CAIE Physics IGCSE

Topic 6.2 - Stars and the Universe

Flashcards

What is the composition of the Sun?

What is the composition of the Sun?

Mostly hydrogen and helium.

In which regions of the electromagnetic spectrum does the Sun radiate most of its energy?

In which regions of the electromagnetic spectrum does the Sun radiate most of its energy?

In the infrared, visible, and ultraviolet regions of the electromagnetic spectrum.

How does the Sun release energy?
(supplement)

How does the Sun release energy? (supplement)

The Sun releases energy through nuclear reactions, specifically the nuclear fusion of hydrogen into helium.

What makes up galaxies?

What makes up galaxies?

Billions of stars.

To which galaxy does the Sun belong?

To which galaxy does the Sun belong?

The Milky Way.

How are astronomical distances measured?

How are astronomical distances measured?

Astronomical distances are measured in light-years (the distance light travels in one year).

What is a light year equal to in metres?
(supplement)

What is a light year equal to in metres? (supplement)

9.5×10^{15} m

What is a nebula?

What is a nebula?

The interstellar cloud of dust and gas stars form from

How does a protostar form?
(supplement)

How does a protostar form? (supplement)

Gravity collapses the dust and gas in the nebula.

When does a protostar become a stable star?

(supplement)

When does a protostar become a stable star? (supplement)

When the inward gravitational attraction balances the outward gas pressure from nuclear fusion.

What happens to most stars when they run out of hydrogen?
(supplement)

What happens to most stars when they run out of hydrogen? (supplement)

They expand to form red giants, which contract to form planetary nebulas with white dwarfs at the center.

What happens to more massive stars when they run out of hydrogen? (supplement)

What happens to more massive stars when they run out of hydrogen? (supplement)

They become red supergiants and explode as supernovas, leaving behind neutron stars or black holes.

What makes up the Universe?

What makes up the Universe?

Billions of galaxies.

What is the approximate diameter of the Milky Way?

What is the approximate diameter of the Milky Way?

100,000 light-years

What is redshift?

What is redshift?

Redshift is an increase in the observed wavelength of electromagnetic radiation from an object that is receding.

What theory does the redshift of light from distant galaxies support and why?

What theory does the redshift of light from distant galaxies support and why?

The Big Bang Theory, because it indicates that they are moving further away, showing that the Universe is expanding .

What does the Hubble constant describe?

(supplement)

What does the Hubble constant describe? (supplement)

How a galaxy's speed changes as it recedes.

How can the Hubble constant be calculated?
(supplement)

How can the Hubble constant be calculated? (supplement)

Hubble constant = the speed of a galaxy moving away from the Earth / the galaxy's distance from the Earth

$H_0 = v / d$

What is the current estimate for the Hubble constant?

(supplement)

What is the current estimate for the Hubble constant? (supplement)

2.2×10^{-18} per second

How can the Hubble constant be used to estimate the age of the Universe and what does this show?
(supplement)

How can the Hubble constant be used to estimate the age of the Universe and what does this show?(supplement)

Using the equation:

$d / v = 1 / H0$

- Shows all the matter in the Universe was present at a single point.

What is cosmic microwave background radiation (CMBR)?

(supplement)

What is cosmic microwave background radiation (CMBR)? (supplement)

- Microwave radiation of a specific frequency
- Observed at all points in space
- Produced shortly after the Universe was formed
- Expanded into the microwave region as the Universe expanded.

How does CMBR support the Big Bang Theory?
(supplement)

How does CMBR support the Big Bang Theory? (supplement)

- It was predicted by the theory.
- It shows the Universe has been expanding since its formation.