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## Observing the first phases of planet formation: measuring vertical dust settling in a sample of Edge

*Thursday, 17 October 2019 15:25 (15 minutes)*

Contributed talk

Abstract:

Planets form in Protoplanetary disks. New instruments like ALMA and VLT / SPHERE are revealing features in young disks that may be the traces of these planets: rings, gaps, spirals. The direct detection of forming planets still located inside their disk remains, however, very challenging. The consequence is that direct observational constraints on the formation mechanism are sparse. In this talk I will show the results of an on-going survey with ALMA and HST to look for a significant sample of edge-on disks. The ALMA data reveal without ambiguity that vertical dust settling has had a major impact on the dust distribution within the disk. Clearly the dust seen by ALMA is located at the disk midplane, in a very thin layer, unresolved even with ALMA's longest baselines! This is in sharp opposition from the smaller dust seen by HST in scattered light images and located at much higher altitude above the disk midplane, co-spatial with the gas. From these data sets, direct measures of the gas scale height and geometrical thickness of the dust layer can be obtained. Other important quantities like the amount of turbulence, and the gas-to-dust ratio in the disk midplane can be derived. These observational constraints are critical to inform planet formation theories and models.

**Presenter:** Dr MÉNARD, François

**Session Classification:** Circumstellar Disks