

Hopes and challenges in modern planet formation

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Abstract

With the discovery of over 5000 extra-solar planets to date, the formation and evolution of planets and planetary systems is one of the most rapidly developing fields of astrophysics. In the standard ‘bottom-up’ scenario, planets form from planetesimals — km or larger-sized bodies. Planetesimals form from small, mm-cm size pebbles, which themselves form from micro-sized dust grains immersed in gaseous protoplanetary disks around young stars. I will describe several obstacles, but also new possibilities, on the road from dust to planets from recent theoretical modeling of planetesimal formation in modern models of protoplanetary disks.