

## NASA's new planet-hunting mission begins

A SpaceX Falcon 9 rocket transporting the TESS satellite lifts off from launch complex 40 at the Cape Canaveral Air Force Station in Cape Canaveral | Photo Credit: [AP](#)

NASA's latest planet hunting satellite was successfully launched today on the first-of-its-kind mission to find new worlds beyond our solar system and identify the ones that could support alien life.

The Transiting Exoplanet Survey Satellite (TESS), which is expected to find thousands of new exoplanets orbiting nearby stars, lifted off at 4:21 am IST on April 19 on a SpaceX Falcon 9 rocket from the Cape Canaveral Air Force Station in Florida. The twin solar arrays that will power the spacecraft were successfully deployed soon after.

"We are thrilled TESS is on its way to help us discover worlds we have yet to imagine, worlds that could possibly be habitable, or harbour life," said Thomas Zurbuchen, associate administrator of NASA's Science Mission Directorate in Washington. "With missions like the James Webb Space Telescope to help us study the details of these planets, we are ever the closer to discovering whether we are alone in the universe."

The Hindu explains: NASA's Transiting Exoplanet Survey Satellite

Over the course of several weeks, TESS will use six thruster burns to travel in a series of progressively elongated orbits to reach the Moon, which will provide a gravitational assist so that TESS can transfer into its 13.7-day final science orbit around Earth. After approximately 60 days of check-out and instrument testing, the spacecraft will begin its work.

"One critical piece for the science return of TESS is the high data rate associated with its orbit," said George Ricker, TESS principal investigator at the Massachusetts Institute of Technology (MIT) in the US. "Each time the spacecraft passes close to Earth, it will transmit full-frame images taken with the cameras. That's one of the unique things TESS brings that was not possible before."

For this two-year survey mission, scientists divided the sky into 26 sectors. TESS will use four unique wide-field cameras to map 13 sectors encompassing the southern sky during its first year of observations and 13 sectors of the northern sky during the second year, altogether covering 85 % of the sky.

TESS will be watching for phenomena called transits. A transit occurs when a planet passes in front of its star from the observer's perspective, causing a periodic and regular dip in the star's brightness. More than 78 % of the approximately 3,700 confirmed exoplanets have been found using transits. NASA's Kepler spacecraft found more than 2,600 exoplanets, most orbiting faint stars between 300 and 3,000 light-years from Earth, using this same method of watching for transits.

TESS will focus on stars between 30 and 300 light-years away and 30 to 100 times brighter than Kepler's targets. The brightness of these target stars will allow researchers to use spectroscopy, the study of the absorption and emission of light, to determine a planet's mass, density and atmospheric composition. Water, and other key molecules, in its atmosphere can give us hints about a planets' capacity to harbour life.

"The targets TESS finds are going to be fantastic subjects for research for decades to come," said

Stephen Rinehart, TESS project scientist at NASA's Goddard Space Flight Center in the US.

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