CIPS Planetary Lunch
Wednesday, May 14, 544 Campbell Hall, Noon - 1:00pm

A.G.G.M. Tielens

NASA Ames

"Building planets one grain at a time"

The formation of planets in circumstellar disks around young stars starts with the coagulation of small dust grains promoted by weak van der Waals interaction forces and driven by grain-velocities resulting from the gas turbulence in the disk. In this talk I will review the microphysical processes that are involved in the interaction of small dust grains. This interaction results in a critical velocity below which two dust grains will stick. Large agglomerates can also dissipate collision energy through rolling and this will lead to large scale restructuring and compaction. Again, a critical energy is involved. These simple concepts can be coupled to models for the velocity distribution of grains in a turbulent environment to follow the growth of dust. Some results of such calculations will be presented. Finally, I will discuss chondrules and the collisional origin of their dust rims in the context of coagulation.