OCR B Physics A Level

5.1.5 - Space and Relativity

Flashcards

What is a light year?

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A light year is the distance travelled by an electromagnetic wave in a vacuum in the space of one year.

How can distances be measured using parallax?

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By measuring the angle of an object in the sky at different times of the year and then using trigonometry to calculate distances.

What is redshift?

What is redshift?

Red shift is the apparent increase in wavelength of light when the source moves away from the observer.

What does redshift from distant galaxies suggest?

What does red shift from distant galaxies suggest?

- Distant galaxies are moving away from us
- The further away a galaxy is, the greater the red shift and so the faster it is travelling

What theory does the redshift of distant galaxies provide evidence for?

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The Big Bang Theory

What relationship is used to calculate the proportional change in wavelength?

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$$\frac{\Delta\lambda}{\lambda} = \frac{v}{c}$$

What is Hubble's Law?

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Hubble's Law states that a galaxy's recessional velocity is directly proportional to its distance from the Earth.

What does CMBR stand for?

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Cosmic Microwave Background Radiation

What does CMBR provide evidence for?

What does CMBR provide evidence for?

The Big Bang Theory

Where is CMBR believed to originate from?

Where is CMBR believed to originate from?

- It is believed that CMBR originated from gamma rays that were produced in the Big Bang.
- The wavelength of this radiation has been stretched as the universe has expanded.

What was Einstein's First Postulate for his Theory of Special Relativity?

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The laws of physics have the same form for all observers regardless of their relative motion.

What was Einstein's Second Postulate for his Theory of Special Relativity?

What was Einstein's Second Postulate for his Theory of Special Relativity?

The speed of light is a universal constant - all observers regardless of their motion perceive the speed of light to be the same.

What is time dilation?

What is time dilation?

Time dilation is when two observers with different relative velocities record a different time taken for an event to occur.