Dust mineralogy in proto-planetary and debris disks

Johan Olofsson[1], Thomas Henning[1], Jean-Charles Augereau[2], Akemi Tamanai[3], the *Spitzer* "c2d" Legacy Program, & the *Herschel* "DIGIT" Key Program

[1]*MPIA, Heidelberg, Germany,* [2]*IPAG, Grenoble, France,* [3]*Kirchhoff-Institut für Physik, Heidelberg, Germany*

The initial conditions of planetary formation are governed by the evolution of initially (sub)μm-sized silicate dust grains in the early phases of young circumstellar disks. Dust grains are the building blocks of planets (which requires growth spanning over several orders of magnitude), and they provide clues to the dynamical evolution of the disk at all stages of the planet-forming process. Our knowledge about dust, and its evolution, has significantly improved during the past years, thanks to statistical studies at mid- and far-infrared wavelengths based on space-based missions such as *Spitzer* and *Herschel*. The mineralogical information (lattice structure, chemical composition, and grain morphology), as determined by spectroscopic observations, provide valuable constraints on the dynamical evolution of disks at various ages (e.g., radial and vertical transport, coagulation, fragmentation, and crystallisation). I will summarize our findings for circumstellar disks at different key steps of the planet-forming process, trying to connect them with our understanding of the solar system.