

Scientists: To Evaluate Habitability of the Universe, Up to 80 Earth-like Planets Must Be Studied

Scientists from the Swiss Federal Institute of Technology Zurich, led by physicist Daniel Angerhausen, have studied how many Earth-like exoplanets need to be analyzed to discover life and potential human habitability or definitively state the absence of life in the Universe outside of Earth.

According to the research report published in The Astronomical Journal, to assert that life is likely present on 10-20% of exoplanets, it is necessary to analyze 40 to 80 such planets and find no signs of life based on predefined parameters, from a statistical perspective.

Scientists emphasize the importance of correctly formulating research questions and being cautious not to miss or misidentify signs of life. Precise formulations are important but must encompass a range of possibilities.

Researchers suggest potential signs of habitability for exoplanets may include the presence of an evaporating ocean with high water vapor content in the atmosphere and effective heat redistribution on tidally locked planets, which have eternal day on one side and eternal night on the other.

The authors of the study caution against setting too general or overly specific requirements, as this could lead to excluding potentially habitable planets from the analysis. Ultimately, the choice of criteria and evaluation of results must depend on the capabilities of the instruments and the accuracy of measurements, and after formulating questions, there should be no deviation from predetermined values.

"It's not just about how many planets we study but also about asking the right questions and ensuring confidence in whether we observe or miss what we seek. Even a large-scale review can lead to unreliable results if we are careless or overly confident in our ability to recognize life," Angerhausen emphasized.