Observations

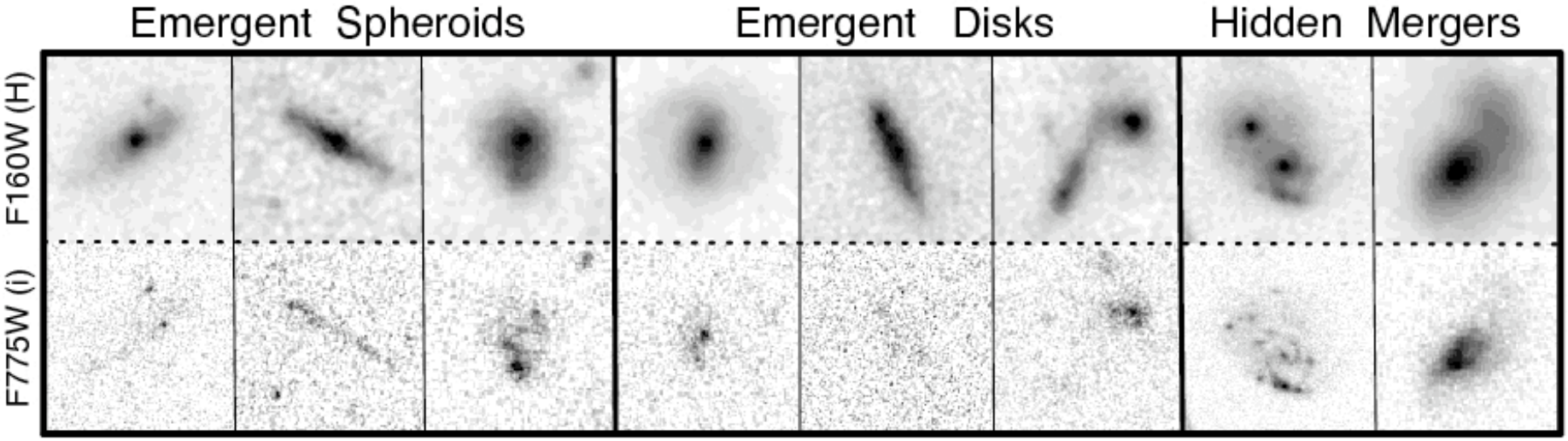
The five fields targeted are those in the SEDS Warm Spitzer mission.
We argued that these fields give unique stellar masses for z > 2.5.

Four Wide fields: 9' x 30' 4 x 15 WFC3 tiles 60 tiles each
120 orbits each 480 orbits total
- COSMOS, EGS, ECDFS, UDS/UKISS
- 2/3 orbit J and 4/3 orbit H

Two Deep Fields: 6 x 12' 3 x 6 WFC3 tiles 18 tiles each
270 orbits each 480 orbits total
- GOODS-N and GOODS-S
- 5 orbits each of Y, J, H

GOODS-S field is embedded within ECDFS and overlaps the ERS2 data, saving orbits and driving the total down to **960 orbits.**

What WFC3-IR can show: greater depth, new structure



Four orbits of ACS i-band vs. 2 orbits of WFC3-IR H-band

Depths

Point source depths (5-sigma):

- Wide: summed J+H goes to 27.4 AB mag
  - This is ~L* at z = 8
  - Mass-limited to 10^9 $M_\odot$ at z = 2
- Deep: each 5-orbit sequence of Y, J, H goes to 27.9 AB
  - This is ~0.5L* at z = 8
  - Sum of all 15 orbits: 28.5 AB mag -->> 0.3L*
  - Approx mass-limited to 10^9 $M_\odot$ at z = 7-8

Reliable structural parameters:

