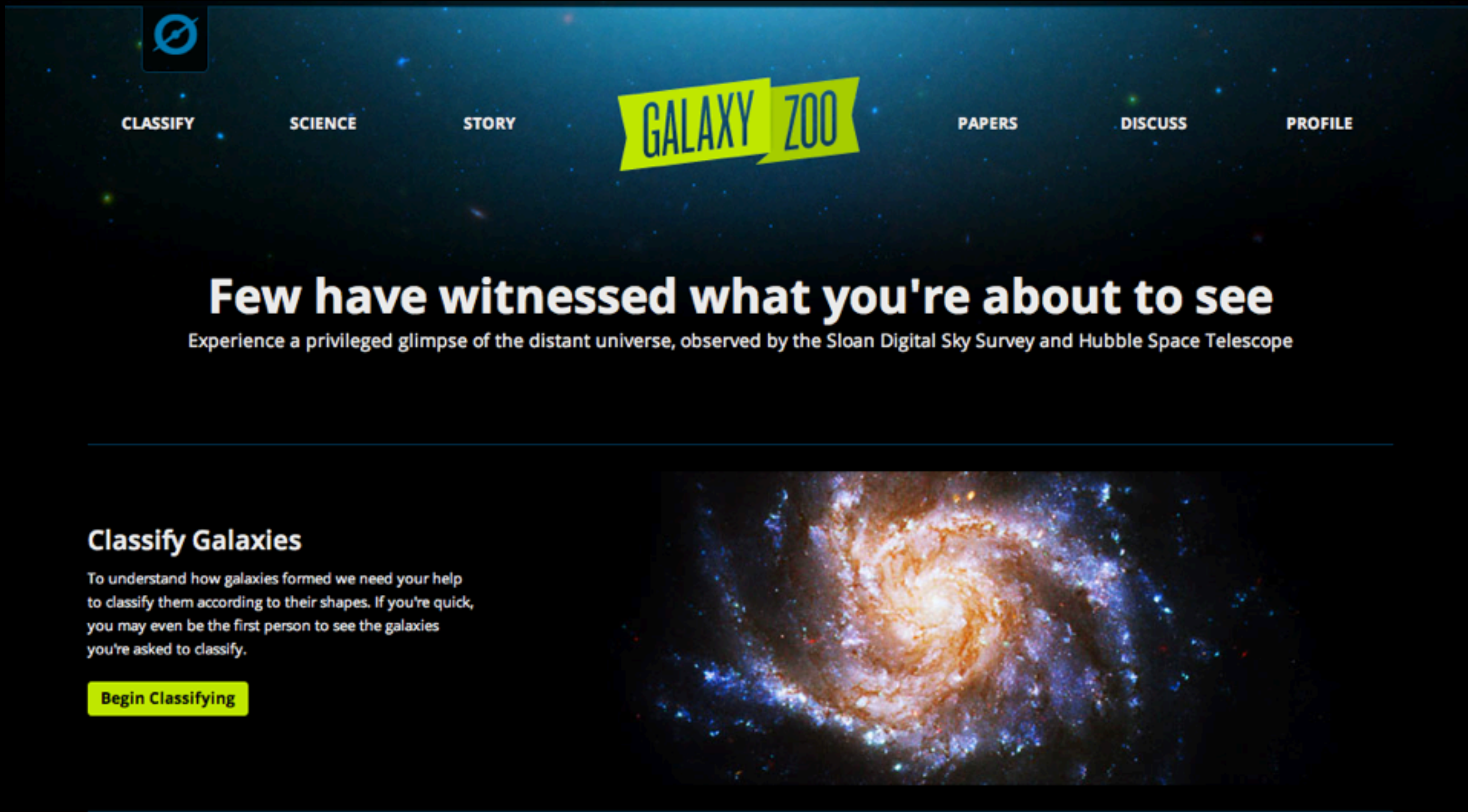
The Scientific Legacy of Galaxy Zoo



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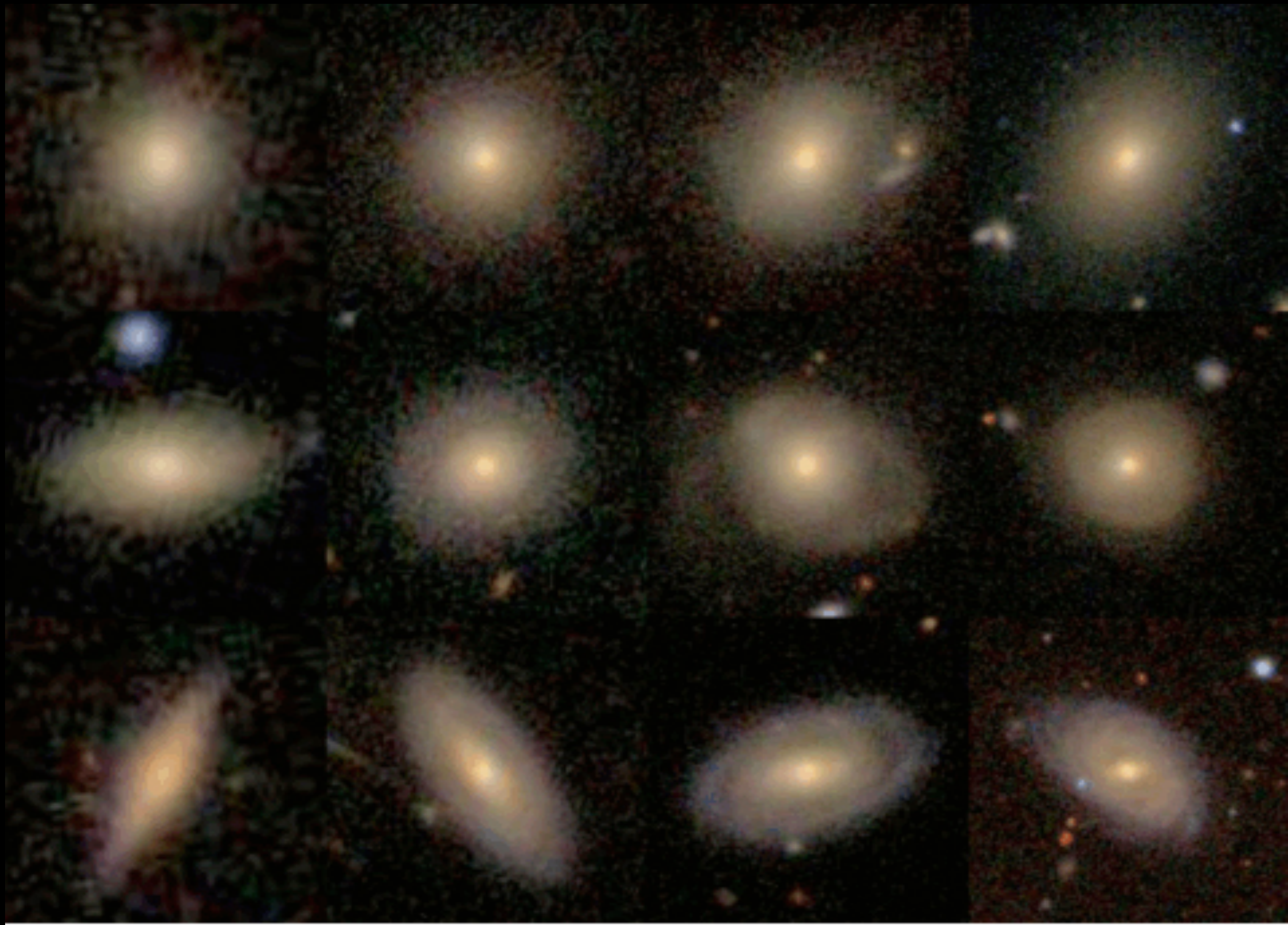
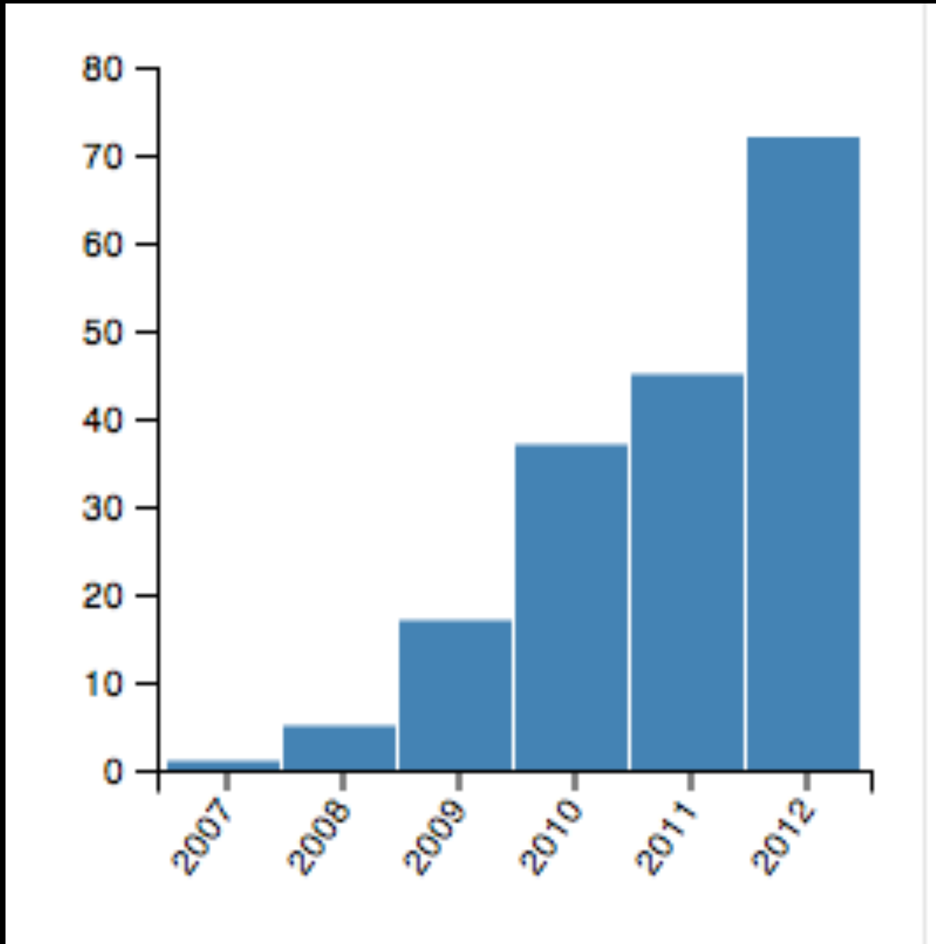
Classifying very large data sets is obviously beyond the capability of a single person. Therefore the galaxy classification problem calls for new approaches.

Lahav et al., *Science*, 1995

We thank the UKST unit of the Royal Observatory of Edinburgh for the plate material, the APM group at RGO Cambridge for scanning support...





