'Alien Earth' is among eight new far-off planets

07/01/2015

All eight were picked out by Nasa's Kepler space telescope, taking its tally of such "exoplanets" past 1,000.

But only three sit safely within the "habitable zone" of their host star - and one in particular is rocky, like Earth, as well as only slightly warmer.

The find was revealed at a meeting of the American Astronomical Society.

Red sky

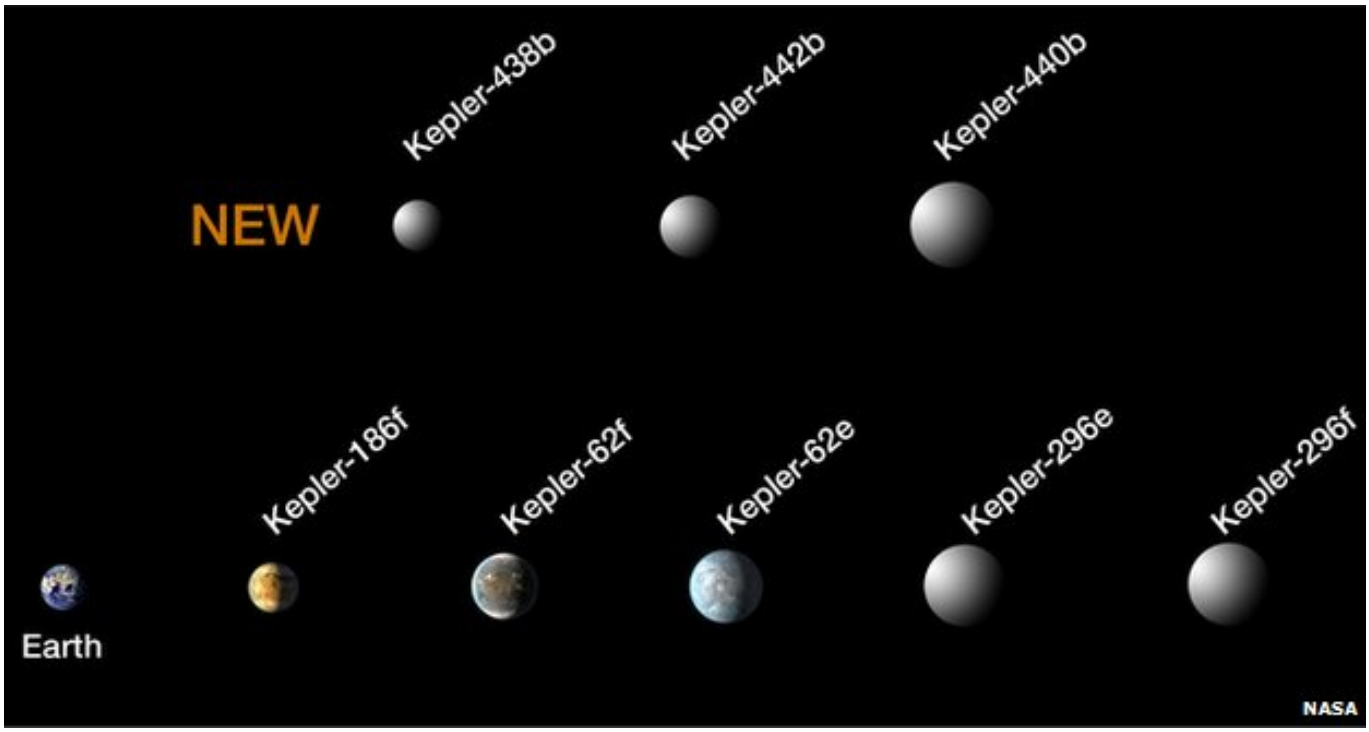
The three potentially habitable planets join Kepler's "hall of fame", which now boasts eight fascinating planetary prospects.

And researchers say the most Earth-like of the new arrivals, known as Kepler 438b, is probably even more similar to our home than Kepler 186f - which previously looked to be our most likely twin.

At 12% larger than Earth, the new claimant is bigger than 186f but it is closer to our temperature, probably receiving just 40% more heat from its sun than we do from ours.

So if we could stand on the surface of 438b it may well be warmer than here, according to Dr Doug Caldwell from the Seti (Search for Extra-Terrestrial Intelligence) Institute in California.

"And it's around a cooler [red dwarf] star... so your sky would look redder than ours does to us," Dr Caldwell said.



With the three new arrivals, Kepler's 'hall of fame' expands to eight small, habitable-zone exoplanets

That first-person encounter, however, is unlikely - both because the planet is 475 light-years away and because we still have essentially no idea what it's made of.

Images from the Kepler telescope, which trails behind the Earth and peers far into the distance as we orbit our own sun, are used to identify far-off planets by observing "transits".

This refers to the dimming of a star's light when a planet passes in front of it.
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Kepler space telescope mission

- Launched in 2009, the Kepler space telescope sought to find Earth-like worlds orbiting distant stars in the Constellation Lyra

- It used the so-called transit technique - looking for the periodic dips in light as exoplanets pass in front of their host stars
- Last year, a single release of Kepler results added 715 exoplanets to the tally

- How does the Kepler telescope work?
- How rare is our blue planet?

A large team of researchers then uses additional data from Earth-bound telescopes to further explore these unfamiliar solar systems.

