FAINT GALAXIES IN AND AROUND COMPACT GROUPS

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Compact Groups:

- Densest galaxy associations
- 4-10 members
- Projected separations ~ galaxy diameters
- High number density+low velocity dispersion= Interaction-induced galaxy evolution: bursts of star formation, nuclear activity, enhanced radio emission,x-ray emission and ultimately merging of the galaxies?

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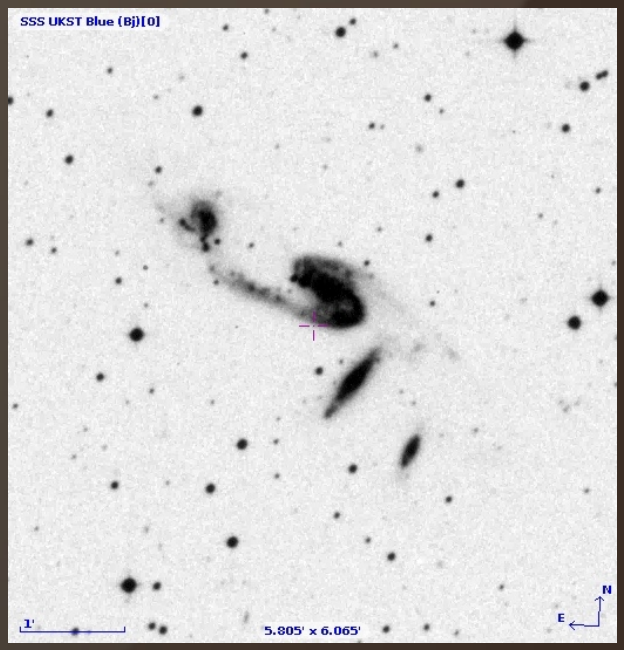
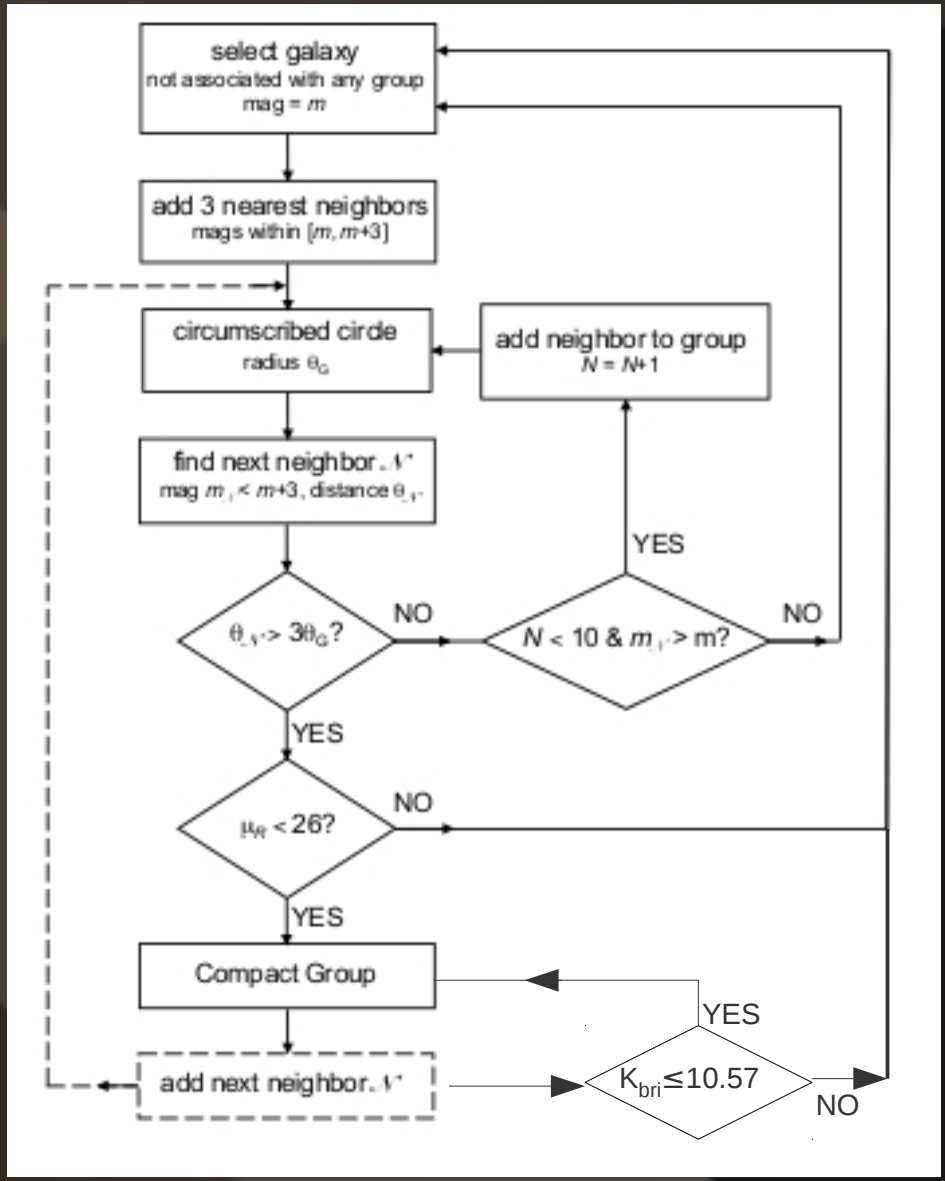


1948: Seyfert's Sextet

1977: Rose visual catalogue

Criteria to identify Compact Groups

- $4 \leq N \leq 10$ (population)
- $\mu_K \leq 23.6$ (compactness)
- $\Theta_N > 3\theta_G$ (isolation)
- $K_{bri} \leq K_{2MASS} - 3 = 10.57$ (flux limit)



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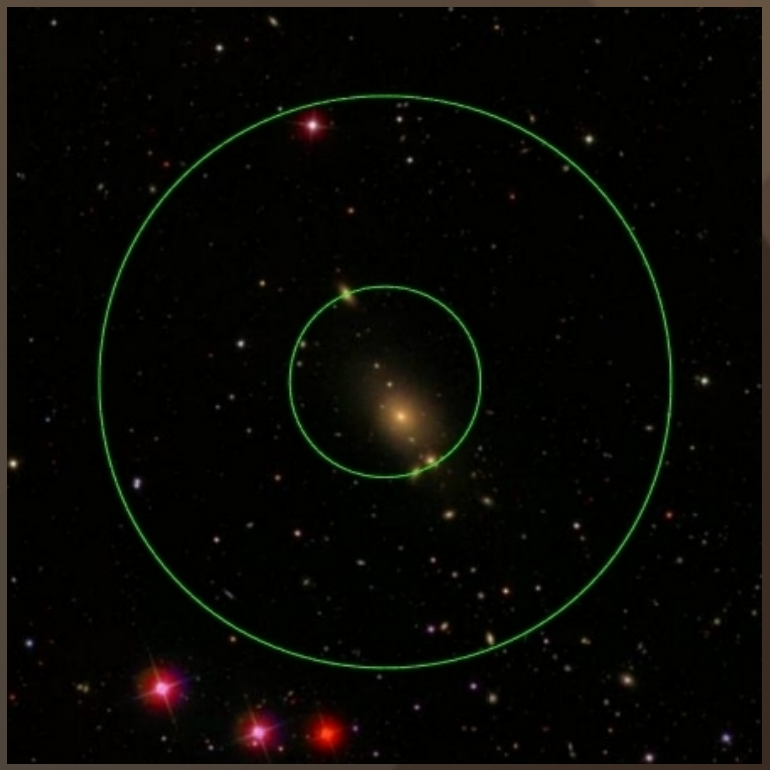

