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Author: Ms. Sarah Cader
Connectomix, India

A STUDY OF TERRESTRIAL AND HABITABLE EXOPLANETS

Abstract

Exoplanets or Extra-Solar planets revolve around a different star, outside of our solar system. Just like the planets in our solar system, these exoplanets orbit around different stars. These exoplanets vary in size, mass, radius, etc, which are influenced by their host star, their distance from it, their age, and their evolutionary stages. Since the discovery of the first exoplanet in 1992, more and more exoplanets and exoplanetary systems are discovered each day. These exoplanets are of importance in Astronomy and Astrophysics because there are exoplanets similar to our Earth orbiting around other stars. And these exoplanets might be our answer to the decades-long search for habitable planets. Like Carl Sagan said, “The universe is a pretty big place. If it’s just us, seems like an awful waste of space”. And so the search for extra-terrestrial, intelligent species and other habitable planets goes on. This is why exoplanets that even, slightly resemble Earth are considered very important. This study focuses on such Earth-like or terrestrial exoplanets, within the circumstellar habitable zone (CHZ) of the host star. Studying these exoplanets aid in understanding the formation and evolution of planets and other systems around different types of stars and could also shed light on the origin of life. This study focuses on the rocky exoplanets around different stars but especially sun-like, G spectral-type stars. The lower density level of the planets studied here is taken as $3.93 \left(\frac{g}{cm^3}\right)$ (density of Mars). This paper studies these particular types of exoplanets with an extensive literature review. The exoplanet data is collected from the NASA Exoplanet Archive. This study investigates if there are any correlations between parameters such as mass, radius, semi-major axis, orbital period, etc of these exoplanets, via plots and graphical representations. Similarities and differences between exoplanetary systems and our own solar system are also studied. The results of this paper highlight the features of prominent terrestrial exoplanets that might hold the answer to our search for other habitable worlds, parsecs away.