

## Constraints on the Birth Environment of the Solar System

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This talk outlines several ways in which the birth environment can affect the formation of the solar system. Since many solar systems form within star clusters, our first task is to understand the dynamical evolution of these systems. Cluster evolution depends on the pre-cluster initial conditions, the star formation efficiency, and the gas removal history. For clusters of intermediate size with  $N = 100 - 3000$ , roughly spanning the range expected for the solar birth cluster, the dynamics are highly chaotic and multiple realizations of equivalent cases ( $\sim 100$  simulations per initial condition) must be carried out in order to build up a robust statistical description of the results. From these dynamical calculations, we find the distributions of closest approaches and the distributions of radial positions of solar systems living within the cluster. In a separate set of Monte Carlo scattering calculations, we determine the cross sections for solar system disruption through stellar flybys. The closest approach distribution is then used in conjunction with the interaction cross sections to assess the disruptive influence of stellar scattering interactions and to thereby constrain the possible birth aggregate of our solar system. Similarly, the distributions of radial positions are used in conjunction with distributions of cluster FUV (and EUV) luminosities to determine the radiation exposure of the solar system during its planet forming phase. This assessment is then coupled with disk photoevaporation models to provide additional constraints on the solar birth aggregate.