Papers mentioning Galaxy Zoo
in major journals (ApJ, ApJS, AJ,MNRAS, A&A)

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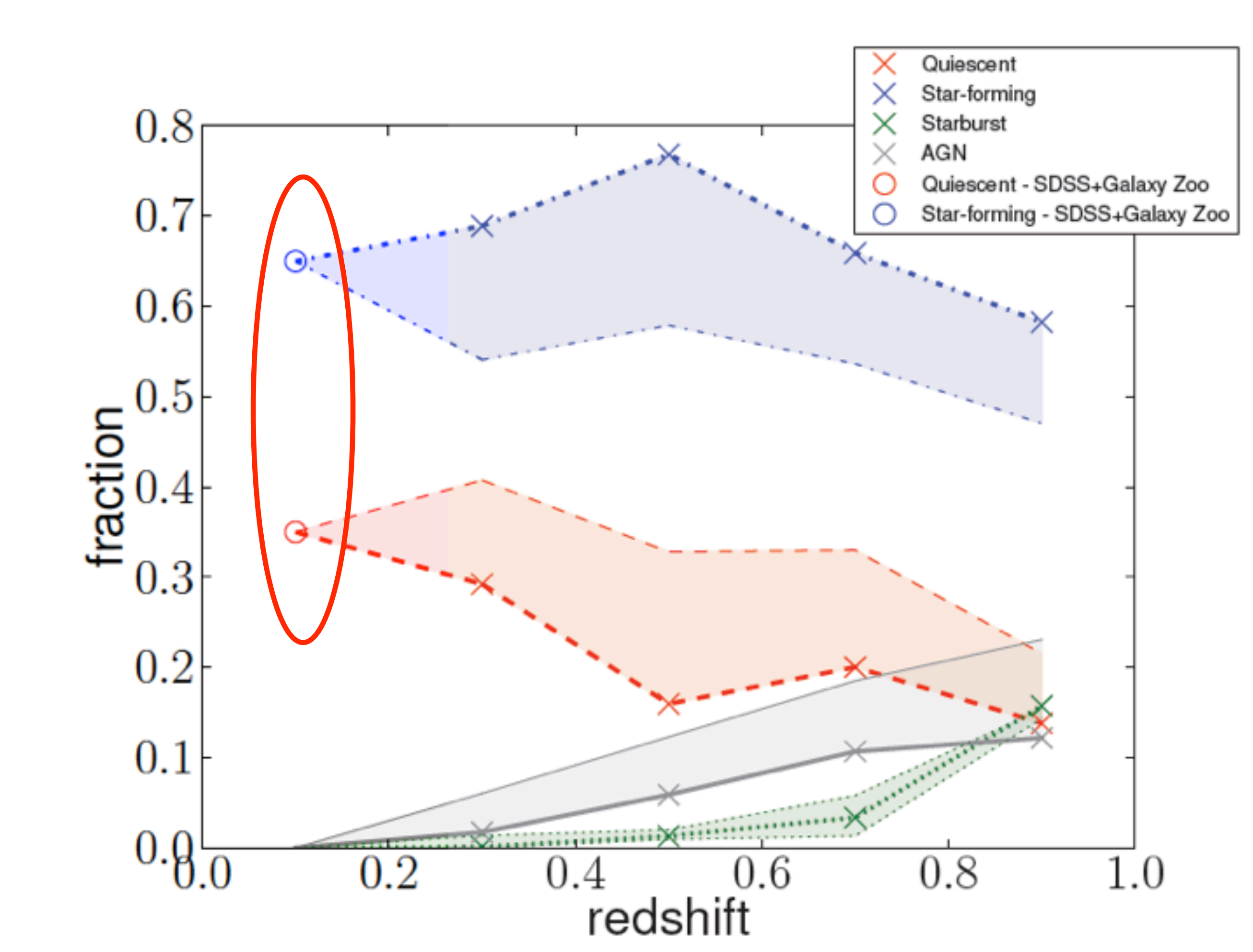
Extragalactic Background Light Inferred from AEGIS Galaxy SED-type Fractions

A. Domínguez[1,2,3★], J. R. Primack[4], D. J. Rosario[5], F. Prada[2,6], R. C. Gilmore[4,7],



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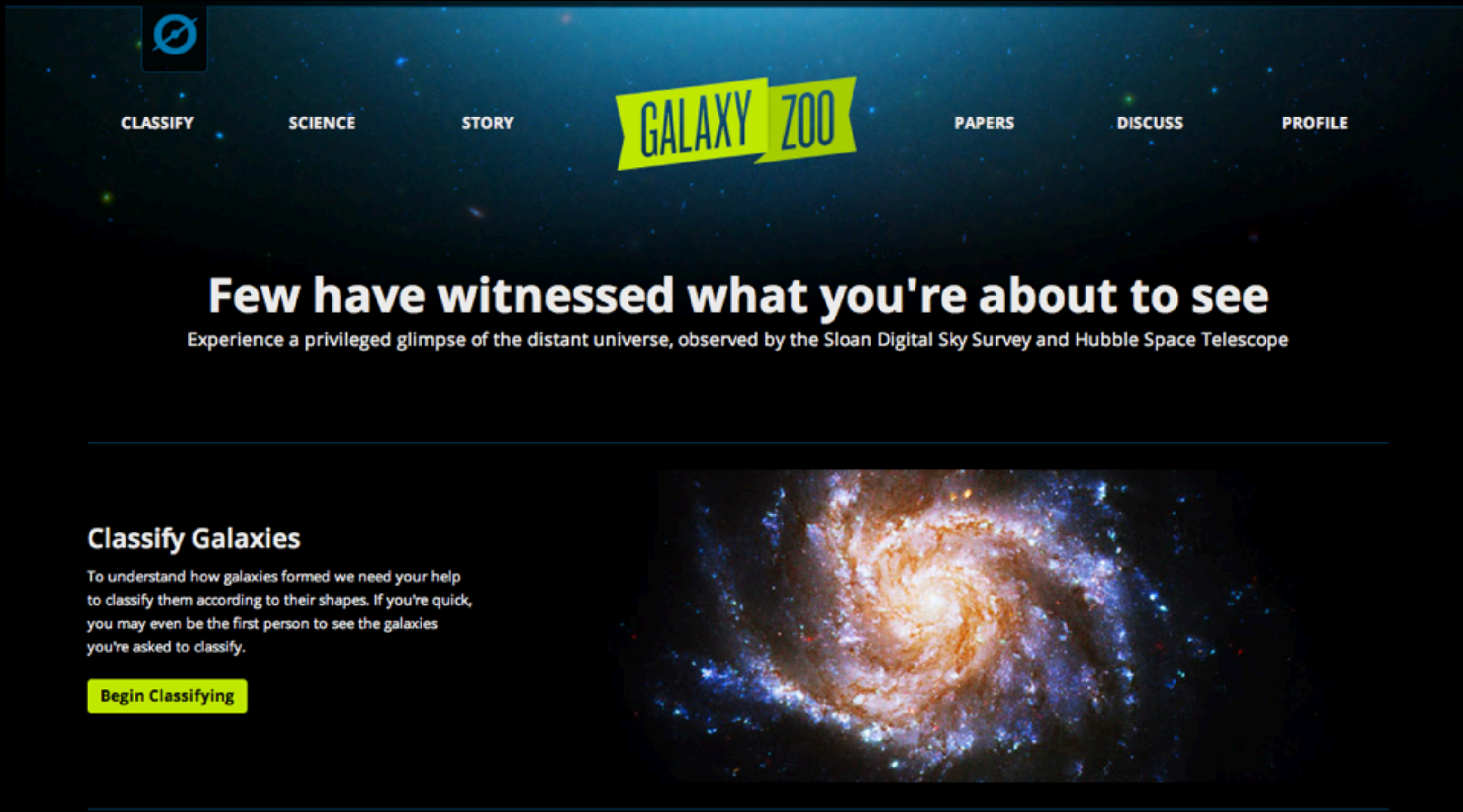

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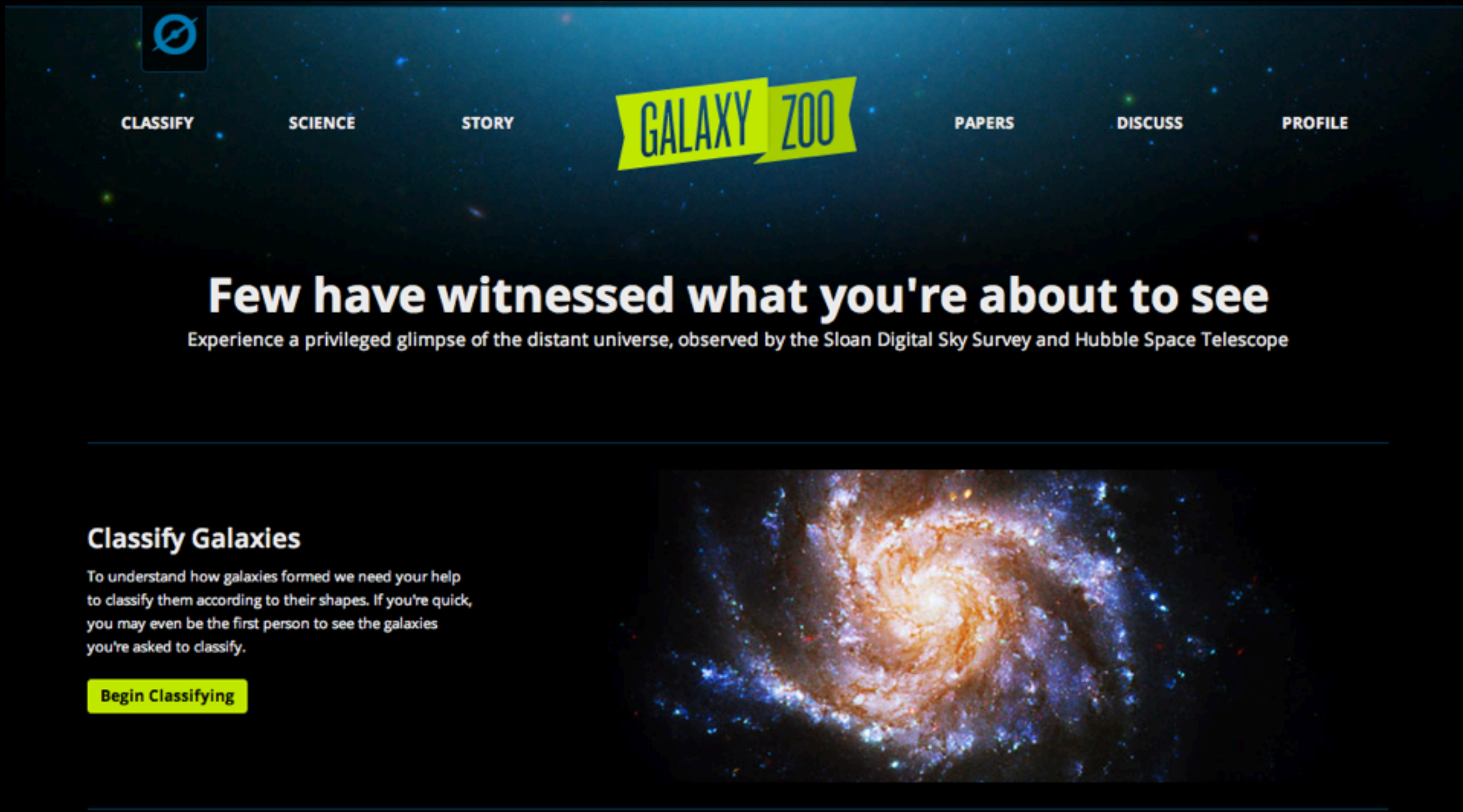
Important stuff led by people who aren't here



