The Stability Principle of Planet Formation

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March 13, 2017
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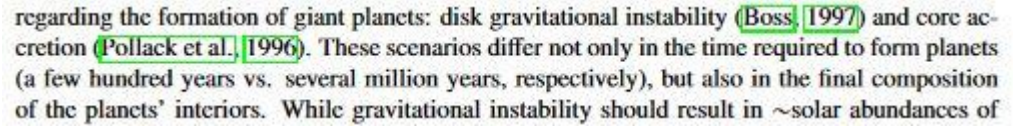
Abstract: Another principle of planet formation is added to the general theory of stellar metamorphosis. It is reasoned that planets can only form where the environment is stable for hundreds of millions of years.

In stellar metamorphosis, stellar evolution is planet formation. Since planets form inside of stars (the planet is the remains of the evolved star), we can reason they form in very stable conditions that do not change dramatically over short periods of time. A short period of time in this case would be < 100 million years. The interior of stars only change slowly in scales of tens of millions of years as they cool and die, not only that, but they shield the planetary embryo forming in its center from gravitational instabilities and surface impacts. This means that any planet formation model that relies on gravitational instabilities and/or direct impacts to form it, is misguided. This includes both the accepted leading scenarios, the disk gravitational instability model (a few hundred years) and the core accretion model (a few million years). Planet formation is an extremely gravitationally stable process. The planet embryo is also protected almost entirely as the atmosphere of the star is too thick for smaller objects to interrupt the process in an unstable manner. Therefore, there are two main reasons why the stability principle supports stellar metamorphosis theory. The gravitation of the star remains very, very stable as it evolves and the thick atmosphere protects the internal planetary embryo from significant impacts which might interrupt the process of planetary differentiation and physical deposition. It would be expected that if there was not a very thick atmosphere to protect the internal planetary embryo, then there would not be an almost perfectly formed sphere of iron/nickel composite at the centers of highly evolved/dead stars. As well, it would be expected that if planet formation relied on instabilities of gravitation in a disk, then nothing would form at all, as the instabilities would prevent anything stable from forming to begin with, and without physical mechanism for angular momentum loss the disk instability model is dead on arrival. Below is a screen shot of the above references of disk gravitational instability and core accretion models.


regarding the formation of giant planets: disk gravitational instability (Boss, 1997) and core accretion (Pollack et al., 1996). These scenarios differ not only in the time required to form planets (a few hundred years vs. several million years, respectively), but also in the final composition of the planets' interiors. While gravitational instability should result in ~solar abundances of

https://arxiv.org/pdf/1703.04358.pdf