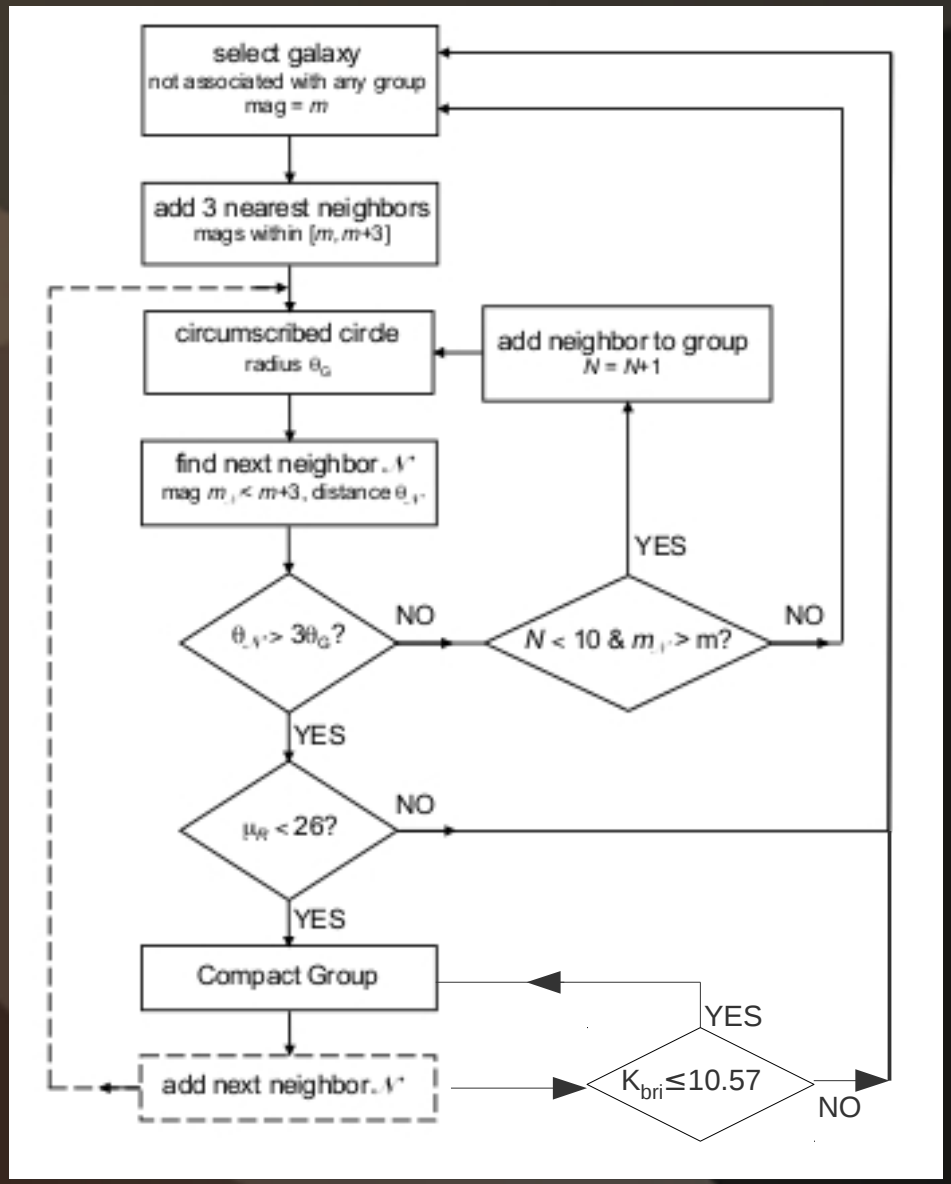

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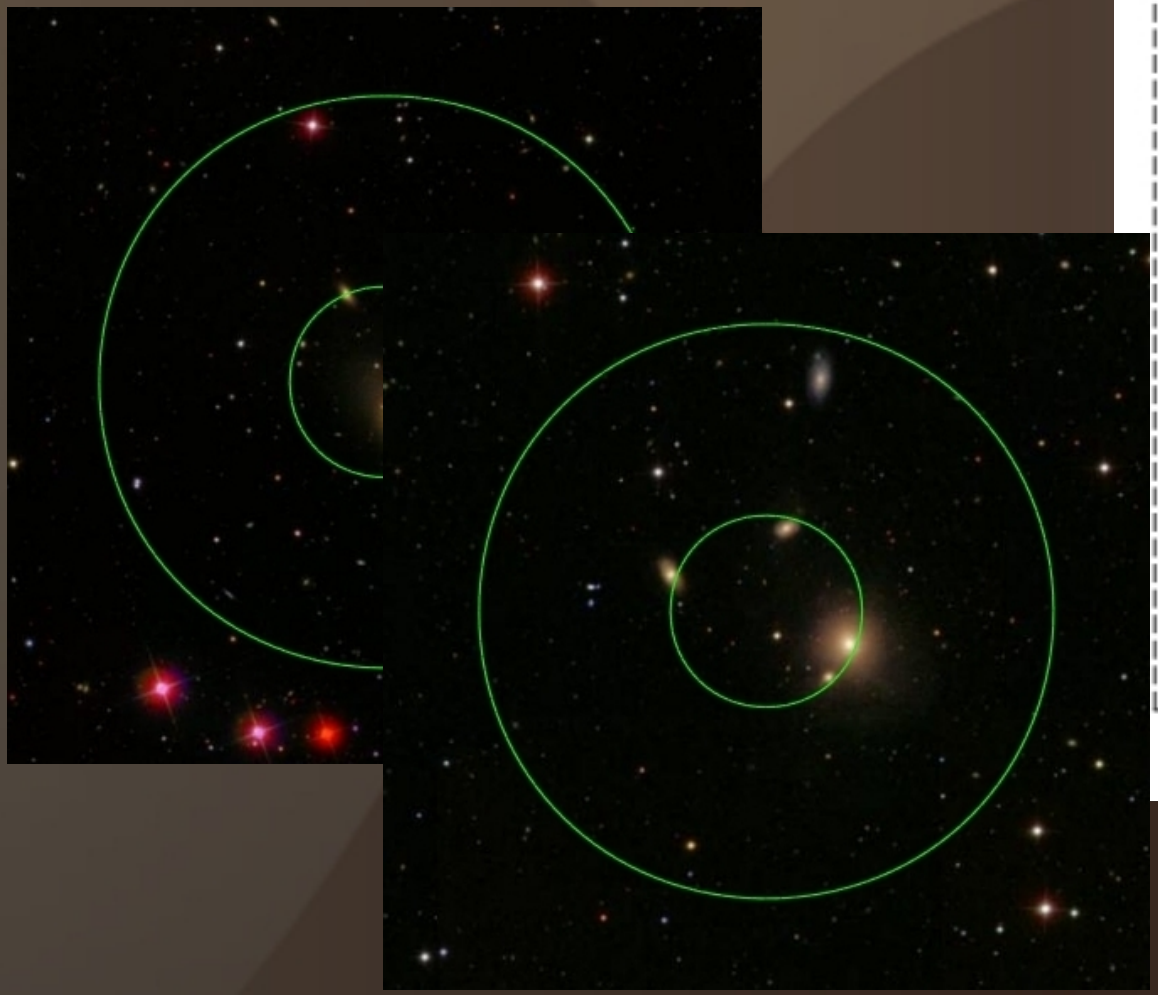
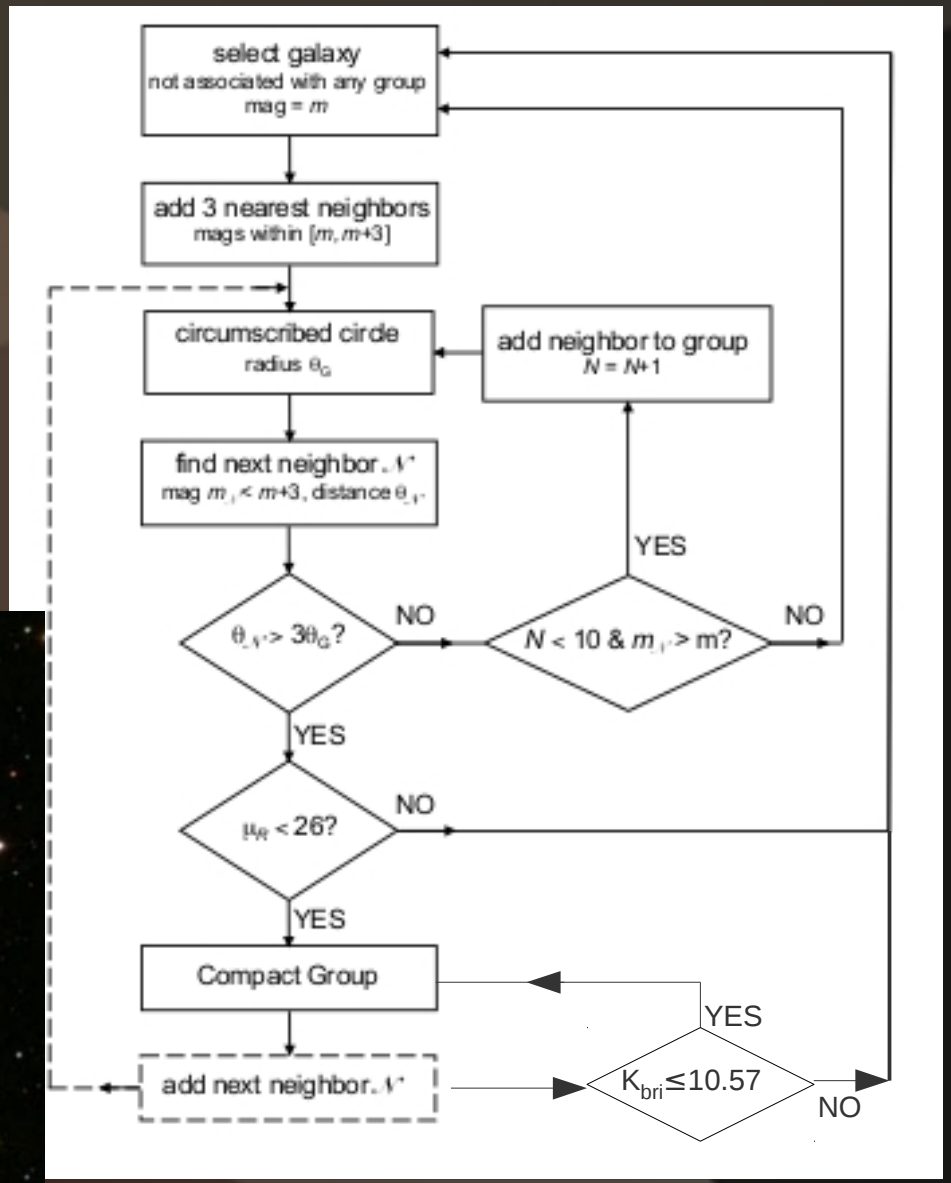




Identifying CGs in a mock galaxy catalogue

Mock galaxy catalogue:

- Semi-analytic galaxies from Guo et al. 2011 on top of MSII
- All Sky Light Cone (evolution of structures & properties)
- r_{lim}= 16.3 (k-corrections from Chilingarian et al. 2011)
- Galaxy size according to Shen et al. 2003 ($R_{half\ light}$ vs. M_r)

Compact Group Catalogue

- $4 \leq N \leq 10$ (population in a 3-mag range)
- $\mu_r \leq 26.33$ (compactness)
- $\Theta_N > 3\theta_G$ (isolation)
- $r_{bri} \leq r_{lim} - 3 = 13.27$ (flux limit)
- $|v_i - \langle v \rangle| < 1000$ km/s (velocity filtering)

432 Compact Groups

Identifying faint galaxies in/around CGs

Mock galaxy catalogue:

- **Semi-analytic galaxies from Guo et al. 2011 on top of MSII**
- **All Sky Light Cone (evolution of structures & properties)**
- **r_{lim}= 17.77 (k-corrections from Chilingarian et al. 2011)**

Faint point galaxies:

- not member galaxies within $3\theta_G$ and $|v_i-\langle v\rangle| < 1000$ km/s

