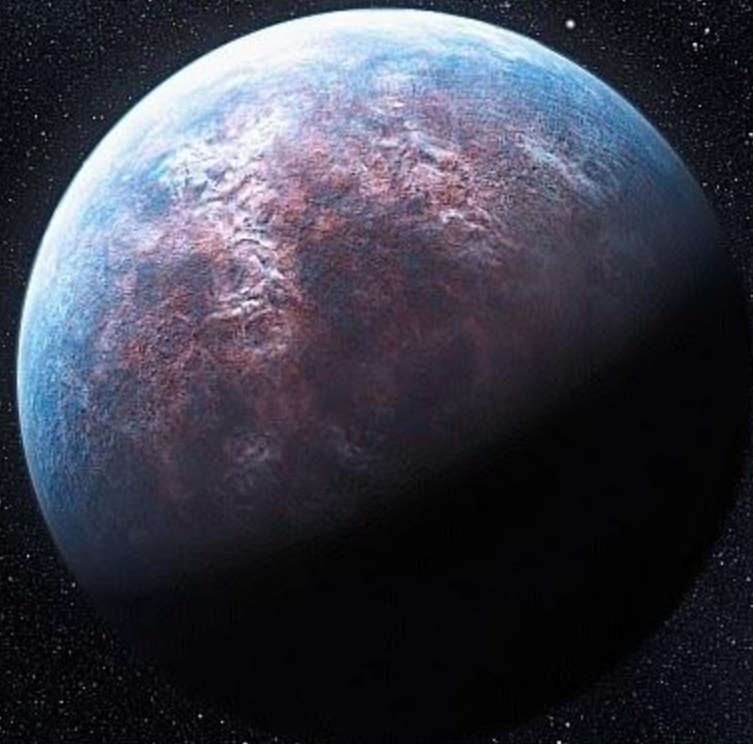


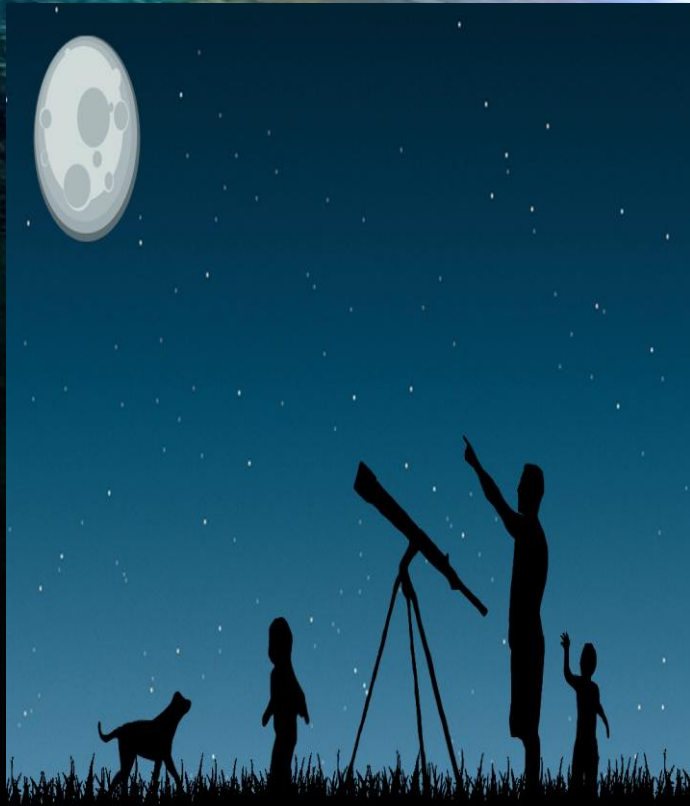
# Astronomy

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# ASTRONOMY: ECLIPSE SOLAR SYSTEM GALAXIES



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# Main Ideas

Astronomy is a science that will change your imagination.  
How many stars are there in a galaxy? Is there life on other planets apart from the Earth?  
There are a lot of stars in the universe, planets...





