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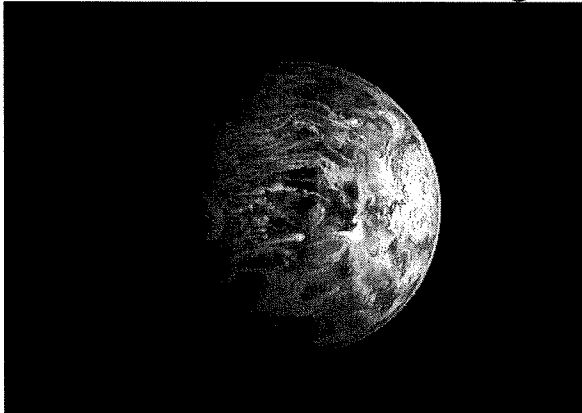
## The strangest exoplanets humans have 'discovered' ... so far

*Facts about the strangest, most unusual and downright cool exoplanets astronomers have discovered over the past few decades.*

Adapted from Jane Wilson, Sky at Night Magazine:

Since the discovery of the first exoplanets in the 1990s, all manner of weird and wonderful worlds have been found orbiting distant stars beyond our Solar System. Who wouldn't want to leave Earth for the promise of an interplanetary trip to a strange exoplanet? With thousands confirmed and the number of exoplanets discovered growing daily, you may get lucky: about half of the Sun-like stars out there are thought to have the potential to host life. That's about 300 million potentially habitable worlds in our galaxy. Don't pack your bags just yet though – as these weird planets show, you may be in for less of a holiday and more of a fight for survival! And, with a wealth of new exoplanet-hunting missions in the pipeline, there could be plenty more strange worlds discovered over the coming years.

### **HD 189773b – where it rains glass sideways**



This nightmare world is only 64 lightyears away and the closest 'hot Jupiter' to Earth. It may look like a gorgeous deep-blue marble floating serenely in space, but if you had the misfortune to visit this massive gas giant, you'd soon regret it. As well as being spun furiously by winds blowing at 8,700 km/h, you'd be cut to shreds by glass rain. The planet's delightful blue colour is the reflection of silicate in its atmosphere – silicate that, when heated by the planet's deathly 1300°C temperature, forms grains of glass.

### **TOI 849 b – a desolate world**

Discovered in 2020 by NASA's Transiting Exoplanet Survey Satellite (TESS), it's no fun at all on TOI 849 b. This exoplanet orbits so tightly to its star that a year passes in 18 hours. Don't bother with constant birthday parties though, as there's no atmosphere and the 1530°C heat would melt the cake. What makes TOI 849 b particularly weird, though, is the strangely hybrid nature. While it's around the size of the gas giant Neptune, it's

This exoplanet in orbit around Sun-like host star 55 Cancri A may be a real gem. The first super-Earth discovered around a main sequence star, it was thought to be so abundant in carbon that, thanks to immense pressure and 2,700°C temperatures, its interior was made of diamond. More recent research has disputed the diamond theory, revealing less carbon than previously thought, but the nature of 55 Cancri e remains a controversial topic among scientists.

### **TrES-2b – the darkest exoplanet**

Identified by NASA's Kepler Space Telescope in 2011, it's the darkest known exoplanet, reflecting less than 1% of any light that hits it. TrES-2b orbits a star some 750 lightyears away in the direction of the constellation Draco and is the darkest planet or moon ever discovered. "It's darker than the blackest lump of coal, than dark acrylic paint you might paint with. It's just ridiculous how dark this planet is," said study lead-author David Kipping from the Harvard-Smithsonian Center for Astrophysics.

### **KELT-9b – the hottest exoplanet**

Ultra-hot Jupiter-type exoplanet KELT-9b is so scorching that it's even hotter than many stars. It orbits so close to its sun that its surface sizzles at 4,300C – so hot that it has atomic iron and titanium in its atmosphere – and a year lasts less than a day and a half. Using data from the Spitzer Space Telescope, researchers have found that the extreme temperatures on the planet's dayside cause molecules of hydrogen gas to tear apart, only to recombine when they flow to the relatively cooler eternal nightside, before being torn apart once more when they move back into the furnace.

### **HR 5183b – the planet with the craziest orbit**

HR 5183b is in no hurry to orbit its star. Discovered in 2019, it is a giant, three times more massive than our biggest planet, Jupiter. It orbits at a leisurely 74 years around the sun (far more than Saturn's 29 Earth years, but close to Uranus's 84 years). What's strange, though, is its bizarre orbit, which sees it loitering on the outer reaches of its system before slingshotting into the centre, passing a hair's breadth from its host star before floating away again. This mad behaviour has earned it the nickname the 'whiplash planet'. It's also been likened to a wrecking ball for its likely devastating effect on any other planets in the system that are trying to quietly orbit in a more orthodox fashion.

### **K2-18b – where a swim *may* vaporize you**

K2-18b, twice the radius and eight times the mass of Earth, has been a top contender for an Earth-like planet for years, so there was huge excitement when it was announced in 2019 that water had been discovered in K2-18b's atmosphere. For the first time, we'd found a rocky planet orbiting in the habitable zone of its star, in which liquid water could potentially pool on the surface. Before we could dream of swimming in exotic oceans, though, came the view that K2-18b may be more like the far less friendly mini-Neptunes – planets with a thick hydrogen atmosphere, a watery layer and a rocky iron core, where temperatures and pressures are far too high to support life.