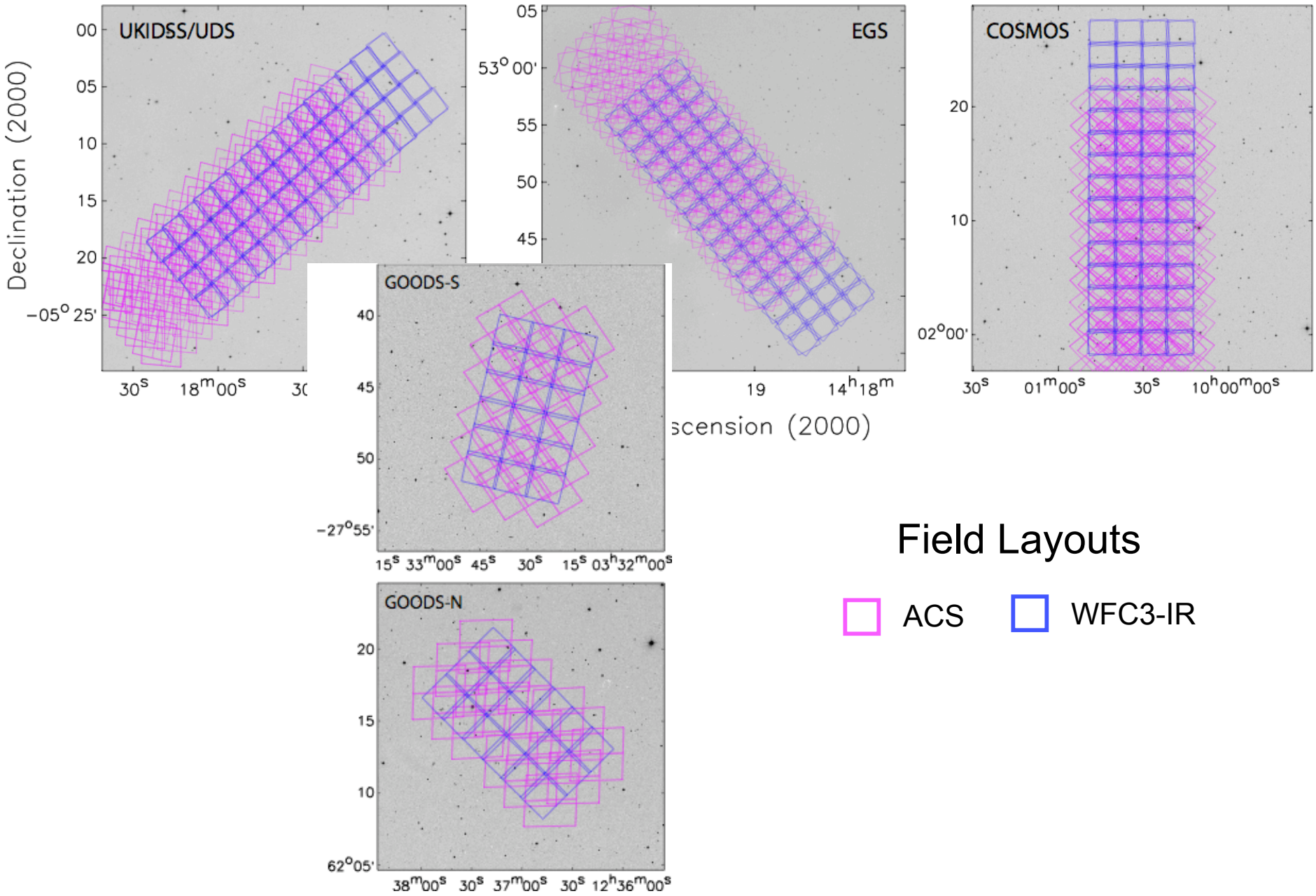
- Wide: H = 24 AB (3×10^{10} $M_\odot$ at z = 2)
- Deep: H = 24.5 AB (10^{10} $M_\odot$ at z = 2). Catches even faintest galaxies migrating to red sequence