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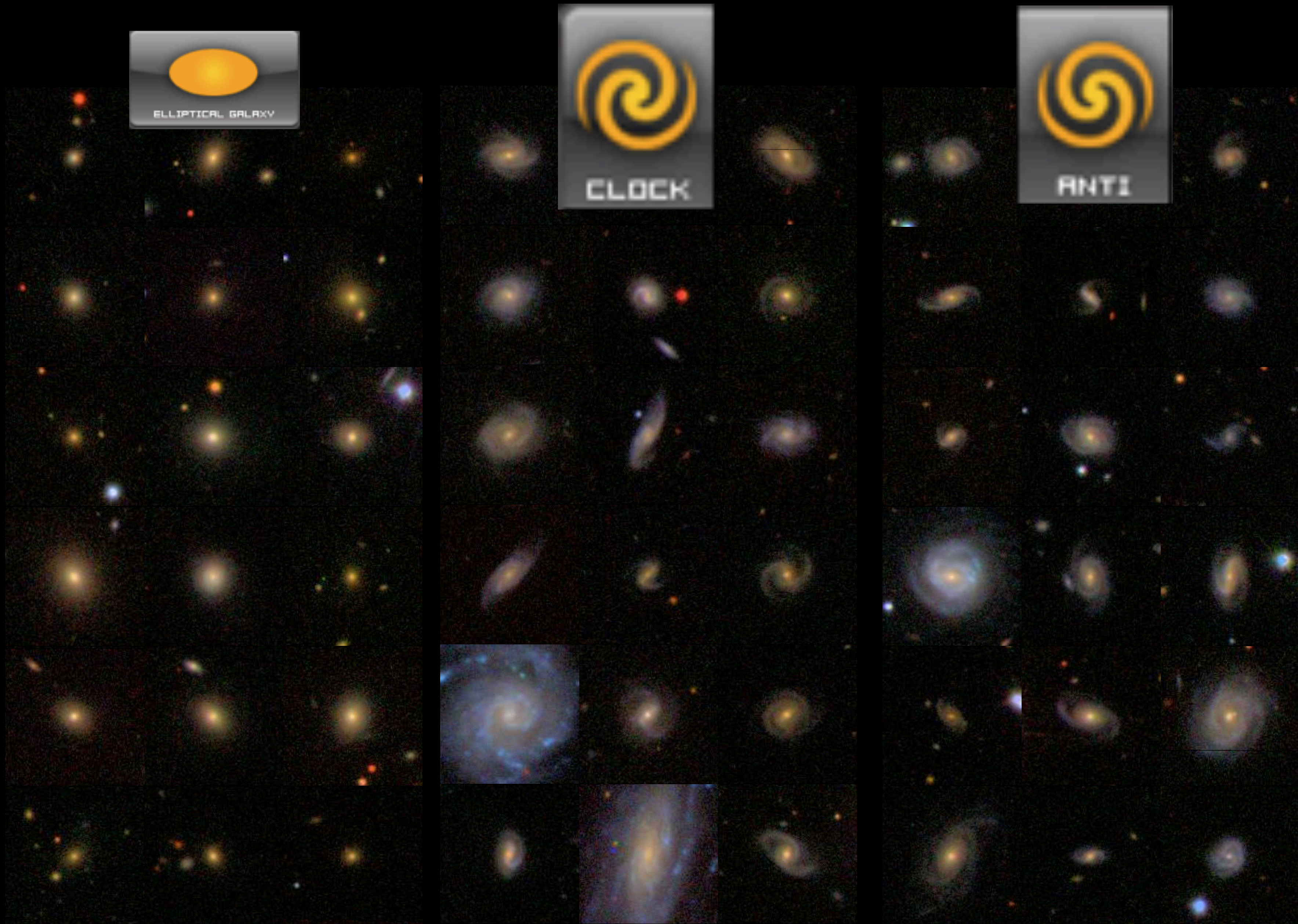

Longo (astro-ph/0707.3793) finds an excess of anticlockwise spirals

Land et al. arXiv/0803.3274

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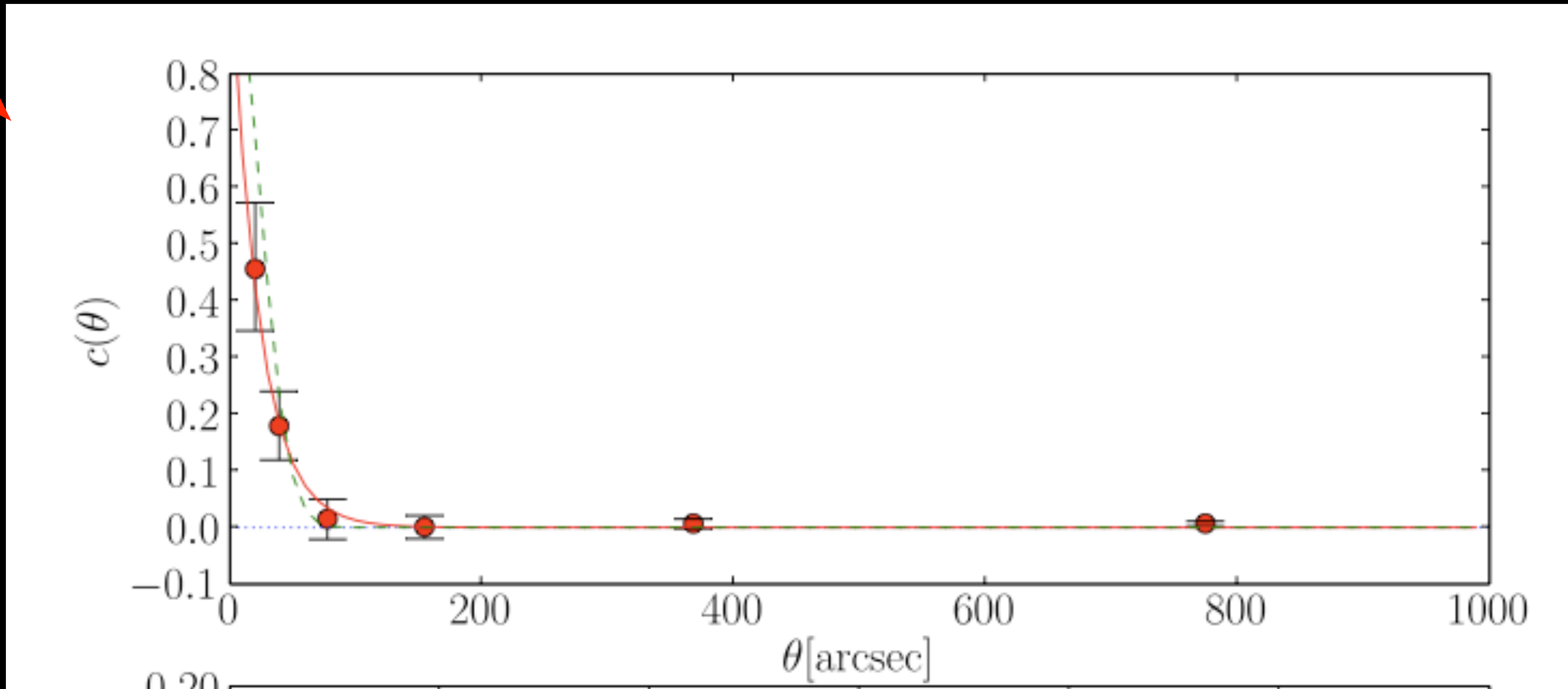
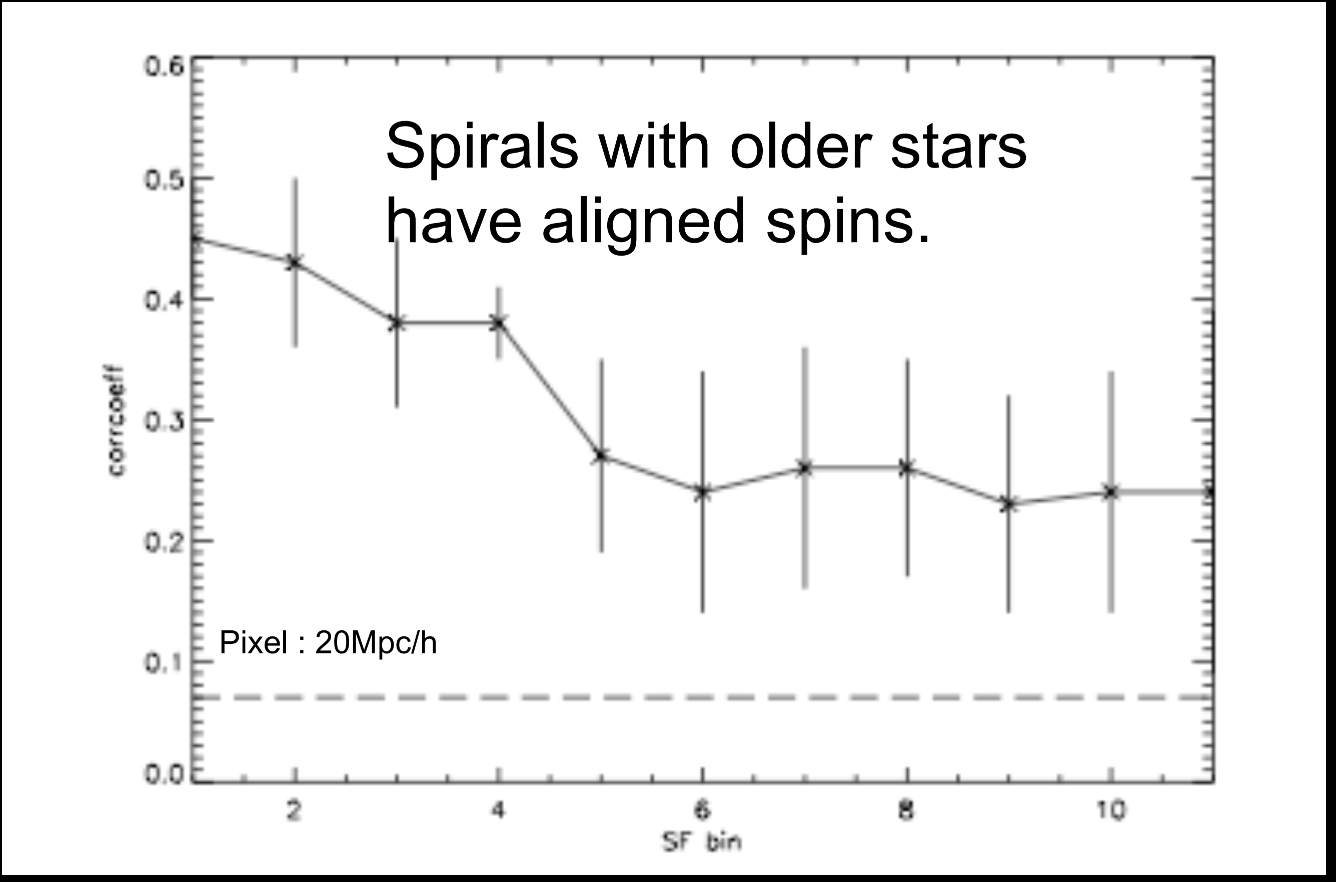
Odds of two galaxies having the same spin



Separation (in 1/3600 of a degree)

