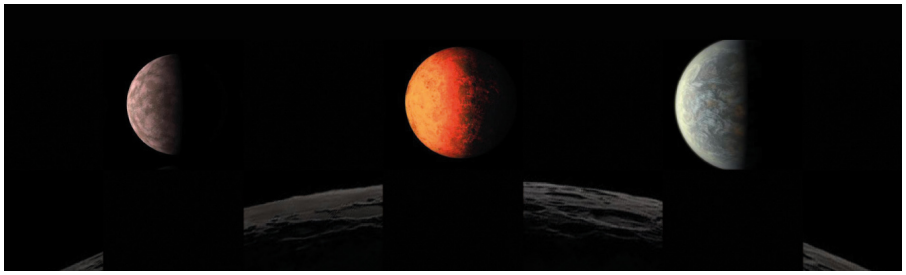

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Characterization of rocky exoplanets in habitable zones: An astrobiological approach

Friday 24 October 2025 12:30 (1 hour)

Rocky exoplanets, defined by their predominantly silicate and metal composition, represent a fascinating frontier in contemporary astrobiology, as their study allows us to explore conditions that could sustain life forms beyond our solar system. Complementary to this, those rocky planets that orbit in the habitable zone, which refers to the region around a star where the temperature allows for the existence of liquid water on the surface, becomes an essential criterion for selecting targets in the search for life outside planet Earth.
The identification of exoplanets in the habitable zone, especially those that share characteristics with Earth, gives us a perspective on the diversity of planetary environments that could exist in the universe. Additionally, the study of these worlds allows us to explore fundamental concepts in the physics and chemistry of processes that lead to the formation of complex organic molecules. Research on the interaction between exoplanets and their host stars also provides us with information about how initial conditions in a planetary system can influence the evolution of its atmosphere and its impact on habitability. With the advancement of tools like the James Webb telescope, we will be able to detect biomarkers such as methane and oxygen, reinforcing the importance of a multidisciplinary approach in the exploration of life in the cosmos.
This work focuses on the characterization of rocky planets located in habitable zones, with the aim of finding possible candidates for future astrobiological research. For this purpose, habitable zones will be identified based on the spectral type of host stars. Subsequently, the physical and orbital properties of these confirmed exoplanets in these planetary systems will be studied. Finally, prioritization criteria will be established for those planets with the highest probability of harboring conditions conducive to life.

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