New Scientist

WEEKLY October 3 – 9, 2020

LAST OF THE MEGA FISH
Earth's vanishing river monsters

REASONS TO BE CHEERFUL
Ruby Wax on mindfulness and mental health

CHINA'S CLIMATE SURPRISE
Can it really go carbon neutral by 2060?

SPECIAL REPORT

LIFE BEYOND EARTH

The discovery on Venus, and the race to understand it

Have we been looking for life in all the wrong places?

Why we will (probably) never make contact with intelligent aliens

LOCKDOWN OR LET IT RIP?
Difficult decisions as European coronavirus cases rise once more

PLUS RAISED BY WOLVES / **THE PROBLEM WITH THE PALEO DIET** / **FIRST EXTRAGALACTIC EXOPLANET?** / A WHALE DIVING RECORD

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Exoplanets

First planet outside our galaxy?

Astronomers may have spotted a world 28 million light years away

Leah Crane

IN A galaxy far, far away, a huge planet may be orbiting a binary star system. If this world is real, it would be the most distant ever spotted – the first planet to be found in another galaxy.

A team of researchers led by Rosanne Di Stefano at the Harvard-Smithsonian Center for Astrophysics in Massachusetts spotted this potential planet, now named M51-ULS-1b. It resides in a galaxy called M51, known as the Whirlpool galaxy, which is 28 million light years away. The researchers found the planet by hunting through data from 2624 observations made by the Chandra X-ray Observatory space telescope.

They scanned the data for signs of transits, which occur when a planet blocks out the light of a star or other bright object it passes. To eliminate the chance that changes in light levels were merely due to fluctuations in the bright objects themselves, the researchers looked for cases in which all the light was blocked out. They found one possible exoplanet (arxiv.org/abs/2009.08987).

NASA/HUBBLE

The Whirlpool galaxy may host the first extragalactic world ever spotted

"It's exciting, but not unexpected," says Angelle Tanner at Mississippi State University. "There's absolutely no reason to think there wouldn't be planets in other galaxies."

The planet appears to be in a system where a star orbits a black hole or neutron star. The team says the best explanation for the transit is a planet, but this isn't certain.

"It's sticky that there's only one transit," says Matthew Kenworthy at Leiden University in the Netherlands. "The gold standard is three transits equally spaced from one another because then you know it repeats", which indicates that the planet is in orbit, he says.

We have never seen a planet in a system like this, says Tanner, so we don't have much in our own galaxy to compare it with. "I'm cautiously optimistic, but I would not be surprised if it ended up being something else," she says. "It could be something that just passed in front of this system, never returning again."

The Chandra measurements indicate that if the planet is real, it is probably a gas giant a bit smaller than Saturn, orbiting tens of astronomical units (AU) from the centre of the binary system. The distance between Earth and the sun is 1 AU, so that puts the planet at least as far from the system it orbits as Saturn is from the sun.

That is potentially a problem for confirming that the planet exists, says Kenworthy. "If it's more than a few AU out, then it's going to be decades before it comes around and causes a transit again," he says. "I can't think of a good way how I'd confirm this."

There have been few other planet candidates outside our galaxy, with none ever confirmed. If we determine that this planet exists, it will be our first glimpse of a world outside the Milky Way and confirmation that our galaxy isn't special in its ability to host planets. "It gives us a little bit more of a feeling that maybe we're not alone in the universe," says Tanner. ▮

Animals

Fairy shrimp can live in the hottest place on Earth

TINY freshwater shrimp have been found in the world's hottest desert, where their eggs can lay dormant for years between rare downpours.

In 2006, satellite measurements recorded ground temperatures in Iran's Lut desert reaching 70.7°C, a world record. Since then, the desert's surface has surpassed 80°C. The intense heat and relative dearth of knowledge about the region's flora and fauna spurred scientists to make a series of expeditions to the Lut to survey biodiversity there.

Hossein Rajaei at the State Museum of Natural History Stuttgart in Germany was on one of these excursions in early 2017. As he was cooling off in a temporary pool left behind by a recent, rare deluge, he spotted something moving in the water. He grabbed a net and scooped up a swarm of freshwater crustaceans, each smaller than the nail of a pinky finger and with a battery of feathery legs.

Martin Schwentner at the Natural History Museum Vienna in Austria helped him identify the crustaceans as a type of fairy shrimp. These animals live in temporary water sources in the world's arid places and survive on algae. Between floods, their eggs can survive in the soil in a form of stasis.

"These eggs can stay dormant in the sediment for decades, maybe longer," says Schwentner.

They found that this was a previously undescribed species and have named it *Phallocryptus fahimii* (*Zoology in the Middle East*, doi.org/d93r).

"The shrimp eggs can stay dormant in the sediment for decades, maybe even longer"

"There doesn't seem to be any permanent water or groundwater in this region of Iran, which begs the question: where have these [fairy shrimp] come from, evolutionarily?" says Michelle Guzik at the University of Adelaide in Australia, who wasn't involved in the research.

For Rajaei and Schwentner, the next step is determining if the new crustacean is widespread or if it is endemic to the Lut and thus needs special protection. ▮

Jake Buehler