Science goals

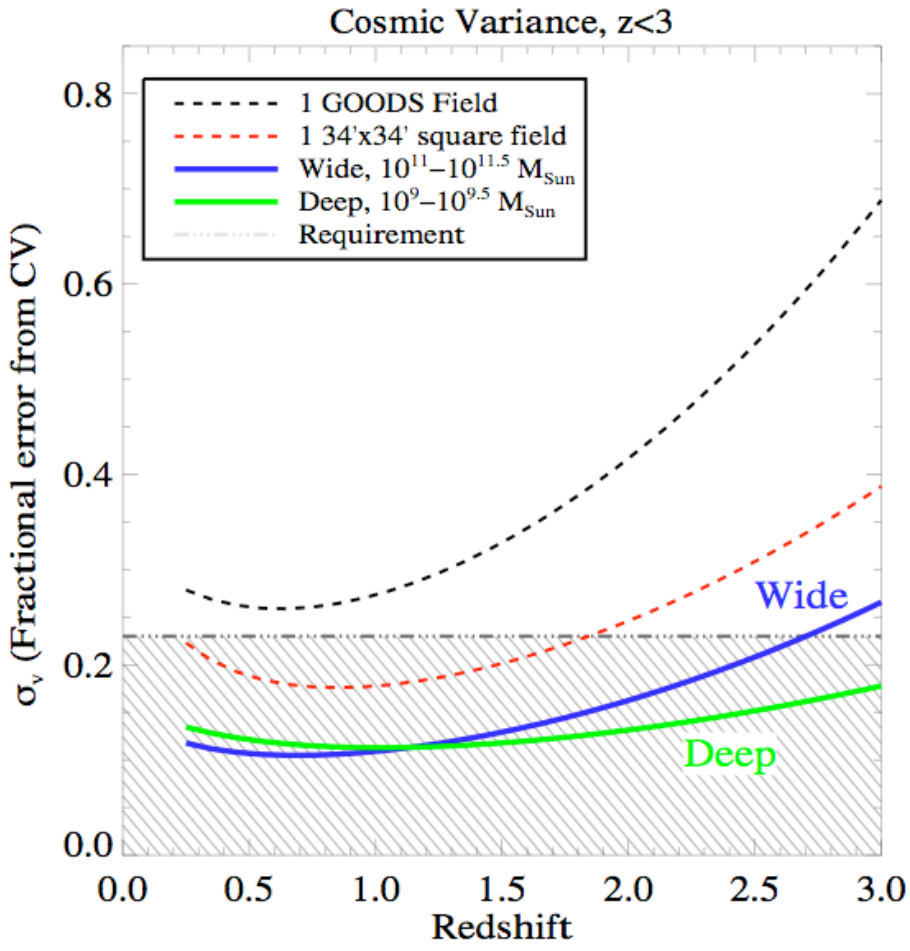
Part I, z ~ 2: Straddling the Balmer break: Galactic metamorphosis at z ~ 2
- Disk settling and star formation at z ~ 2
- The emergence of massive spheroids at z ~ 2
- The role of AGN at the peak of the QSO era

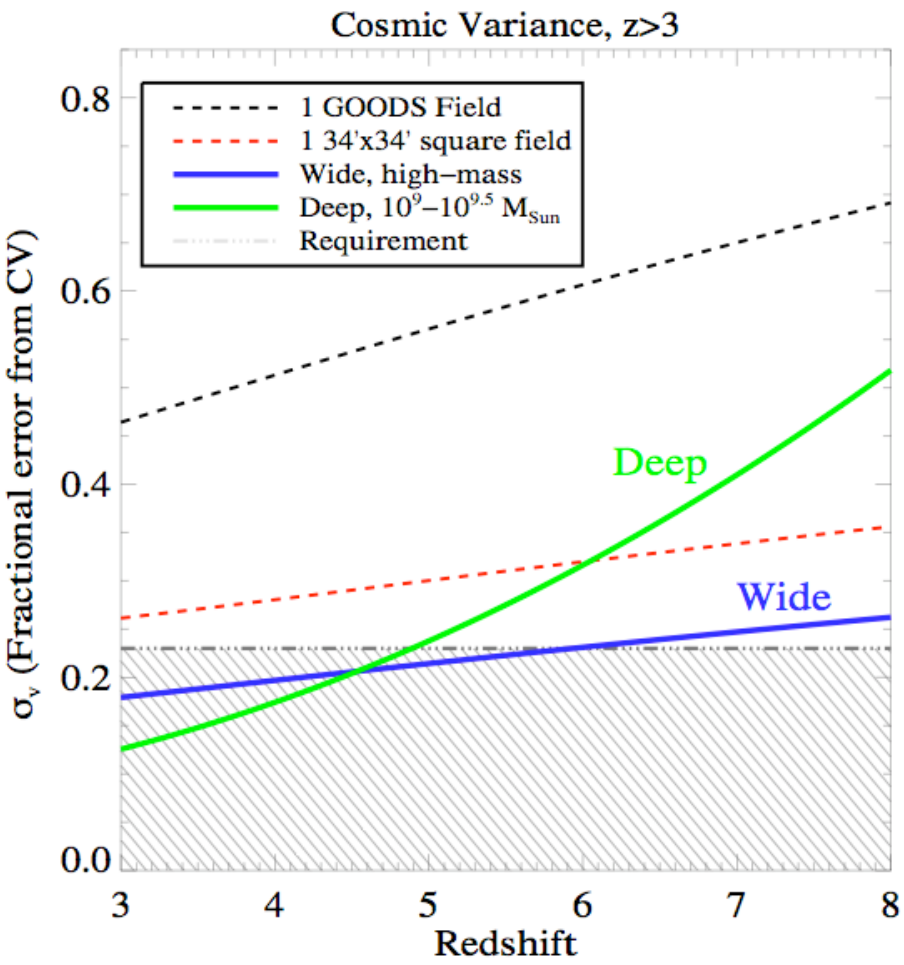
Part II, High-z: Straddling the Lyman break: "Infant" galaxies to z ~ 8
- Star-formation rates down to 0.3L* at z ~ 8
- Stellar masses and star-formation histories to z ~ 8
- High-z AGN and early BH growth

Part III, Supernova discovery:
- Two orbits in Wide permit two visits to discover supernovae in quantity beyond z ~ 1.5. Nine are predicted in the program.
- An additional 9 lower-z supernovae will be discovered in the repeat Deep visits.
- Additional HST follow-up of 22 orbits per supernova will be required.

