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The Space-Based Photometry Revolution

Invited talk

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Abstract. The Transiting Exoplanet Survey Satellite (TESS) is a NASA Astrophysics Explorer-class mission that will perform an all-sky survey to search for planets transiting nearby bright stars. The primary goal is to search for planets smaller than Neptune that are amenable to follow-up spectroscopic observations that will yield planet masses, thereby providing prime targets for future atmospheric characterization studies. In its two-year prime mission, TESS will monitor more than 200,000 stars with four wide-field optical CCD cameras that will tile more than 90% of the sky. TESS will also obtain full-frame images (FFIs) of the entire field of view with a cadence of 30 minutes to facilitate additional science. These FFIs will provide photometry for more than 30 million objects brighter than magnitude I=16 during the two-year prime mission. The TESS legacy will be a catalogue of the nearest and brightest main-sequence stars hosting transiting exoplanets. The TESS Mission will also have a robust Guest Investigator (GI) Programme that will be managed by the TESS Science Support Center at NASA Goddard Space Flight Center. Under the GI programme, the astrophysics community may propose new 2-minute cadence targets and investigations using the 30-minute cadence FFI data. TESS GI calls for proposals will occur once per year, and about 20,000 targets will be available for each GI programme cycle.

TESS was launched in April 2018, and will observe from a unique elliptical high-Earth orbit that will provide an unobstructed view of its field to obtain continuous light-curves.

Keywords. Space vehicles: instruments, data bases: surveys