

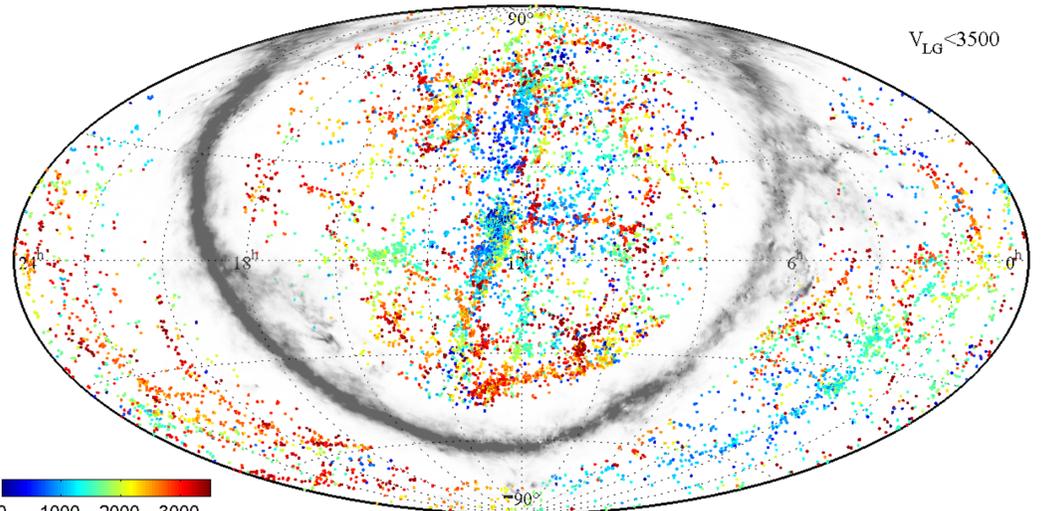
# Groups of Dwarf Galaxies in the Local Supercluster

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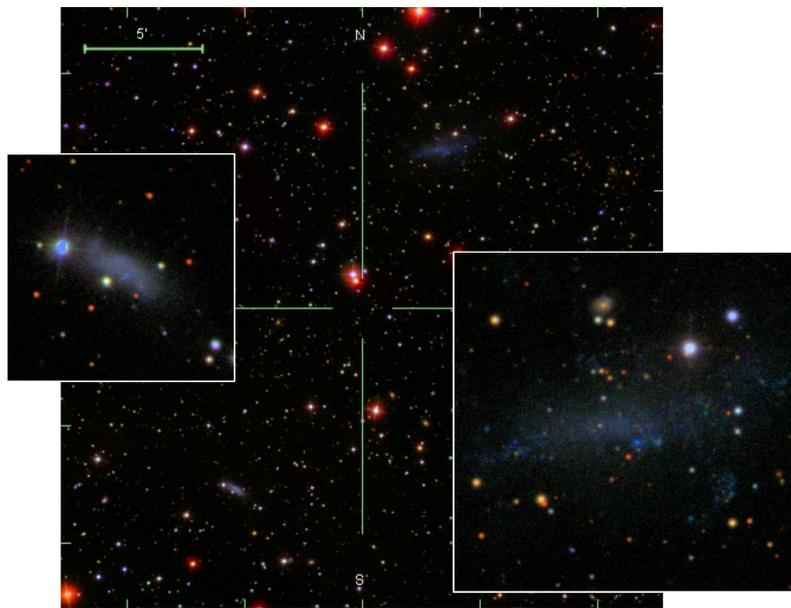
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## CATALOGUE of GROUPS

In previous works we prepared catalogue of groups of galaxies on scale of 80 Mpc (Makarov & Karachentsev, 2011, MNRAS). The catalogue bases on sample of objects from the HyperLEDA and NED databases with velocity less than 3500 km/s respect to the Local Group and located at Galactic latitudes  $|b| < 15^\circ$ . The sample has been purified of astronomical “spam” as wrong velocities, false multiplicity and so on. The groups were formed using assumption that a total energy of physical pair of galaxies must be negative (Karachentsev & Makarov, 2008, Astrophysical Bulletin, 63, 299). As result the 5927 galaxies of 10915 (about 54%) have been gathered in 1082 groups. The well populated groups ( $n \geq 4$ ) in the Local Supercluster sample are characterized by velocity dispersion 74 km/s, mean projected radius 268 kpc, K-band luminosity  $L_K = 1.2 \times 10^{11} L_\odot$ , mass  $M_p = 3.3 \times 10^{12} M_\odot$ . These values are typical for small groups like the Local Group, M81 and Centaurus A groups of galaxies.



The distribution of nearby galaxies on the sky.

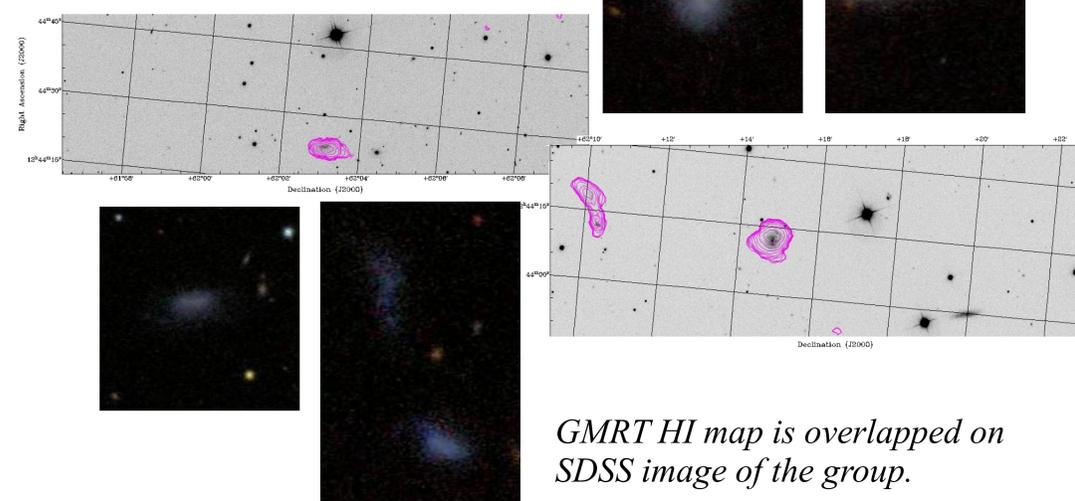


An example of group of dwarfs from SDSS.

