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THE NEPTUNIAN DESERT

The Neptunian desert is a region in the exoplanet parameter space that has scarcity of Neptune-sized planets at short orbital periods. It was first noticed in the 2000's during analysis of observational data of exoplanets, and was first clearly identified and confirmed in the 2010's. The Neptunian desert does not arise because of bias in observational studies as such planets are easily detectable with transit photometry and radial velocity techniques. Aim of this study is to review several theories that have been proposed to explain the existence Neptunian desert. We reviewed several mechanisms that have been proposed, including the stripping of atmospheres by intense stellar radiation, atmospheric loss from internal heat, tidal disruption near the Roche limit, and the influence of stellar metallicity on planet formation.

To better understand this population, examination of trends among different properties like orbital periods, planet masses and radii, atmospheric fractions, and stellar properties has to be done. In addition, these should be supported by simulations of planetary formation and tidal evolution. Exploring the reason behind the existence of gap provides important clues about how planetary systems are formed.

Authors: A, Kruthika (Jain (deemed to be University)); Dr GURUMATH, Shashanka.R (Jain (deemed to be University)); M N, Sundar (JAIN (Deemed-to-be University))

Presenter: A, Kruthika (Jain (deemed to be University))

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