Towards a General Theory for Planet Formation

Eiichiro Kokubo[1]

[1] NAO

Since the first discovery of an extrasolar planet in 1995, more than 120 extrasolar planets have been reported. These planets are considered to be gas giant planets as they are as massive as Jupiter. However, their orbits are largely different from those in the solar
system. Some have the semimajor axis smaller than that of Mercury and others have the eccentricity as large as comets.

These planets may form from a protoplanetary disk more massive than the standard protosolar disk from which the solar system formed. From a massive disk, several gas giants can form. The gravitational interaction among the gas giants and/or the interaction between the massive gas disk and the planets may change the orbital elements of the planets to those we observe today.

In this paper, I review the current understanding of the planet formation theory and show the possible diversity of planetary systems, focusing on the formation of the extrasolar planets.