- $r_{bri}+3 < r < r_{bri}+4.5$

1640 faint neighbours in/around 390 CGs

Faint sized galaxies:

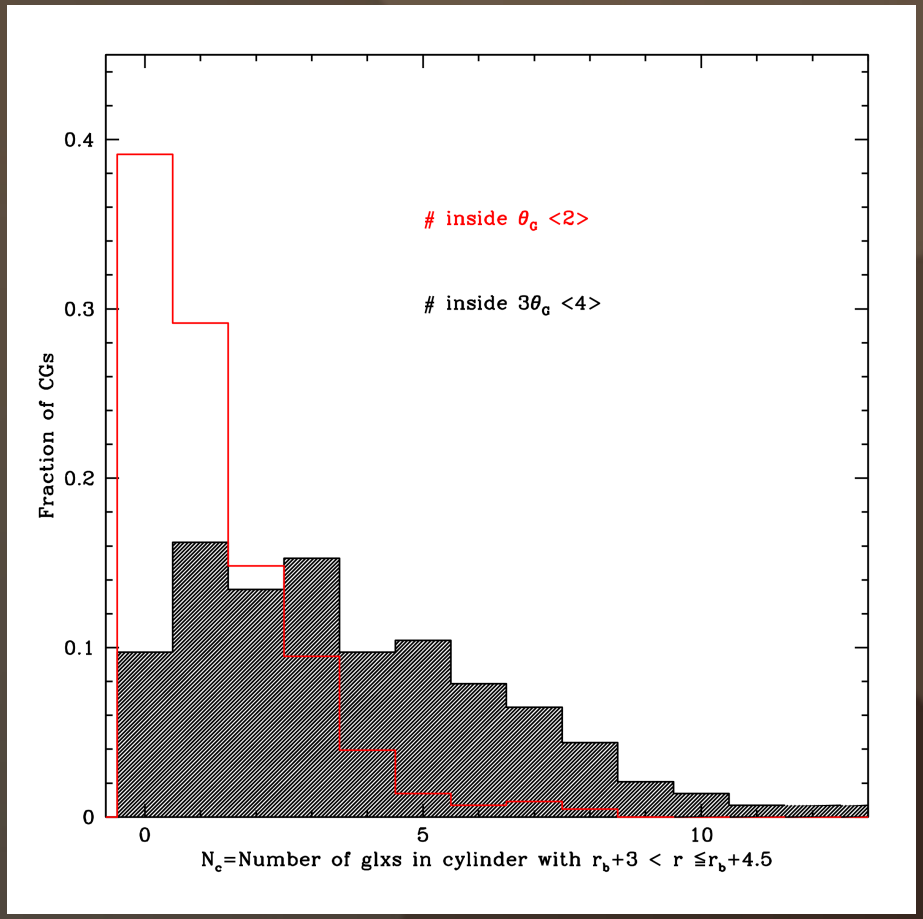
- not member galaxies within $3\theta_G$ and $|v_i-\langle v\rangle| < 1000$ km/s

- $r_{bri}+3 < r < r_{bri}+4.5$

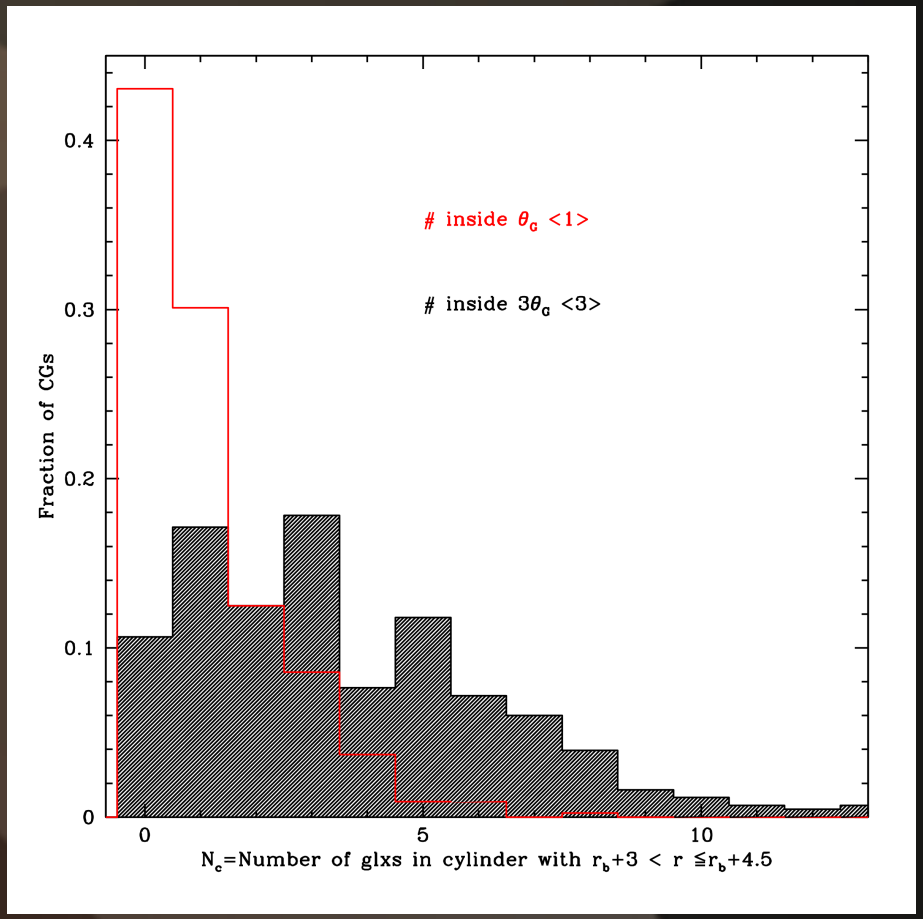
- not closer than (R_i+R_m)

1557 faint neighbours in/around 386 CGs

Point Particles



Sized Particles



Projected number density profiles of faint galaxies

Around different centres:
- **minimum circle centre**
- **barycentre**
- **brightest galaxy**
- **second brightest galaxy**

Projected number density profiles of faint galaxies

Around different centres:

- ~~minimum circle centre~~
- ~~baricentre~~
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Projected number density profiles of faint galaxies

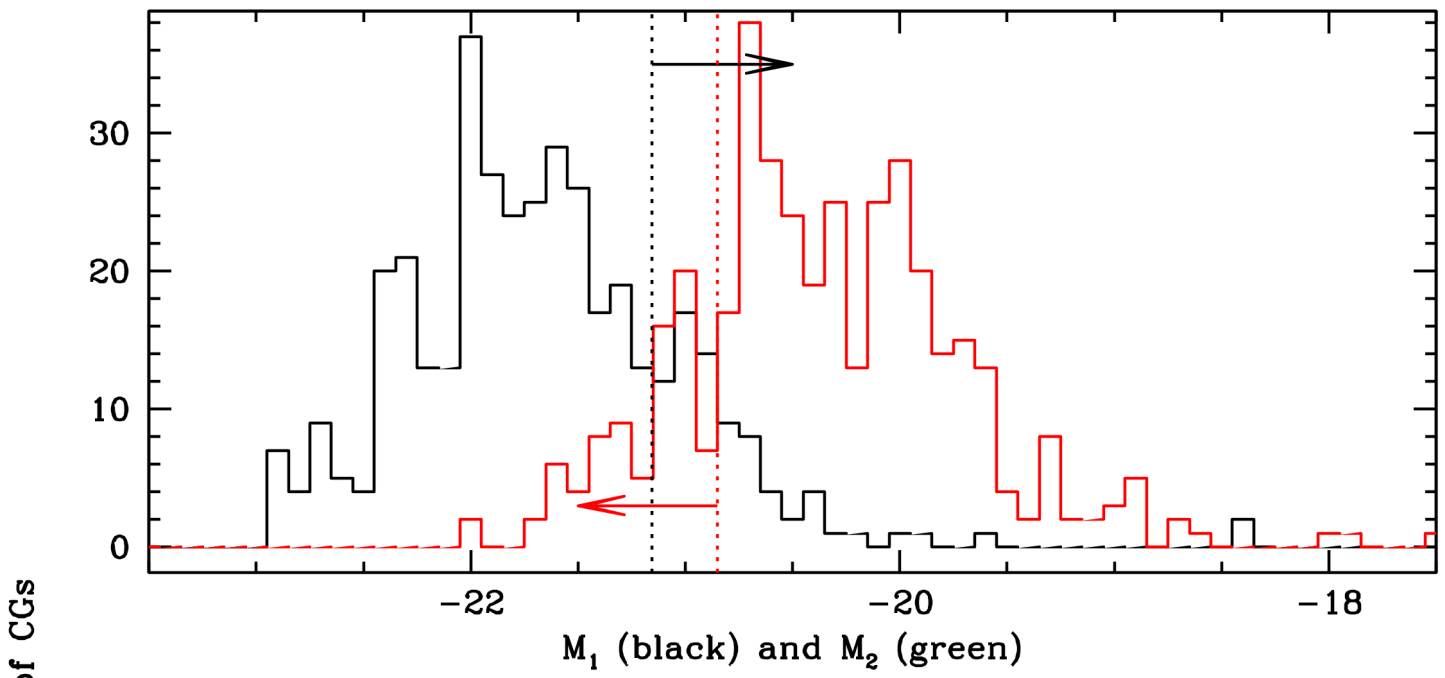
Around different centres:
- ~~minimum-circle-centre~~
- ~~baricentre~~
- brightest galaxy
- second brightest galaxy

