

Gas is a very important component of galaxies with regards to how they evolve, because its amount, density, and temperature govern how, how fast, and how many stars form in galaxies. We know that the current reservoirs of gas in most galaxies are too small to sustain the formation of new stars for long. Therefore it is expected that significant amount of gas is constantly flowing onto galaxies from the space between them. This is the key process governing galaxies' evolution, but unfortunately only a few galaxies have been shown to experience such gas inflow currently. This is because gas well outside galaxies is too diffuse to be detected, whereas there are no simple ways to find galaxies currently experiencing gas inflows.

In this project I will investigate this inflow process by testing the hypothesis that galaxies hosting explosions of very massive stars (so-called gamma-ray bursts and supernovae type Ib/c) have recently experienced gas inflows. This will enable me to build a sample of galaxies for which this process can be studied in details. In this way I will answer the question of how galaxies acquire gas necessary to fuel formation of stars. In particular, I will investigate how and how fast inflows change properties of galaxies. Additionally, I will contribute to stellar astrophysics by revealing what conditions are necessary for massive stars to explode as different types of supernovae.

I will use both archival and new data revealing the properties of gas in galaxies hosting gamma-ray bursts and supernovae. This will allow me to look for signatures of recent gas inflows into galaxies and check how inflows influence the properties of these galaxies.