

TESS (Transiting Exoplanet Survey Satellite)

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On April 18th, 2018 a SpaceX Falcon 9 rocket launched NASA's Transiting Exoplanet Survey Satellite (TESS). TESS is the successor to the Kepler mission, seeking to find new exoplanets that could potentially support human life. The mission began in 2006 when a private team successfully funded the project. MIT proposed TESS to NASA in 2008 and 2010, however it was not selected until 2013.

TESS can find exoplanets around stars brighter than its predecessor, allowing subsequent analysis to be clearer. It will also provide targets for deeper exploration once the James Webb Space Telescope enters operation in addition to other future telescopes. TESS is the scouting mission to find planets of interest for deeper investigation after the satellite's operation.

TESS is designed to operate for two years, during which the satellite will watch sectors of the sky for at least 27 days each before moving on to the next one. Each of the 26 sectors is 24° by 97° , half in the northern hemisphere and the other half in the southern hemisphere. All of the sectors in each hemisphere will overlap at the pole, allowing TESS to be more sensitive in the continuous viewing zone of the upcoming James Webb Space Telescope. The satellite sits in a High Earth Orbit (HEO), giving TESS an unobstructed view for 13.7 days before nearing Earth to transmit its data. It will watch more than 200,000 stars for dips in their brightness caused by transiting exoplanets. TESS will watch one hemisphere per year, scanning the entire sky for exoplanets.

As of September 2018, TESS has already scanned two sectors and is working on its third. Two exoplanets have already been discovered from the small volume of data returned. The first

is a super earth with an orbital period of 6.3 days. The second is slightly bigger than Earth with an orbital period of 11 days. Both are currently being reviewed by “other scientists.” GEOFF with project PANOPTES hopes to join TESS and the many other observatories currently searching for exoplanets not so far away from home.

Works Cited

Launch Manifest. SpaceX, www.spacex.com/missions. Accessed 24 Sept. 2018.

@NASA_TESS. "The @NASA_TESS team is excited to announce the mission's first candidate planet -- a super-Earth around the bright star Pi Mensae, nearly 60 light-years away. The planet orbits every 6.3 days. The discovery is now being reviewed by other scientists to validate it. Stay tuned!" *Twitter*, 19 Sept. 2018, 12:31 p.m., twitter.com/NASA_TESS/status/1042496479108243456.

---. "A second @NASA_TESS candidate planet has been discovered! Slightly bigger than Earth, this planet orbits LHS 3844, a M dwarf star 49 light-years away, every 11 hours. This find is being reviewed by other scientists, and we're looking forward to studying this cool 'hot Earth.'" *Twitter*, 20 Sept. 2018, 6:52 a.m., twitter.com/NASA_TESS/status/1042773553777664000.

"TESS Observations." *TESS*, MIT, tess.mit.edu/observations/. Accessed 26 Sept. 2018.

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