BBC

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SPACE

"We discovered the most distant object ever observed in our Solar System"

Astronomers led by Dr Scott Sheppard *of the Carnegie Institution for Science have found 2018 VG18 – a new dwarf planet that's been nicknamed 'Farout'*

ABOVE: **Dwarf planets orbit a parent star and have sufficient gravity to form themselves into a roughly spherical shape**

How did you spot dwarf planet 2018 VG18?
We've been doing the largest, deepest survey for distant Solar System objects. In the past we had big telescopes, but it was like looking through a straw at the sky – we could only cover very small areas at faint depths. But the digital cameras we're now using are as big as a small car, and they allow us to cover bigger areas. Five to six years ago, one image would be smaller than the field of a full Moon and now we're covering 10 times that.

In November 2018, we discovered the most distant object ever observed in our Solar System, which is at a distance of 120 astronomical units [one astronomical unit is the distance from the Earth to the Sun]. That's over 3.5 times further out than where Pluto is.

Why was it nicknamed 'Farout'?
We take two images, separated by a few hours to a day or two, and look for anything that moves. Stars and galaxies are far away, so they don't really move, but things in our Solar System are much closer. And the moment I saw this object – it's the slowest object I've ever seen moving – I uttered to myself "Farout!", which is like "that's cool!" So there's a double connotation to that word, because it's so far away and it's a very cool object. If you're on Farout, the Sun would just be another star in the sky.

What do we know about its appearance?
It's kind of pink in colour, and this suggests that its surface is icy because if you expose ice to the Sun's radiation over billions of years, it turns pinkish. We know how far away Farout is and roughly how bright it is, so we can deduce how big it must be. We don't know exactly how much light it reflects, if it's as bright as snow or as dark as coal, but if we assume it's somewhere between the two, it's about 600km wide – a quarter of the size of Pluto.

The definition of dwarf planet is you have to be big enough where gravity will crush the material and make the object spherical. Farout is big enough. Right now we know of 30 or so dwarf planets – most are in the Kuiper Belt, the area just beyond Neptune. We're continuing our survey, we've covered about 20 per cent of the sky to a pretty faint level and so we hope to uncover more dwarf planets, if not a really big object like a 'Planet X'.

How could Farout help us find 'Planet X'?
Planet X is a planet that may or may not exist. We think it's more likely than not it exists, but it's

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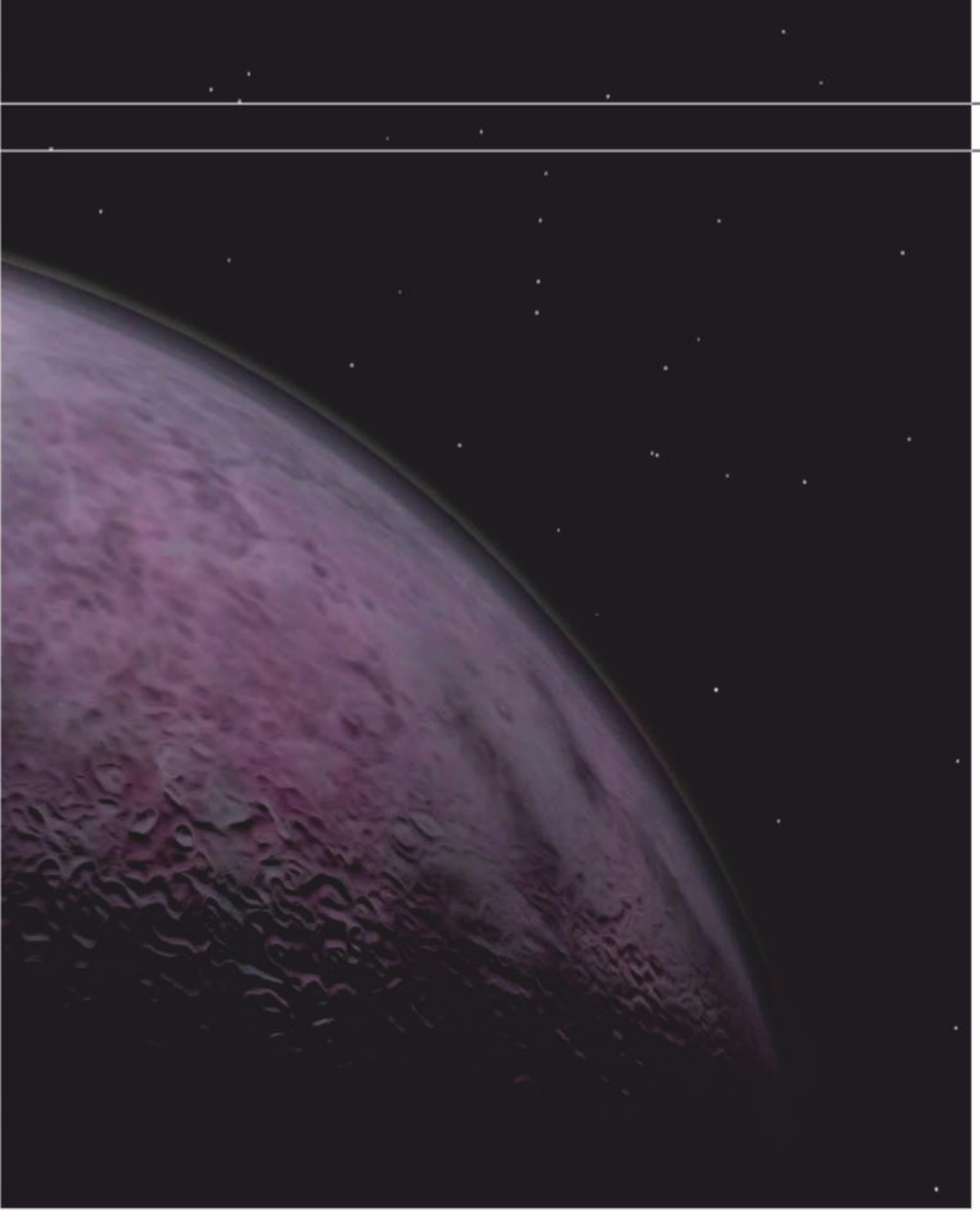