# Eclipse

•An eclipse is an event that occurs when an astronomical object is temporarily obscured, either by passing into the shadow of another body

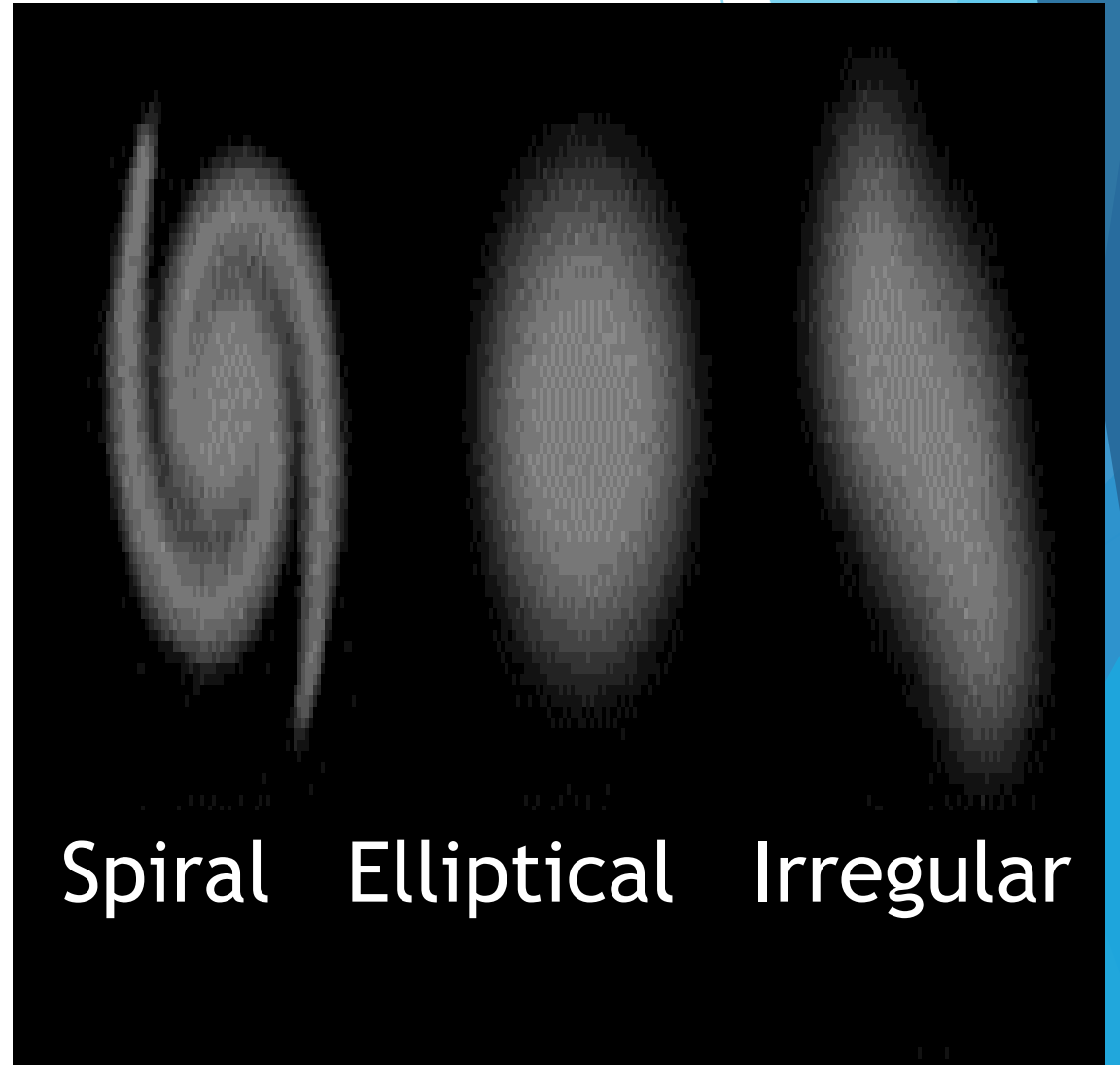
•There are two types of eclipses :

- Solar eclipse
- Lunar eclipse



# Galaxies

- .There are three different types of galaxy system composed of dust, gas.*
- .The number of galaxies can't be counted.*
- .Galaxies are classified into three main types: Spiral, elliptical and irregular galaxies.*



Spiral

Elliptical

Irregular

# What do Astronomers study?

## .Solar System

- .Sun
- .Solar Wind
- .Planets
- .Moons
- .Asteroids/NEOs
- .Kuiper belt objects
- .Interplanetary dust
- .etc.....





# *PLANETS AND SATELLITES*



PLANETS

NATURALS SATELLITES

ARTIFICIAL SATELLITES

LIFE IN OTHER PLANETS

Jorge Lorenzo



# PLANETS

- ▶ NASA defines a planet as an object that:
  - Orbits the Sun
  - Has sufficient mass to be round
  - Is not a satellite of another object, like the Moon
  - Has removed debris and small objects from the area
- ▶ Planets have spherical forms (but they are flatten in both poles), with dense materials in the centre and less dense materials in the atmosphere.