They try to calculate how big the planets are, and how closely they orbit their host stars.

Not everything that causes such a dimming eventually turns out to be a planet, however.

At the same time as the eight confirmed new exoplanets were announced by a 26-strong team spanning Nasa and multiple US institutions, the Kepler mission's own scientists released another tranche of more than 500 "candidate" planets.

"With further observation, some of these candidates may turn out not to be planets," said Kepler science officer, Fergal Mullally.

"Or as we understand their properties better, they may move around in, or even outside, the habitable zone."

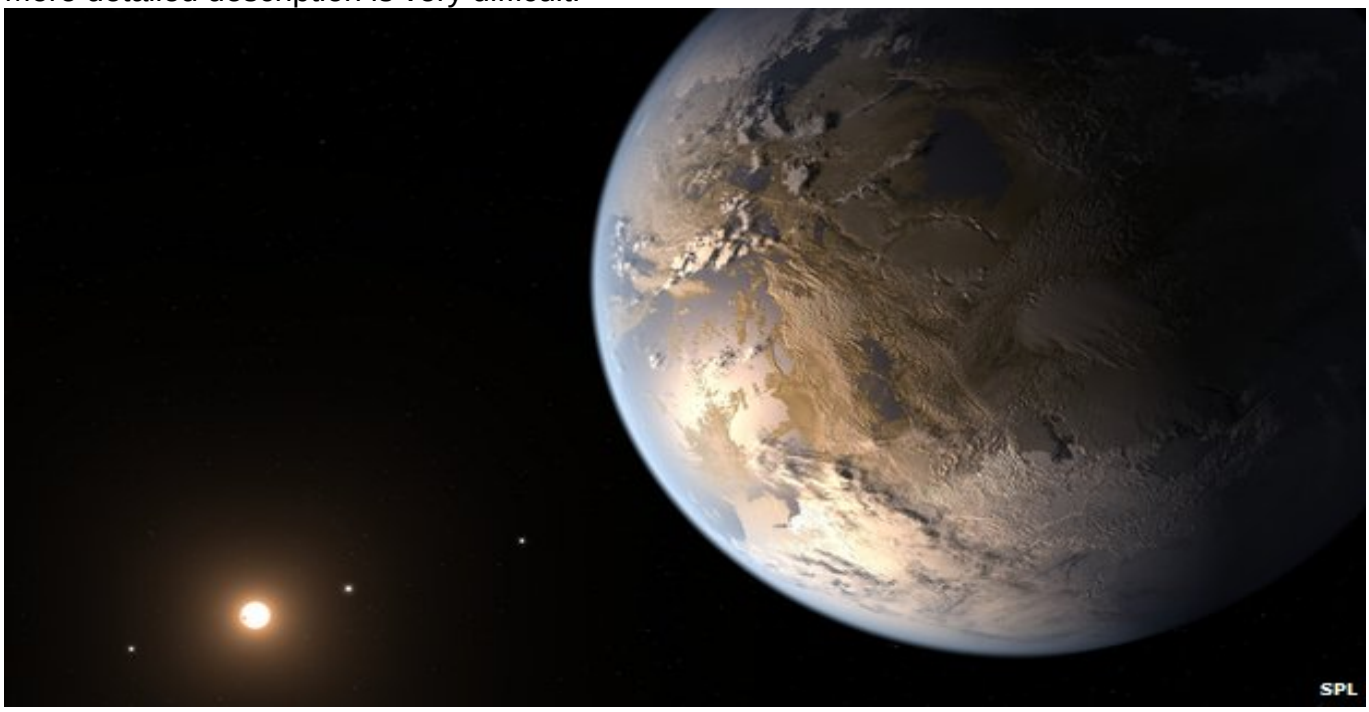
'Star Trek' scenario

Even once scientists have anointed a candidate as a confirmed exoplanet, the question of whether or not it is "Earth-like" is a fraught one, with fuzzy boundaries.

The size of the habitable, or "Goldilocks" zone, where a planet is far enough from its sun to hold water but not so distant that it freezes, depends on how confident scientists want to be with their guess-work.

According to Dr Cardwell, just three of the eight new exoplanets can be confidently placed in that zone - and only two of those are probably rocky like the Earth.

More detailed description is very difficult.



An artist's view of Kepler 186f, which experts say has now been pipped as "most Earth-like" known exoplanet

"From the Kepler measurements and the other measurements we made, we don't know if these planets have oceans with fish and continents with trees," Dr Caldwell told BBC News.

"All we know is their size and the energy they're receiving from their star.

"So we can say: Well, they're of a size that they're likely to be rocky, and the energy they're getting is comparable to what the Earth is getting.

"As we fill in these gaps in our solar system that we don't have, we learn more about what it means to be Earth-like, in some sense."

Speaking at a related event at the conference, Prof Debra Fischer from Yale University said she remembered a time before the first exoplanet was discovered, more than two decades ago.

"I remember astronomers before that point being very worried," she said.

"We really had to step back and say: Maybe the Star Trek picture is wrong. That filled me with despair."

Prof Fischer said that sensitive telescopes like Kepler had ushered in an era of "amazing and impressive work".

"We're talking about a planet - and we can only see its star with a powerful telescope.

"And we can draw graphs and sketch its composition and have serious scientific discussions. This is incredible."