
SatMeet8 - Connecting Stellar Abundances and Planet Habitability

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Abstract

When considering whether a planet is habitable, there are a number of factors that must be taken into account. To date, the most prevalent discussion has centered around the physical location of the planet orbiting the star, specifically the habitable zone and temperatures on the planet. However, the chemical make-up of the planet, including the atmosphere, is equally important in determining whether a planet can support life. The presence of particular bioessential elements within the planet profoundly affects not only interior processes, but also surface (continents, oceans) and atmospheric conditions. All of these environmental influences ultimately determine the habitability of the planet. Therefore, to better understand the structure and formation of habitable extrasolar planets, we need to investigate the composition of the stellar host and how it affects orbiting planet(s).

Currently, the only confirmed connection between stellar host abundances and their planets is the presence of giant planets around stars with an enriched [Fe/H] -content. The purpose of this satellite meeting is to more closely examine other elements in stars that have both giant and/or terrestrial planets and discuss their implications for planet evolution. We will explore how stellar abundances impact and are impacted by the presence of exoplanets. We also would like to address how to define meaningful, chemical biomarkers within the star-planet system. The connection between planetary structure and element abundances within the host star is important, yet not well understood. As a result of the talks and discussion within this satellite meeting, we hope to make progress down the pathway towards habitable planets.

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