

STELLAR COMPANIONS AND THE EARLY STAGES OF PLANET FORMATION.

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Introduction: Two-thirds of the G stars in the solar neighborhood are members of multiple-star systems [1] and several of them are found to harbor giant planets [2]. Similarly, young low-mass pre-main sequence stars are very frequently found in multiple systems, most commonly in binaries [3]. This suggests that planet formation around a single star as our Sun may be atypical and urges us to explore the effect of stellar companions on this process. We tackle this question from an observational point of view. Because meteoritic evidence from our Solar System as well as numerical simulations of grain agglomeration suggest short timescales for the formation of planetesimals [4], it is crucial to know how stellar companion(s) affect the dust processing in the first few million years.

Method: We selected two statistically significant samples of young coeval disks around single and multiple stars that have been observed with the Spitzer Space Telescope. From the strength and shape of the 10 micron silicate emission feature, we infer the degree of grain growth and crystallinity in the upper layer of the selected disks. We use the slope of the mid-infrared continuum as a proxy for dust settling.

Results: Our study shows that stellar companions at projected separations larger than 10 AU do not appreciably affect the initial dust processing. Hence the first steps of planet formation are not influenced by the presence of a star at tens of AU. We discuss our results in the context of other studies investigating later stages of planet formation in multiple systems.

References: [1] Duquennoy A. and Mayor M. 1991. *Astronomy & Astrophysics* 248:485–524. [2] Desidera S. and Barbieri M. 2007. *Astronomy & Astrophysics* 462:345–353. [3] Duchene G. et al. 2007. In *Protostar and Planets V*, 379, Univ. Arizona Press. [4] Beckwith S. et al. 2000. In *Protostar and Planets IV*, 533, Univ. Arizona Press.