“The world's most famous number "

CACHT A STAR

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Abstract

In this work we searched for information about exoplanets. For that, we first discovered the most famous number in the universe, the number pi, because it is needed in the formula used by scientists to determine whether the extrasolar planet detected can resemble to our earth. This is important if you want to find life in another Solar System

1. Celestial Body:
EXOPLANET

2. Features:
An exoplanet, also called extrasolar planet, is orbiting another star other than our own, such as Kepler-22 wich is orbiting another star other than the Sun

3. How scientists got this information:
Planetary science tells us that number Pi is used to find exoplanets.

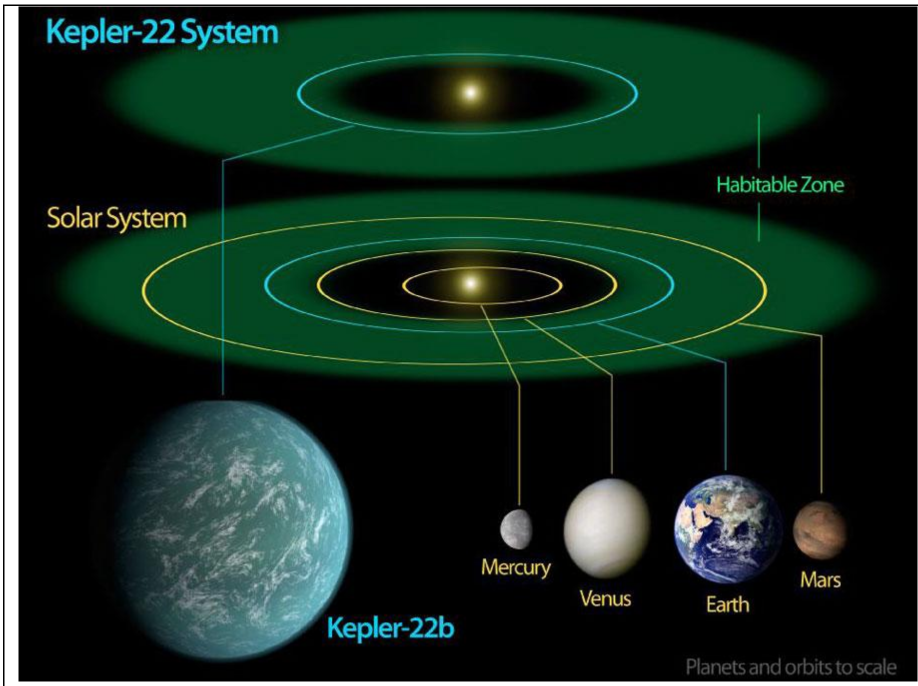
Once we have discovered an exoplanet the first thing we want to know is whether it is rocky or gaseous. If a planet's density is close to the density of the earth it means that it is rocky and if it has a lower density it means it's made of gas.

We compare them to the Earth to know what is their composition. The Earth has a density of 5.05 kg/m3 because it's rocky and scientists are looking for an exoplanet with an approximate density to see if there is life on it.

To determine the density of a planet mass is divided by the volume using this formula in which you need number pi (π). A planet's volume is approximately 4/3 pi times the cube of its radius (4/3 π r3). This number is what tells Seager and his colleagues whether a planet is primarily gaseous like Jupiter, rocky like Earth, or somewhere in between.

Apply and calculate the volume to calculate the density.

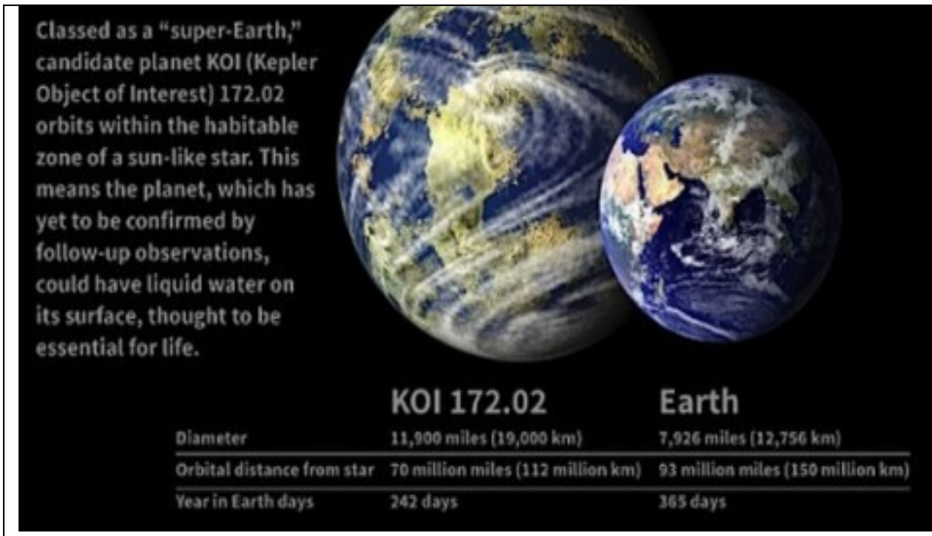
4. Pictures:

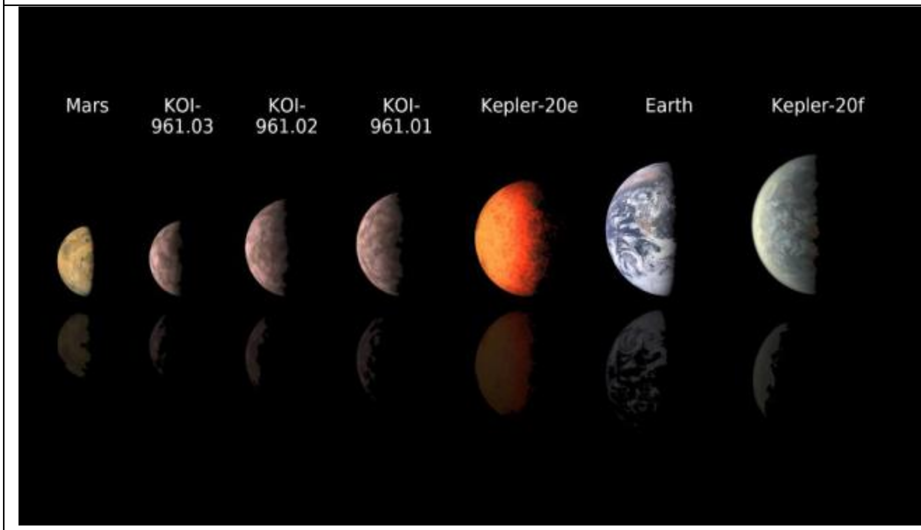


Kepler-22b

This exoplanet is Kepler-22b. In the picture you can see Kepler-22b and it's solar system.

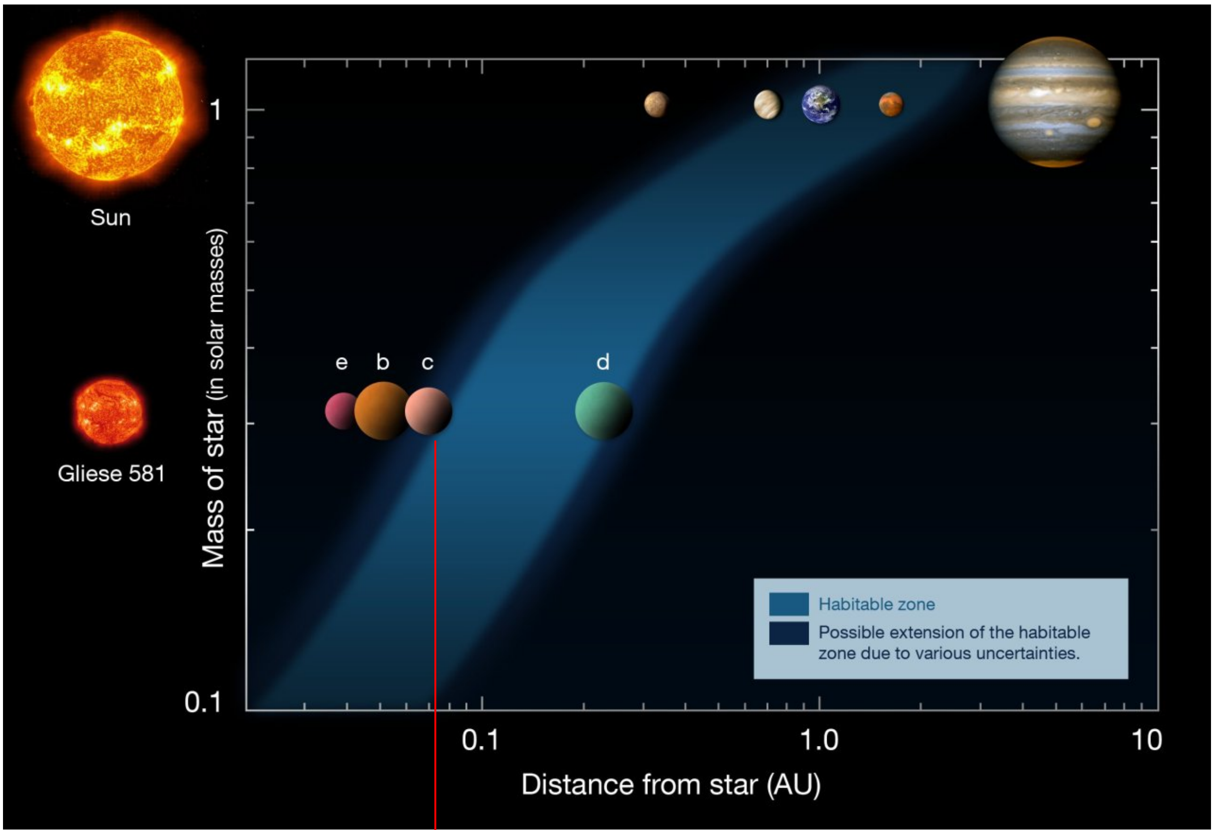
In the system of Kepler-22b we can find no other exoplanet.