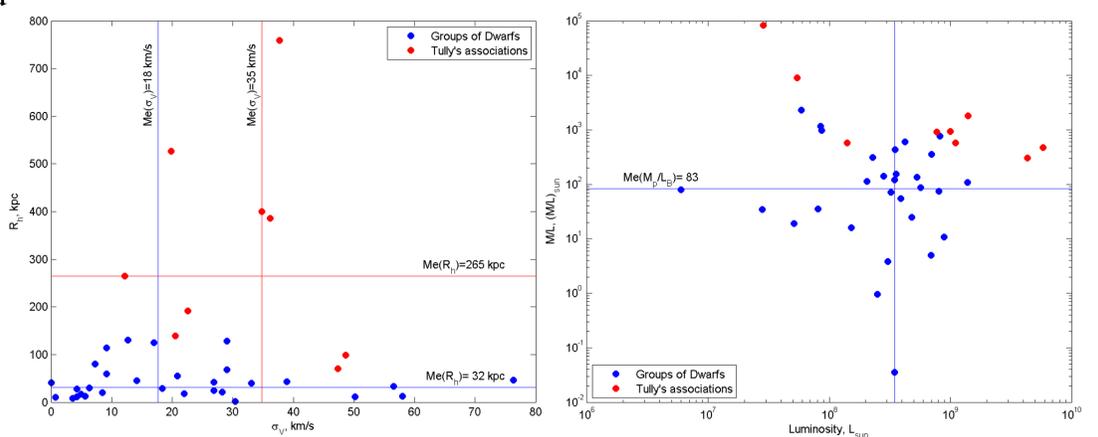
## GROUPS of DWARFS

During our work on group catalogue we found interesting population of groups which consist of only dwarf galaxies with luminosity less than SMC. The number of such systems is surprisingly high, at least 3% of all groups in the Local Supercluster. Most of the galaxies are blue and show sign of ongoing star formation. Some very interesting objects happen to be among them, for instance, famous metal deficient galaxy I Zw 18. It seems that gas rich and metal-poor galaxies appear quite often among multiple dwarf systems.

A chain of dwarfs. Probably, we see the group in act of its formation.



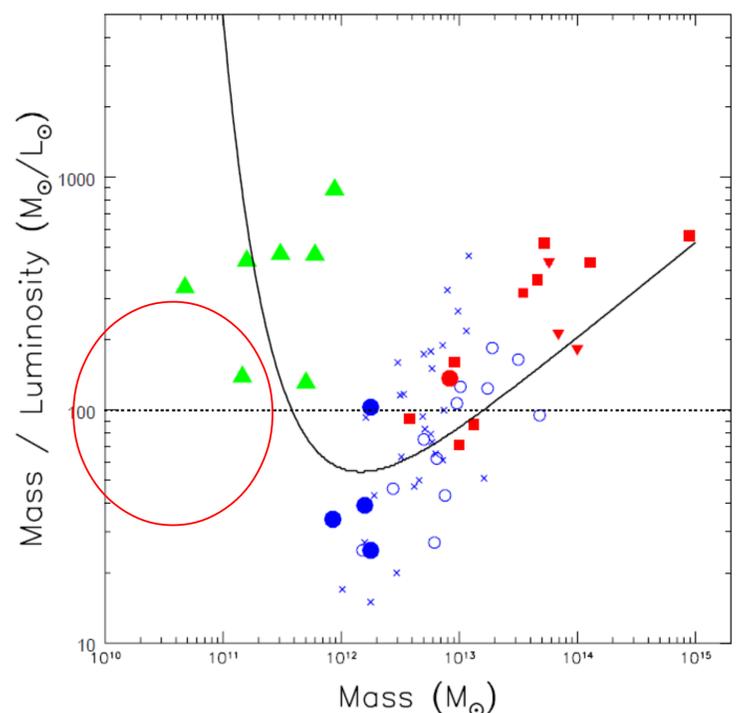
GMRT HI map is overlapped on SDSS image of the group.



Groups of dwarfs versus associations of dwarfs by Tully et al. 2006

Our groups of dwarfs are similar to the associations of dwarfs (Tully et al. 2006, AJ, 132, 729), which were identified from 3D distribution of nearby galaxies. The groups and associations have comparable velocity dispersion 18 and 35 km/s respectively, but associations are significantly wider 265 kpc against 32 kpc for groups.. The difference appears because of different methodology of group selection. Our algorithm is oriented to find a bounded and virialized systems, while associations were selected by correlation in position, velocity and distances of nearby galaxies.

The median value of luminosity of groups is  $L_B = 3.5 \times 10^8 L_\odot$  and median mass is  $3.1 \times 10^{10} M_\odot$ , which lead to mass-to-light ratio of 83 in solar units. Despite of mass of the groups is systematically lower than mass of associations, they form continuous sequence on  $M/L$ -luminosity



$M/L$  as a function of mass for groups and associations and a place of groups of dwarfs on it. The figure have been taken from Tully et al. 2006.