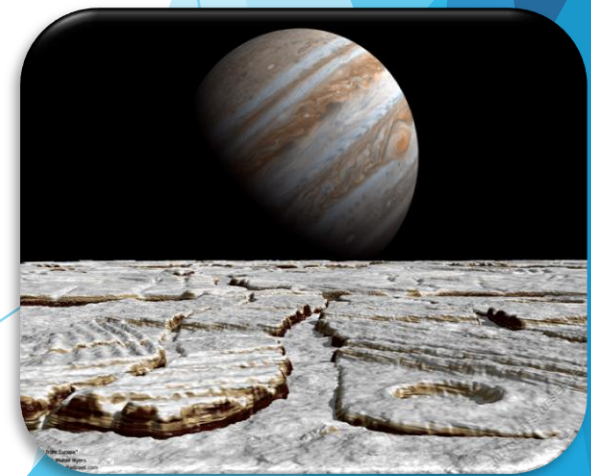


# NATURAL SATELLITES

- ▶ A satellite is an object in space that orbits around a bigger object.
- ▶ A natural satellite is a smaller body (Moon) which moves around a planet. The small body is in orbit by gravitation.
- ▶ The Earth has only one moon. Some other planets have many moons, and some have none.
- ▶ Anything that goes around a planet is called a satellite. Moons are natural satellites, but people also use rockets to send machines into orbit around the Earth, called artificial satellites.



A view from Europe (a Jupiter satellite) →





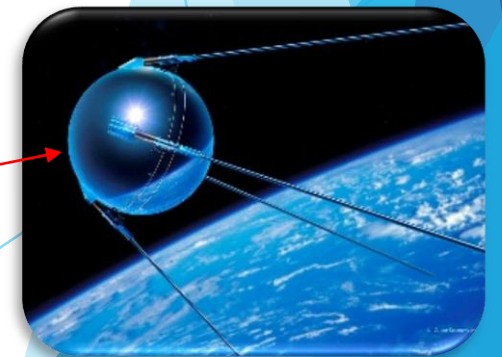
# ARTIFICIAL SATELLITES

the Meteosat satellite



- ▶ There are lots of natural satellites in the Solar System. Saturn has 63 natural satellites and one artificial one: the Cassini spacecraft (that explores the ringed planet and its moons). In fact, this artificial satellite has become part of the orbiting natural satellites around Saturn.
- ▶ Artificial satellites weren't in space until mid of the 20th century.
- ▶ The first artificial satellite was Sputnik (a Russian one) that lifted off on 4th October, 1957. That act shocked much of the western world, as it was believed the Soviets did not have the capability to send satellites into space.

the Sputnik satellite





# LIFE IN ANOTHER PLANET

- ▶ Nowadays, some people believe that there is life in other planets.
- ▶ For a lot of years, astronomers thought that there was life in Mars because they found ice on its surface. They studied its atmosphere and its surface but they didn't find any signals of life.
- ▶ Astronomers found water in other planets and also in satellites, like Europe, the one from Jupiter.
- ▶ In 2015, NASA found a planet out of the Solar System which has similar conditions of the Earth and they also found some water. Now they are studying the planet for knowing if we can live in the future in it, because maybe we can destroy the Earth with pollution.

An alien







# ***THE STARS***

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# *THE STARS OF THE UNIVERSE, THEIR LIFE AND THEIR EVOLUTION.*

## ▶ The stars of universe

The stars are masses of gas, mostly hydrogen and helium, which emit light. They are at very high temperatures. Inside there are nuclear reactions.

## ▶ Evolution of the stars

The stars evolve over millions of years. Born when a large amount of material accumulates in a place of space. The material is compressed and heated until it starts a nuclear reaction, which consumes matter, making energy.

## ▶ The life of a star

The life cycle of a star begins as a large mass of relatively cool gas. A star reaches  $1,000,000^{\circ}\text{C}$ . Here nuclear reactions, resulting in the nuclei of the hydrogen atoms combine with deuterium to form helium nuclei occur. At one point starts a reaction between hydrogen, lithium and other light metals in the body of the star and again energy is released.

# *CHANGEABLE AND DOUBLE STARS*

## ▶ Changeable stars

This term includes any star whose brightness as seen from Earth, is not constant. "Be Stars" whose light emission actually fluctuates - intrinsexas - or stars whose light is interrupted on its way to Earth, another star or a cloud of interstellar dust, called extrinsic variables.

