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NANCY-GRACE ROMAN TELESCOPE: A NEW FRONTIER IN CLASSIFYING EXOPLANETS

Abstract

The Nancy Grace Roman Telescope, originally known as the Wide-Field Infrared Survey Telescope (WFIRST), is a NASA observatory that aims to answer key issues about dark energy, exoplanets, and infrared astronomy. Roman's Galactic Bulge Time Domain Survey, which will be one of the first large-scale surveys employing gravitational microlensing for exoplanets, is one of the telescope's core missions. Previous research indicated that the approach will be particularly sensitive to planets orbiting Sun-like stars at a distance of 1-10 astronomical units. We here implement microlensing, a type of gravitational lensing in which light from a background source is twisted, multiplied, and/or brightened by the gravitational field of a foreground lens. Unlike most other survey missions up to this point, a planet discovery bias favoring smaller planets The twin detection approach allows Roman to identify a varied assortment of planets using microlens, and transits complement each other. In this research, we propose combining the transit method in which a planet covers the light rays projected by star leading to the formation of light curves which give us essential information on parameters of the planet such as size, atmospheric compositions, and different elements which affected the dispersion, works best for planets orbiting extremely close to their host star, with Microlensing, which can detect planets circling far from their host stars, to analyze exoplanets discovered by the expedition. Microlenses are uncommon, and the planetary system's timescale is brief. If the lensing star has an exoplanet, it functions as a second star, brightening the star even more. We aim to present a possibility of a probable catalog combining the results from Roman's microlensing survey and transiting planet searches which will help provide a more complete planet census by revealing worlds with a wide range of sizes and orbits habitable for humankind.