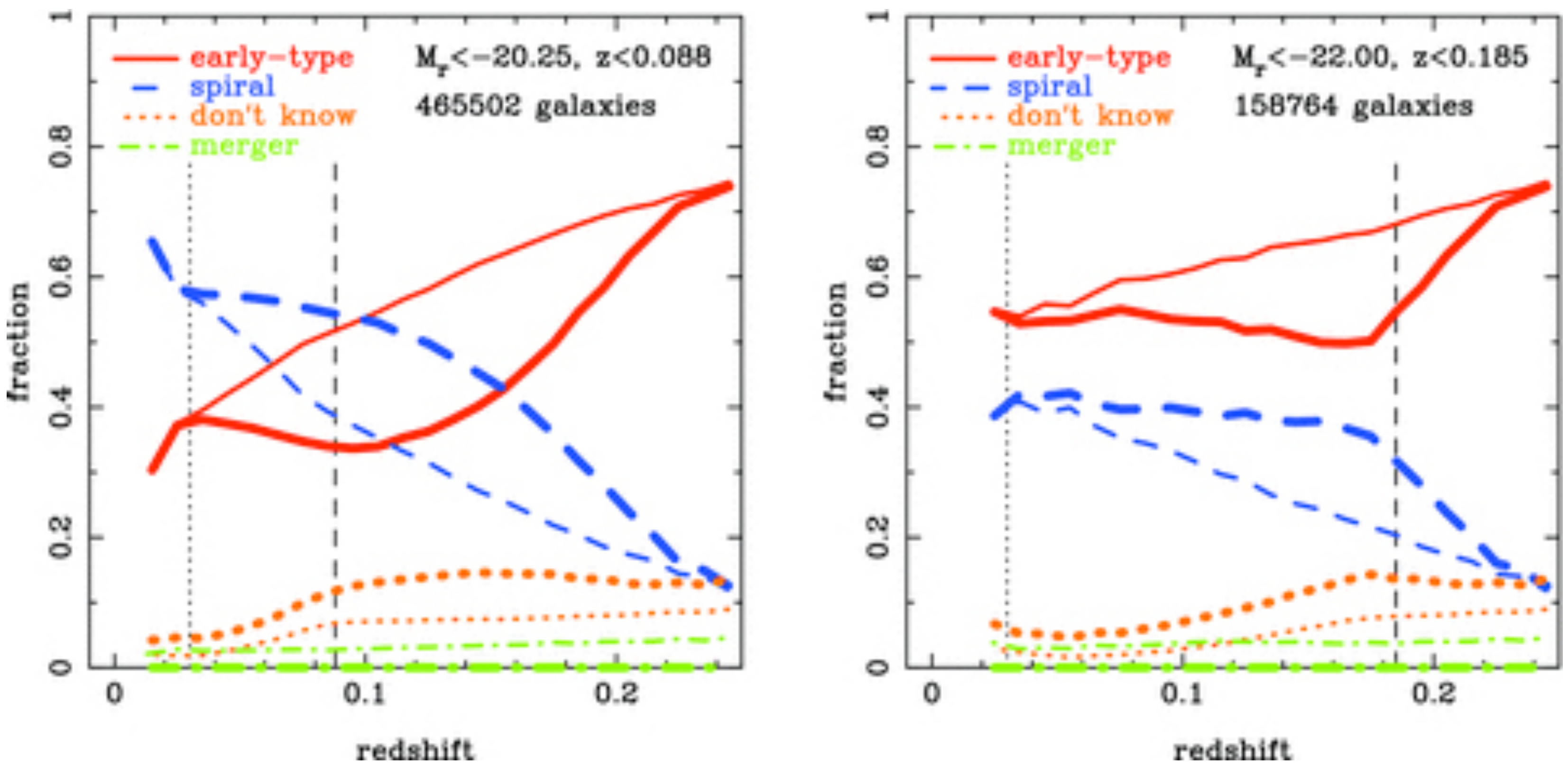
Slosar et al. arXiv/0809.0717



SF Bin	1	2	3	4	5	6	7	8	9	10	11
<age>	12	8.5	4.7	2.3	1.1	0.5	0.3	0.1	0.06	0.03	0.01

Jimenez et al. arXiv/0906.0994

Morphological-type fractions, from our full sample of unweighted Galaxy Zoo likelihoods, as a function of redshift.



Bamford S P et al. MNRAS 2009;393:1324-1352

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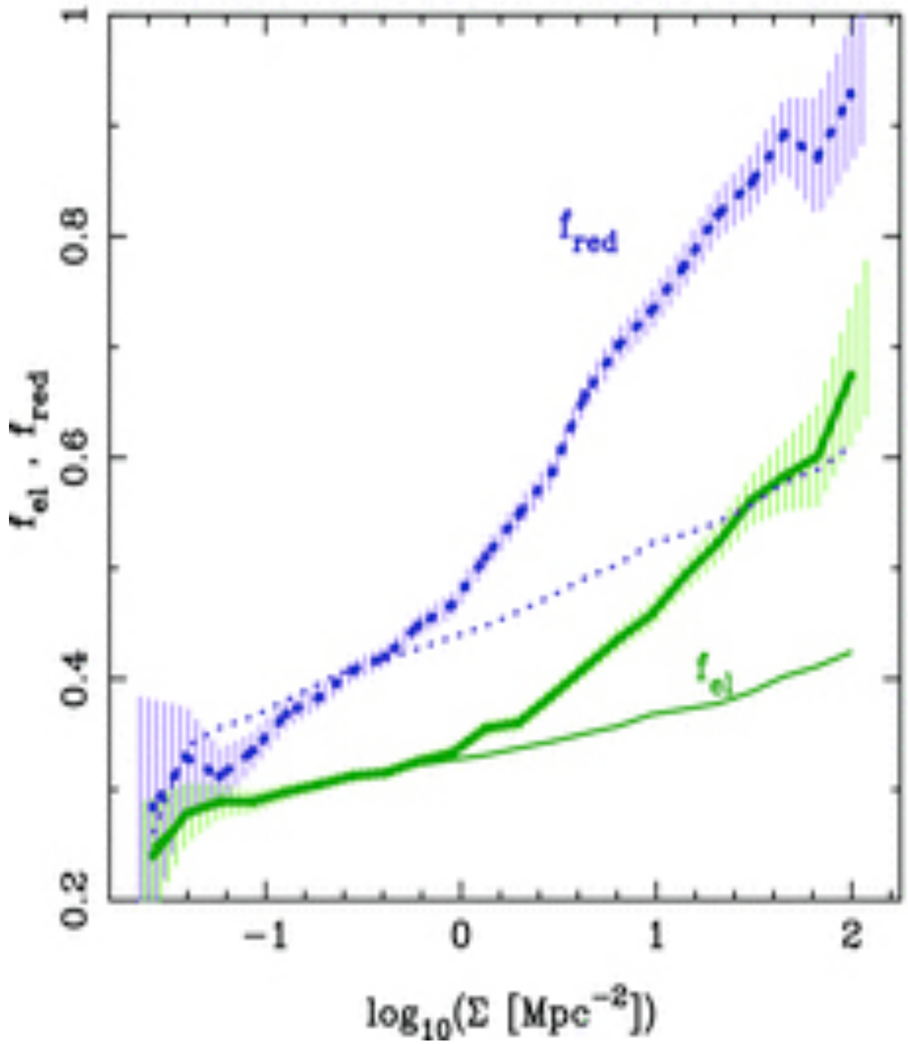
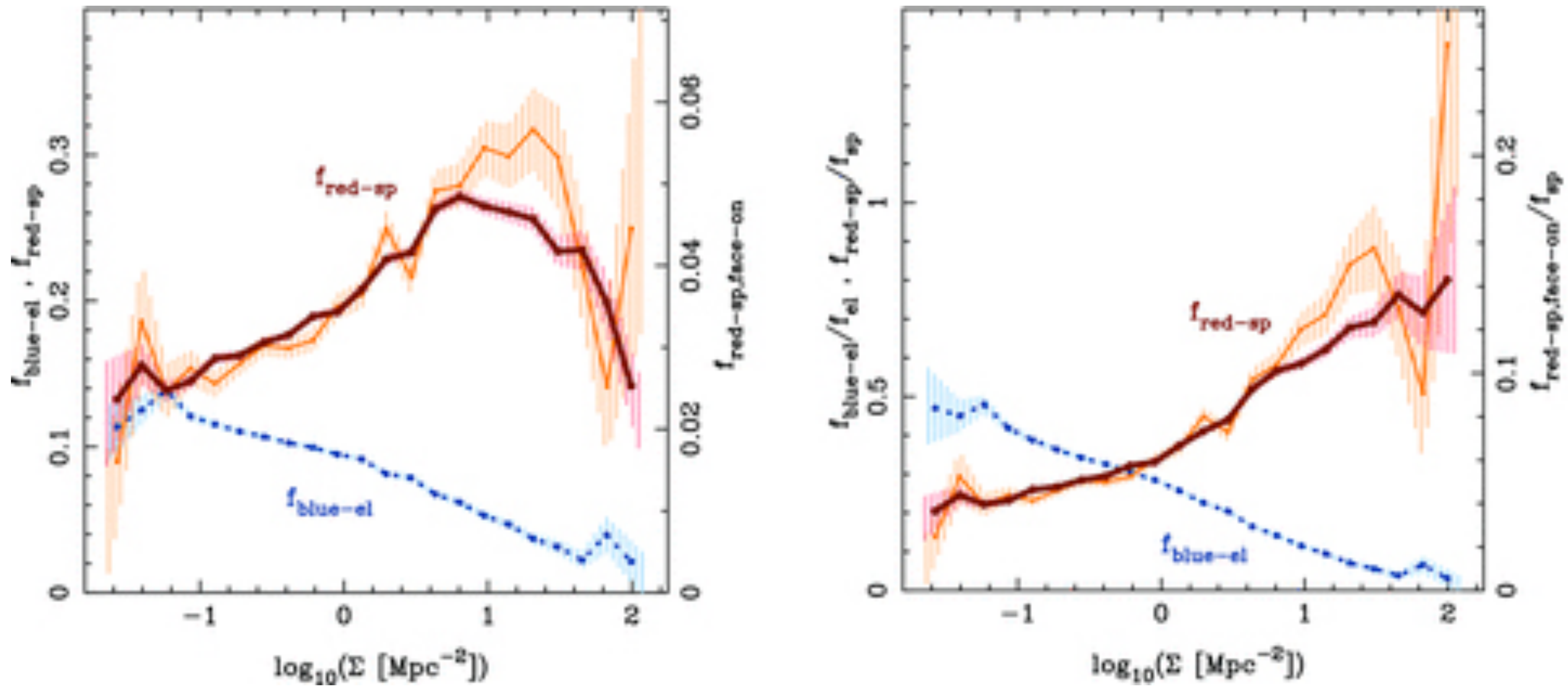


f_{red}
f_{el}
f_{el} , f_{red}
0.2
0.4
0.6
0.8
1
−1
0
1
2
$\log_{10}(\Sigma\ [\mathrm{Mpc}^{-2}])$

The number of red spirals (red, thick, solid line) and blue early-types (blue, dotted line) in our luminosity-limited sample versus local galaxy density (left) as fractions of our whole sample and (right) as fractions of all spirals and early-types, respectively.