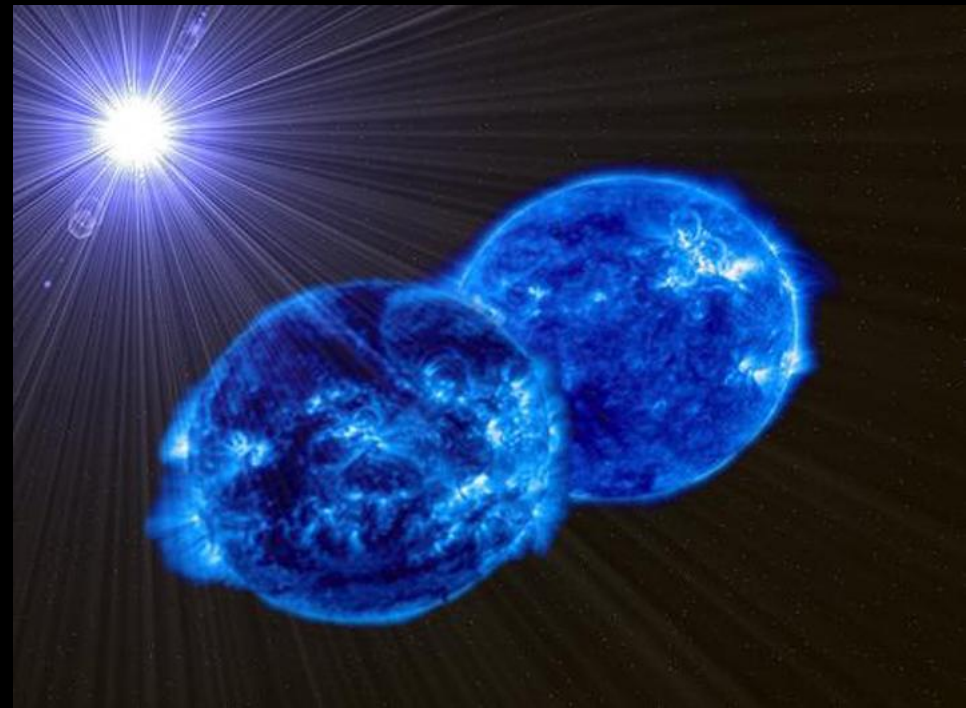




# CHANGEABLE AND DOUBLE STARS

## ▶ Double stars

The double (or binary) stars are very common. A double star is a pair of stars held together by the force of gravity and revolve around their common centre. There are also multiple star systems in which three or four stars revolve complex trajectories.

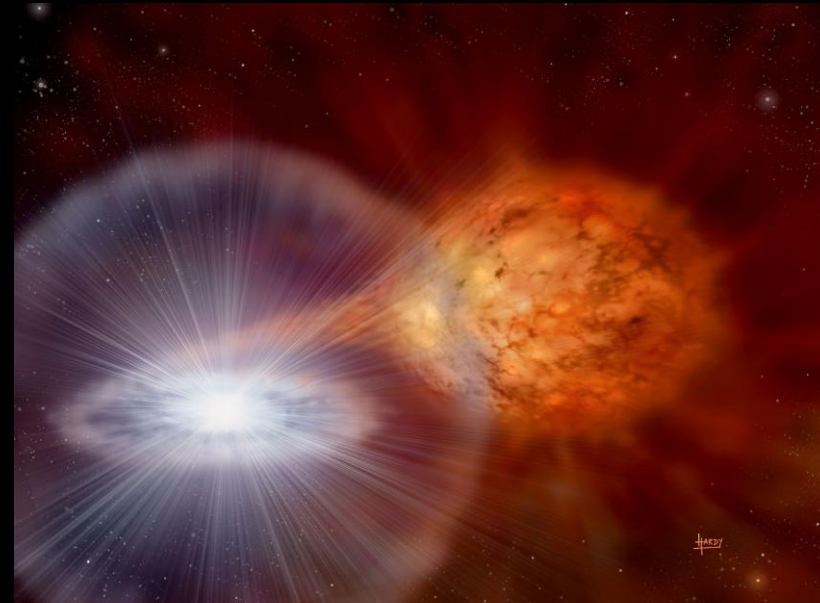


# NOVAE AND SUPERNOVAE

## ▶ Novae

Formerly a star that suddenly appears where there was nothing, it was called nova, or 'new star'.

A nova is the most easily observed in other nearby galaxies than in our own. A nova increased by several thousand times its original brightness in a matter of days or hours. After entering a transition period during which pale, and charges shine again. Novae are stars in a late period of evolution.

