Dust in protoplanetary disks, (still) that great unknown

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Resumen

Planetary systems are a side effect in the formation of a star. Planets are believed to be just simply the last remaining of dusty circumstellar disks which is formed around the protostar at very early stages. Thus, understanding how planets are formed requires to understand how dust evolve in these disks. It is less than ten years that we have the possibility of mapping the dust distribution in protoplanetary disks with great detail with powerful radio interferometers such as the VLA and ALMA. We were highly surprised by the first images showing a rich diversity of substructures in the disk distribution, consequence or initial stages of forming planets. We have already mapped hundreds of disks in different regions and we are now proposing different paths in the evolution of disks that will end in very different planetary systems. We are stating to understand the importance of ice lines in the formation of planetesimals. But, probably the most surprising result is the realization that we ignorance about the internal structure of the dust grains prevent us of obtaining basic properties of the dust such as their mass or size. In this talk, I will summarize how we arrived to this point and how we can unlock this situation.