Bamford S P et al. MNRAS 2009;393:1324-1352

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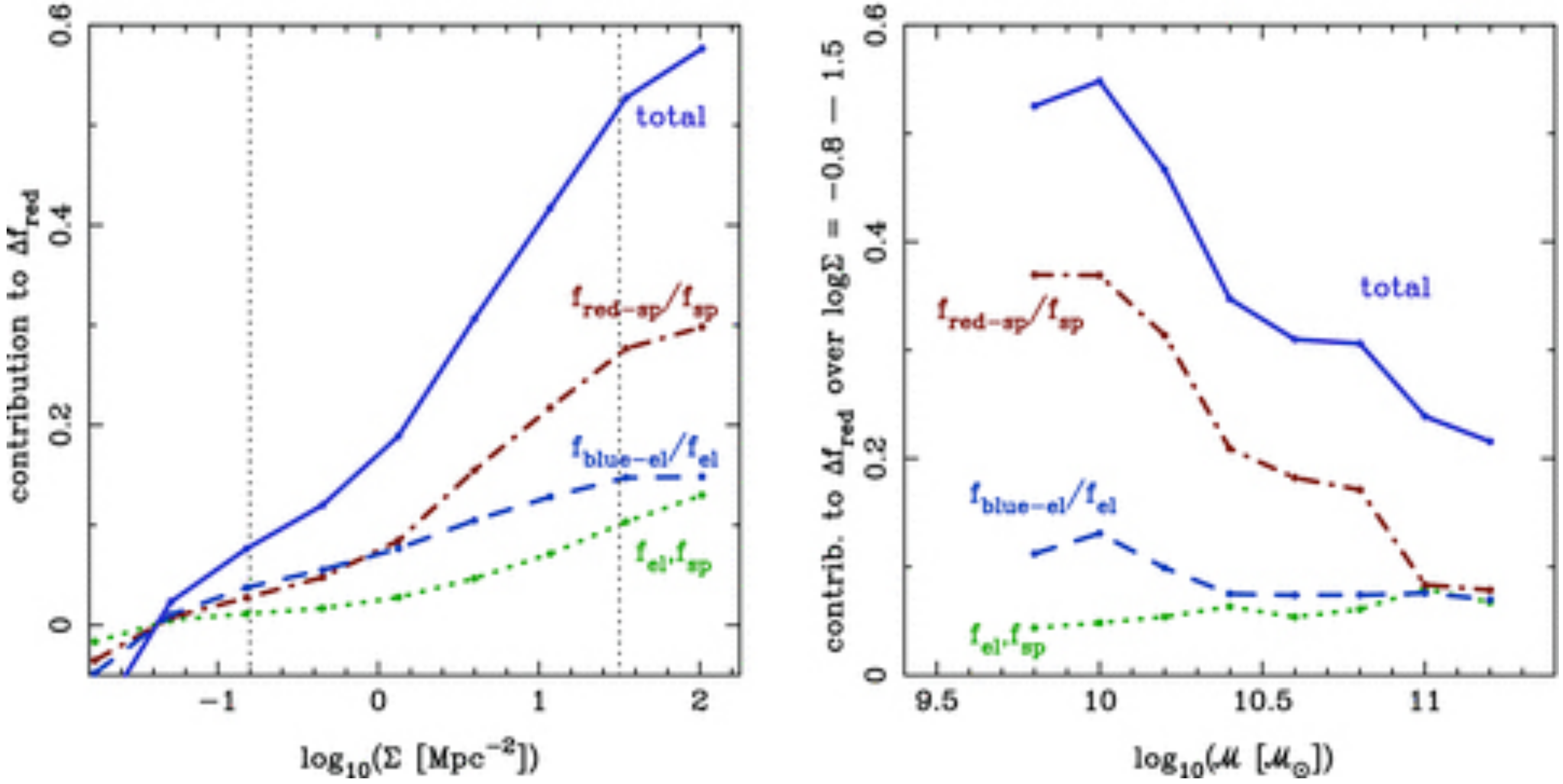
Left: the change in the red fraction of galaxies in our luminosity-limited sample, divided into contributions due to the variation with local density of the morphological-type fractions (green, dotted line), the fraction of spirals that are red (red, dot–dashed line) and the fraction of early-types that are blue (blue, dashed line).



Bamford S P et al. MNRAS 2009;393:1324-1352

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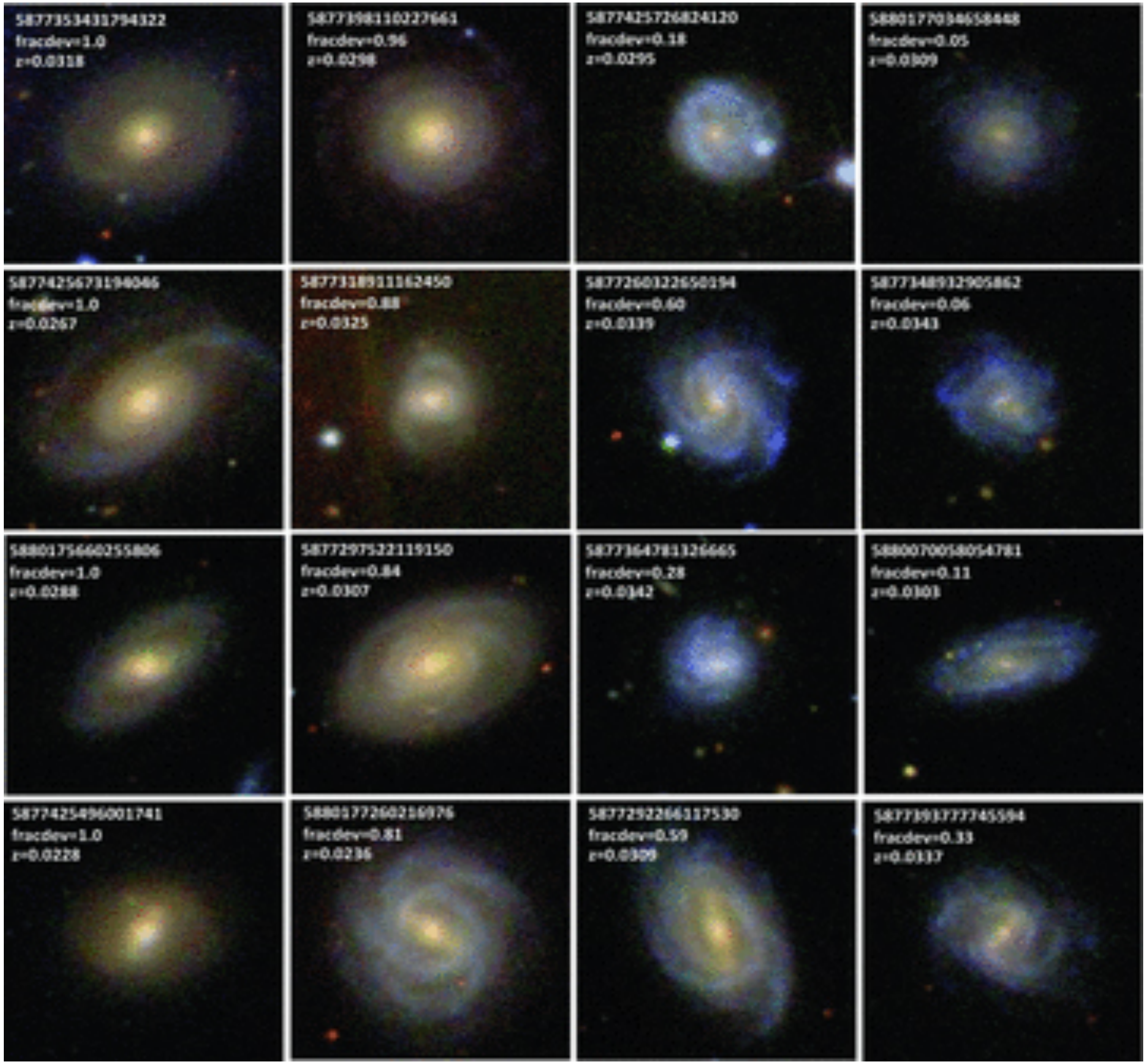
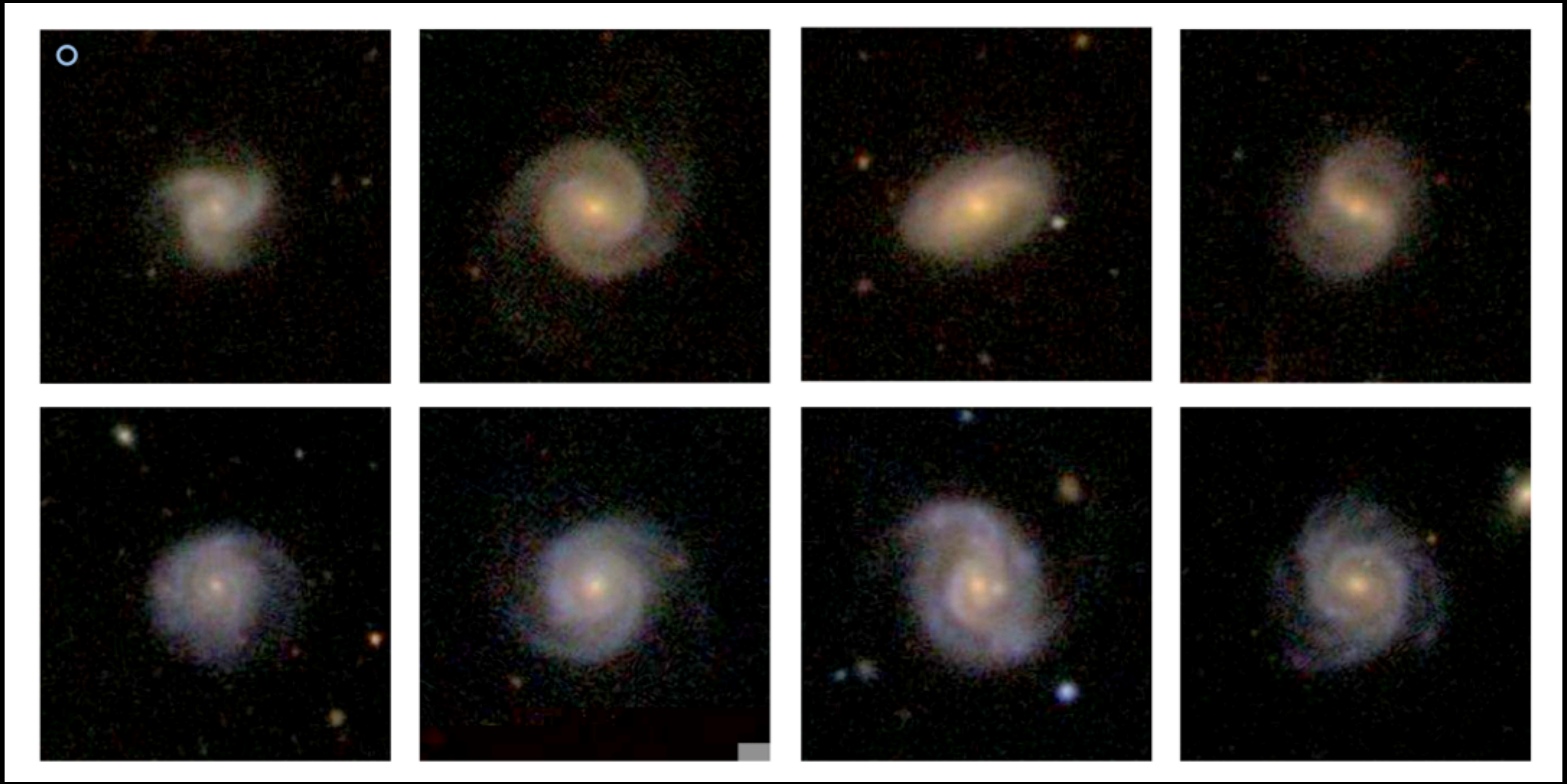