<table>
<tr>
<td>
</td>
<td>KOI 172.02

Koi172.02 is also called the "Super Earth" because it is much larger than the Earth.</td>
</tr>
<tr>
<td>
</td>
<td>This is a comparison of different planets and exoplanets.</td>
</tr>
<tr>
<td>
</td>
<td>This is another comparison of planets and exoplanets adding the moon.</td>
</tr>
</table>

5. Analogies and differences:

The Exoplanets below are similar to existing planets in our Solar System



This is the exoplanet Pegasi b and the other 51 Pegasi.
His star is called Gliese 581

6. Find information about his past and his future:

Extrasolar planets became an object of scientific research in the nineteenth century. The existence of exoplanets was known for sure from 1992 but it was not until 1995 that an Earth-like exoplanet was first discovered. They called it 51 pegasi b. Pegasi b is orbiting a star similar to our sun. It was discovered by Michel Mayor and Didier Queloz.

From then on, many more exoplanets have been found.

7. Activities:

At the beginning of this work we discovered number pi, a number we did not know about before. To get number pi we searched for many round and spherical objects around the school and we measured their perimeter. Thus we collected the following data:

Gymnastic hoop: 158 cm	
2 euro coin: 7 cm and fruit bowl: 81 cm	

Other:

- - Pencil bowl
- - Beer cap
- - Rhythmic Gymnastics Ball
- - Polystyrene ball
- - Round paper of a Ferrero chocolate: outer circle and inner circle

We had to use our imagination to be able to measure some of the objects we had collected.

Then we measured their diameters, the line from edge to edge across the centre, or which is the same, twice its radius.

- Pencil: 7.5 cm

- Fruit bowl: 26 cm

- Role of chocolate outer circle: 7.7 cm

- Role of chocolate inner circle: 2 cm

Finally, we divided the perimeter of each object by its diameter and we built this table:

Object	Perimeter	Diameter	Resulting from the division number
Gymnastic hoop	155 cm	50 cm	3,10
Role of chocolate outer circle	24,8 cm	7,7 cm	3,22
Role of chocolate inner circle	6,3 cm	2 cm	3,15
Fruit bowl	81 cm	26 cm	3,11
Pencil bowl	22 cm	7 cm	3,14
Polystyrene ball	24 cm	7,5 cm	3,20

What can we see in the last column when we relate the data from the other columns?

The last column is the result of dividing the perimeter of a circumference by its diameter and we can observe that we always get three point something no matter that we worked with very different sizes of circumferences: We were identifying the number PI.

Greek letter pi.

Symbol adopted in 1706 by William Jones and popularized by Leonhard Euler is equivalent to a value of 3.141614161416

After finding number pi we started researching the scientific identification of exoplanets and we discovered those that are closer to our earth using the same formula that scientists use to know the density of the planets.

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