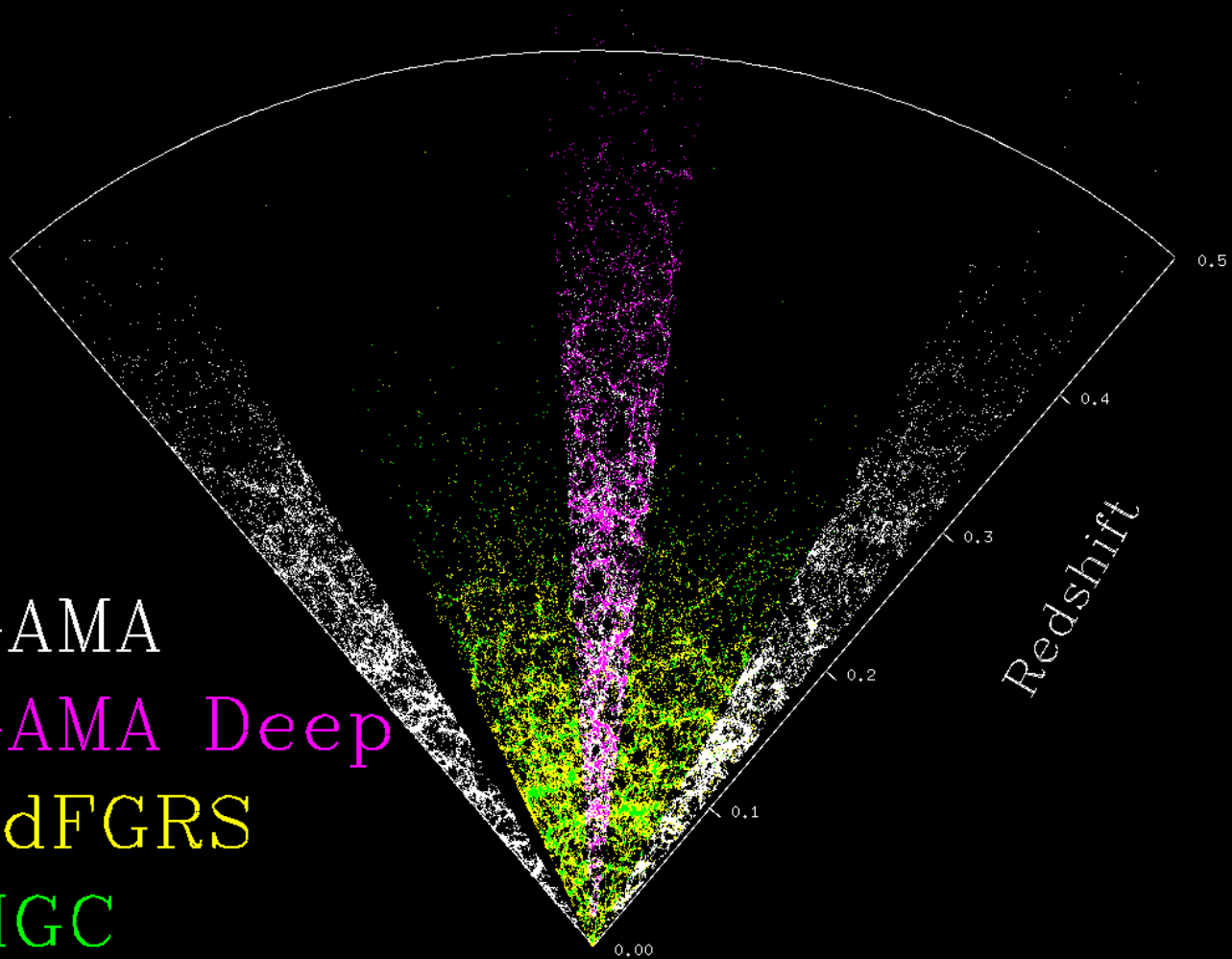