Skibba R A et al. MNRAS 2012;423:1485-1502



Masters et al. arXiv/1003.0449

Marked Weighted Correlation Functions

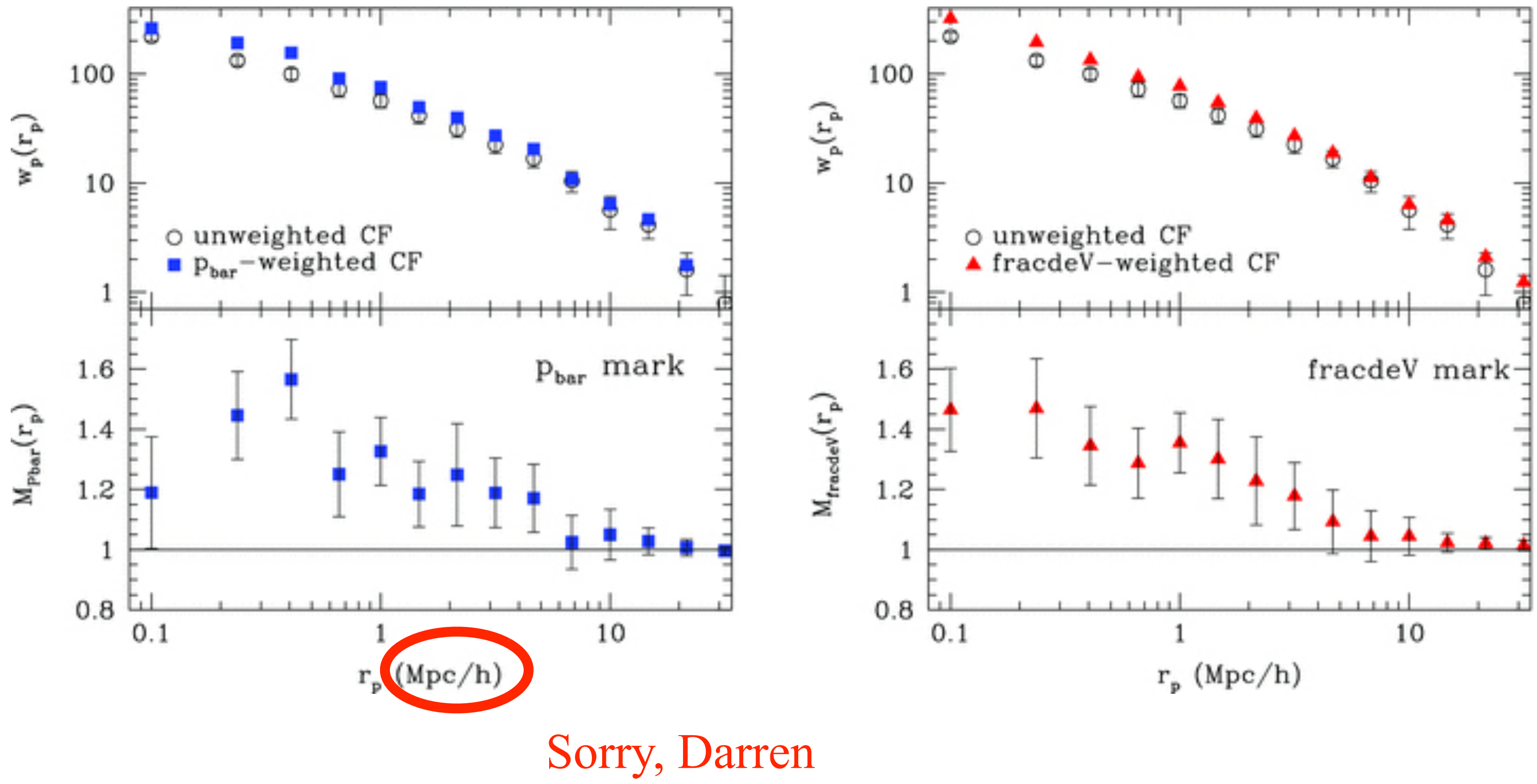
$$w_{\mathrm{p}}(r_{\mathrm{p}}) = \int \mathrm{d}r\, \xi(r_{\mathrm{p}}, \pi) = 2\int_{r_{\mathrm{p}}}^{\infty} \mathrm{d}r\, \frac{r\,\xi(r)}{\sqrt{r^2 - {r_{\mathrm{p}}}^2}},$$

$$\xi(r_{\mathrm{p}}, \pi) = \frac{DD - 2DR + RR}{RR},$$

$$W(r_{\mathrm{p}}, \pi) = \frac{WW - 2WR + RR}{RR},$$

$$M_{\mathrm{p}}(r_{\mathrm{p}}) = \frac{1 + W_{\mathrm{p}}(r_{\mathrm{p}})/r_{\mathrm{p}}}{1 + w_{\mathrm{p}}(r_{\mathrm{p}})/r_{\mathrm{p}}},$$

Upper panel: projected correlation function wp(rp) (circle points) and weighted projected correlation functions Wp(rp).



Skibba R A et al. MNRAS 2012;423:1485-1502

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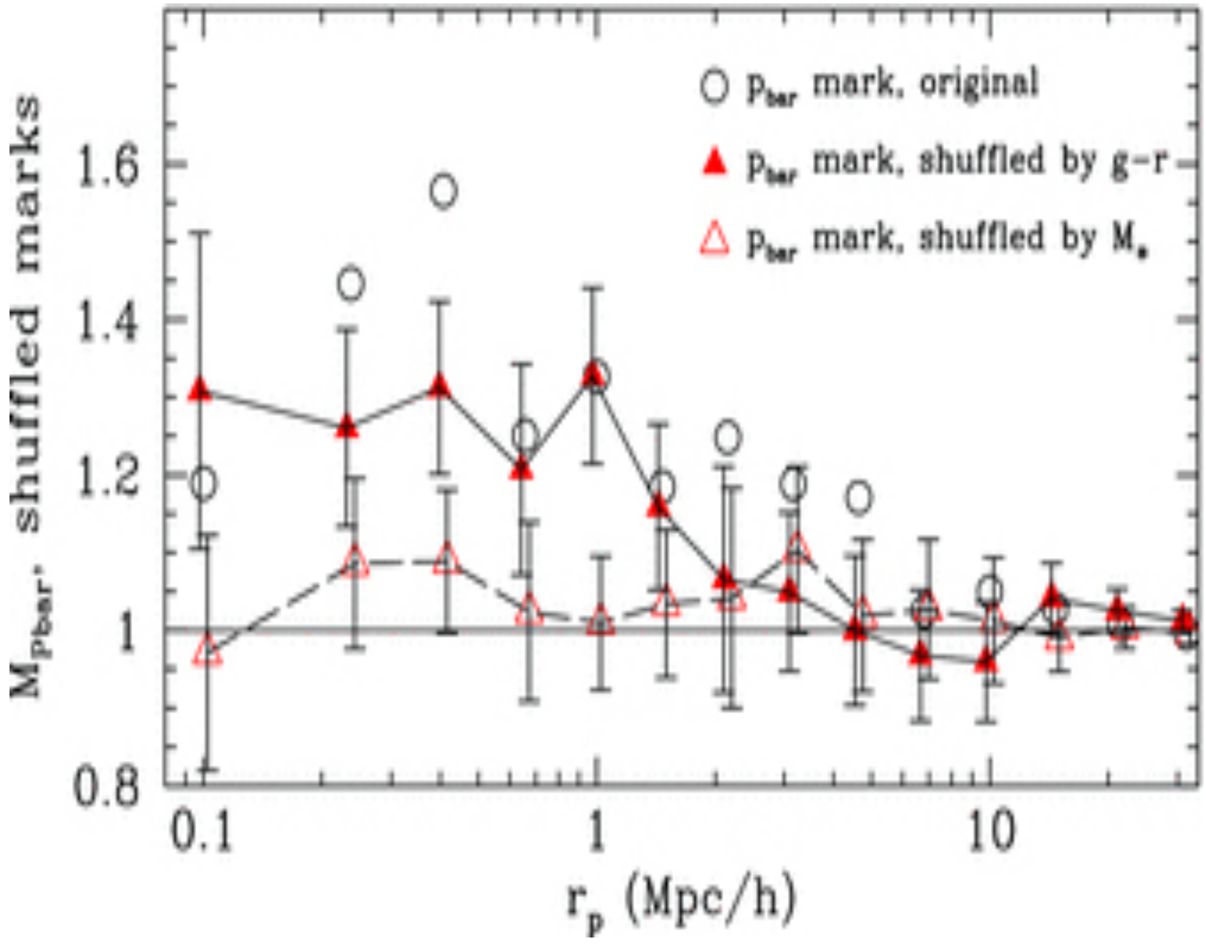

p_{bar} mark, original
p_{bar} mark, shuffled by g-r
p_{bar} mark, shuffled by M_*
$M_{p_{bar}}$, shuffled marks
1.6
1.4
1.2
1
0.8
0.1
1
10
r_p (Mpc/h)

