Co-Evolution of Central Black Holes and Galaxies
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Byurakan–*IRAS* Galaxy Pairs as Indicators of Starburst and Galaxy Evolution

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The Byurakan–*IRAS* galaxies (BIG objects; Mickaelian 1995) are the result of a project of optical identifications of *IRAS* Point Source Catalog (PSC; *IRAS* 1988) in a 1500 square degree high-galactic latitude ($|b| > 15°$) area based on the Digitized Sky Survey (DSS) images and the Digitized First Byurakan Survey (DFBS, or digitized Markarian survey) low-dispersion spectra. As a result, 1278 galaxies have been identified (as well as galactic objects, Byurakan–*IRAS* Stars [BIS]), including 42 PSC sources identified with 103 galaxies that make up 30 physical pairs and 12 multiples. Thirty-nine sources are also listed in the *IRAS* Faint Source Catalog (FSC; Moshir *et al.* 1990) allowing the use of more accurate IR positions and fluxes. These BIG objects have been observed spectroscopically with the Byurakan Observatory 2.6-m, the Special Astrophysical Observatory 6-m, and Observatoire de Haute-Provence 1.93-m telescopes and the redshifts have been measured ($0.017 \leqslant z \leqslant 0.173$). In all cases, a physical relationship has been established, thus confirming that these tight pairs and multiples are interacting systems and/or "mergers." Using more accurate NVSS (Condon *et al.* 1998) and FIRST (Becker *et al.* 1997) radio positions, we have defined the real IR sources; it might be that either one of the components or all the components (i.e., the interaction/merging regions) are responsible for the IR radiation. It is shown that for the cases where more than one component is an IR source (30%), the average IR luminosity is higher; typically IR luminosity greater than $10^{12}\ L_{\odot}$ is emitted by the whole system, which means that the interactions heat vast amounts of dust and/or trigger intense starburst processes in these objects. Hence, the maximum IR luminosity for a single spiral galaxy has been estimated as $10^{12}\ L_{\odot}$. The dependence of the mean distances of components on the IR luminosity and redshift has been studied to follow the evolution of these interacting/merging systems (Mickaelian 2007). Some of the systems contain AGN (9 components are Sy2/LINER and 10 have composite spectra) that allows us investigate the interrelationship between starburst, nuclear activity, and interaction phenomena.

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