

## A PROBLEM OF PLANETS

How many planets are in our Solar System?

Nine? Eight?

According to some recent research, there may be more planets out there than the original planets of our Solar System. A team of scientists now hypothesize that some planets orbiting our Sun exist far beyond Pluto.

Scientists who study the Extreme Trans Neptunian Objects (ETNO) have noted anomalies that hint at a massive, yet far away, gravitational source. ETNO is the asteroid belt after Neptune, as its name suggests, and should be distributed in a random manner with a certain set of defined characteristics.

Or at least that is how it would be distributed if no other force was acting upon it.

However, according to observations, dozens of bodies move in unexpected patterns inconsistent with the current Solar System module.

Therefore, scientists now believe that two more planets may exist over 200 AU away from our Sun.

To understand the grand distance of 200 AU, the Earth is 1 AU away from the Sun and Pluto is 39 AU away. From Pluto, the Sun just looks like an

anomalous bright star. From the Mystery Planets, the Sun wouldn't stand out at all.

As for size, for the gravitational force to work, calculations show that both planets would be 5 times the size of Earth, with the farther one reaching 10 times Earth.

While this theory is still very uncertain, it is a fascinating idea. Can our Solar System have two new planets? Or maybe even more?

## WITH THESE RINGS...



*Courtesy of BBC/M. Kenworthy, Leiden*

A Dutch-US team of scientists have found a planet with a unique feature: rings.

Using data from the SuperWASP observatory which measures the dimming of stars' lights as planets pass in front, the scientists observed a complex pattern of eclipses lasting for 56 days on star J1407 in the constellation Centaurus.

They came up with the solution: a planet with a giant ring system which blocked out the light and dimmed it by 30 to 40%.

According to calculations, the team thinks that the planet is most likely a gas giant much like Jupiter but 10 to 40 times larger. The planet would also be surrounded by 30 rings, tens of millions of km in diameter each, that add up to 200 times those of Saturn.

Creatively dubbed J1407b, the ring system will offer a glimpse into the past formation of our Solar System.

## FUN FACT

- ❖ Mercury sometimes gets so close to the sun and speeds up so much that the Sun appears to go backwards in the sky.

### PICTURE OF THE MONTH

#### ❖ Windmill's Moon – First Full Moon of the New Year

© Babak Tafreshi (Canary Islands)



### PLANETS AS OLD AS TIME

NASA's Kepler has found 5 more planets only this time they're almost as old as time.

The worlds are 80% as old as the universe and are earth-sized, proving that such planets have been in the Milky Way almost from the start.

All 5 planets are rocky and complete their orbit in less than 10 days; they are much too close and hot to their star Kepler-444 to support life as we know it.

However, data collected from Kepler-444 does give hope: other such ancient planets may actually be in the correct zone for habitability.



Courtesy of Tiago Campante/Peter Devine



Courtesy of ESA/Denman productions

### Lost on Mars

"To be frank I had all but given up hope of ever knowing what happened to Beagle 2." – Mark Sims, Beagle 2 Mission Manager

It was Christmas Day 2003 in Britain. A team of scientists were excitedly following the descent of the latest Mars Lander, the Beagle 2. As the craft slowly began its descent, it was a countdown moment that was not to be completed. Scientists lost all contact with the Beagle.

Everyone supposed that the telemetry had gone wrong. That due to malfunctioning connections between the lander and Earth, the Beagle 2 had entered free fall during its descent and crashed somewhere on the red planet.

But now, more than a decade has passed and the truth has been revealed.

According to pictures by NASA's Mars Reconnaissance Orbiter (MRO), the Beagle 2 not only landed safely but also was only 5 kilometers from where it was supposed to have touched down.

So why was the craft unable to contact with headquarters even after its proper landing? The craft was never fully deployed and the transmitter was hidden by the solar panels which did not successfully unfurl. Scientists now suppose that the primary battery eventually died with no way of recharging as the solar panels were not facing the sun.

While the mission ended tragically, scientists were delighted to know about the Beagle 2's fate and that this mystery has finally been solved.