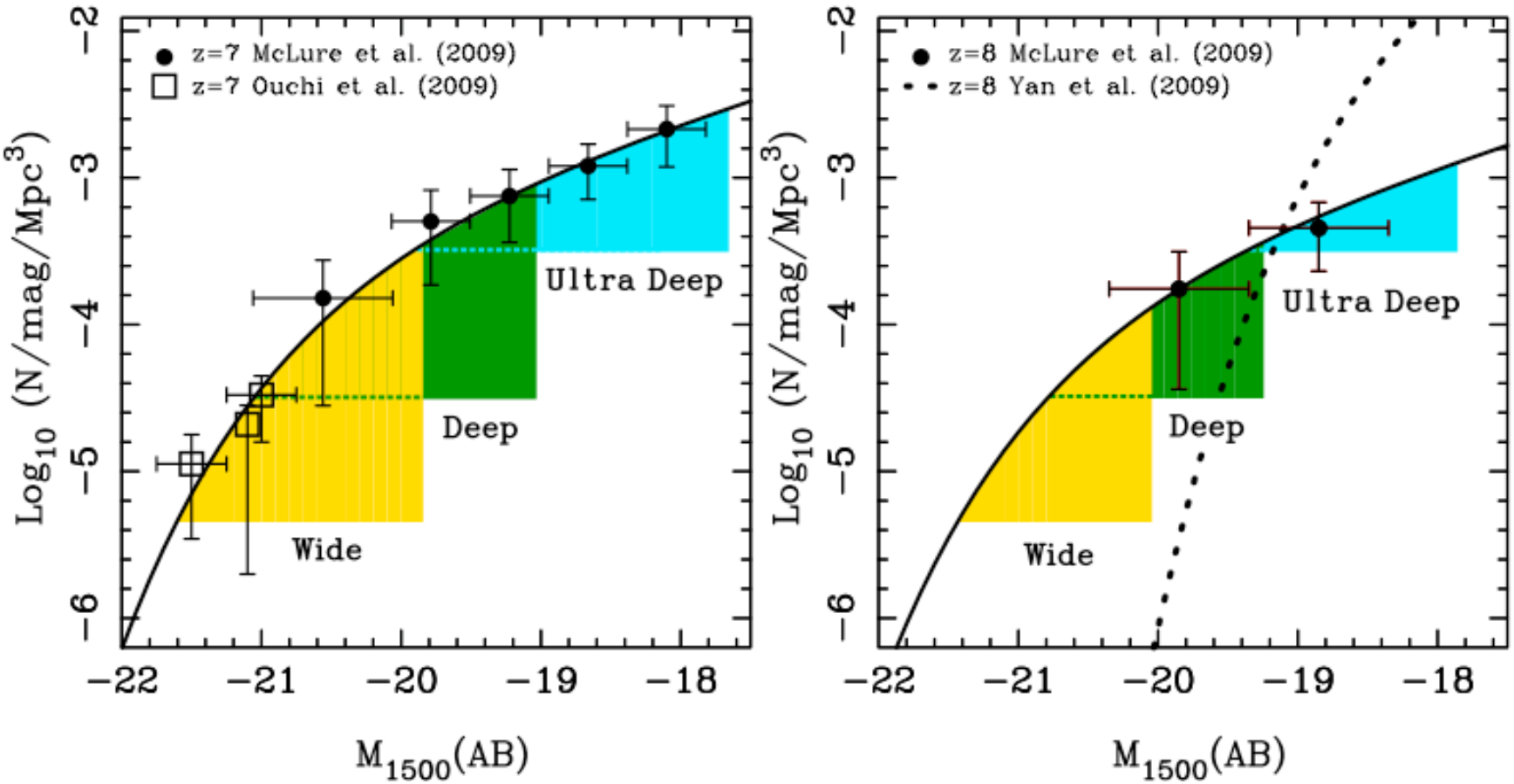

UKIDSS/UDS
EGS
COSMOS
GOODS-S
GOODS-N
Declination (2000)
Field Layouts
ACS
WFC3-IR