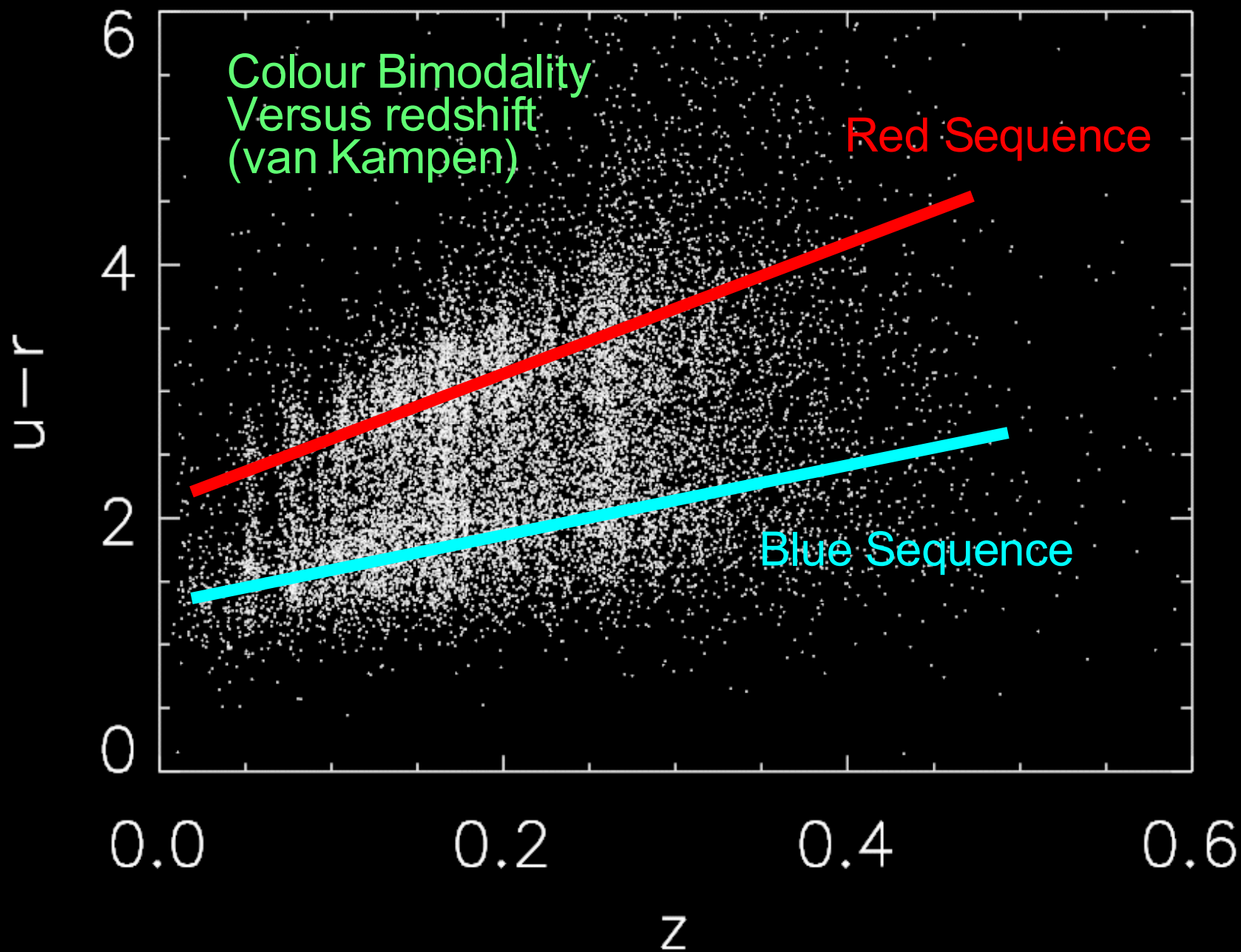
Dec (degrees)