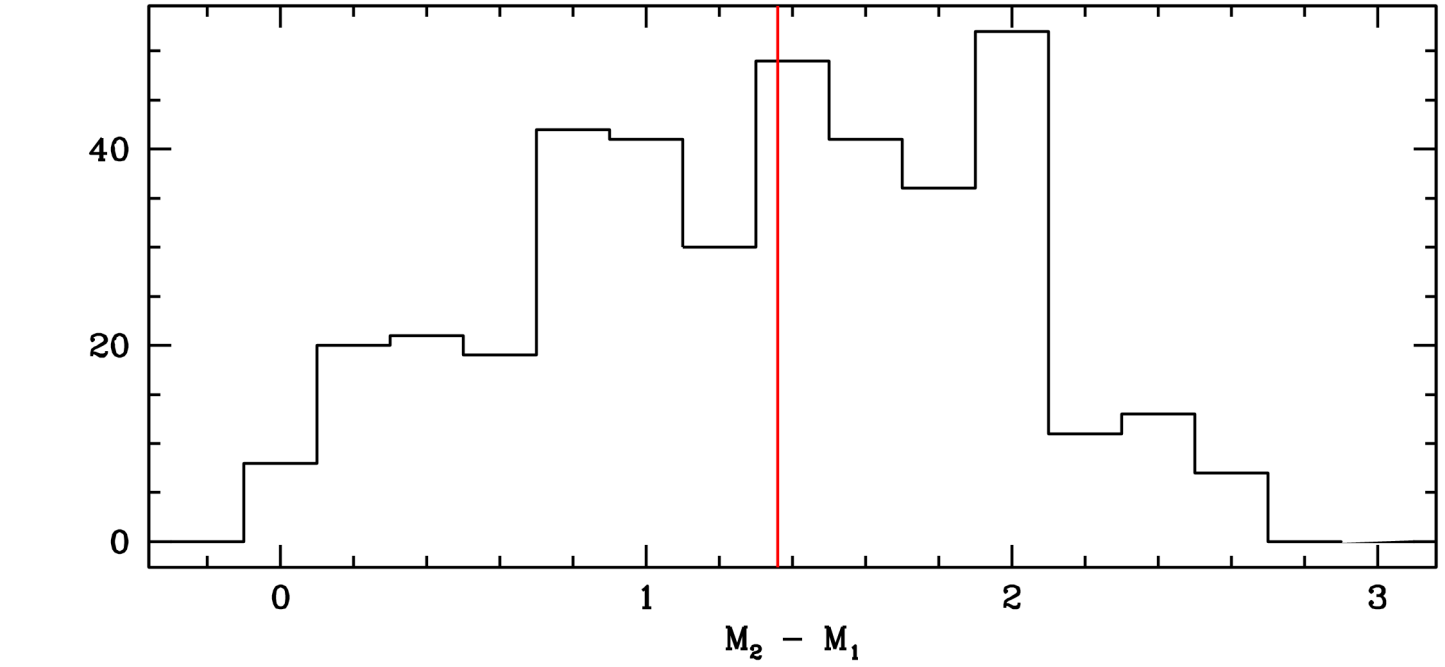
Split into different CG subsamples
- Reals and Chance Alignments (real-space 3D classification)
- Having the brightest or the faintest 1st ranked galaxies
- Having a 'faint' 1st ranked galaxy and a 'bright' 2nd ranked galaxy
- Dominated or non-Dominated by a bright galaxy

Projecte

Around
- ~~minim~~
- ~~baricc~~
- bright
- secon

Split int
- Reals
- Having
- Having
- Domin





galaxy

Projected number density profiles of faint galaxies

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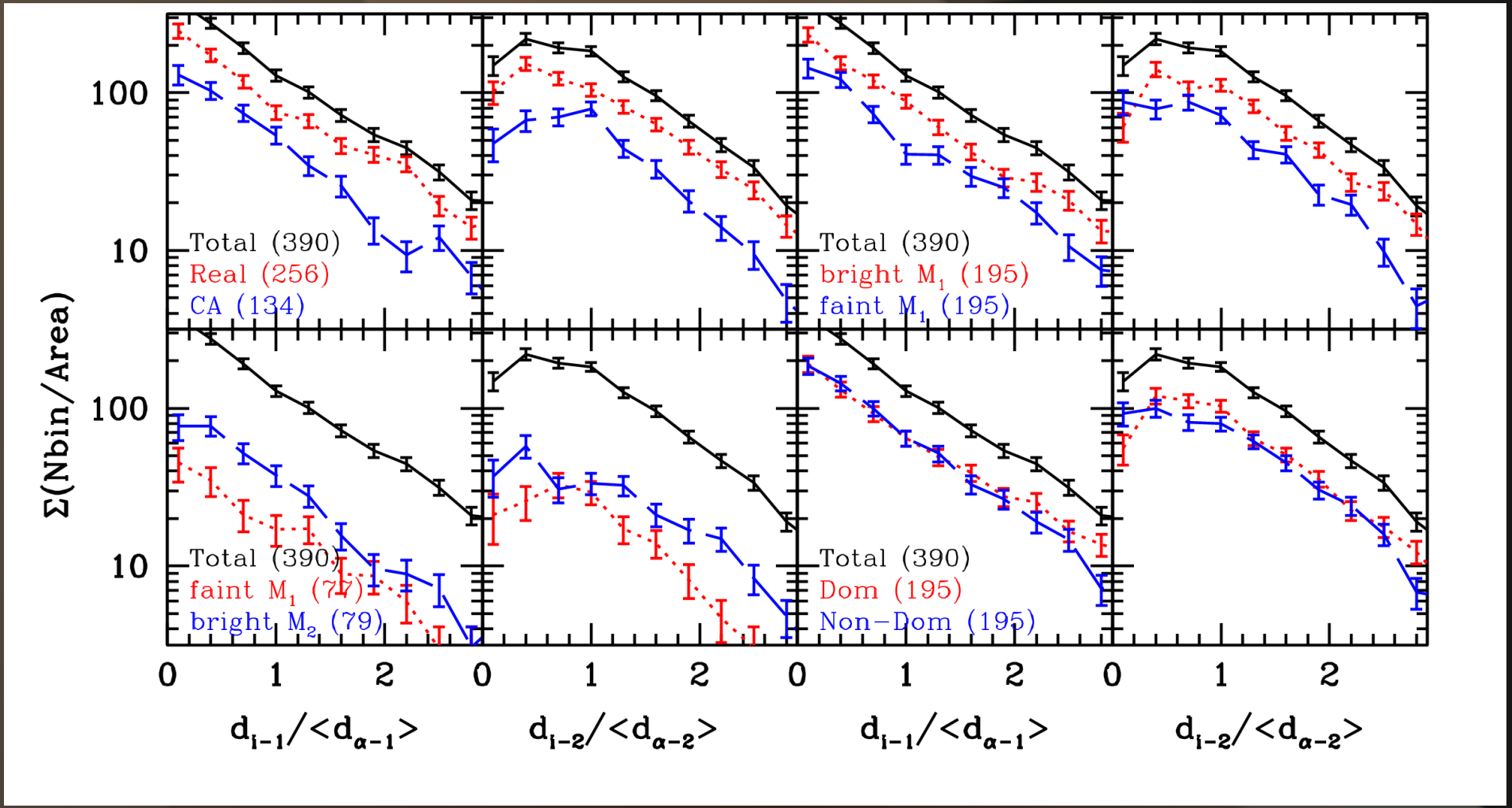
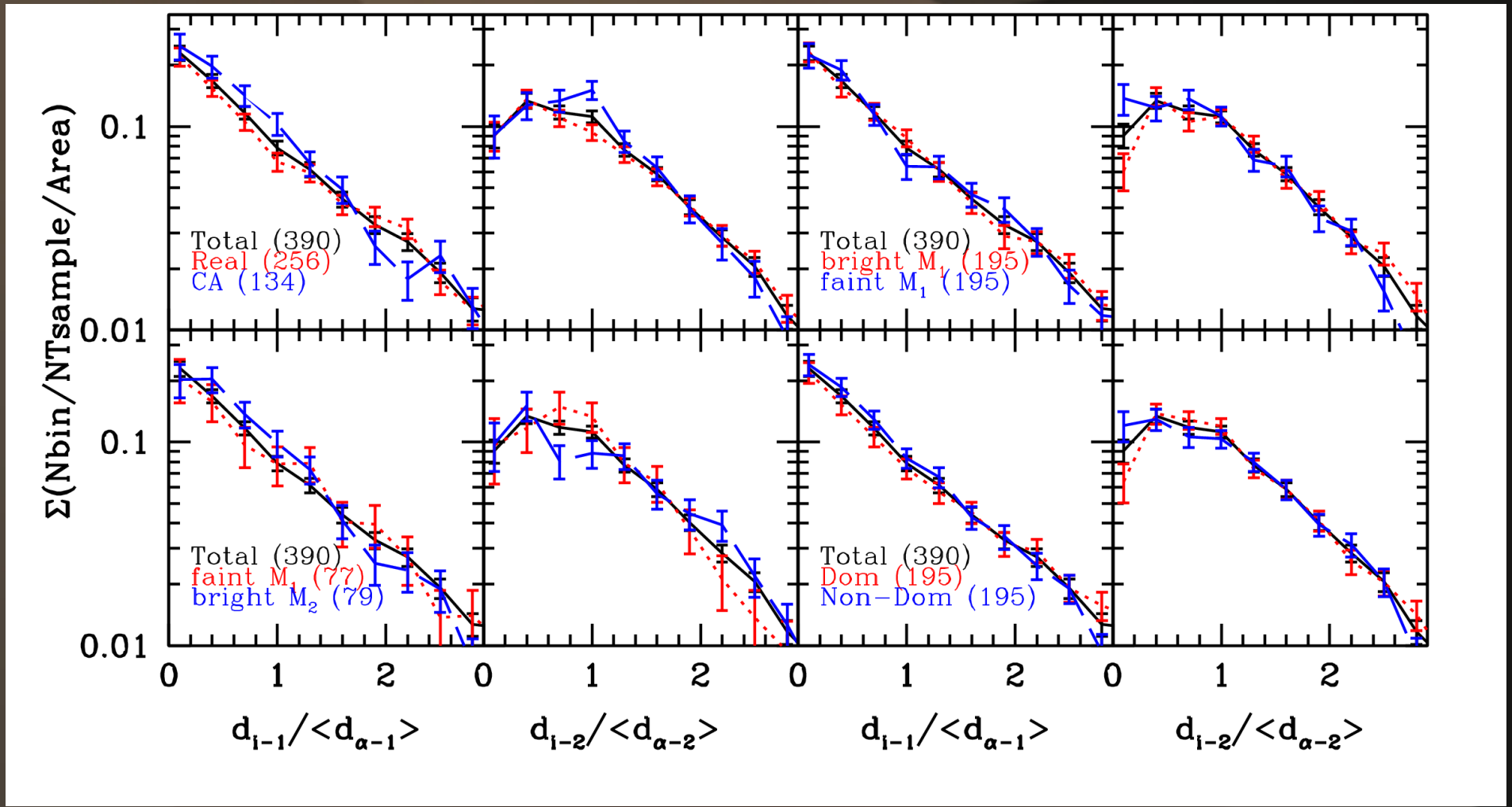


