

8.4: Rings

One characteristic we will find with the Gas Giant planets is rings. A **ring** is a disk of dust or small object orbiting a planet or other body. It is hypothesized that rings can form in one of three ways.

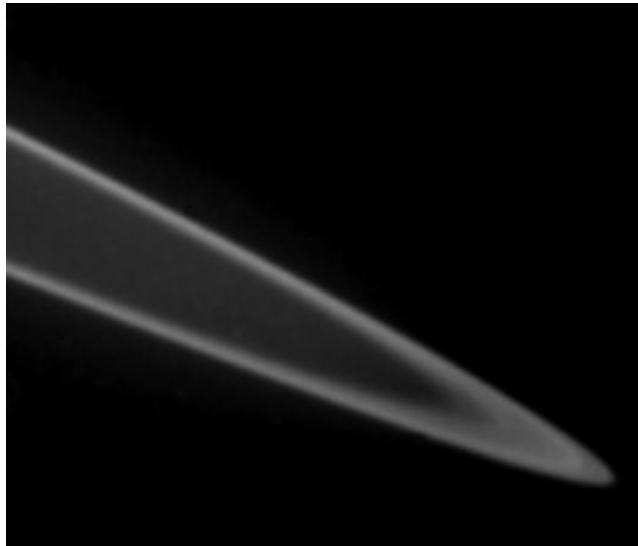
1. Material from the solar system's original protoplanetary disk that was within the planet's Roche limit, thus not forming a moon.
 - The **Roche limit** is the minimum distance to which a satellite can approach its primary body without being torn apart by tidal forces due to gravity.
2. A moon that broke apart due to Roche limit tidal stresses.
3. Debris from the moon that broke up due to a large impact.

Different forces can influence rings and ring structures. These include other rings, satellites orbiting the planet, and the planet itself.

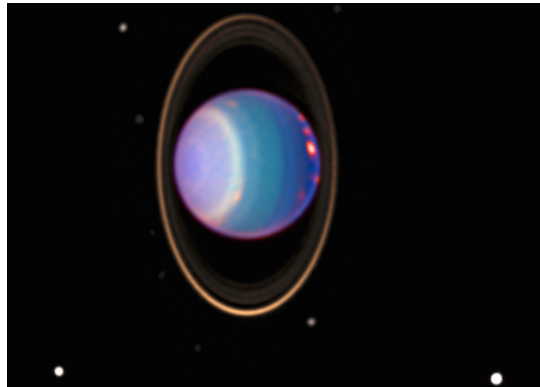
There are some objects that have rings but are not Gas Giants. For example, one asteroid has been discovered with rings; this is thought to be due to a collision or collisions. The Martian moon Deimos will eventually break up due to the gravitational tidal forces of Mars and Deimos' orbit getting too close to Mars; one hypothesis is that a ring will be formed from Deimos around Mars at that time.