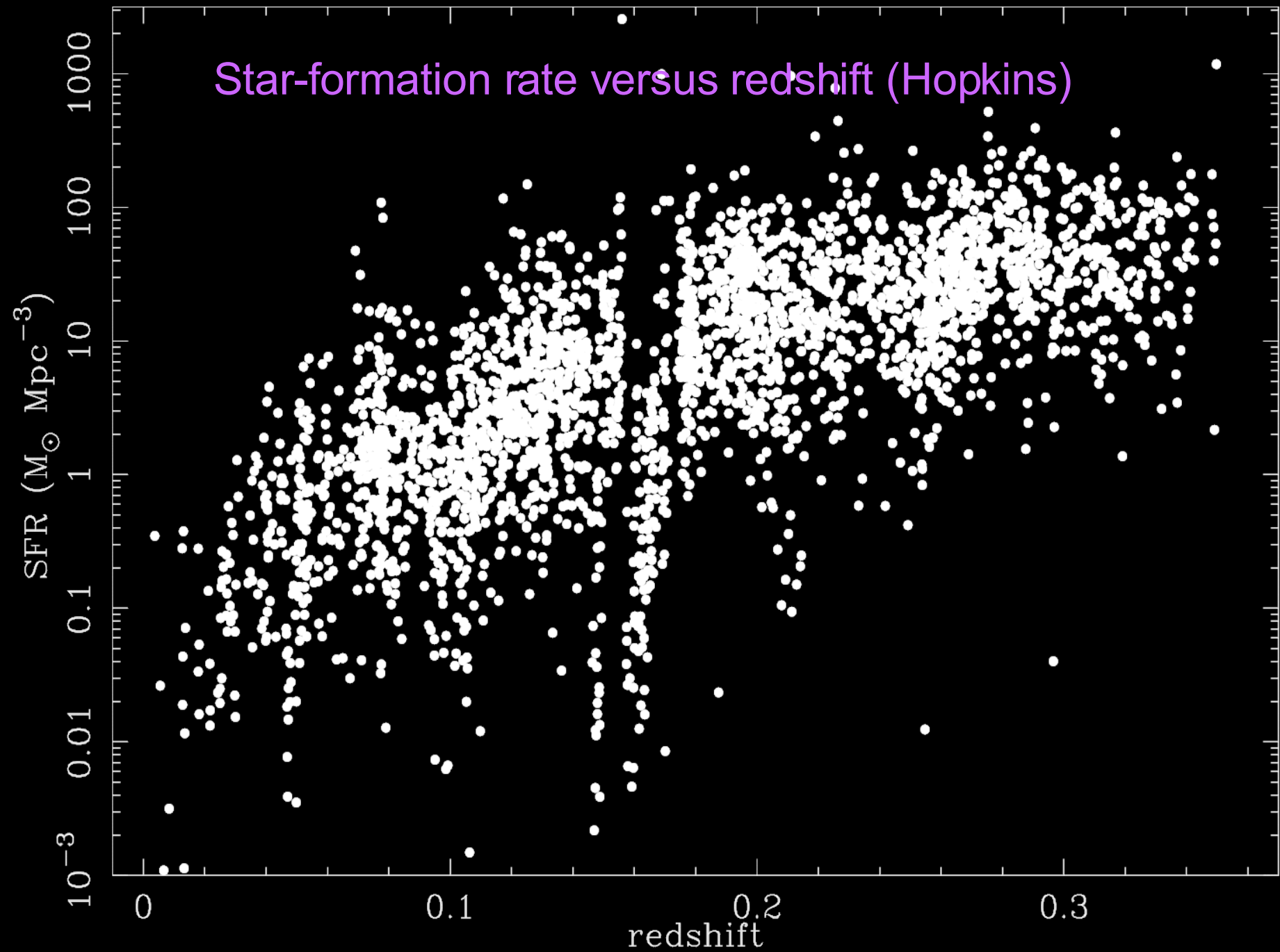
GAMA
CONE
PLOT
18/03/08

GAMA
GAMA Deep
2dFGRS
MGC