Normalized projected number density profiles of faint galaxies

Point particles



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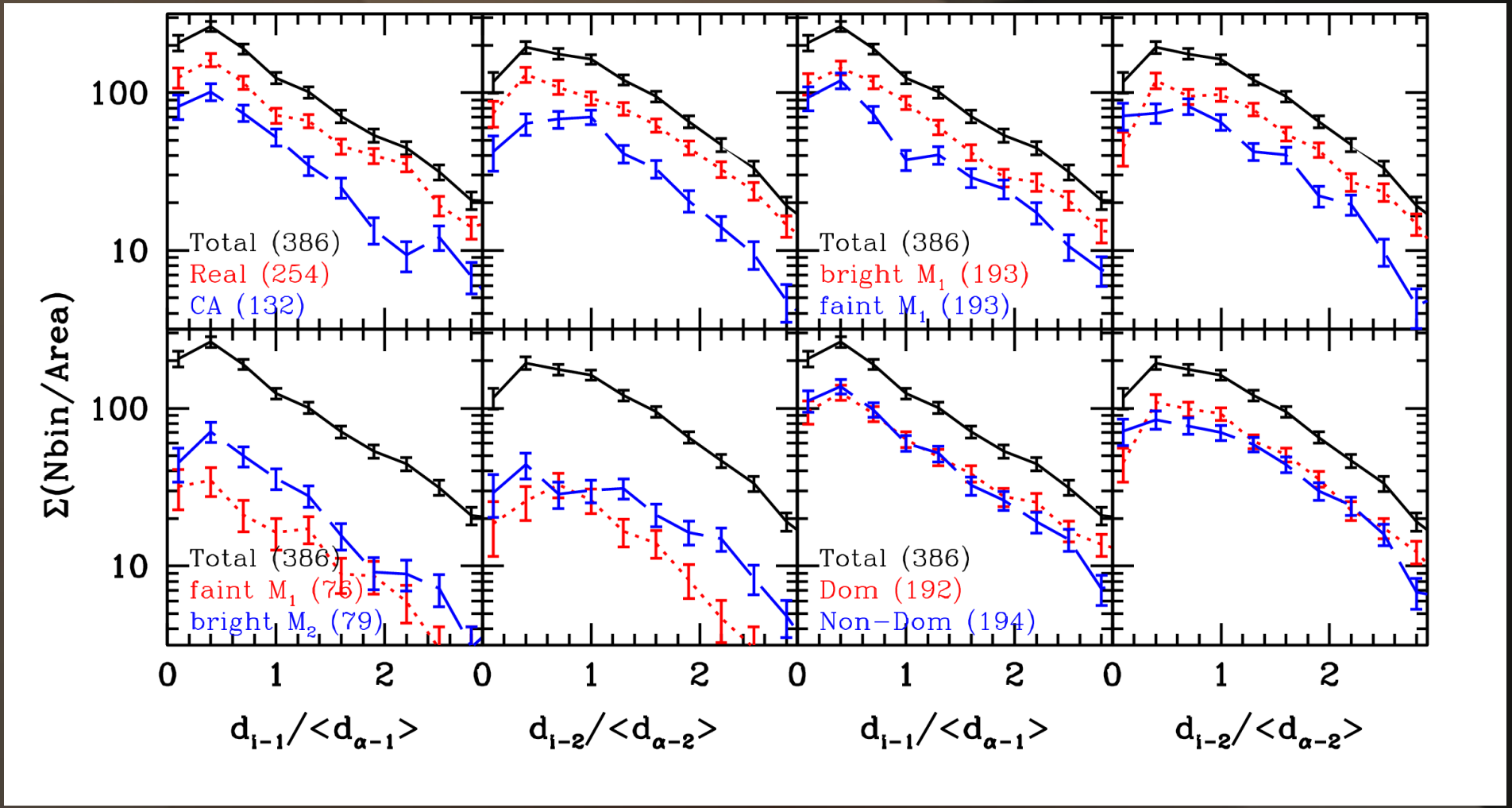

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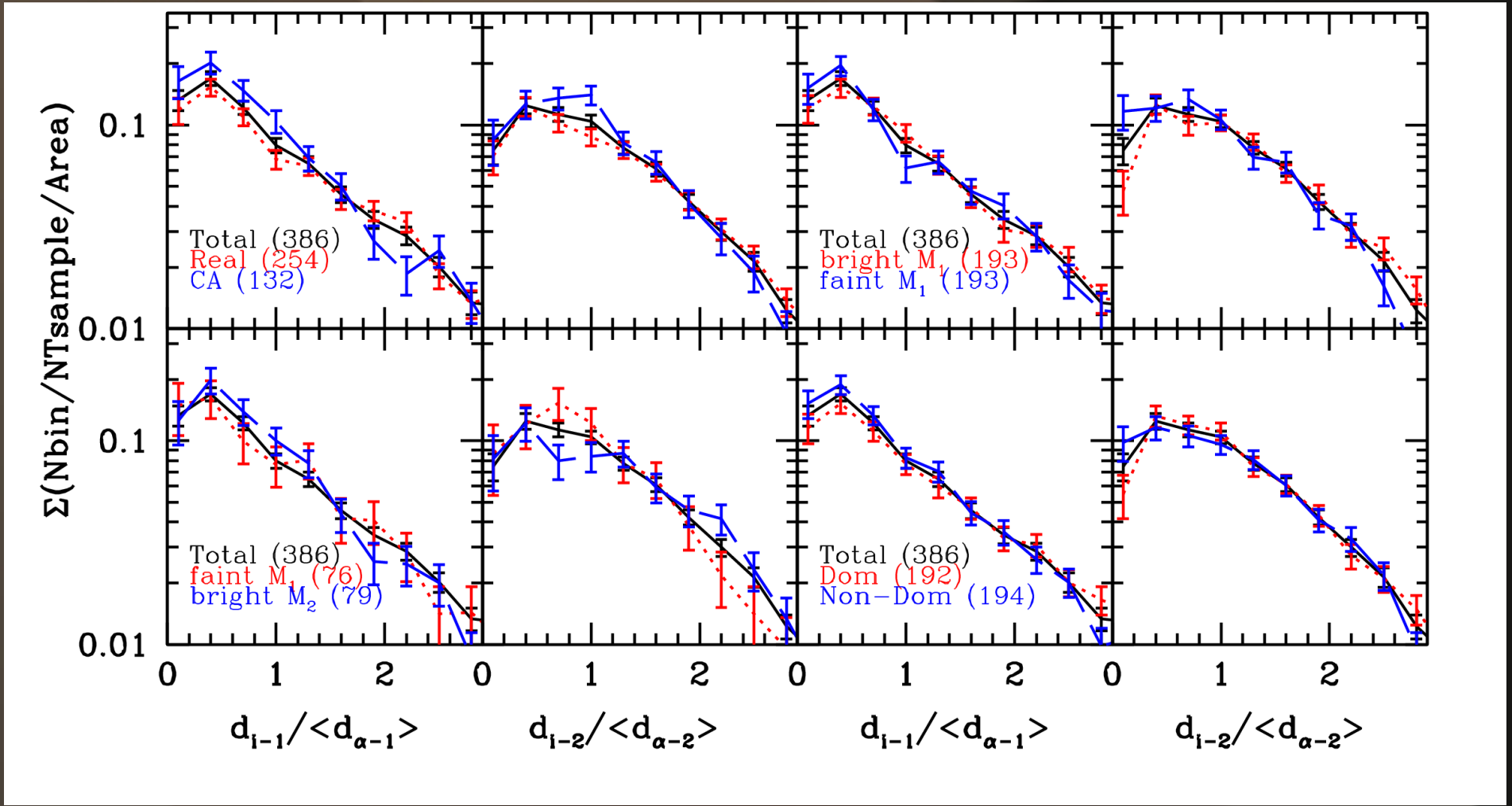
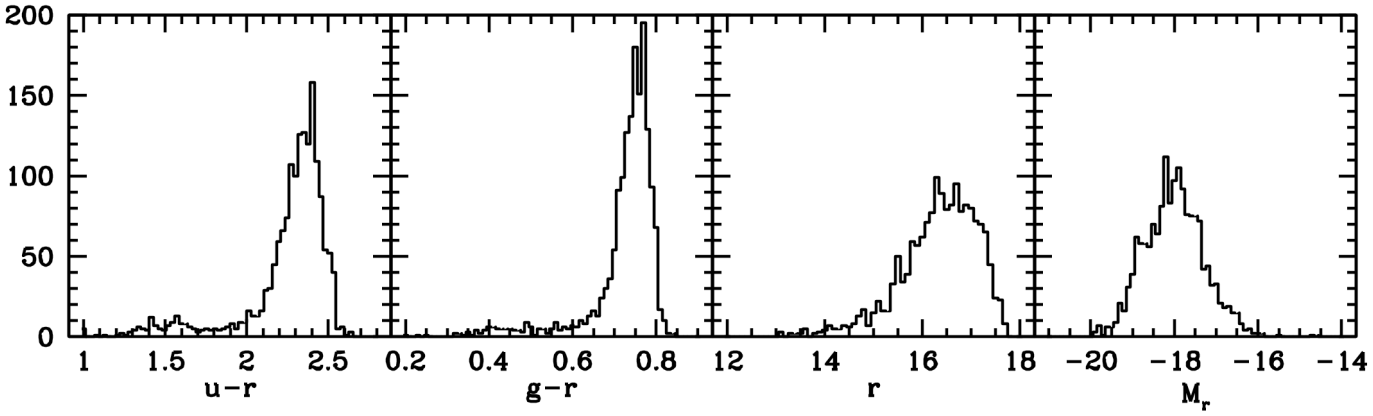