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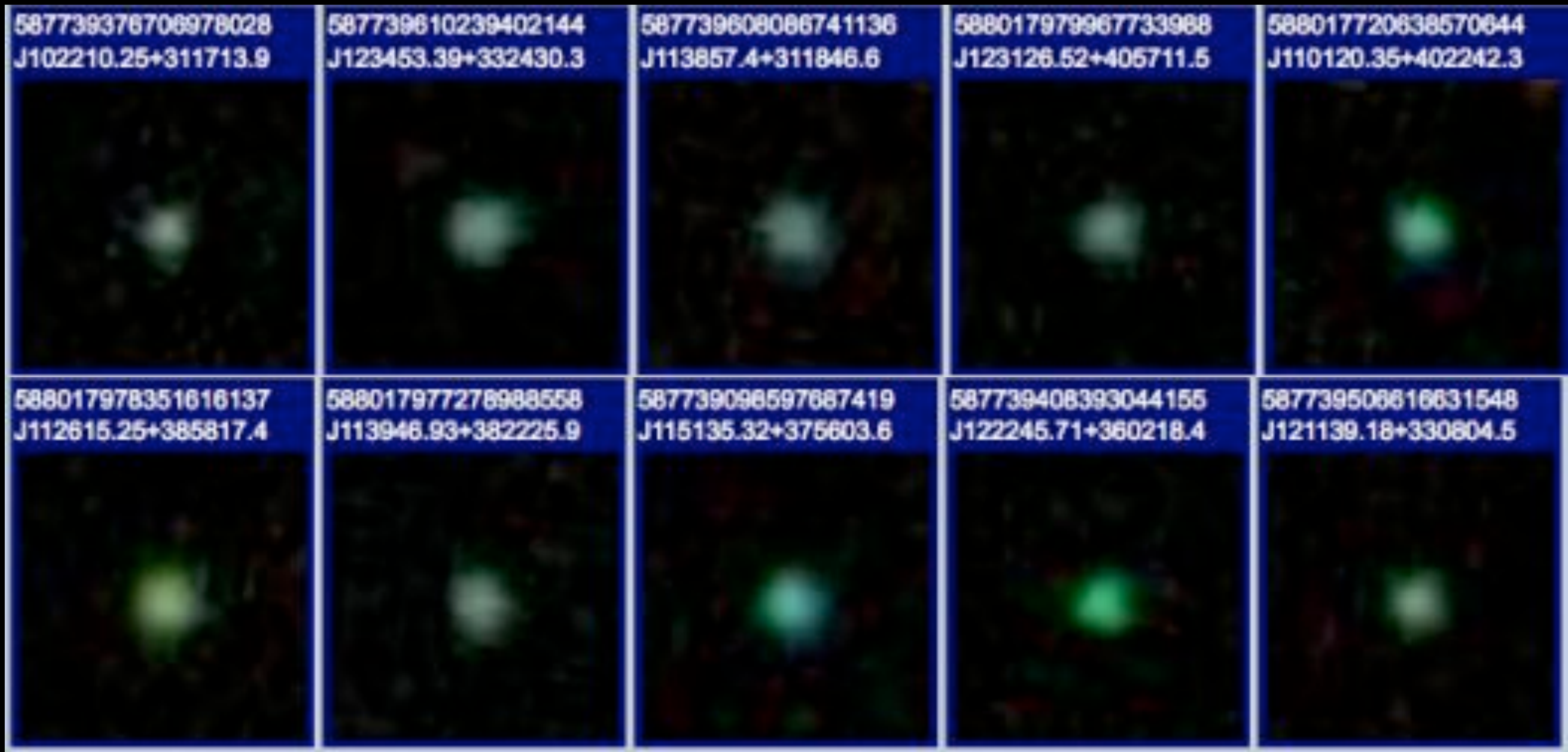
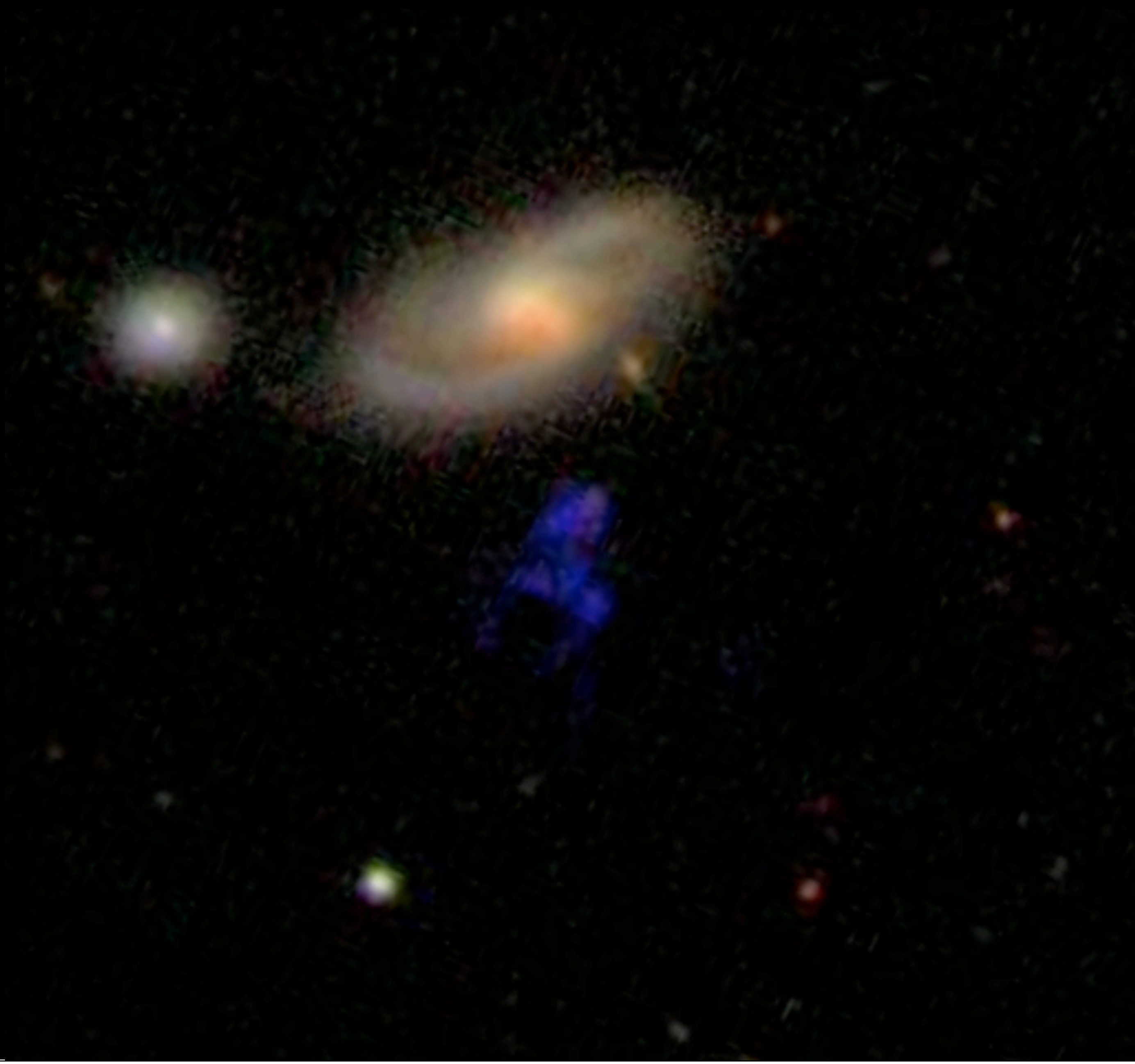
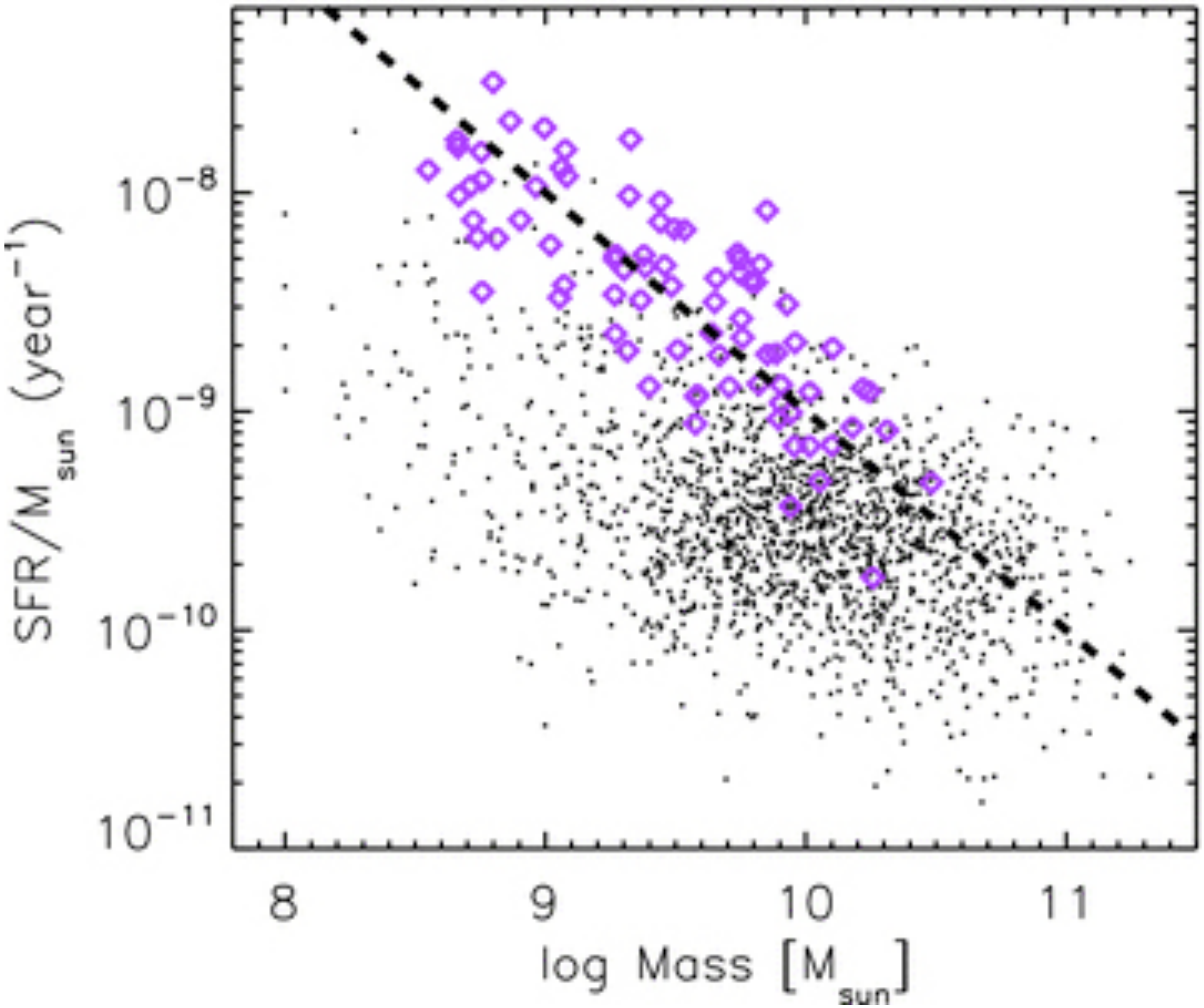




Specific star formation rate versus mass for the Peas (purple diamonds) and the Galaxy Zoo Mergers sample (black points).



