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**TIME: Wednesday, 3:00 PM, Nov. 30, 2011**      **LOCATION: A601 NAOC**

## Planet Formation: From Dust to Planetesimals

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Hubertus Klahr is a staff scientist at Max-Planck Institut für Astronomie. He is the head of the Theory Group in Planet and Star Formation. He got PhD degree on Astrophysics from Friedrich Schiller University in 1998. He has been a Privatdozent (Adjunct Professor) at

University of Heidelberg since 2009. His interest in research is focused on the formation of stars and planets. The main tools in such investigations are multidimensional self-gravitating magneto hydrodynamical simulations of turbulent gas and embedded particles on massive parallel computers. He is the member of IAU, AAS, DGP, AG.

### Abstract

Planetesimals are several-kilometer-sized objects in the solar nebula, which are believed to be the building bricks for planets. The structure of the solar nebula, the dust growth mechanisms and the effects of dust transport in the turbulent gaseous disk are intimately coupled. The interplay of these effects leads to what is conventionally called the meter-size barrier: gas drag effects and high collision velocities prevent the collisional growth of dust particles from proceeding beyond the size of at most a meter, if not less.

Here we study the scenario for the rapid formation of planetesimals, based on the combined effects of magneto hydrodynamical or baroclinic turbulence and gravity. Particles representing approximately meter-sized boulders clump in large scale overpressure regions in the simulation box. These overdensities readily contract due to the combined gravity of the particles to form gravitationally bound clusters with masses ranging from a few to several ten times the mass of the dwarf planet Ceres. Gravitationally bound clumps are observed to collide and merge at both moderate and high resolution. The collisional products form the top end of a distribution of planetesimal masses ranging from less than one Ceres mass to 35 Ceres masses.

*All are welcome! Tea, coffee, biscuits will be served at 2:45 P.M.*