Cosmic Variance

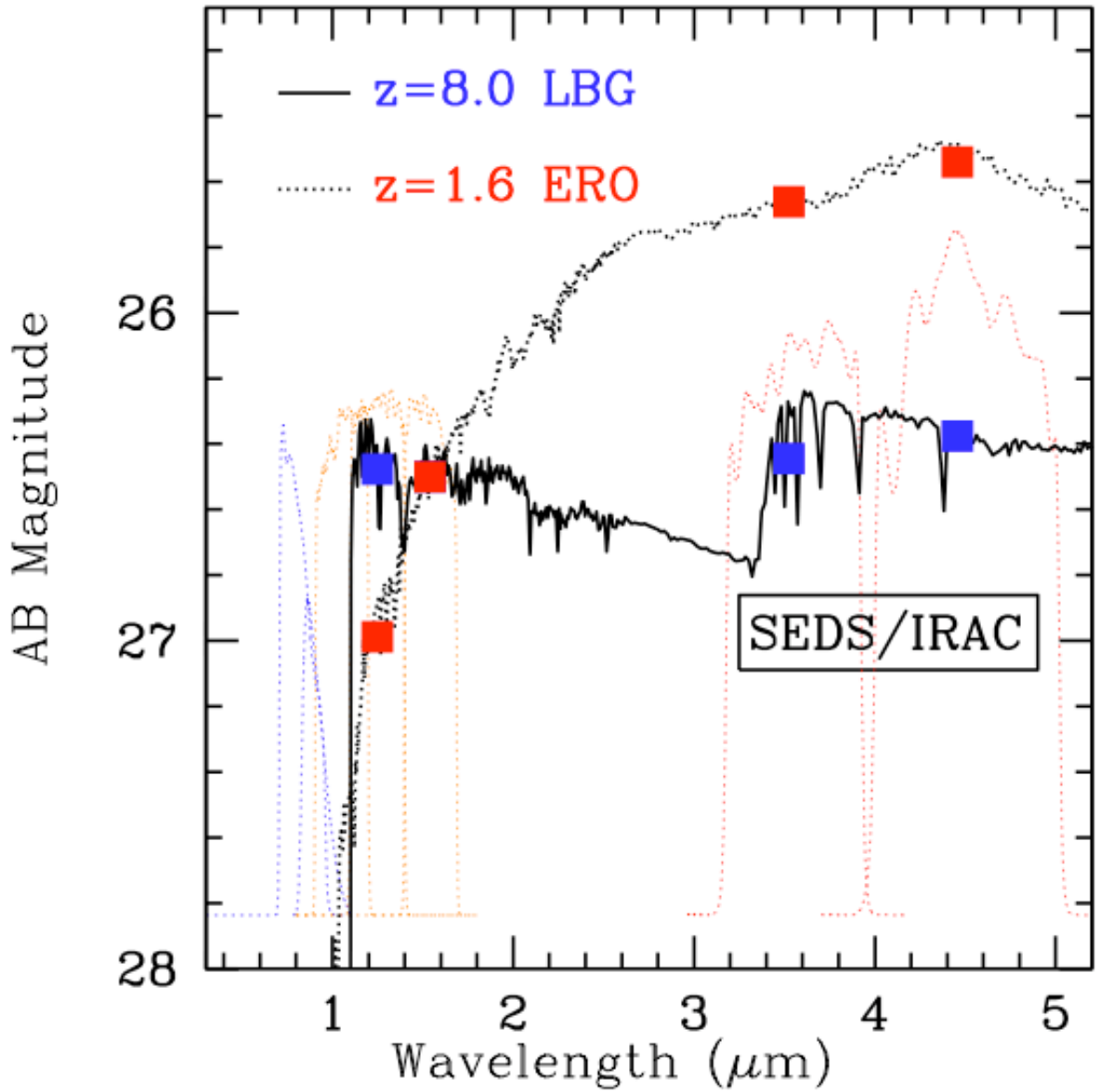