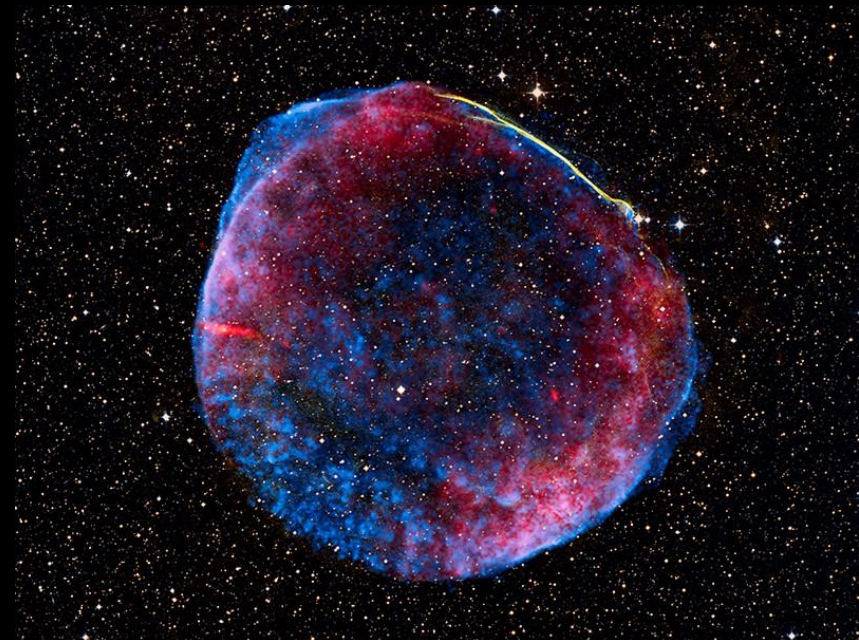




# SUPERNOVAE

## ► Supernovae

The explosion of a supernova is more spectacular and destructive than a nova and much rarer. This is rare in our galaxy, and despite its incredible brightness increases, few are visible to the naked eye. Supernovae, like novae, are seen more frequently in other galaxies. Very large stars explode in the final stages of its rapid evolution, as a result of gravitational collapse. The explosion of a supernova little remains except the gas layer expands. A famous example is the Crab nebula.







Pablo Molina Pérez



# BLACK HOLES

- ▶ Imagine a very big star with a lot of gravity force. The star has enough gravity, so that the light can't escape. This is a black hole.
- ▶ A black hole is born when a big star dies.
- ▶ Something that is near a black hole (astronauts, planets, stars) will disappear.
- ▶ It is like a star, it is as if it was burning.



# Astronomy

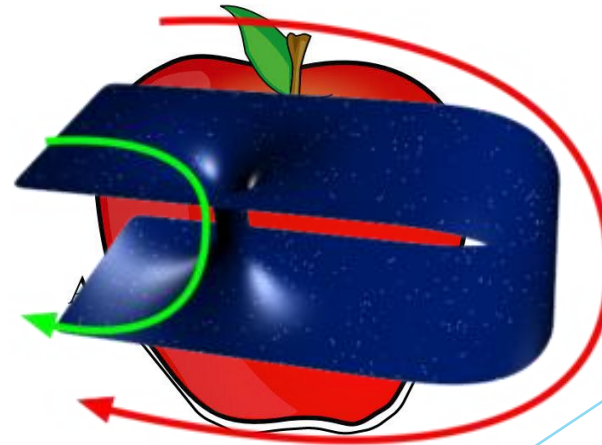
BLACK HOLES, WORMHOLES AND THE DARKNESS

Andrés Adroher



# WORMHOLES

- ▶ Imagine an apple and a worm. The worm wants to go to the other side of the apple and it travels outside the apple. But the worm can go faster to the other side if it eats the apple and it travels inside the apple.
- ▶ Now, imagine that the outer skin is the universe, and the tunnel that the worm ate, is a wormhole.
- ▶ If we can use this tunnel, we can travel to the other side of the universe in seconds. But with our space ships, we can never arrive.
- ▶ Wormholes are only a theory.



# THE DARKNESS

- ▶ Next, I'm going to tell you about the dark energy and the dark matter.
- ▶ These are things that we need to explain, that is, some space phenomena that we don't understand.
- ▶ We know that the universe are in constant expansion, because we can see as galaxies are separating themselves. If we want to explain this movement, we need the dark energy.
- ▶ If you have more matter, you will have more gravity force. We know that the galaxies are grouped together due to their force. But it is supposed that more matter is needed. This extra matter is called "Dark Matter".
- ▶ The dark energy and the dark matter are only a theory.

