

Hot Debris Disks Formation Caused by Giant Impacts for Terrestrial Planet Formation

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For terrestrial planet formation, dozens of Mars-sized bodies are produced from planetesimals until depletion of these planetesimals and substantial collisions between these large bodies construct larger planets such as Earth and Venus. The total mass of fragments produced by such a giant impact is only 10% of colliders but comparable to or larger than that of bodies in typical debris disks. Therefore, giant impacts result in debris disks. We numerically integrate orbits of Mars-sized bodies to obtain the collisional history of these bodies. Simultaneously collisional outcomes between these bodies are calculated by high-resolution hydrodynamic simulations. We finally obtain the brightness evolution of debris disk using these data in collision cascade model. We discuss our model comparing with observed debris disks.