Projected number density profiles of subsamples of faint galaxies

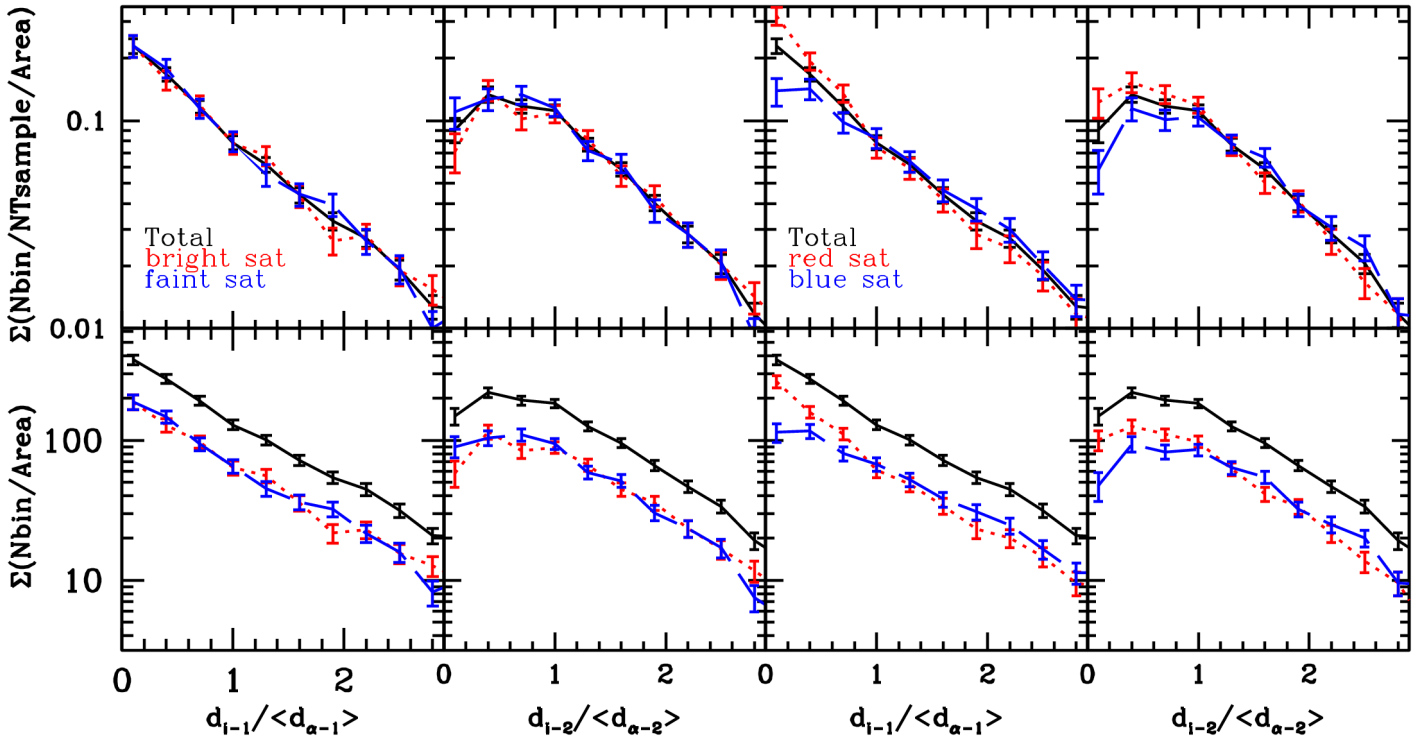
- bright / faint neighbours
- red / blue neighbours

Projecte galaxies

- brigh
- red /



- Point particles



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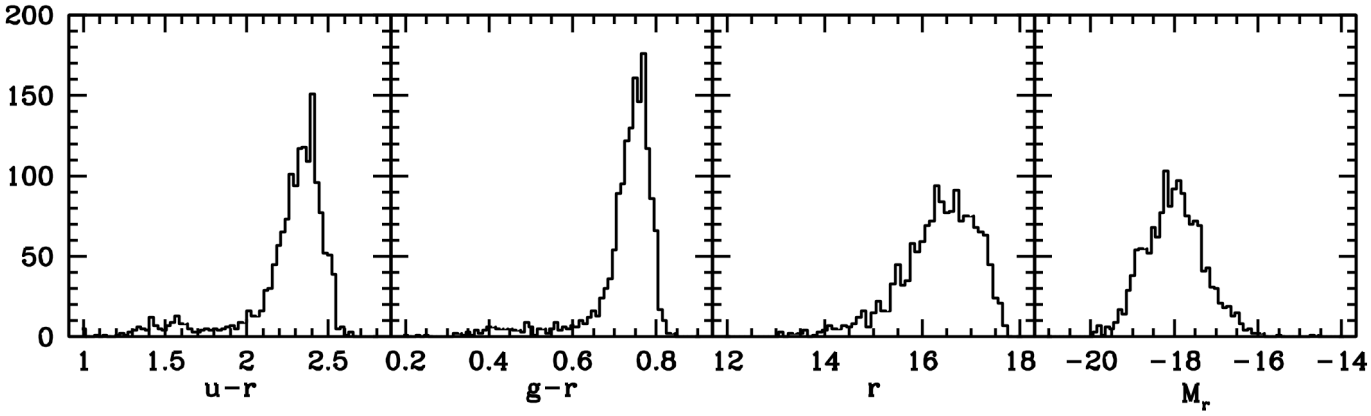

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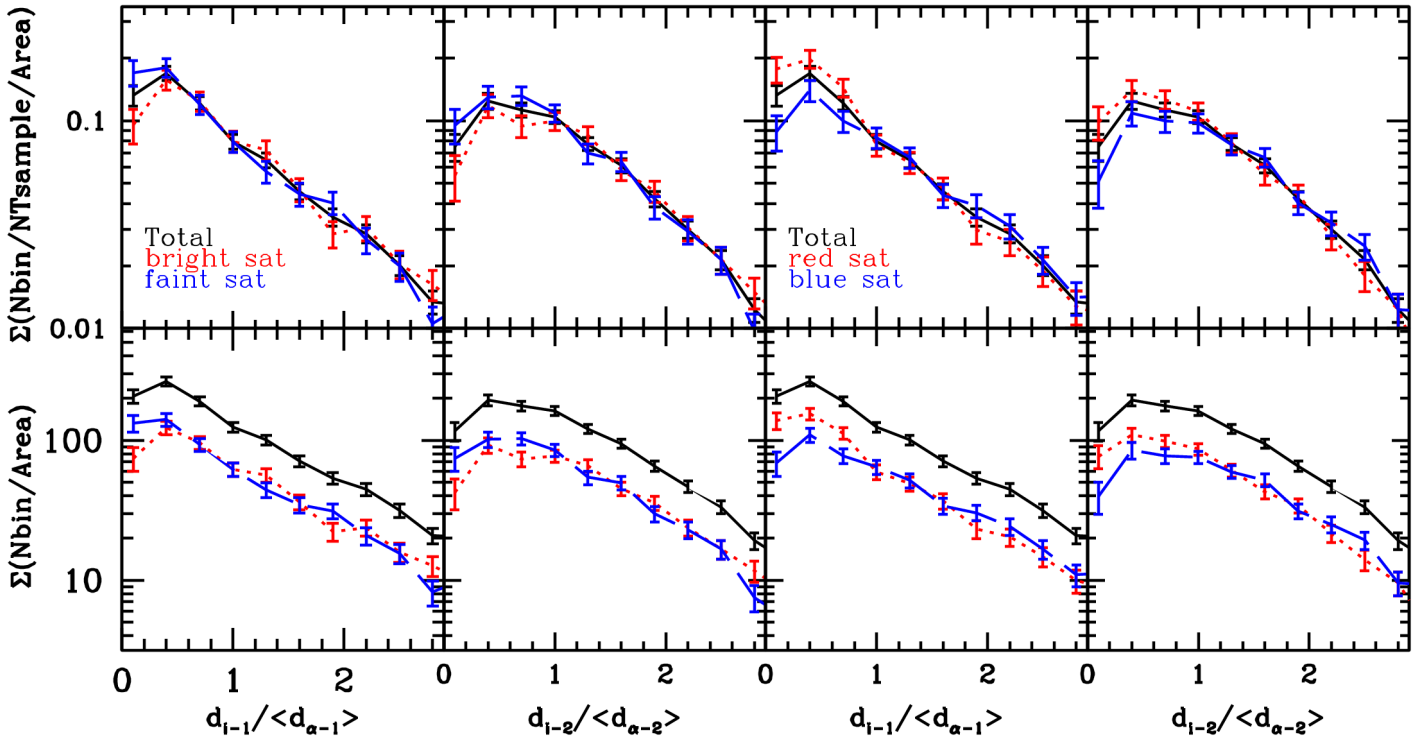


So far...

- Faint galaxies in CGs tend to cluster around bright galaxies (regardless the ranking of the galaxy in the CG)
- The brighter the galaxy, the largest the number of 'satellites'
- The frecuency/distribution of faint galaxies might be used as an observational constraint to differenciate Reals from CAs
- Red satellites are more concentrated than blue satellites

→ CGs are not enough hostile (?)