## STARGAZING IN SAN JOSE

### February 2 – 26 – Alpha and Beta Centaurids

It will be relatively weak with only 7 meteors per hour at its peak on February 8<sup>th</sup> at 12:30 UTC. For viewers in San Jose, the meteor shower will probably be best seen around midnight to the SE horizon.

### February 6 – Jupiter at Opposition

Jupiter will be at its closest point or “opposition” to the Earth. Only 650 million kilometers away, Jupiter will not be this close to us again until 2019. Jupiter will appear in Cancer (straight up towards the NE) throughout the night.

### February 22 – Conjunction of Venus and Mars

Venus and Mars will appear closely together to the W underneath the waxing crescent moon. The distance between the two will be ½ degree which is about the diameter of the moon. However, Mars might still be overshadowed enough that it won’t be visible to the naked eye; so you may have to take out your binoculars.

### ACROSS

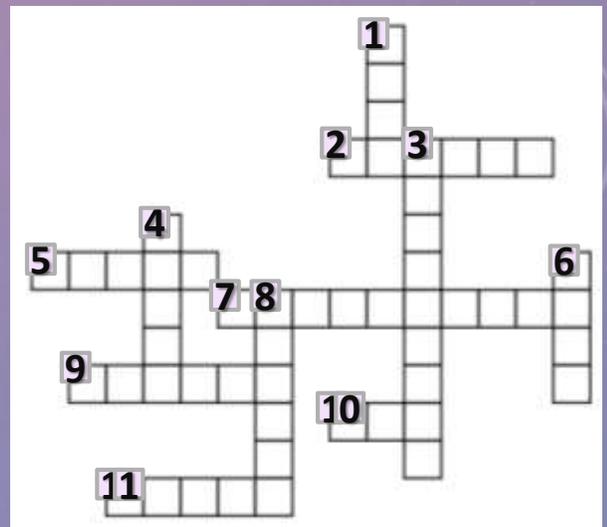
2. 
5. SEA 
7. GREAT 
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11. 

### DOWN

1. 
3. GREAT 
4. 
6. SOUTHERN 
8. 

### CONSTELLATION CLUES

Each clue is for a February constellation.



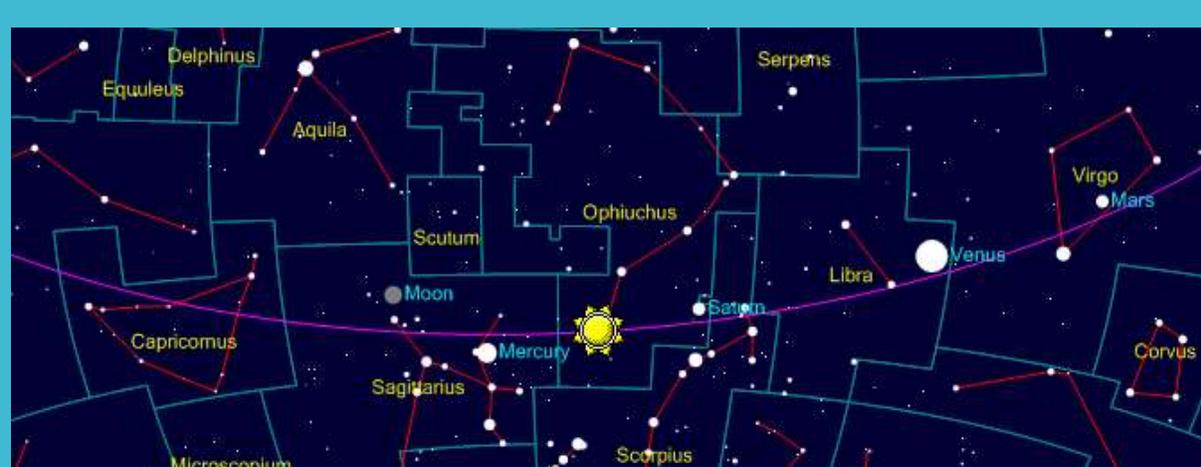
Answers to last month’s puzzle: Mars; Venus; Neutron stars; Away from the sun; Shakespeare’s characters; Quasars; January; In a high-mass star preceding the Sun; Iron; 59%

Please comment at:

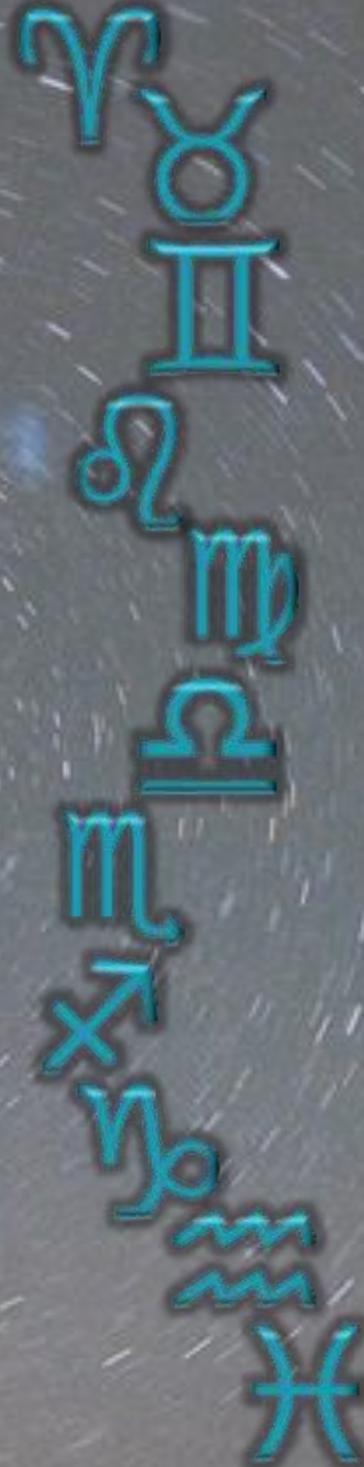
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Written and designed by Janani Mohan ©JM

Data Courtesy of various Internet websites/ newspapers/ databases



2015 ecliptic – Courtesy of Heavens Above



The zodiac, named from the Greek word for the circle of animals, is an astronomical masterpiece.

It began as a series of Babylonian astrological charts of the skies that they used to predict seasonal patterns and celestial events. To them, astrology was astronomy and both were a mix of the sciences and the supernatural.

Over the next thousands of years, the Babylonians introduced their ideas about the skies and the zodiac to the Greeks who soon spread it further. Men such as Plato and Aristotle turned astrology into a precision science before presenting it to the Romans, the Arabs, and the entire world.

The zodiac was developed on the studies of early astrologers who had calculated that the sun returned to the same position in the skies once every 12 lunar cycles or months. The astrologers mapped out the 12 constellations that the sun moved across in the celestial sphere on a line known as the “ecliptic”.

They named these constellations based on mythological animals and people.

The signs of the zodiac were meant to show what they believed to be the basic elements of the universe: Earth, Water, Air, and Fire. In modern day usage:

Earth: **Capricorn** (Goat), **Taurus** (Bull), **Virgo** (Virgin)

Water: **Cancer** (Crab), **Scorpio** (Scorpion), **Pisces** (Fish)

Air: **Libra** (Scales), **Aquarius** (Water Carrier), **Gemini** (Twins)

Fire: **Aries** (Ram), **Sagittarius** (Archer), **Leo** (Lion)

Today, the sun has shifted in the sky to include Ophiuchus but the traditions of the ancient Babylonians and Greeks remain the same and the zodiac is still as popular as ever.

Dates	Zodiac	Sun's Actual Location (approx. match)
March 21 – April 19	Aries	Pisces
April 20 – May 20	Taurus	Aries
May 21 – June 20	Gemini	Taurus
June 21 – July 22	Cancer	Gemini
July 23 – August 22	Leo	Cancer
August 23 – September 22	Virgo	Leo
September 23 – October 22	Libra	Virgo
October 23 – November 21	Scorpio	Libra
November 22 – December 21	Sagittarius	Scorpio, Ophiuchus
December 22 – January 19	Capricorn	Sagittarius
January 20 – February 18	Aquarius	Capricorn
February 19 – March 20	Pisces	Aquarius

*The Sun no longer aligns with the original zodiac but a new one. While the constellations remain the same, the timings are different by almost one month and the ecliptic has shifted North so that the Sun travels over Ophiuchus spending only a week or so in Scorpio.*

