It is clear that, at first glance, it sounds rather improbable that galaxies are quite densely placed throughout Space; however, it seems to be so – it is even said, that the real *trick* would be to find one that is truly isolated from the other ones. Most of the galaxies interact with at least one another, usually with a few, or even a few hundred. And these are *true,* large objects that we think of here, not the tiny satellites.

The grouping tendency of galaxies have been known for long; even in the times before the Grand Debate when galaxies were called *nebulae* and assumed to be just a part of the single, Universe-filling, Milky Way, there have been reports of discoveries of multiple "nebulae" occupying the same area. The first galaxy pair that was discovered in the modern times was M51A&B (1781), the first group – the Stephan's Quintet (1877), and the first cluster – Virgo, 1783. However, it took a long time before detailed studies of these objects have been made.

Development of the observation&simulation technique made it possible to take a closer look on the matter of the multiple galaxies. A significant increase of the interest in the mutual interactions that take place in such systems was due to the works of Toomre brothers in the 70s of the 20th century; they performed the pioneer simulations of galactic collisions: both actual clashes and close passages – revealing how violent could be the results of such *galactic dance*. Since that time all three classes – pairs, groups and clusters – have been studied multiple times with the use of all available methods. However, as it turns out, there exists one, still scarcely explored, issue.

The aforementioned problem is the role and importance of the magnetic fields in low-quantity galaxy systems. Despite being well studied in case of clusters, or the galaxies itself (where magnetic field is said to be the key for understanding the dynamics and evolution), this issue was left nearly untouched when comes to pairs and groups. There are several reasons for such a situation, none of them being the lack of significance; the most important are the requirements for the instruments. The basic method of studying magnetic fields in astronomy is by the analysis of continuum radio emission, as it (more precisely, its non-thermal component) originates from the synchrotron radiation of electrons that pass through the magnetic field. But it is not an easy task to find them in a galaxy group; they mostly come from these supernovae, that originate from stars of a few to dozen times the solar mass. And such stars are hard to be found out of the galactic disks. For sure the magnetised matter can be torn out of galaxies, following the Toomres' simulations; but without the supply of fresh electrons, that age more quickly with increasing energy (and, hence, frequency), shiny tails and bridges fade away, falling into (radio, no doubt) darkness. And this is the reason why intergalactic magnetism is that difficult to be observed. Radio telescopes and interferometers can in general return datasets with either high sensitivity, that is needed because of the extended character of emission, *or* angular resolution, crucial to disentangle details of complicated morphology – but not *both*. Adding the fact that the higher the frequency, the better resolution – and higher synchrotron losses – one can conclude that there are no solutions to this situation.

However, it turns out that the situation is not as grim as assumed at first. The newest instruments are capable of offering both very high resolution and sensitivity at the same moment; it is also possible to merge data from different telescopes. Despite the fact that such results are difficult in reduction and processing, several attempts succeeded. For instance, in case of the aforementioned Stephan's Quintet, conclusions where clear: magnetic field can play a profound role in the dynamics of the intergalactic gas. Unfortunately, there are not enough studies in this matter to find out if such a situation is a common one.

With the planned project we plan to conduct the analysis of new, highly accurate radio observations of two interesting galaxy systems: tight pair Arp 269, and compact group HCG 60 (which is in fact a very dense, central region of Abell 1452 cluster). Both these objects are very unusual representatives of their classes: in case of Arp 269, best known for its giant gaseous tails (that are not an effect of the interactions, but strong stellar winds), we have recently detected a magnetised outflow that does not coincide with the aforementioned tails; without more detailed studies, it is impossible to say why does it happen so (and this is surely an issue worth discussing). In case of HCG60 it is the question of the unusually bent jets (they seem to be nearly parallel to each other) that needs to be answered: is this an effect of interaction with the magnetised matter, that fills the intergalactic space? If so, is it possible that such a mechanism stays beyond a whole class of objects, that did not evolve spatially? Owing to this choice of objects, we want not only to push forward towards the better understanding of intergalactic magnetism, but also to study two, very interesting, low-quantity systems of galaxies.