Observational results

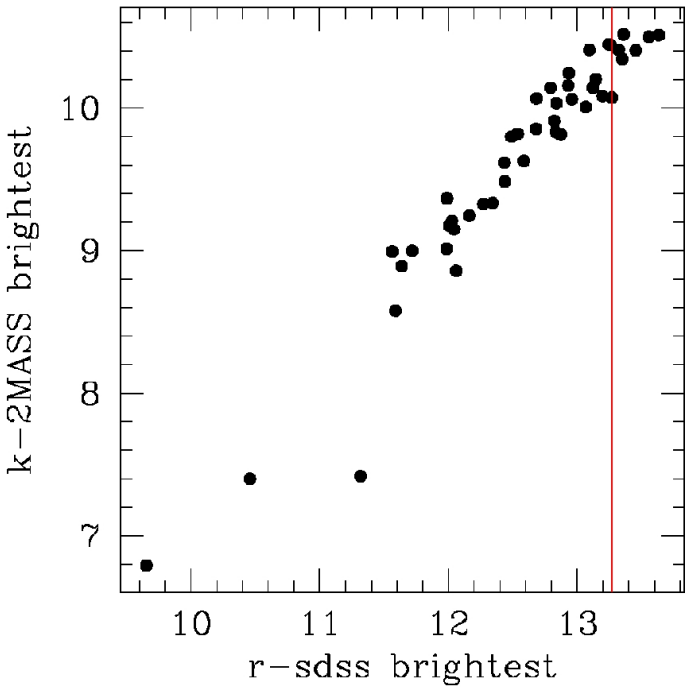
- CG sample: from 2MASS (Díaz-Giménez et al., 2012)
- faint neighbours: from SDSS

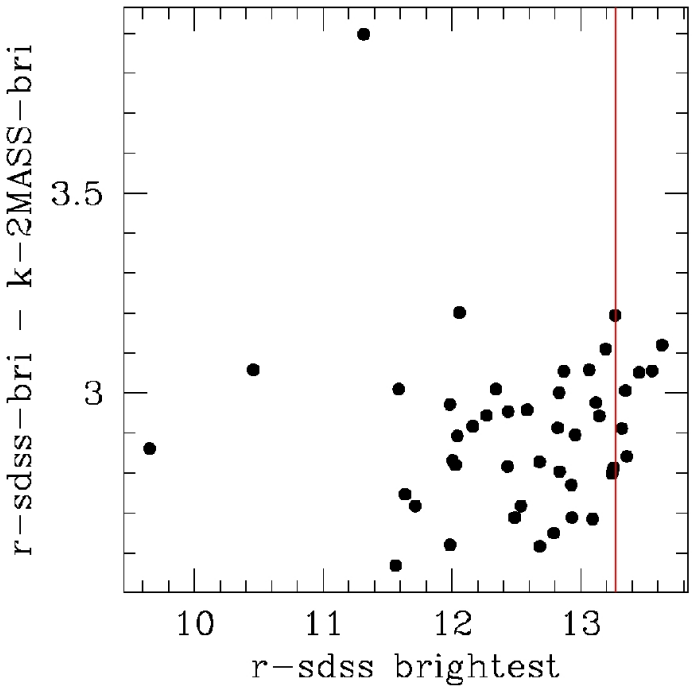
v2MCGs: 85 CGs
45 CGs lie on SDSS area
35 CGs fullfill the CG criteria in the r-band

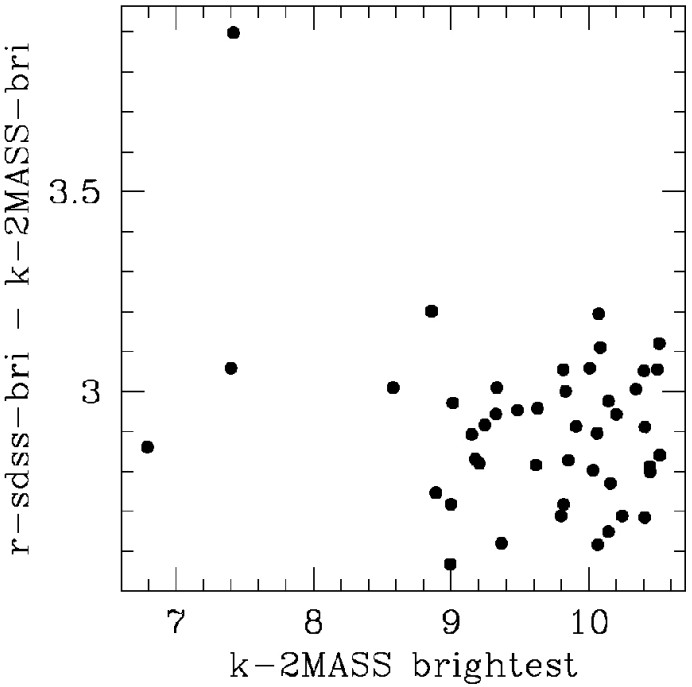
Obser

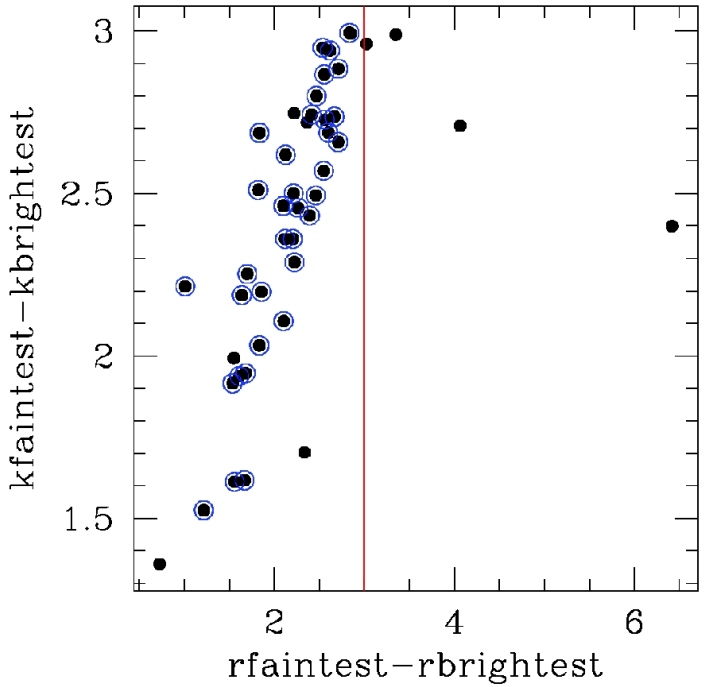
- CG sam
- faint ne

v2MCGs









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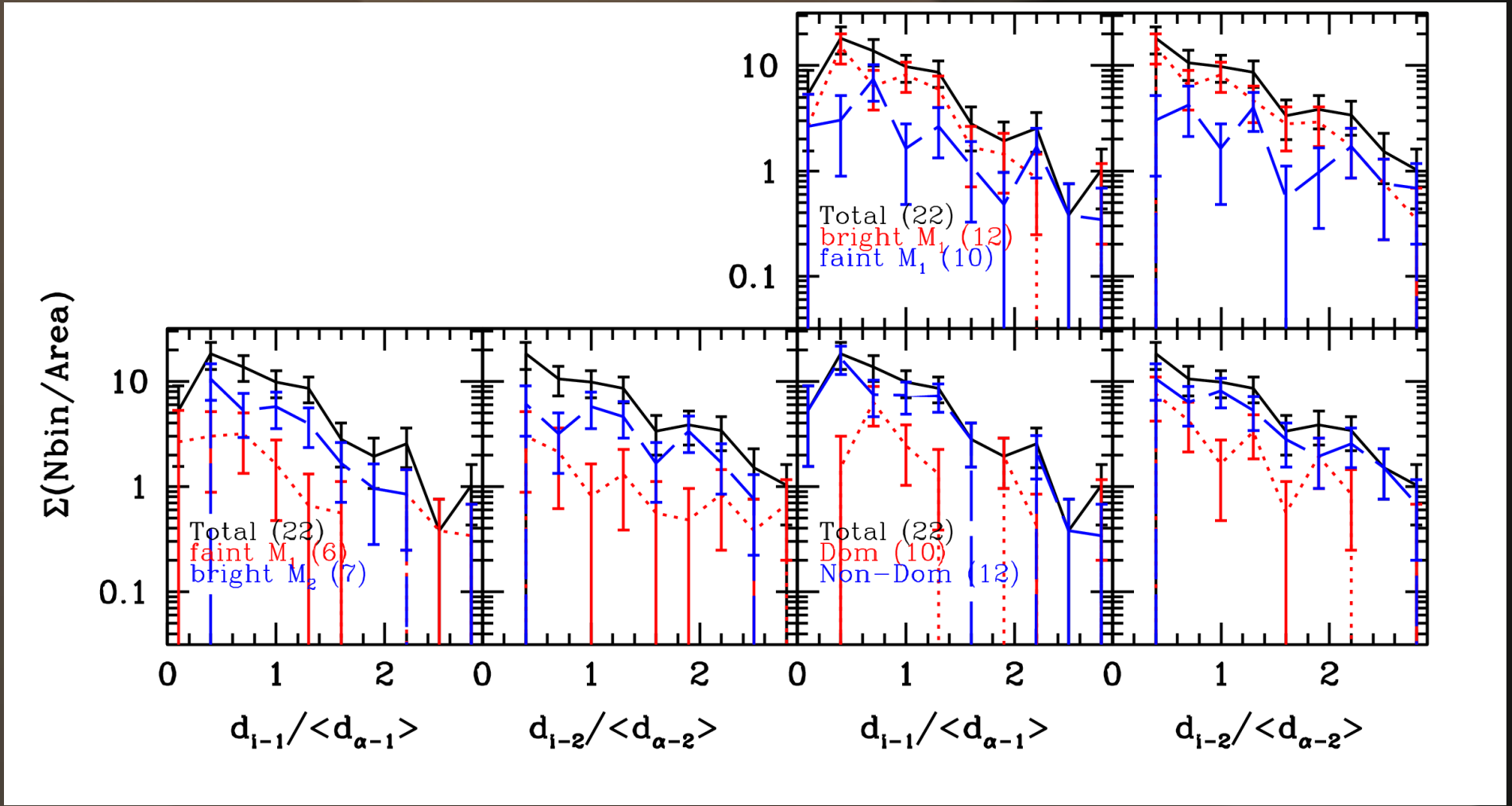
SDSS CASJobs: 22 CGs have faint neighbours within
$3\theta_G$ and $|v_i - \langle v \rangle| < 1000$km/s, with $r < r_{bri} + 4.5$

