

The Earth 2.0 (ET) Space Mission

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The Earth 2.0 (ET) space mission will deploy a space observatory consisting of six wide-angle transit telescopes and one microlensing telescope in a halo orbit near the Sun-Earth Lagrange L2 point. By combining the transit and microlensing methods, the mission aims to search for habitable Earth-like exoplanets orbiting solar-type stars, measure their occurrence rate, and conduct a comprehensive population census of both terrestrial and free-floating planets. This will help reveal the origins of these planets and provide new candidates and perspectives for the search for extraterrestrial life. The ET mission's observations, statistical studies, and theoretical analyses will address key scientific questions, including: (1) How common are habitable Earth-like planets orbiting solar-type stars? (2) What are the properties of terrestrial-like exoplanets? (3) How common are free-floating Earth-mass planets, and what are their origins? In addition, the ET mission will provide vast amounts of high-precision, high-frequency, and long-baseline photometric data, advancing research in fields such as asteroseismology, galactic archaeology, time-domain astronomy, binary stars, and binary black holes.