

## DESCRIPTION FOR THE GENERAL PUBLIC (IN ENGLISH)

Active Galactic Nuclei (AGN) are for decades the subject of very intense research. As a result, we have today a well established model of AGN activity. According to it, there is a supermassive black hole in the center of each active galaxy. Matter falling toward the black hole forms an accretion disk around it, where due to process of friction and turbulence loses the angular momentum emitting radiation in the optical, ultraviolet and X-rays. However, despite that intensive studies, active galaxies continue to conceal many mysteries. We do not know for example why only a small portion of them (15-20%) is active in the radio range of the electromagnetic spectrum.

Being a radio active means a presence of radio jets along the axis of rotation of the accretion disk in these objects. Jets are outflows of relativistic plasma which interacts with the interstellar medium and the magnetic field of the host galaxy and emits radio synchrotron radiation. The plasma finally form large-scale structures called *lobes*. These lobes are pushed by the jet away from each other at speeds of a few percent the speed of light, and therefore radio source increases its size even to the order of Megaparsec with age. Linear size of radio source is therefore a measure of its age.

In the general scenario of the evolution of powerful radio-loud AGN, the younger and smaller gigahertz-peaked spectrum (GPS, linear size < 1 kpc) and compact steep spectrum (CSS, linear size < 15 kpc) sources become large scale radio sources with linear size in the order of hundreds of kiloparsecs. We still do not know, however, many details of this process. In particular, we know that there is an excess of compact radio sources relative to the large scale objects. We don't know however, the reason for this excess and where it then disappears part of the compact radio sources.

Our group, which has been studied the compact radio sources for several years, proposed the hypothesis saying that in the universe there is a very large population of small objects that probably will never be able to develop large-scale radio structures. This means that they will cease their radio activity at the mid-stage of their evolution, as a small source. They were called a short-lived objects.

We believe that the discovered by us newborn GPS sources are those objects. The proposed in this project research and observations will reveal whether our assumptions about the nature of these objects are correct. Undoubtedly, the discovered sources are a new phenomenon and their analysis and identification will have a high impact on the evolutionary considerations concerning AGN. It may indeed be a confirmation of theoretical predictions about the existence of a large population of objects beyond the main evolutionary sequence of radio-loud AGN.