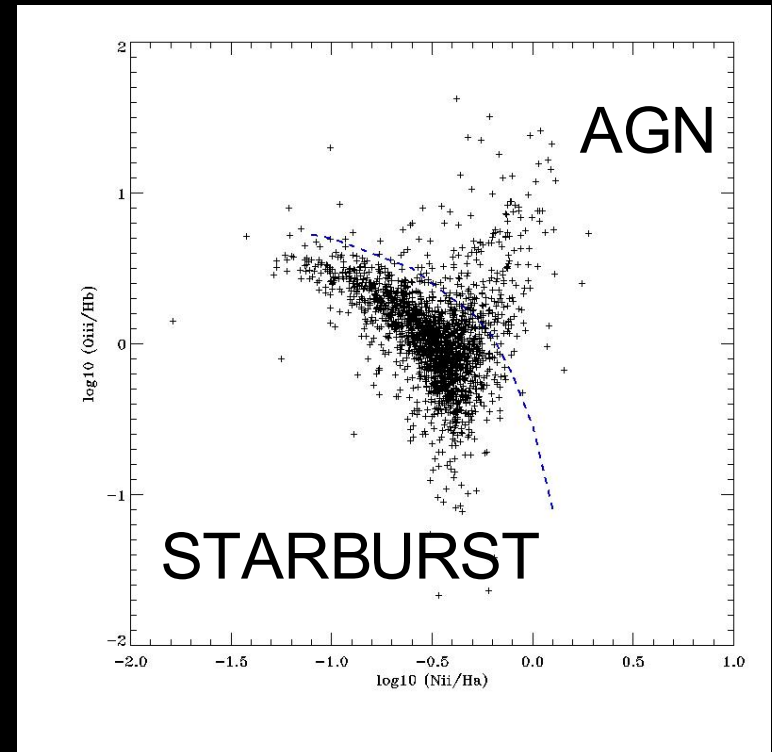
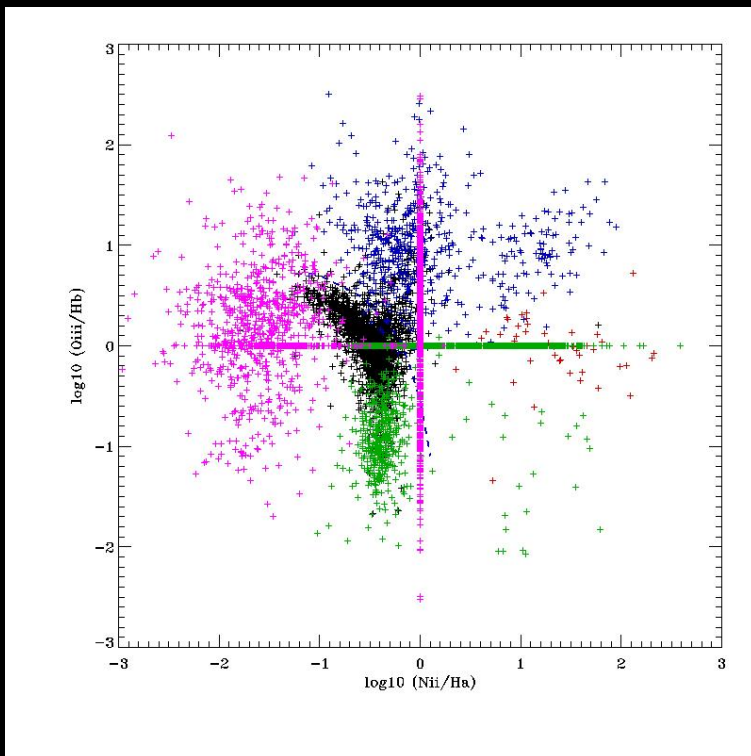


Star-formation rate versus redshift (Hopkins)