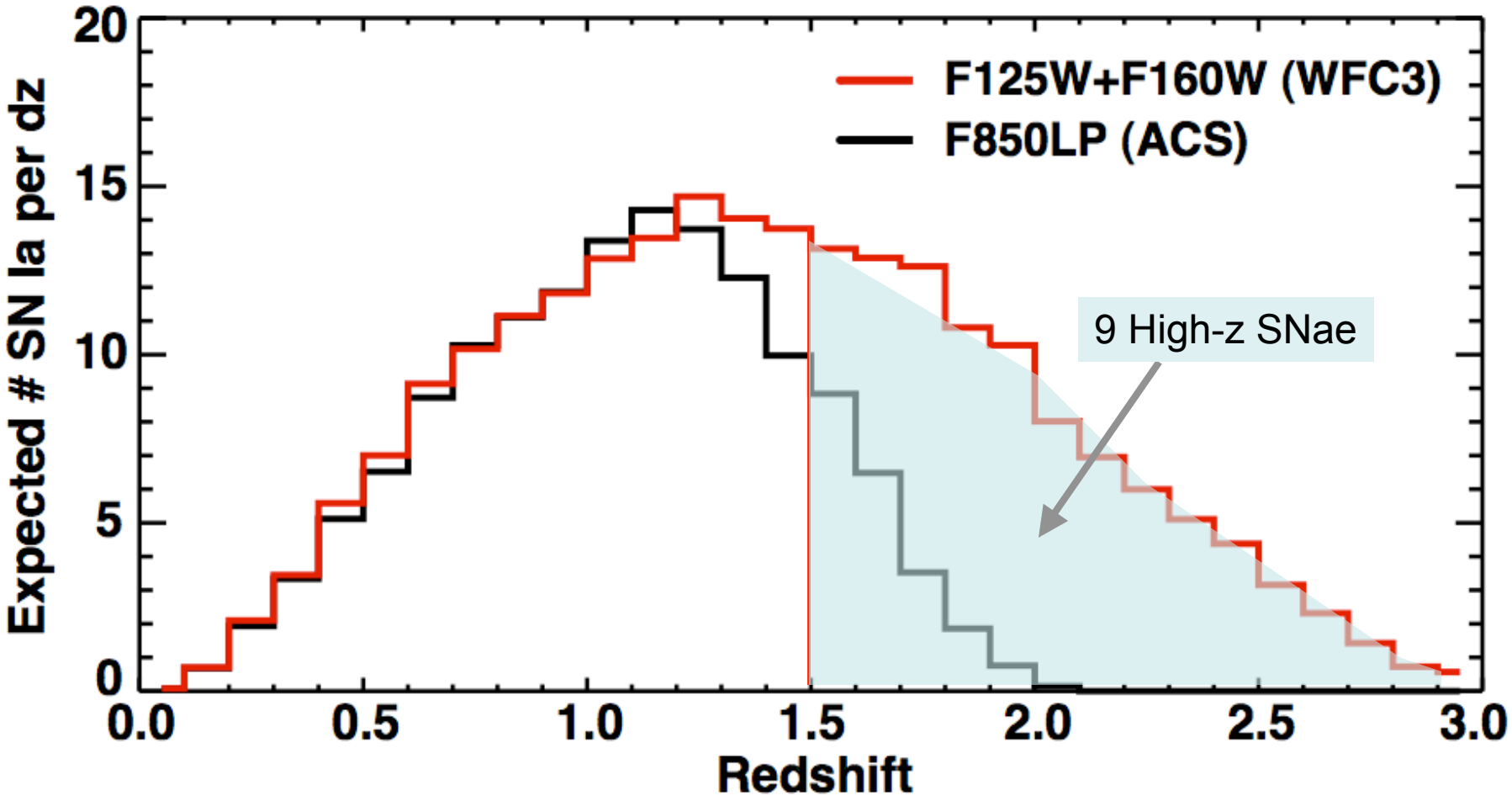
High-z luminosity functions