Cardamone C et al. MNRAS 2009;399:1191-1205

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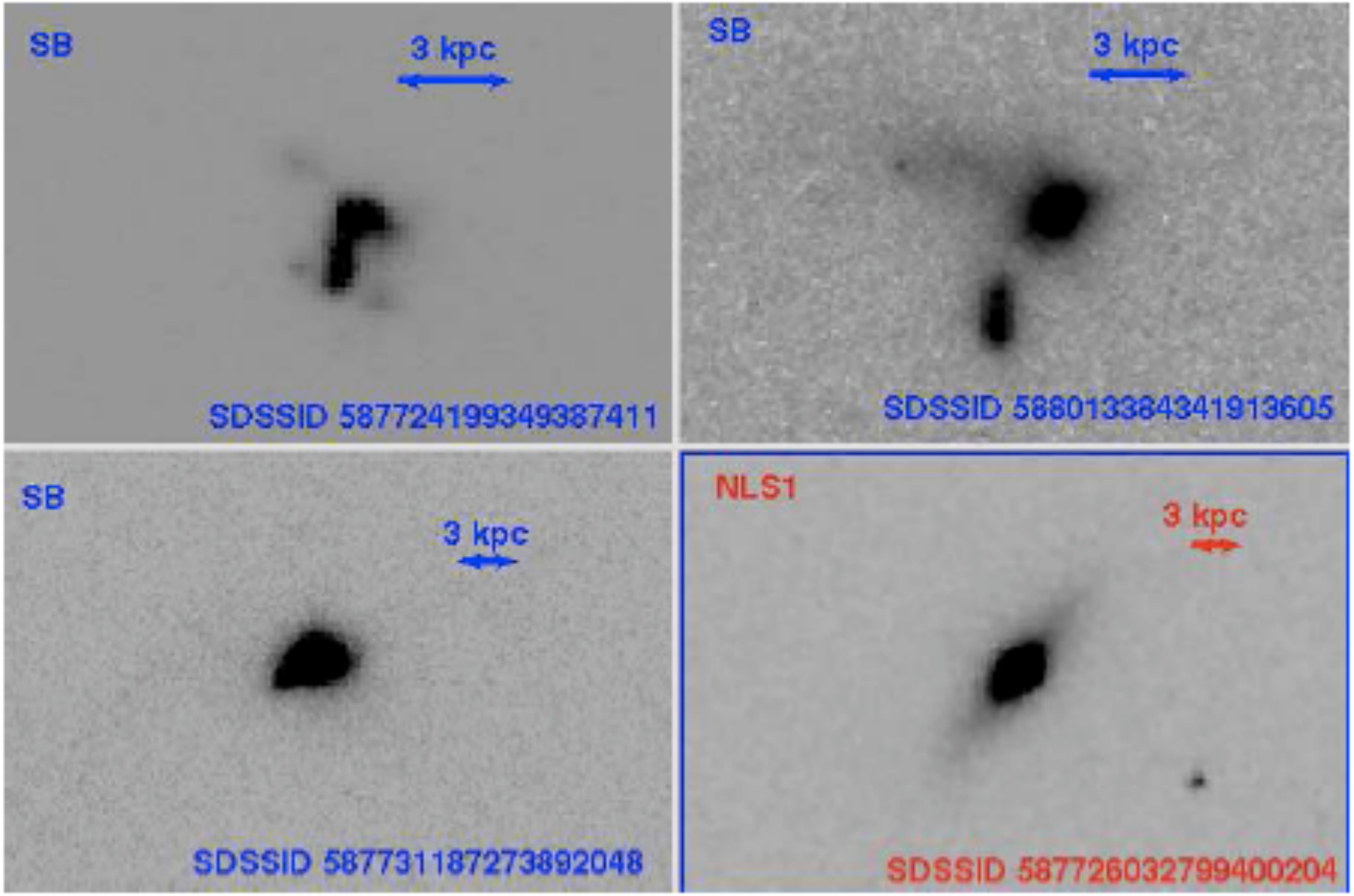
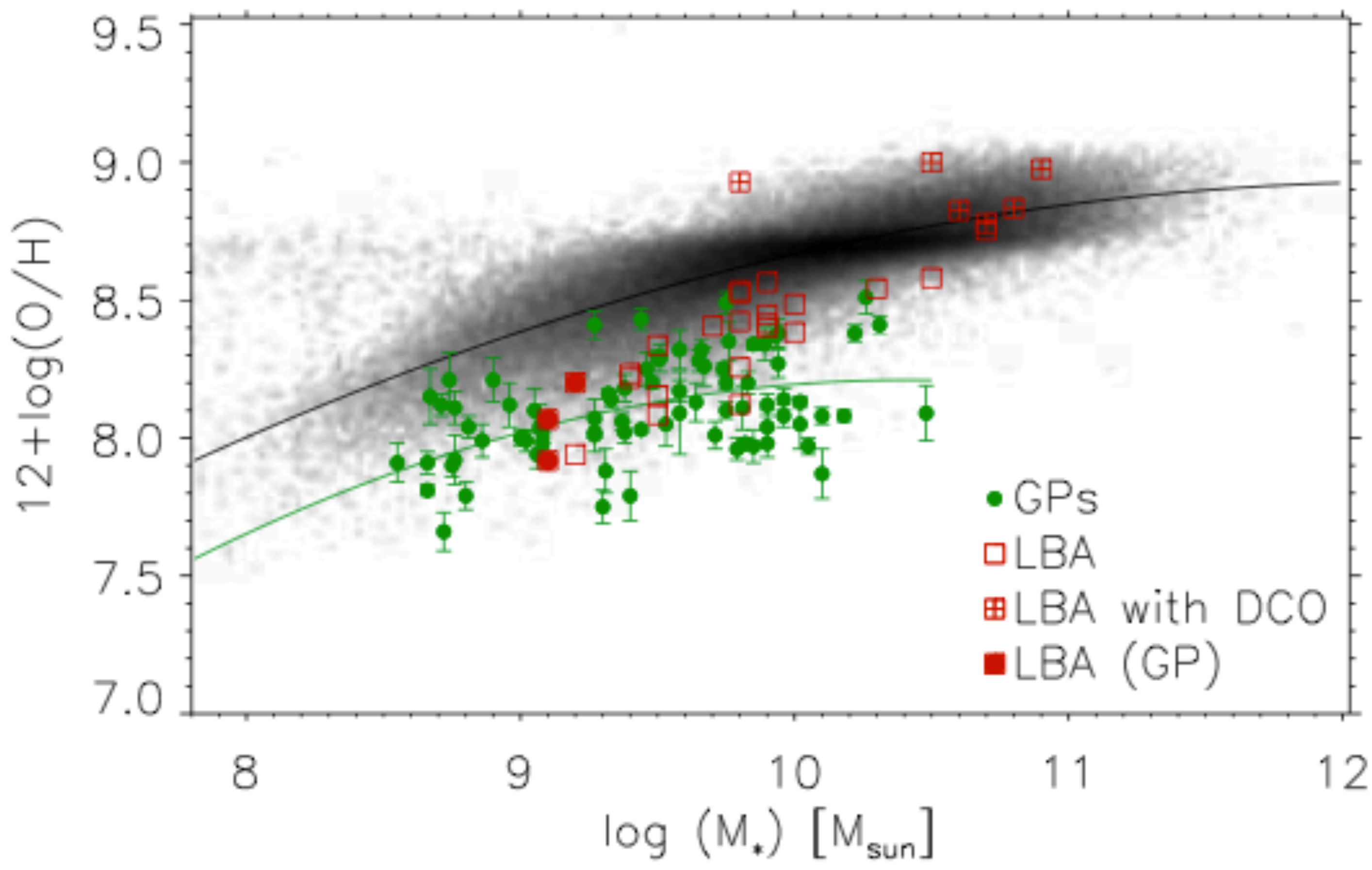
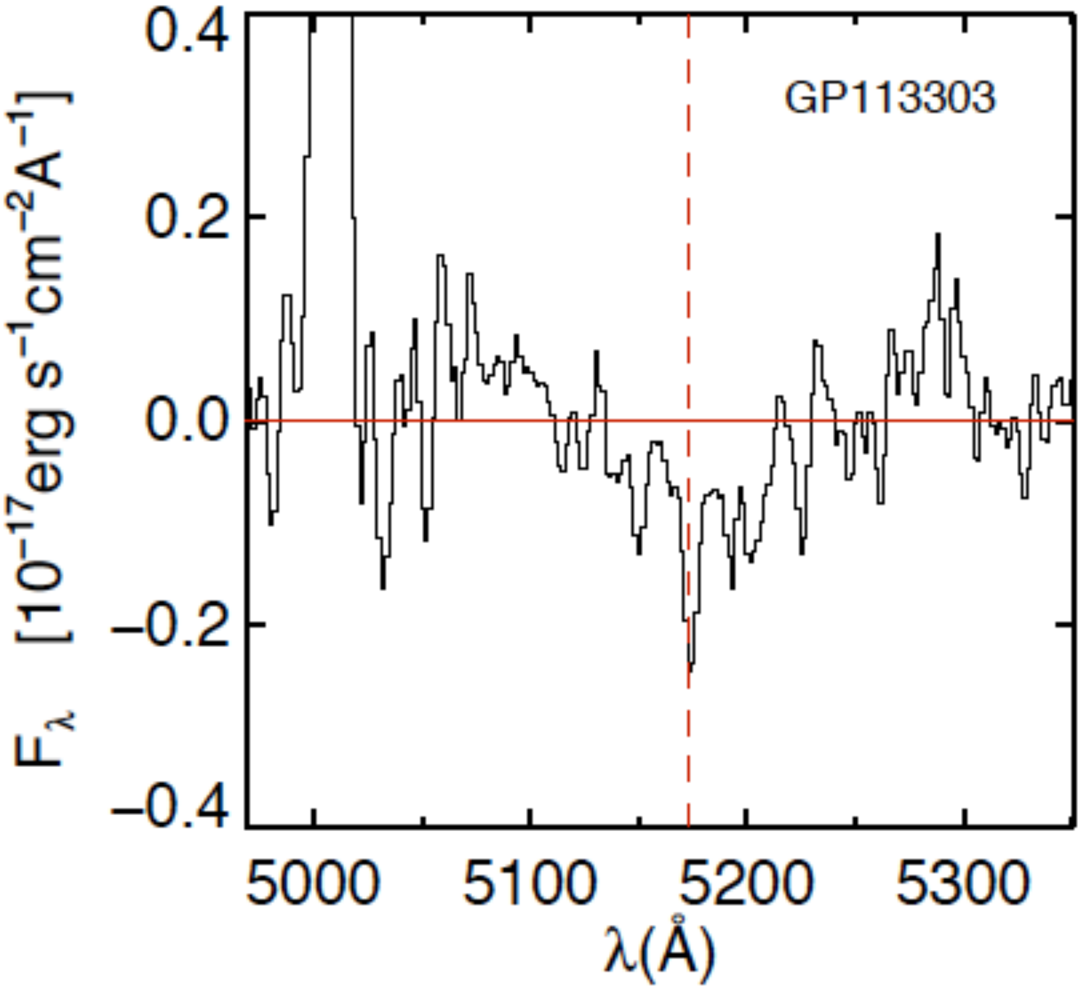
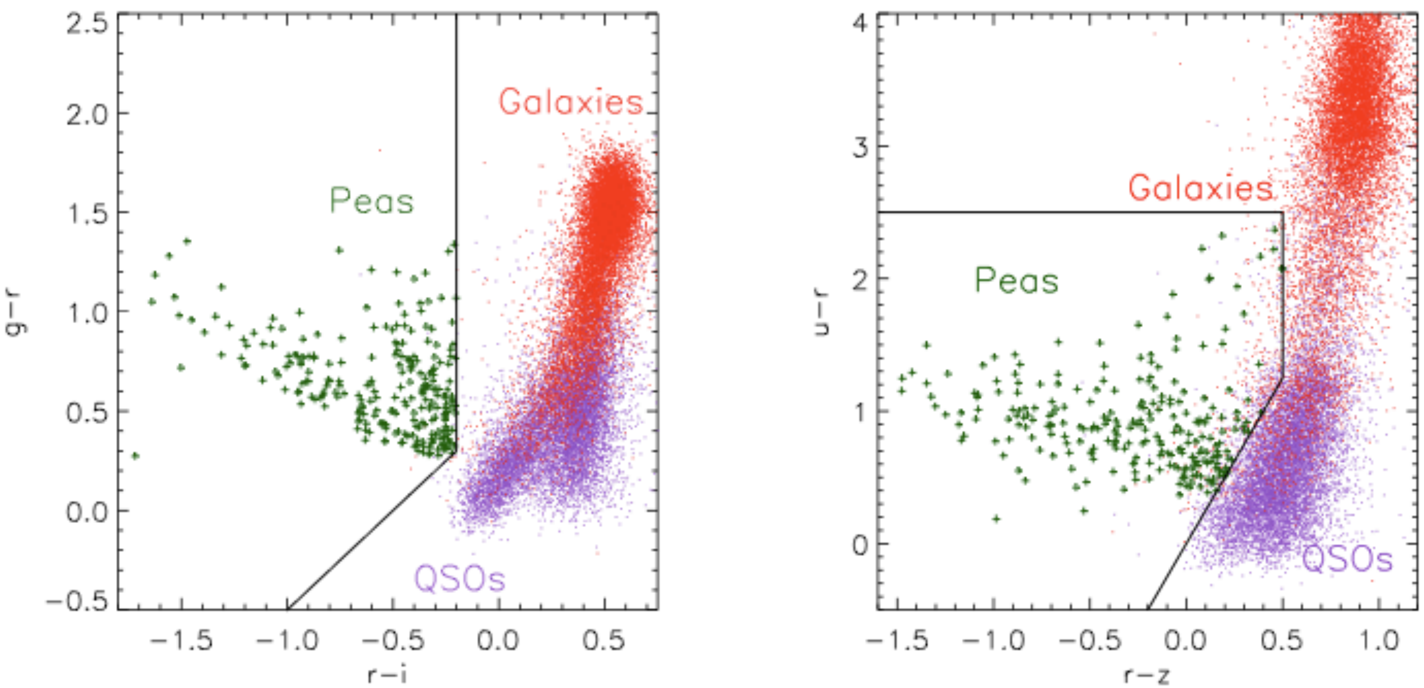



9.5
9.0
8.5
8.0
7.5
7.0
12+log(O/H)
8
9
10
11
12
log (M*) [Msun]
GPs
LBA
LBA with DCO
LBA (GP)

Amorin et al.



Amorin et al.
2012



Galaxies
Peas
QSOs
g−r
r−i
Galaxies
Peas
QSOs
u−r
r−z

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Bamford et al. arXiv/0805.2612
Skibba et al. arXiv/1111.0969
Cardamone et al. arXiv/0907.4155

chris@zooniverse.org