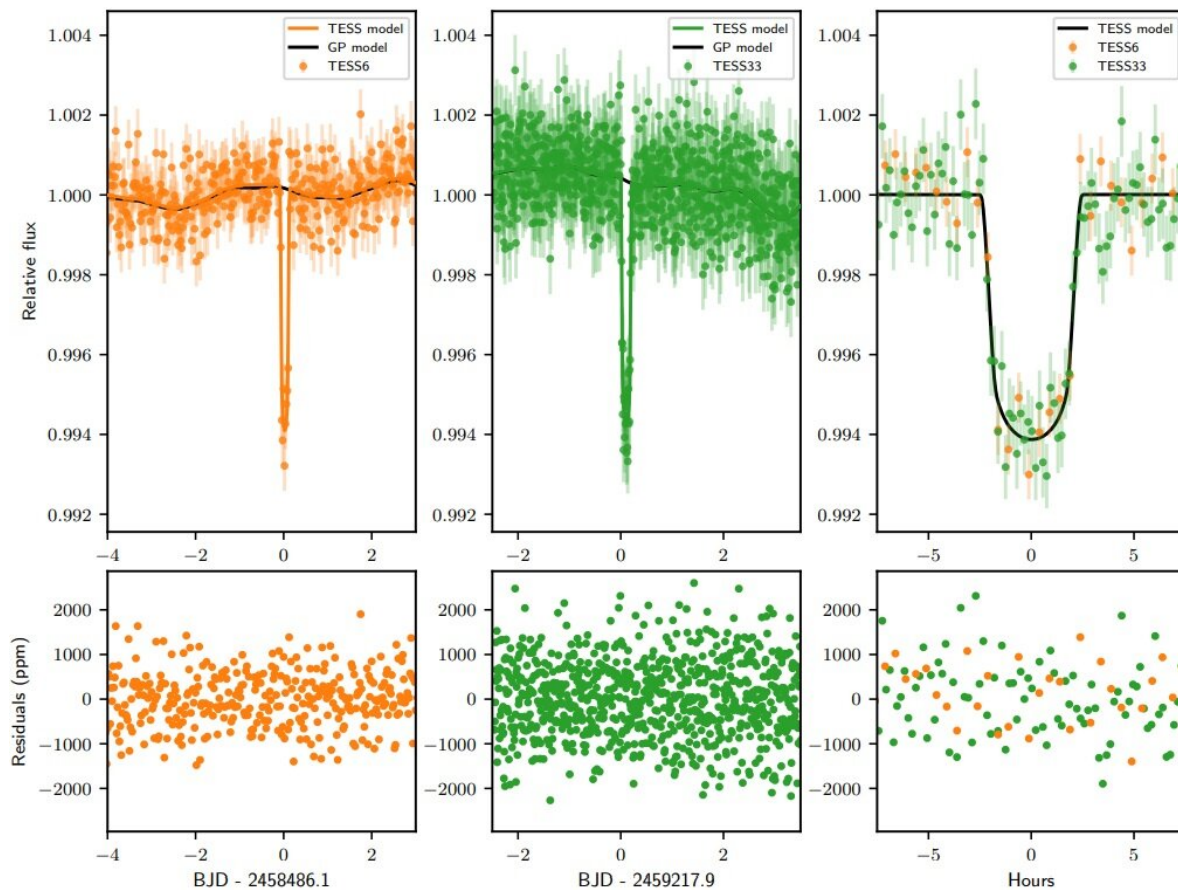


# Two massive Jupiter-sized exoplanets discovered with TESS

July 18 2022, by Tomasz Nowakowski



Photometric observations of TOI-5153 from TESS. Credit: Ulmer-Moll et al., 2022.

Using NASA's Transiting Exoplanet Survey Satellite (TESS), an

international team of astronomers has detected two new extrasolar planets. The newfound alien worlds, designated TOI-5152 b and TOI-5153 b, are the size of Jupiter but about three times more massive than the solar system's biggest planet. The finding is reported July 8 on the arXiv pre-print repository.

TESS is conducting a survey of about 200,000 of the brightest stars near the sun with the aim of searching for transiting exoplanets. It has identified over 5,700 candidate exoplanets (TESS Objects of Interest, or TOI), of which 227 have been confirmed so far.

A group of astronomers led by Solène Ulmer-Moll of Geneva Observatory in Switzerland has recently confirmed another two TOI planets monitored by TESS. They report that transit signals have been identified in the light curves of two stars known as TOI-5152 and TOI-5153. The planetary nature of these signals was confirmed by follow-up observations.

"The discovery photometry was collected with the space-based mission TESS and follow-up observations were carried out from the ground with the photometric facility NGTS, and the high-resolution spectrographs CORALIE, FEROS, CHIRON, HARPS, and TRES," the researchers wrote in the paper.

TOI-5152 b has a radius of about 1.07 Jupiter radii and is approximately three times more massive than Jupiter. It orbits its parent star every 54.19 days, at a distance of some 0.31 AU from it. The planet's equilibrium temperature was measured to be 688 K. The host TOI-5152 is a G1-type star nearly two times larger than the sun, located about 1,200 light years away from the Earth. Its age is estimated to be between 1.4 and 6.8 billion years.

TOI-5153 b has a mass of 3.26 Jupiter masses, while its radius was

estimated to be 1.06 Jupiter radii. The orbital period of this exoplanet was measured to be 20.33 days and its distance to the host is nearly 0.16 AU. The astronomers calculated that the equilibrium temperature of TOI-5153 b is at a level of 906 K. The [parent star](#) is of spectral type F8. It is about 40% larger than the sun and is assumed to be 5.4 billion years old. The distance to this planetary system is about 1,270 [light years](#).

Therefore, TOI-5152 b and TOI-5153 b are warm and massive Jupiter-sized alien worlds. The astronomers noted that they are both metal-enriched and their heavy element content is consistent with the mass-metallicity relation of gas giants. Given that the two planets orbit moderately [bright stars](#), the authors of the paper added that they are ideal targets for additional observations.

"Both warm Jupiters orbit moderately bright host stars making these objects valuable targets for follow-up studies of the planetary atmosphere and measurement of the spin-orbit angle of the system," the researchers concluded.

**More information:** S. Ulmer-Moll et al, Two long-period transiting exoplanets on eccentric orbits: NGTS-20 b (TOI-5152 b) and TOI-5153 b. arXiv:2207.03911v1 [astro-ph.EP], [arxiv.org/abs/2207.03911?context=astro-ph](https://arxiv.org/abs/2207.03911?context=astro-ph)

© 2022 Science X Network

Citation: Two massive Jupiter-sized exoplanets discovered with TESS (2022, July 18) retrieved 21 May 2024 from <https://phys.org/news/2022-07-massive-jupiter-sized-exoplanets-tess.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.