Recent advances in the study of dust in Protoplanetary Disks

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Small solid particles, usually referred to as dust by astronomers, are a key ingredient of circumstellar disks surrounding young stars. They play an important role in the physics and chemistry of disks and the formation of planets in general. In the core accretion model of planet formation, the growth of dust grains from the micron size range to much larger sizes is the first step in planet formation. The recent commisionning of very potent instrument operating at optical and near-infrared wavelengths (e.g., VLT / SPHERE, GEMINI / GPI, SUBARU / ScexAO) and radio wavelengths (ALMA, JVLA) are currently transforming our view of protoplanetary disks. Images with unprecedented sensitivity and angular resolution are revealing fine structures (i.e., rings, gap, warps, shadows), some of which still challenge our detailed understanding.

The wavelength coverage, the availability of linear polarisation measurements, spectroscopy now available from these instruments all contribute to also provide a wealth of new information regsrding the properties of dust located in disks. In this contribution I will review some of the most striking observational results obtained recently. I will discuss their implications for the dust properties in protoplanetary disks. Finally, I will place these results in the context of planet formation and protoplanetary disk evolution.