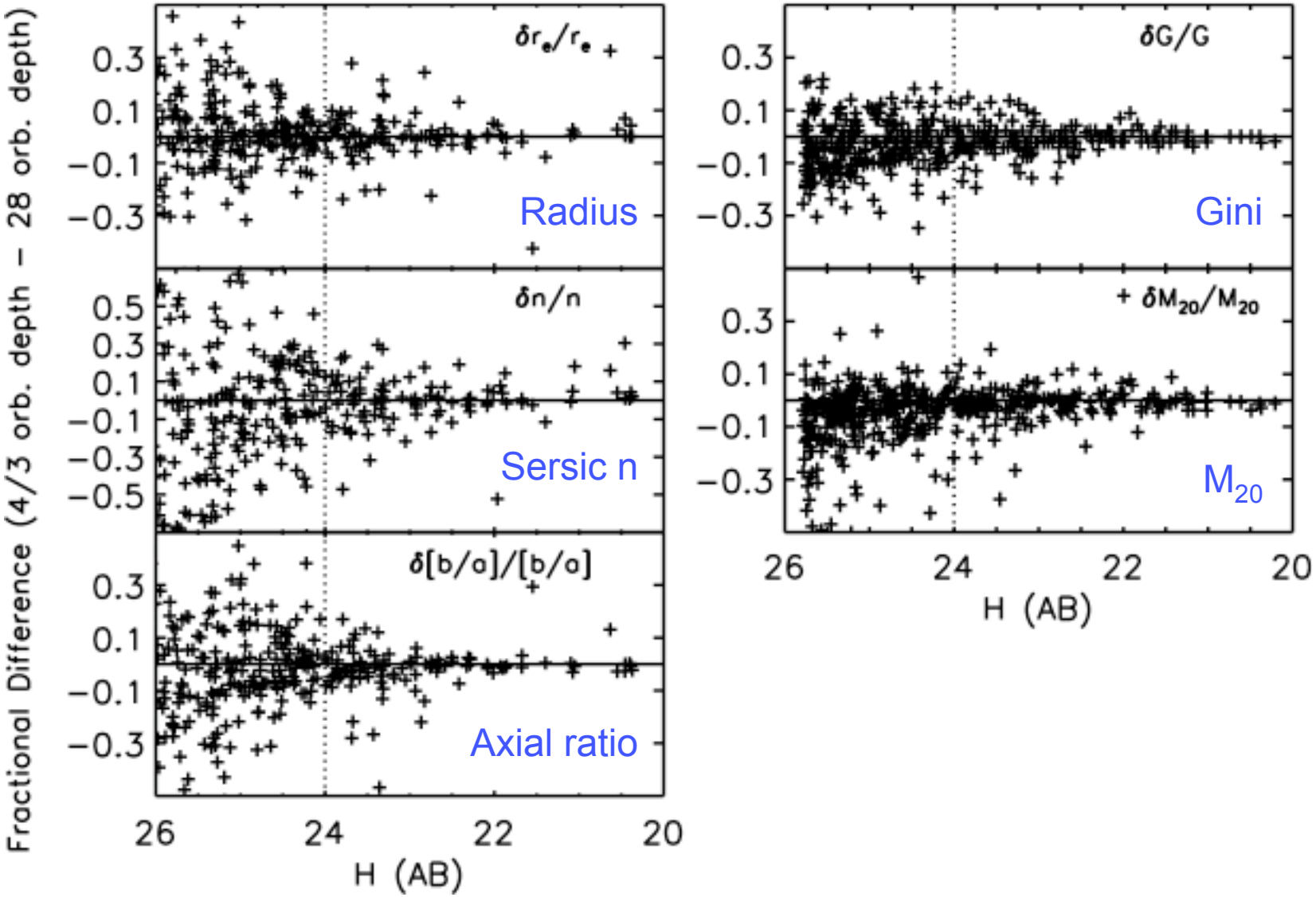
Finding high-z candidates in the Wide program



