

Exoplanets, extremophiles and habitability

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Abstract

Estimates of the average surface temperature and CO₂ partial atmospheric pressure of already discovered exoplanets supposed to be in their Habitable Zone of their stars were surveyed from the Exoplanet Encyclopedia database. Moreover, since planetary surface temperature strongly depends on its albedo and geodynamic conditions, we have been feeding exoplanetary data into a comprehensive model of Earth's atmosphere to get better estimations. We also investigated the possible presence of "exomoons" belonging to giant planets capable of harbour dynamic stability and to retain atmospheric layers and keep geodynamic activity for long time spans. Collected information on biological data of micro-organisms classified as "extremophiles" indicate that such kind of microbial species could dwell in many of them. We thus propose an extension of the more astronomically defined "Habitable Zone" concept into the more astrobiologically "Extremophile Zone", taking into account other refined parameters allowing survival of more robust life forms.