

The metallicity content of planet-host stars: the Ariel reference sample

Most of our current understanding of planet formation mechanism is based on the correlations of metallicity of planet-host stars with planet frequency and therefore, precise and accurate metallicity determinations are fundamental. In this talk, I will present the results of the characterization of the Ariel reference sample for a diverse sample of stars in terms of stellar mass (up to $1.8 M_{\odot}$) in collaboration with the “Ariel stellar characterization” working group. The standard methodology to derive high-precision stellar parameters from high-resolution spectra is based on the iron ionisation and equilibrium conditions and spectral synthesis techniques. Our analysis indicates a close relationship between stellar mass and giant planet radius, with more inflated planets at lower metallicities. We find that giant planets are more frequent around more metal-rich stars that belong to the thin disc, while lower-mass planets are found also in more metal-poor environments, and are more frequent than giant planets in the thick disc.

The Galactic environment, although often overlooked, plays a significant role in shaping the planetary system. We provided observational data to investigate the impact of the chemical evolution of the Milky Way on the current planet populations.

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