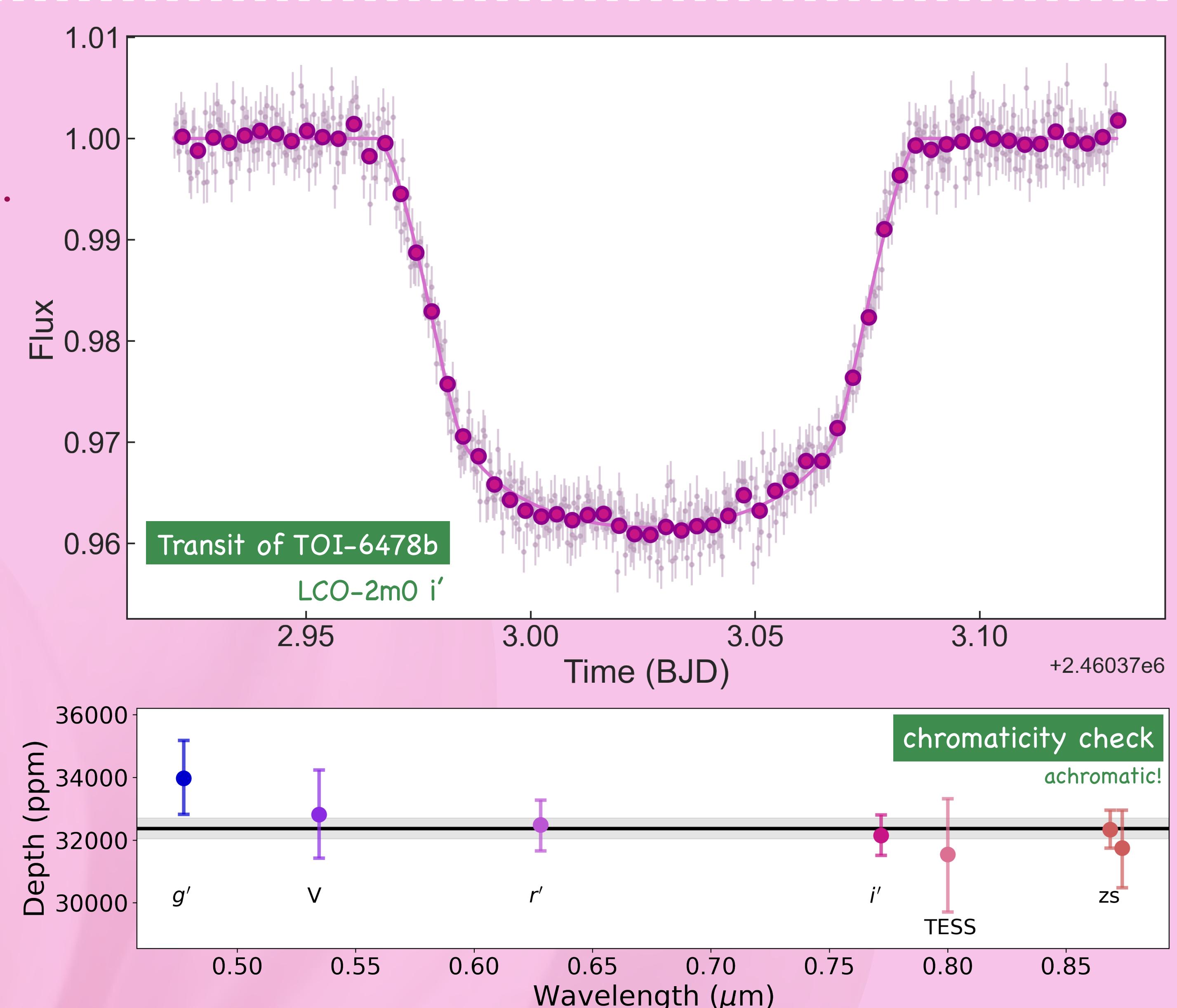
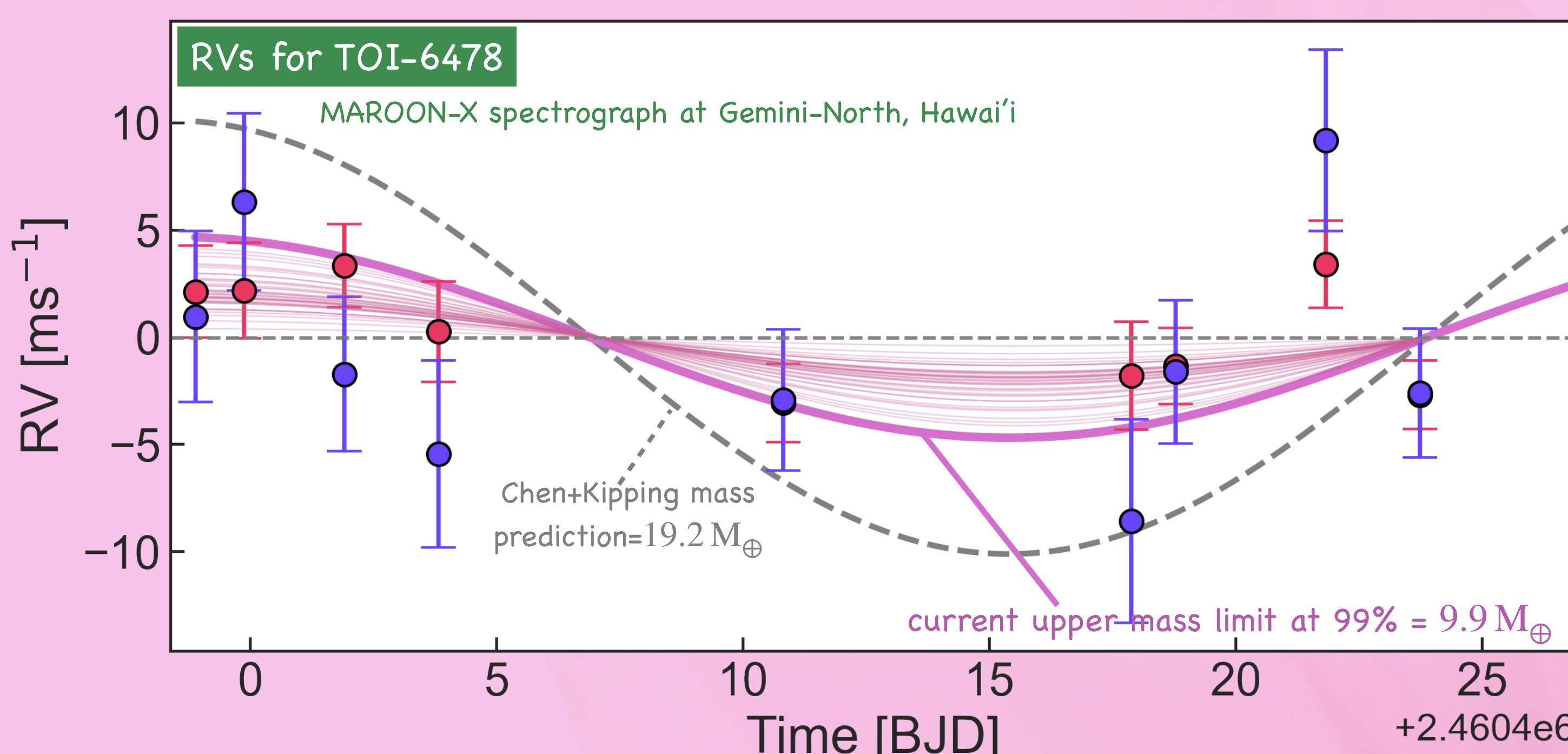


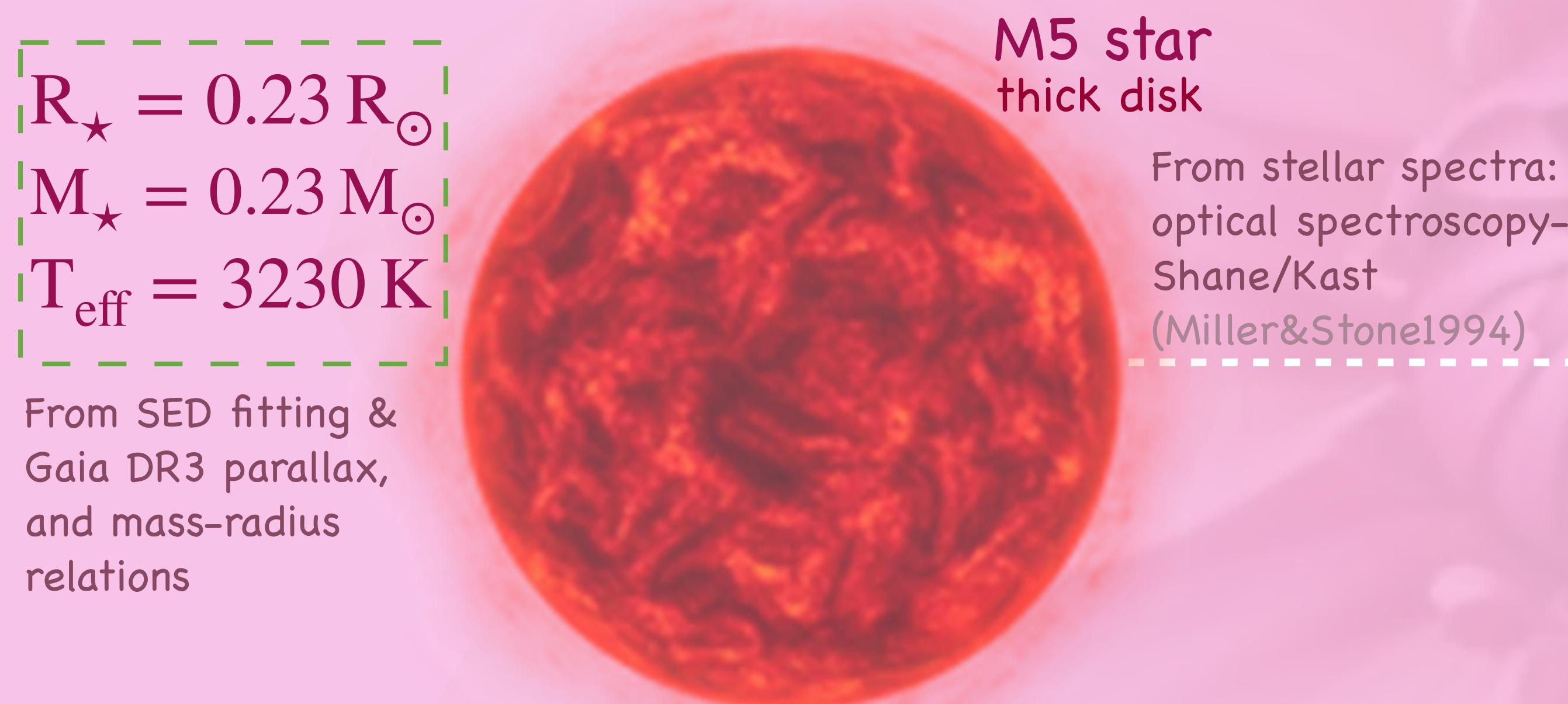