→ 76 neighbours in 22 CGs

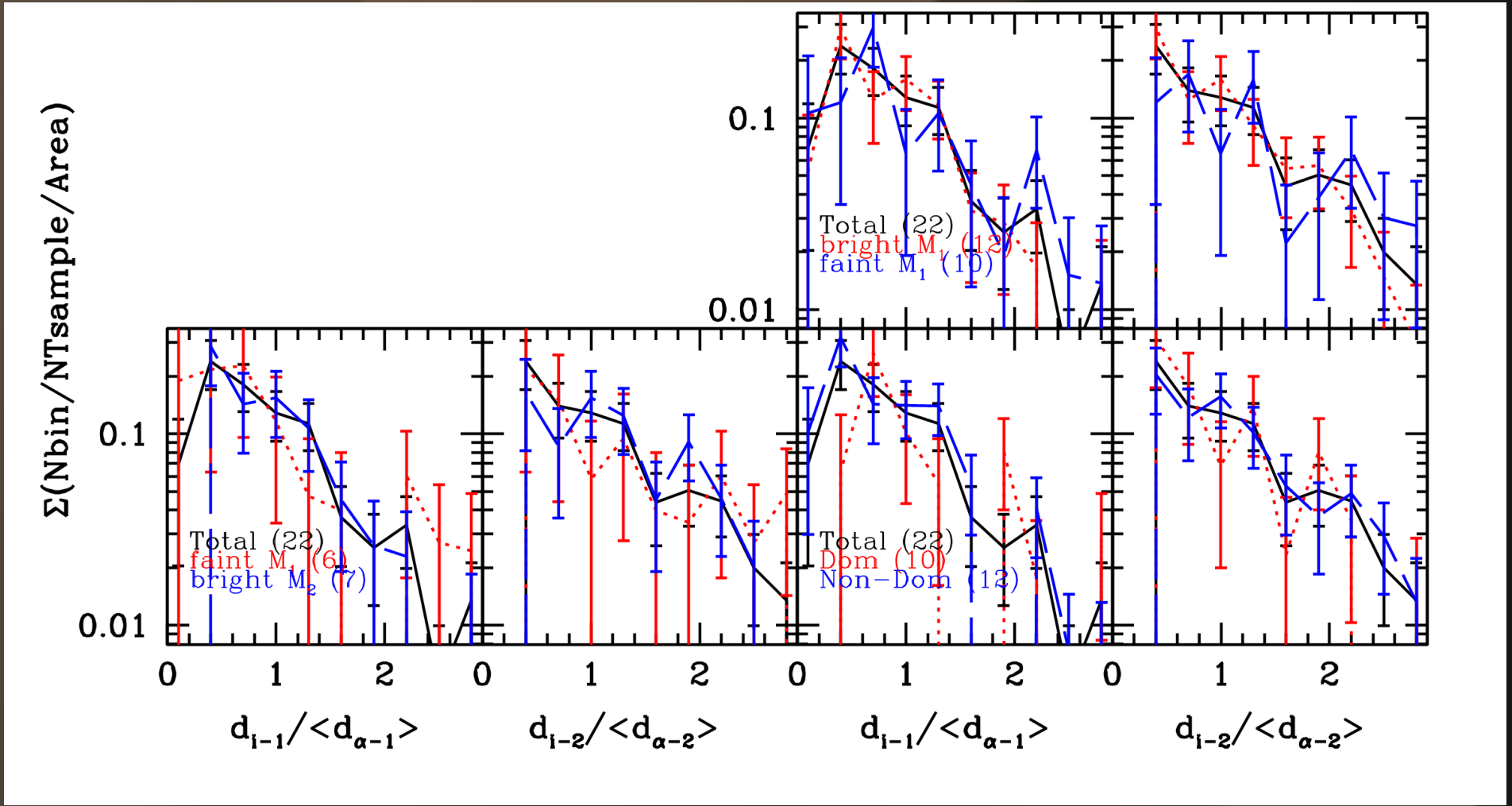
Observational results

- Projected number density profile (split by group types):



Observational results

- Normalized projected number density profile (split by group type)

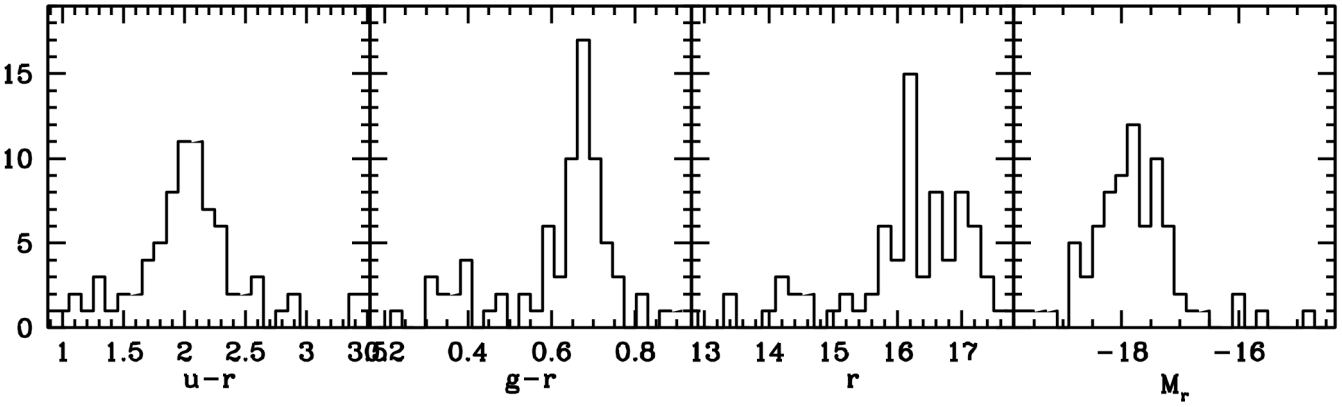


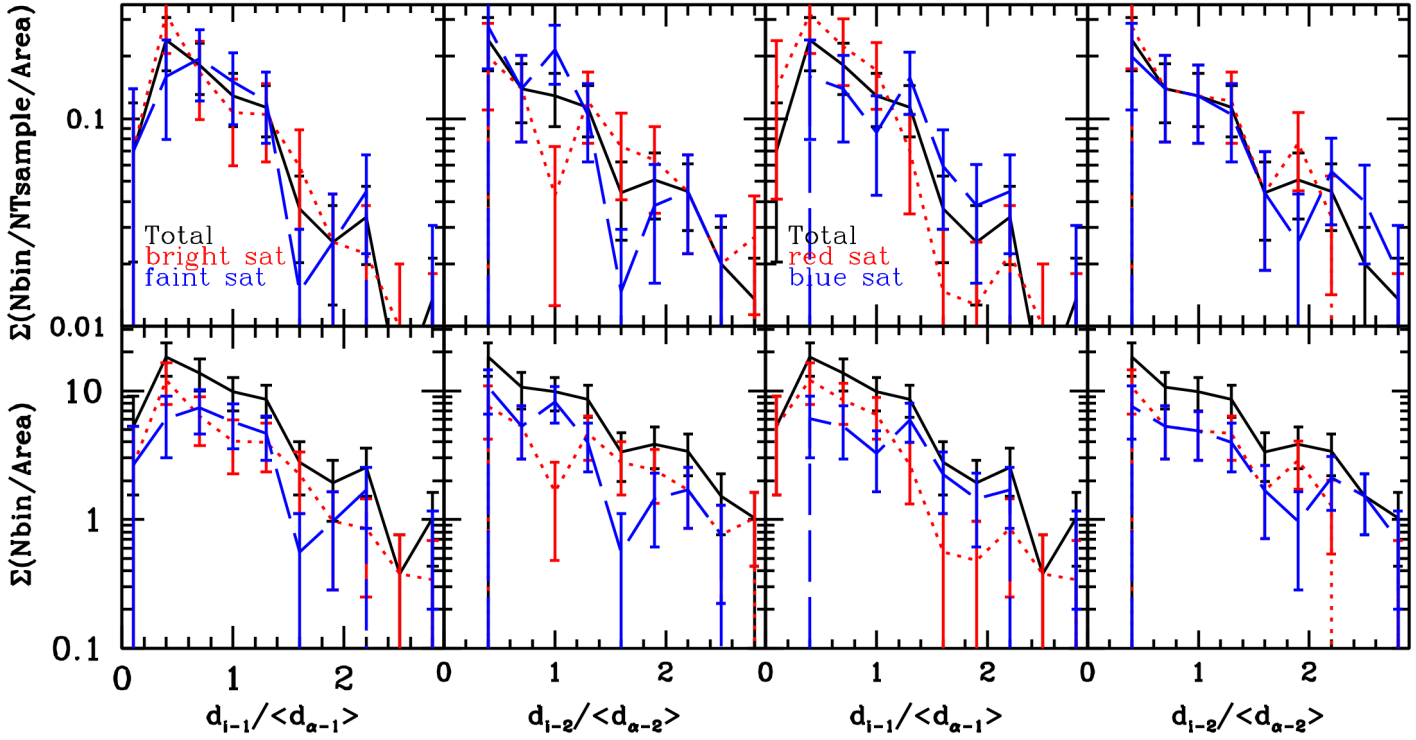
Observational results

- Projected number density profile (split by satellite type)

Obser

- Projec





- We need more data...

THE END