LHS 3844 b

LHS 3844 b, formally named **Kua'kua**,[2] is an exoplanet orbiting the red dwarf LHS 3844, about 48.5 light-years (14.9 parsecs) away in the constellation Indus,[6] discovered using the Transiting Exoplanet Survey Satellite. It orbits its parent star once every 11 hours, and its radius is 1.32 times that of Earth.[1] It has a low albedo, indicating that its surface may resemble that of the Moon or Mercury. LHS 3844 b probably does not have an atmosphere as almost no heat goes to its night side, and it has a dayside temperature of 1,040 K (770 °C; 1,410 °F).[5][7] The presence of cloudy atmosphere with cloud tops above pressure level of 0.1 bar cannot be excluded though.[8]

In order to explain the lack of atmosphere, it has been proposed that the planet was formed interior to the star system's snow-line, because if it formed beyond the snow-line it would have carried volatiles, on the surface and in a thick atmosphere, that according to models on atmospheric loss should have been enough to sustain an atmosphere to the present.[9] The planet probably also formed with a volatile-poor outgassing mantle, in a stagnant lid regime, because if the mantle was similar in constitution to Earth's, with plate tectonics, then it should still have a thick atmosphere, unless the red dwarf consistently flared at an uncharacteristically extreme rate not yet considered in atmospheric loss models.[9] An alternative explanation for the lack of atmosphere could be through a large impact event, one with enough momentum to strip the planet of its atmosphere and a large portion of its mantle.[9] In order to explain the non replenishment of volatiles via comets back onto the planet, it is also proposed that perhaps there is an outer gas giant in the star system.[9]

LHS 3844 b / Kua'kua

Artist's illustration of LHS 3844 b

Discovery[1]	
Discovered by	Vanderspek *et al.*
Discovery date	September 2018
Detection method	Transit
Designations	
Alternative names	Kua'kua,[2] TOI-136.01, TIC 410153553 b[3][4]
Orbital characteristics	
Semi-major axis	0.006 22 ± 0.000 17 AU[3][4]
Orbital period (sidereal)	0.462 929 13 ± 0.000 001 90 d[3][4]
Inclination	88.50 ± 0.51[4]
Star	LHS 3844
Physical characteristics	
Mean radius	1.303 ± 0.022 $R_\oplus$[3][4]
Albedo	<0.2[5]
Temperature	1,040 K (770 °C; 1,410 °F) (day side)[5]

It is thought that LHS 3844 b is tidally locked due to its surface being 'relatively cool', although this hypothesis could possibly be complicated by the fact that the research into the temperature of the planet assumed that there was no atmosphere, a point which isn't definitively confirmed.[10]

Naming

In August 2022, this planet and its host star were included among 20 systems to be named by the third NameExoWorlds project.[6] The approved names, proposed by a team from Costa Rica, were announced in June 2023. LHS 3844 b is named **Kua'kua** and its host star is named **BatsÙ**, after the Bribri words for "butterfly" and "hummingbird".[2]

See also

- List of exoplanets discovered in 2019
- WASP-17b

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