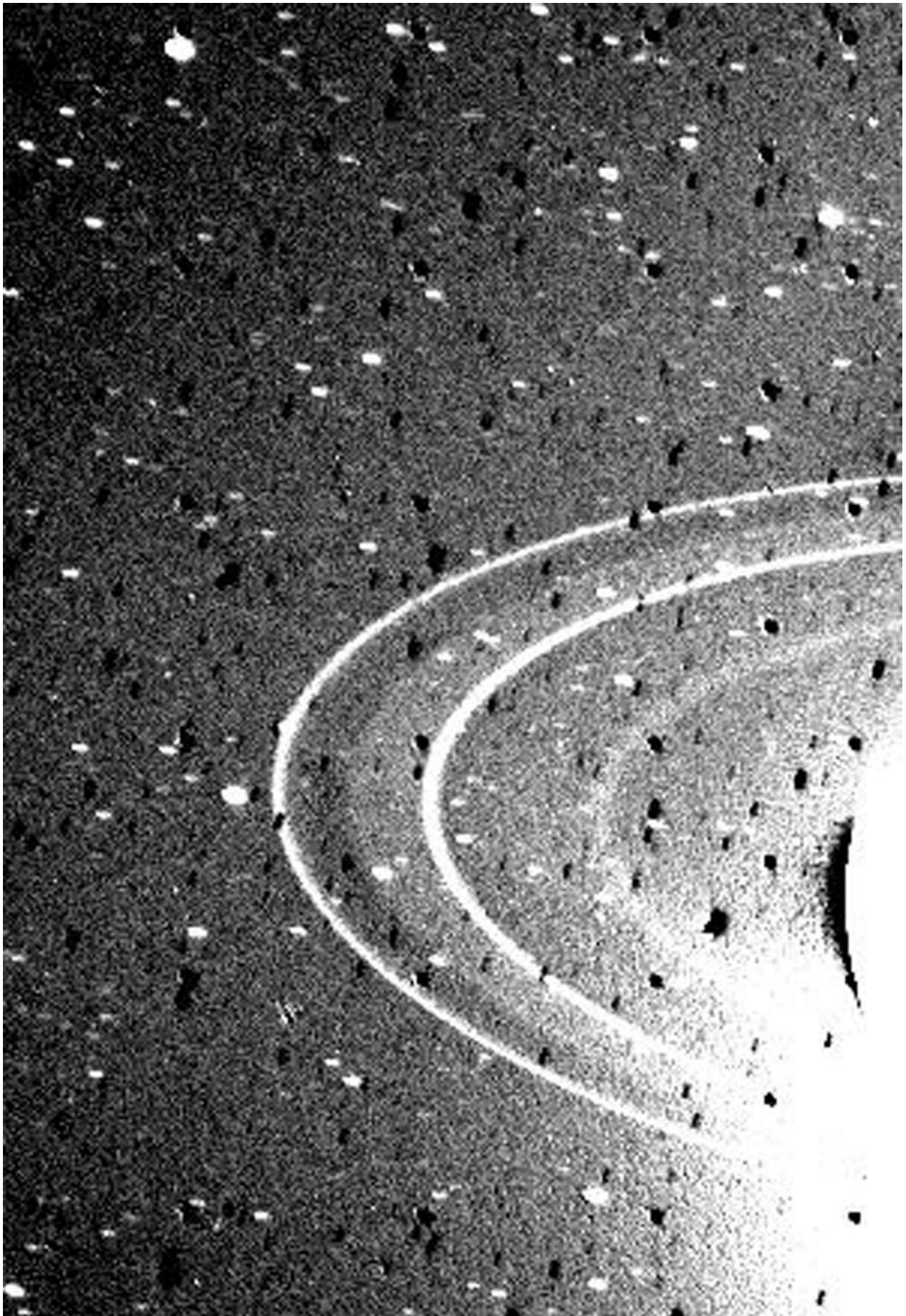
Saturn's rings via NASA VoyagerPublic Domain | Image courtesy of NASA.

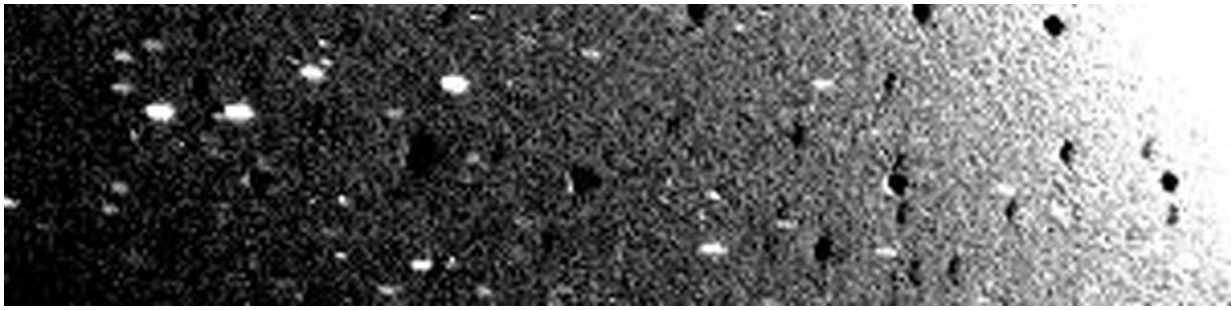


Jupiter's single ringPublic Domain | Image courtesy of NASA.



Uranus and some of its rings via NASA Hubble Space TelescopePublic Domain | Image courtesy of NASA.





Neptune's rings via NASA Voyager 2Public Domain | Image courtesy of NASA.

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