## Planet Confirmation

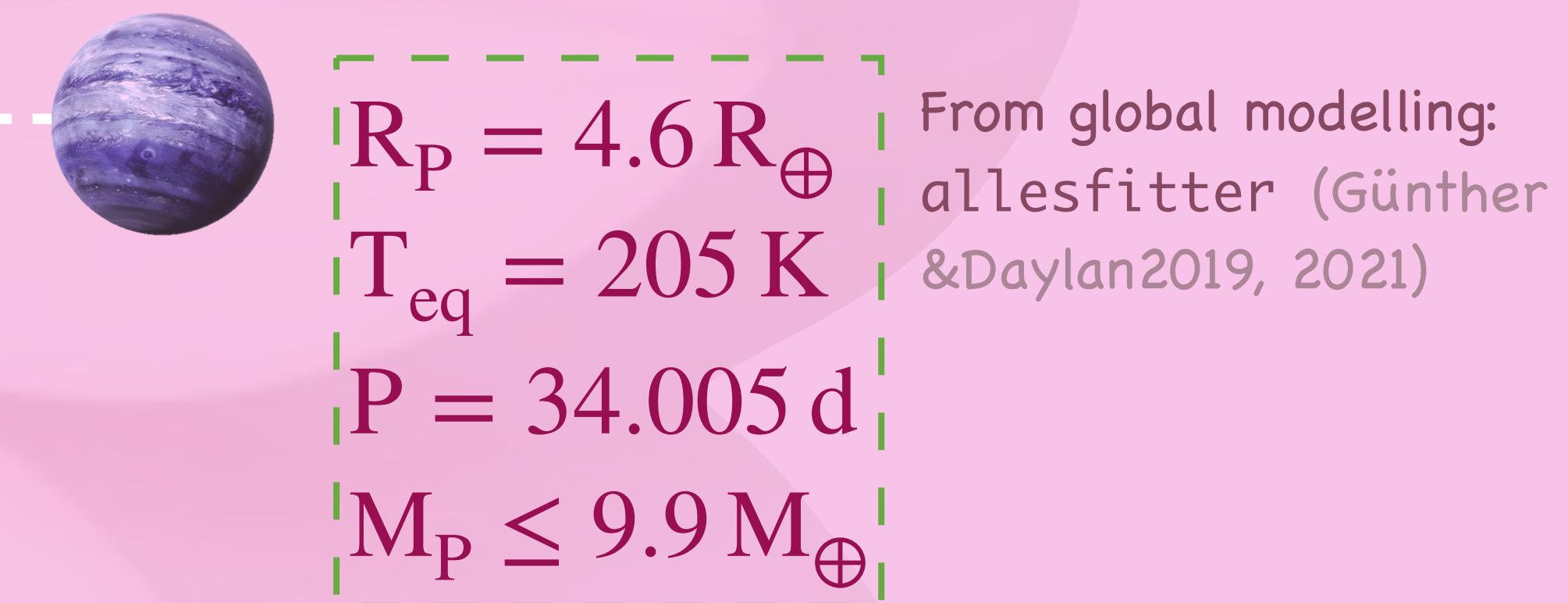
- \*TESS duo-transits in 2019 + 2023 with a duration of 3hrs.
- \*Full transit event observed with LCO-2m0 and LCO-1m0 at Siding Springs Observatory on 2024-03-03.
- \*Observed in 5 bands, transit is achromatic.
- \*Confirmation of orbital period  $\rightarrow 34.005$  d.
- \*Upper mass limit from RVs.



