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# Testing Evolutionary Models of Dwarf Irregular Galaxies through Gas and Stellar Metallicity Determinations in HII Galaxies

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**Abstract.** Dwarf irregular galaxies are usually low-metallicity objects, and show ongoing or very recent star formation, giving rise to their irregular appearance. Especially HII galaxies, a sub-category of dwarf irregulars showing unusually high star formation activity, are believed to be among the least evolved galaxies in existence today. Therefore, they are very interesting objects for studies of early galaxy evolution and of metallicity enrichment mechanisms.

Several groups have developed theoretical evolutionary models of galaxies of this type, describing different possible formation and evolutionary scenarii, and varying factors such as gas infall and outflow, as well as the star formation history, and making predictions about their chemical evolution. One way to evaluate these models is by determining the metallicities of the different components of these galaxies, their gas and stars.

We examine a sample of HII galaxies from the Sloan Digital Sky Survey, which possibly contains the largest homogeneous sample of HII galaxy spectra to date. Using very restrictive selection criteria, which guarantee a sample of high quality spectra and avoid "contamination" by spectra of objects of other nature, we defined a sample of $\sim 700$ HII galaxies spectra.

Through emission line strength calibrations and a detailed stellar population synthesis, we determined the metallicities of both the gas and the stellar content of these galaxies.

For HII galaxies up to stellar masses of $5 \times 10^9$ $M_\odot$, we find enrichment mechanisms not to vary with galactic mass, being the same for low- and high-mass galaxies on average. They do seem to present a greater variety at the high-mass end, though, indicating a more complex assembly history. Our results favour galaxy evolutionary models featuring constantly infalling low-metallicity clouds that retain part of the galactic winds. Above $5 \times 10^9$ $M_\odot$ stellar mass, the retention of high metallicity gas by the galaxies' gravitational potential dominates.

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## Reference

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