

How the origin of stars in the Galaxy impacts the composition of planets?

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Our Galaxy is composed of different stellar populations, characterized by different chemical abundances. They are thought to imprint the composition of small bodies formed together with planets such as asteroids or comets, which ultimately supply the population of Interstellar Objects when they are ejected out of their home systems.

We investigate the expected composition of planets in different Galactic regions. Following Cabral et al. (2023) we use ground-based spectroscopic surveys GALAH and APOGEE to determine the initial chemical composition of the dust in the protoplanetary disk with a stoichiometric model (Bitsch & Battistini 2020). We then compute a global planet formation model taking into account the radial gas and dust disk evolution (Drażkowska & Dullemond 2018), planet migration (Paardekooper et al. 2011) and pebble accretion (Ormel & Klahr 2010) into the planets.

We confirm the stringent chemical link between host-stars and planets (see e.g. Bitsch & Battistini 2020). We further quantify and compare the water content of forming planets around host stars in the thin and the thick disks of our galaxy.