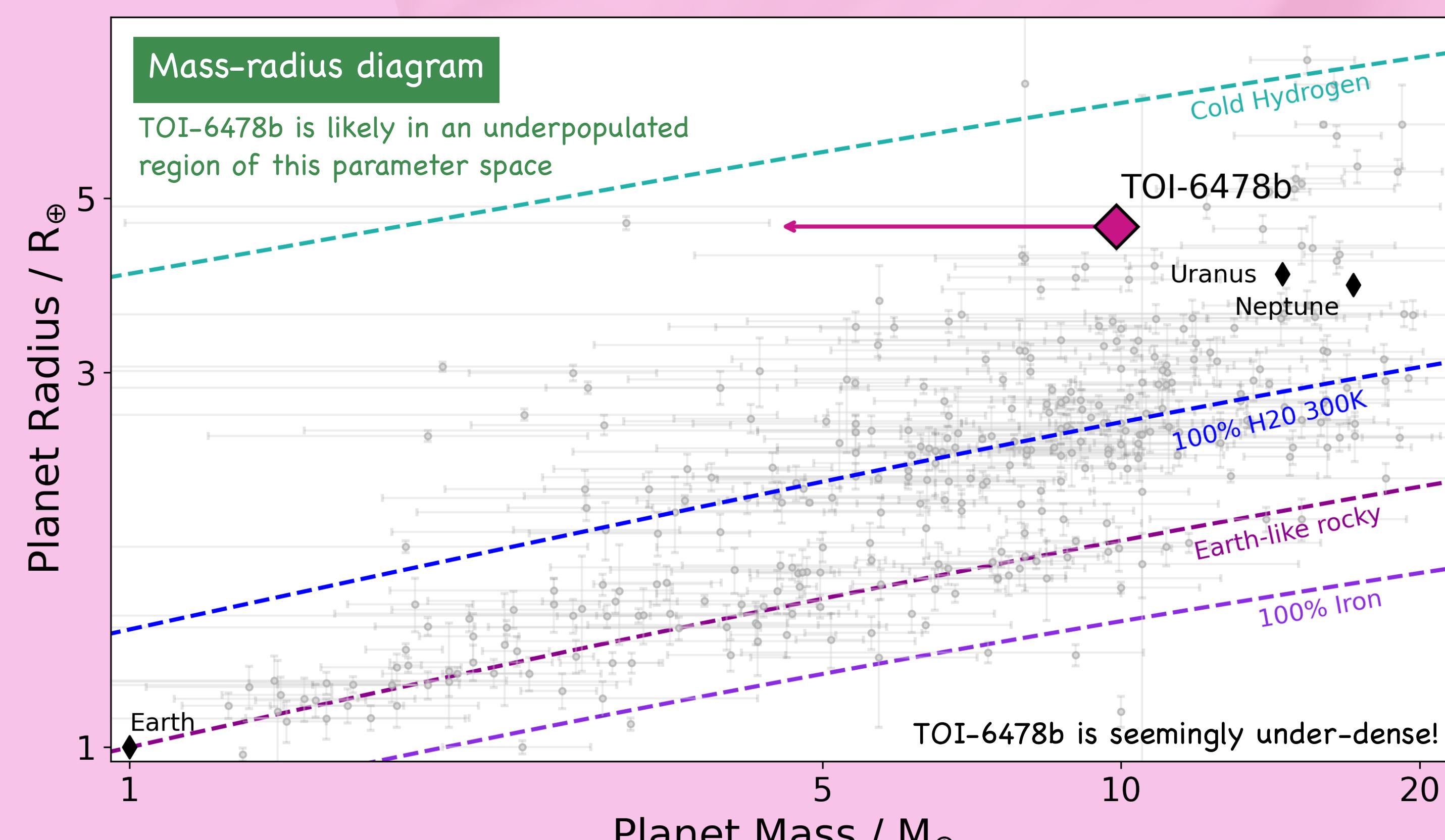
## Know thy star, know thy planet



~Neptune-sized

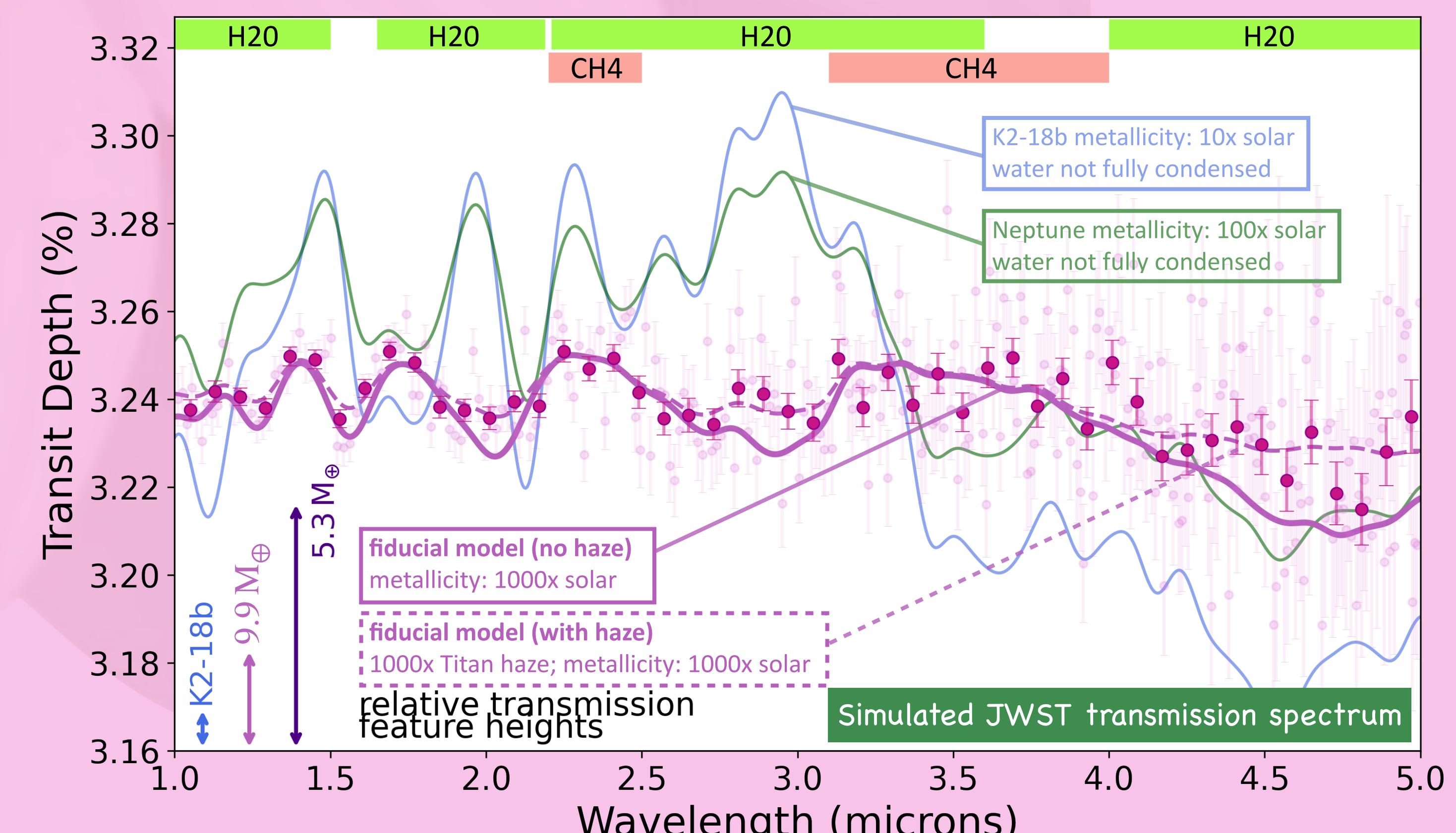


## TOI-6478b in context



	TOI-6478b	K2-18b	Mars	Neptune
P/d	34	33	687	60195
T <sub>eq</sub> /K	205	284	210	47
R <sub>p</sub> /R <sub>⊕</sub>	4.6	2.4	0.5	3.8
a/ice	0.9	0.5	1	20

Ice line @ 210K  
[Ice line is 1.5 au for Solar System - approx the distance of Mars]



- \*TOI-6478b formed beyond the ice line.
- \*Thanks to its M5 host star, it has a cold temperature (205K) despite a relatively short orbital period of 34d.
- \*Its seemingly low density further enhances its transmission signal, permitting detailed atmospheric characterisation with JWST.
- \*It can provide a clear window into the composition and dynamics of a cold, Neptune-like atmosphere.
- \*TOI-6478b can therefore build a bridge between the cold exo-Neptune population and the Solar System Ice giants.