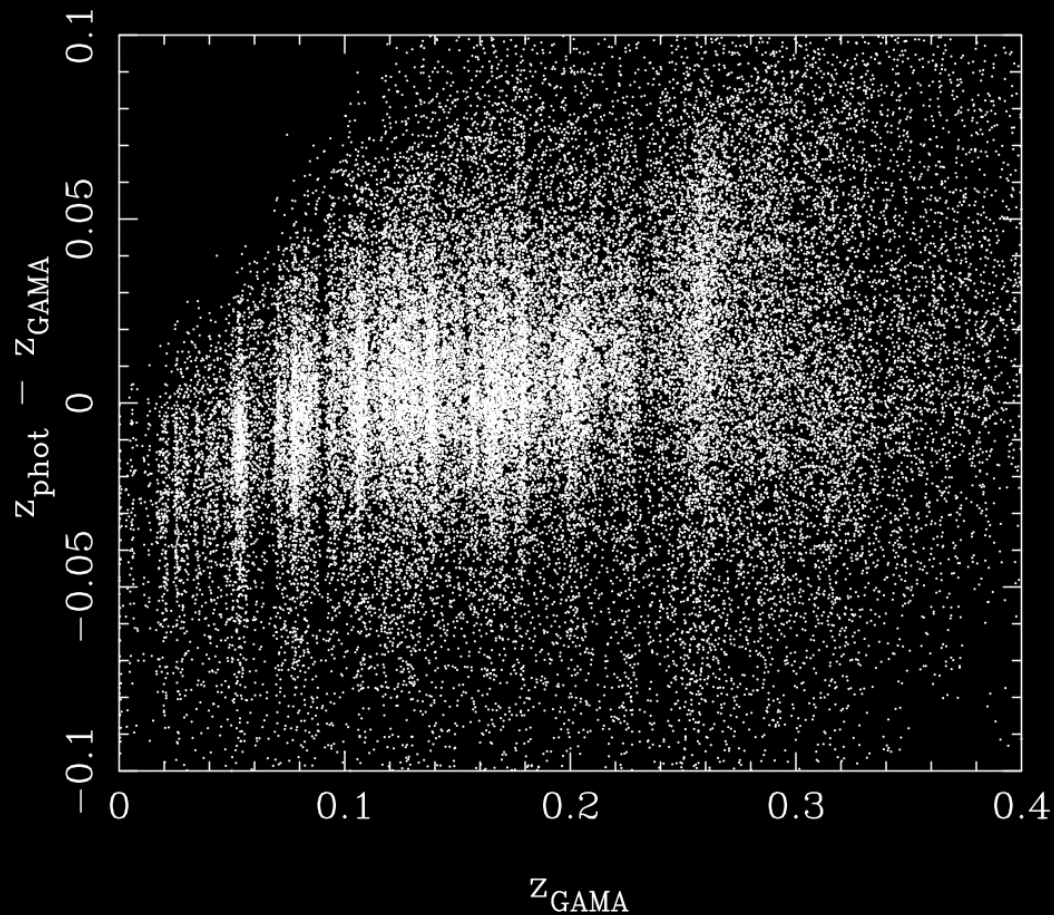
GAMA Y1 Science: AGN

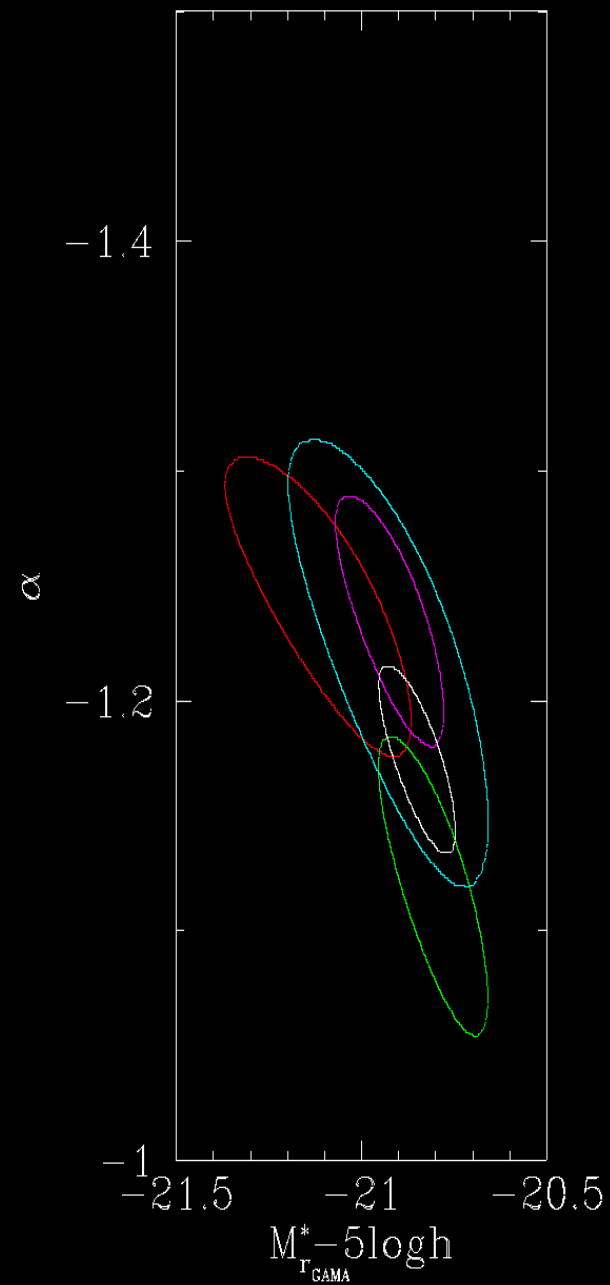
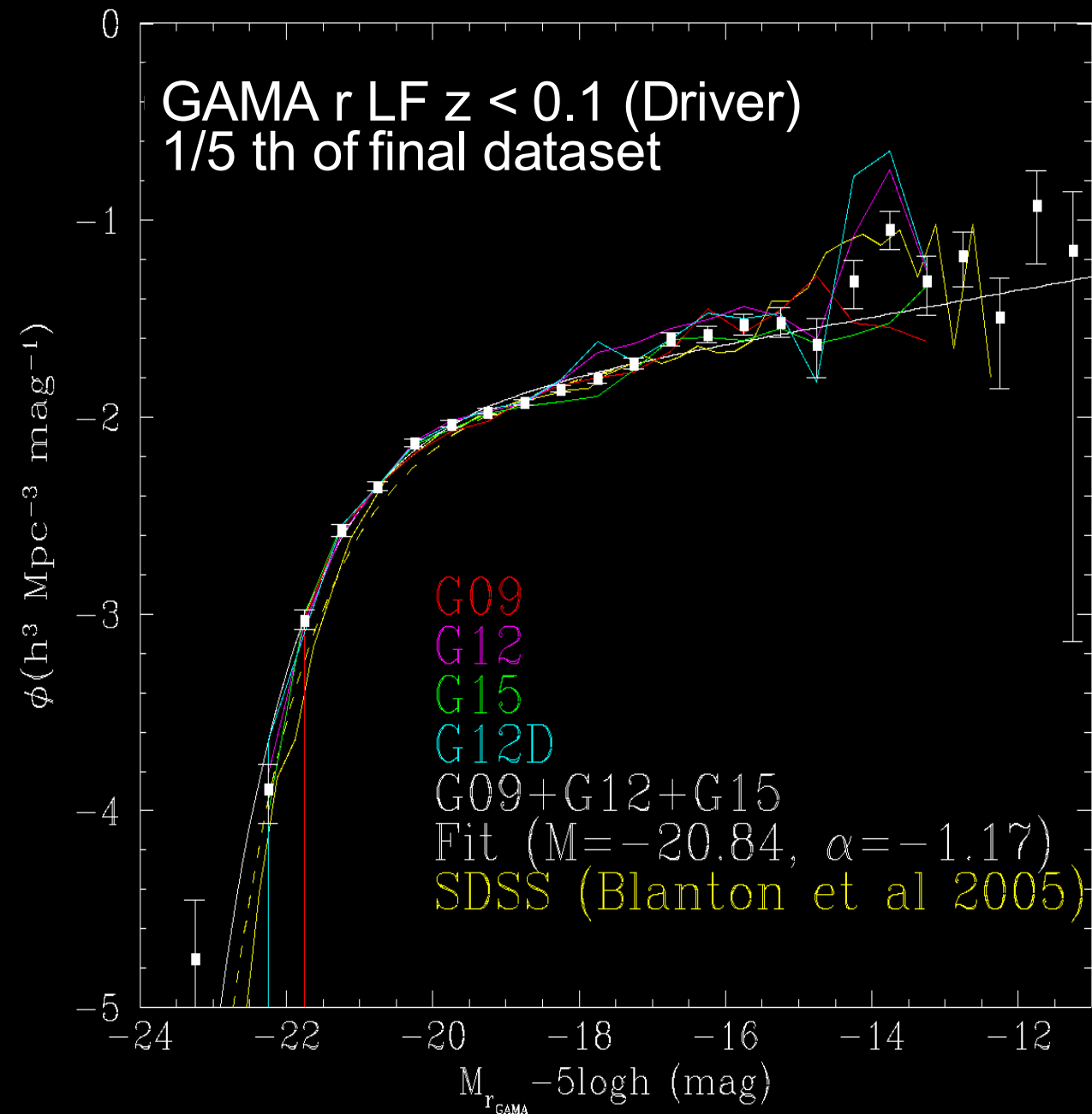
- BPT diagram (Sharp)



GAMA Yr1 Science: Calibration of photo-z codes

SDSS photo-z's versus GAMA (Peacock)





Galaxy And Mass Assembly

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- What is GAMA?
 - New generation SDSS scale survey: 250 sq deg, 2mag deeper than SDSS
 - Fully multi-wavelength: AAT, VST, VISTA, HERSCHEL (XMM, SCUBA II, ASKAP)
 - A comprehensive study of matter and energy on 1Mpc to 1kpc scales $z < 0.4$
- Overlap with ASKAP/DEEP?
 - Superb overlap with ASKAP field-of-view
 - Comparable $n(z)$ distributions
 - Will spectroscopically resolve ASKAPs 10" beam
 - Will provide: optical, near-IR, far-IR, and spectra for galaxies in ASKAP/DEEP
- GAMA update:
 - GAMA commenced March 1st 2008
 - 35,000 redshifts measured in two weeks with AAT/AA (95% Completeness)
 - One more weeks observations currently in progress
 - Quick look science: Local LF, bimodality, BPT, SFH, Photo-z calibration....
- How you can get involved:
 - Annual data release (December 2008)
 - Website: <http://www.st-and.ac.uk/~jliske/gama/>
 - Contact: spd3@st-and.ac.uk or gama_panel@eso.org