

The appearance of large aggregate particles in cosmic environments

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Dust aggregates occur in various environments. They have been shown to be a main component of cometary dust, and it is argued that they are likely present in molecular clouds and in protoplanetary disks where they form the onset of planet formation. These large aggregates have observational and dynamical properties that are very different from more compact particles. Understanding the evolution of protoplanetary disks, the planet formation process, and constraining this from observations, require that we understand the properties and radiative transfer of aggregates in protoplanetary disks. We discuss how we can constrain aggregate size and structure from observations and as such constrain the first step in planet formation. These computations will also be crucial in the analysis of cometary dust and our understanding of the observational properties of interstellar dust from the diffuse ISM to the dense molecular cloud environments.