
Imprints of birth: the effects of stellar encounters in the birth cluster on Super-Earth planetary systems

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Stars do not form in isolation but together with other stars, often in a clustered environment. Depending on the initial conditions of these environments, such as the initial density and substructure, the frequency and “closeness” of stellar encounters will differ. These encounters will not only affect the stars, but also any planetary systems that are in the process of forming around them. In this talk, I will present the results of a large set of simulations, focusing on the effect of stellar encounters on young planetary systems with close-in Super-Earths and Super-Earth systems that contain a cold giant planet (an architecture favoured from demographic studies). I combine encounter information from detailed N-body simulations that are calibrated to mirror different star-forming environments with long-term planetary integrations. I will show how even a single encounter can significantly modify the architecture of a planetary system over a period shorter than 100 Myr, even resulting in dynamical instabilities in otherwise stable systems. In particular, I will focus on evaluating whether an apparent excess of single-transiting systems among Kepler systems (the Kepler Dichotomy) could be an outcome of encounters in birth environments with different initial conditions.