probably five to 10 times further out than Farout is. Planet X has to be massive, five to 10 times larger than Earth. Gravitationally, it should dominate the outer Solar System region, and Farout is so far out that Planet X should be pushing Farout around. Farout's orbit probably takes more than 1,000 years to go around the Sun: we'll need to observe for another year or two to get enough motion of its arc to determine its full orbit.

Where did Farout come from?
That's the big unknown. It could have an elongated orbit that brings it into the inner Solar System – if that's true, it interacted with one of the giant planets and got thrown outwards. But if its orbit never brings it any closer, then it's hard to explain, because the amount of material that far out is probably not enough to form large objects like this.

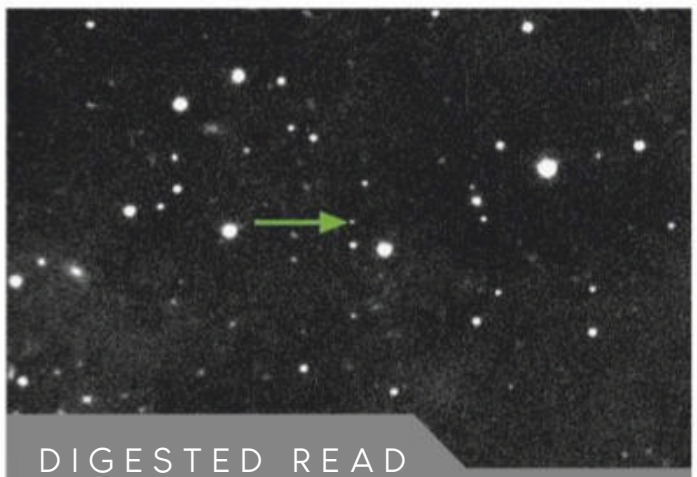

ILLUSTRATION: DANIEL BRIGHT

DIGESTED READ

In November last year, astronomers first observed the dwarf planet 2018 VG18, nicknamed 'Farout'. It's the most distant object ever observed in our Solar System. By studying its orbit, astronomers could determine whether or not the hypothetical Planet X exists.

THEY DID WHAT?!

RESEARCHERS GET FRUIT FLIES DRUNK

What did they do?
A team at Scripps Research Institute fed fruit flies liquid food laced with alcohol and observed the effects of the ethanol on nerve cells in their brains.

What did they find?
Much like people who enjoy a tipple, flies that drink alcohol begin losing their coordination before becoming hyperactive. They found that an enzyme called phospholipase D2, which plays a role in anaesthesia, built up in the flies' nerve cells. This caused the nerve cells to fire more easily, resulting in hyperactive flies.

Why did they do that?
The study is the first time that the direct action of D2 on nerve cells has been linked to the consumption of alcohol. Further study of the effect could lead to treatments designed to prevent us from getting intoxicated or even from suffering from hangovers, the researchers say.