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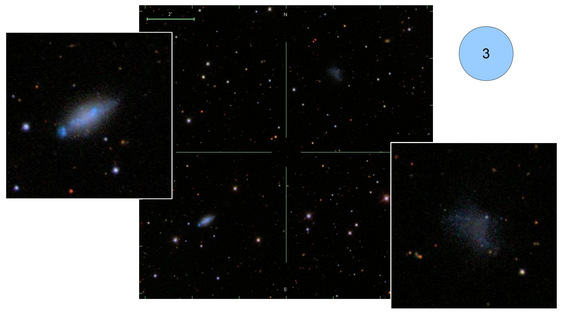
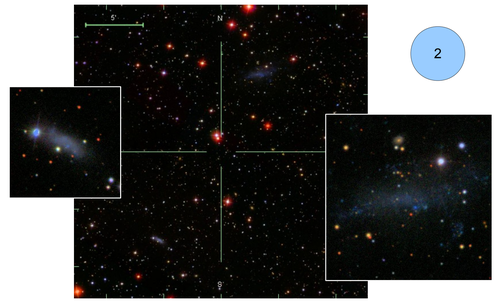
Over the past decade modern mass surveys have substantially increased the number of galaxies with known velocities in the Local Supercluster. We constructed a list of systems consisting of dwarf galaxies only based on the catalog of groups in the Local Supercluster (Makarov & Karachentsev, 2011, MNRAS, 412, 2498). The list contains groups where the brightest galaxy has a K-band luminosity lower than M_K=-19. Such systems make up about 5% of all groups in the Local Supercluster. However, with selection effects taken into account, the total number of multiple dwarf systems should be at least a factor of five to six greater. The groups of dwarf galaxies are characterized by the mean size of 30 kpc and a mean velocity dispersion of 11 km/s. Both these values are much smaller than the corresponding parameters for typical groups in the Local Supercluster (204 kpc and 74 km/s, respectively). Our sample of dwarf galaxy groups forms a continuous sequence in the mass and luminosity distribution diagrams along with associations identified by Tully et al. (2006, AJ, 132, 729) based on an analysis of the three-dimensional distribution of nearby dwarf galaxies. The groups and associations of dwarfs have similar luminosities, however, the groups are by one order of magnitude more compact. The median mass-to-luminosity ratio for the groups of dwarfs is equal to 45 $M_\odot/L_\odot$, which is indicative of a greater amount of dark matter, as compared to normal groups.

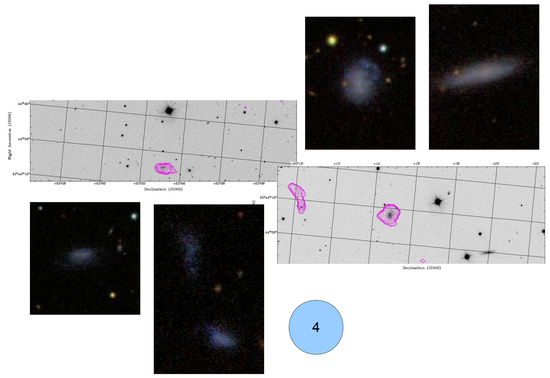
The systems of dwarf galaxies may contain substantial amounts of dark matter. Such “dark” aggregates may be quite numerous. They are difficult to reveal and study and can therefore “hide” a substantial fraction of dark matter, which remains undiscovered in the studies of groups of galaxies. This may partially solve the problem of “missing” mass - the discrepancy between the estimates of the average density of the Universe based on the analyses of cosmic background radiation, and the estimates ensuing from the analysis of groups of galaxies in the Local Supercluster (Makarov & Karachentsev, 2011, MNRAS, 412, 2498).

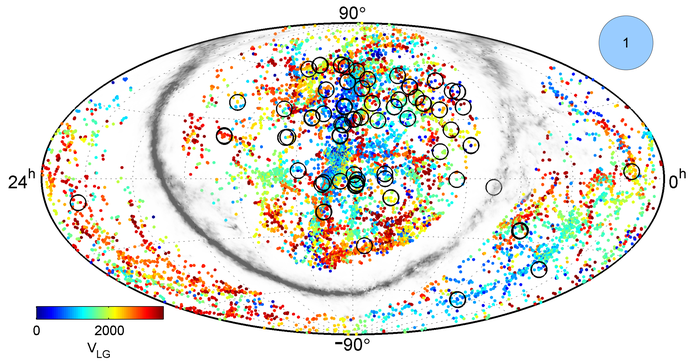
The most populated groups in our list show elongated, filament-like structure. It is possible we see these groups in process of its formation.

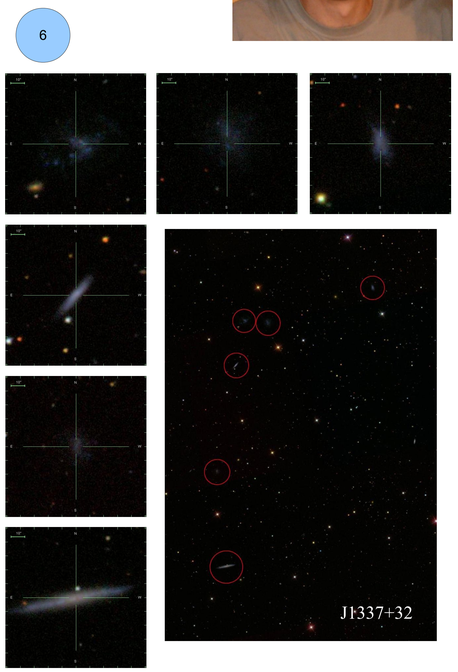
Note that the issues of the formation and evolution of the systems of dwarf galaxies remain highly unexplored. This is due to the difficulties one has to face in the process of observations and interpretation, and the problems of the theoretical approach. When we study groups consisting of dwarf galaxies only, we have to address a large number of problems: the low surface brightness and low luminosity make such systems hardly accessible for observations, whereas their small masses impose very severe constraints in cosmological computations.