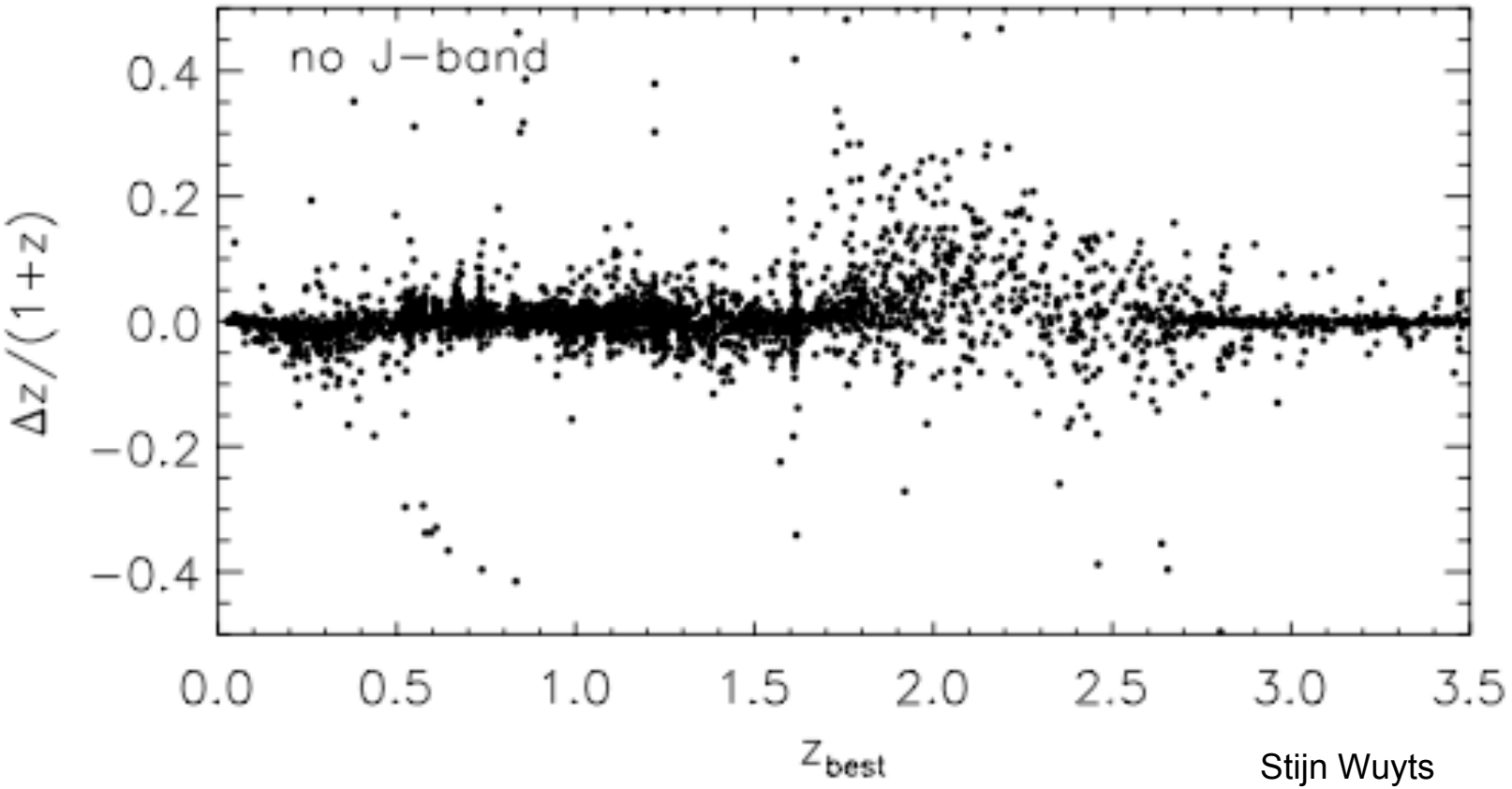
Predicted Supernovae Discovery



Fractional Accuracy of Structural Parameters



The value of J-band for photoz's



Stijn Wuyts

Table 1: Summary of Observations (with a comparison to the UDF)

Survey	Area (deg^2)	Point-Source Limits (AB, 5σ)		$M_{stellar}$ Limit @ z~2 ($\log M_\odot$)	L_{1500} limit @ z~7 (AB)	# of Fields	Ptgs. per field	Exposure per pointing (orbits)		Total Orbits
		WFC3 Y, J, H	ACS V, I, z					WFC3 Y, J, H	ACS V, I, z	
Proposed Wide	0.30	N/A, 27.0, 27.1	28.7, 28.6, N/A	9.04	-19.8 (≤L*)	4	60	0, 2/3, 4/3	2/3, 4/3, 0 †	480
Proposed Deep	0.042	28.1, 28.2, 27.9	29.7, N/A, 28.9	8.72	-19.0	2	18	5, 5, 5	5, 0, 10 †	480
Awarded Ultra-Deep *	0.0039	29.1, 29.5, 29.3	30.2, 30.1, 29.5	8.16	-17.6	3	1	22, 36, 38	56, 150, 150	192

† Effective exposure of ACS is *twice* the exposure indicated above because of the double coverage of most of our ACS parallel fields owing to its larger FOV.

* Cycle 17 GO:11563. Limits and exposures apply to UDF01 when completed. The other two pointings have shallower WFC3 by 0.4 mag and significantly less ACS coverage.

Senior Personnel

PI: Sandra Faber

Senior Co-I's:

- Giovanni Fazio: IRAC/SEDS
- Paul Nandra: Chandra/AGNs
- David Koo: DEEP/EGS/MOSFIRE
- Jim Dunlop: High-z/UDS
- Eric Bell, HW Rix: ECDFS/Hawk-I
- Anton Koekemoer: HST mosaics
- Jeff Newman: clustering statistics
- Jennifer Lotz: mergers

Theorists:

- Avishai Dekel
- Darren Croton
- Joel Primack
- Risa Wechsler
- Romeel Dave
- Aaron Dutton
- Phil Hopkins

40 Co-I's in all