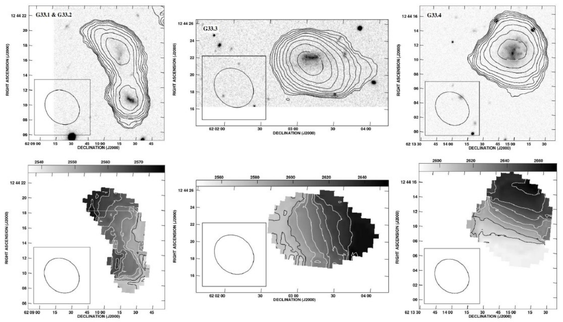


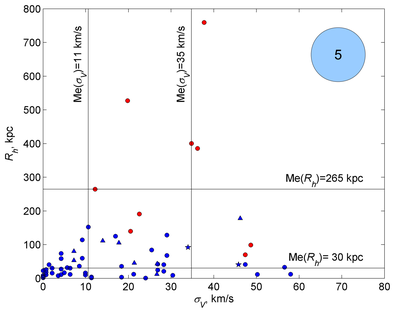












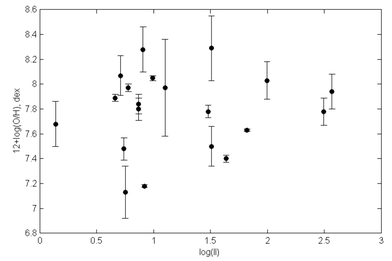
1) The sky distribution of the groups of dwarf galaxies. Most of the systems are concentrated in one third of the sky covered by SDSS. Taking into account sky coverage and deficit of dwarfs below M_B=-15.5, we can roughly estimate that the total number of systems of dwarf galaxies should be five to six times more.

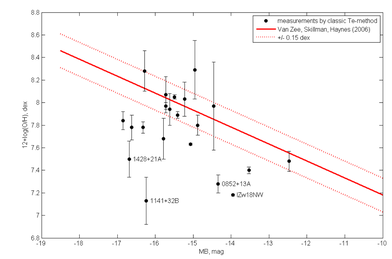
2-3) The examples of the typical group of dwarf galaxies.

4) The chain of 5 dwarfs has been observed in HI with GMRT. The kinematics and hydrogen distribution are shown below.

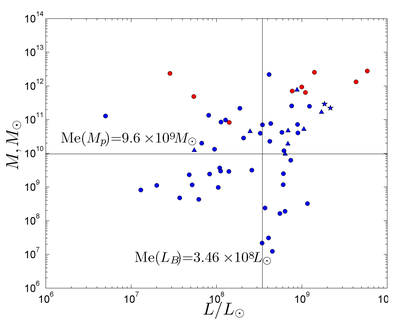
5) Distribution of groups of dwarfs (blue) by characteristic size R_h and velocity dispersion σ_V in comparison with associations of Tully et al (2006, AJ, 132, 729) (red).

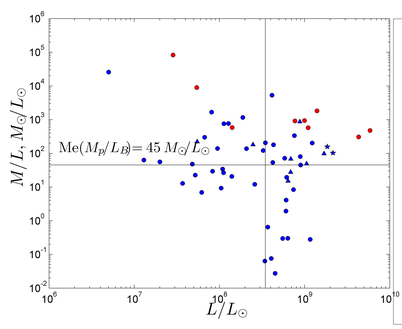
6) The most populated group of dwarfs in our list consists of 6 members.





We carried out spectroscopic survey of groups of dwarfs on Russian 6-meter telescope. The figures above show preliminary results of metallicity dependance on the environment and absolute magnitude of the galaxy. We do not see any correlation of oxygen abundance with the isolation index (II). Significant part of galaxies from our sample lie well below metallicity-absolute magnitude relation of van Zee et al (2006).





The figures show the dependence of the mass and the mass-to-luminosity ratio on the total luminosity. It is evident from the figure that the associations are, on the average, more massive than the groups of dwarfs. It should, however, be noted that despite the use of different identification algorithms and substantial difference in their sizes and velocity dispersions, groups and associations of dwarf galaxies form a continuous sequence on the ``mass--luminosity" diagrams. This fact is a manifestation of the genetic relationship of these systems.

	n	σ_V km/s	R_h kpc	M_p $10^{10}M_\odot$	L $10^9L_\odot$	M/L $M_\odot/L_\odot$
LSC	1082	42	160	61	42	21
n=2	516	24	121	14	17	11
n=3	171	41	156	46	40	15
$n \geq 4$	395	74	204	330	120	31
AD	7	35	265	38	1.0	380
GD	57	11	30	0.96	0.35	45
n=2	47	9	22	0.29	0.29	26
n=3	8	20	67	4.6	0.69	83
$n \geq 4$	2	40	66	26	2.0	129

The table summarizes the main parameters of groups of galaxies in the Local Supercluster (LSC), the associations (AD) and groups of dwarf galaxies (GD). The comparison of the data shows that the groups of dwarfs are the most compact and "cold" formations. Nevertheless, the dwarf systems are intermediate between groups of galaxies and associations in terms of the mass-to-luminosity ratio.