

Telescopes

How have telescopes changed our understanding of the universe?



Image credit: ESA



CHRISTMAS LECTURES *from*
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat 



@Ri_Science

Learning Objectives

Understand how telescopes collect light to observe distant objects

Recognise how telescope discoveries have changed scientific theories



Image credit: Science Museum

Discussion

Why can't we see distant stars and galaxies with just our eyes?

What's the difference between using a telescope and looking at the sky without any equipment?



Image credit: Science Museum

How do telescopes work?

Telescopes gather more light than the human eye and magnify distant objects.

Sometimes we use telescopes on Earth, sometimes we launch them into space.

The James Webb Telescope was launched in 2021, and is the largest telescope in space.

Telescopes in space can see more because they aren't affected by the atmosphere, light pollution, satellites or weather on Earth.

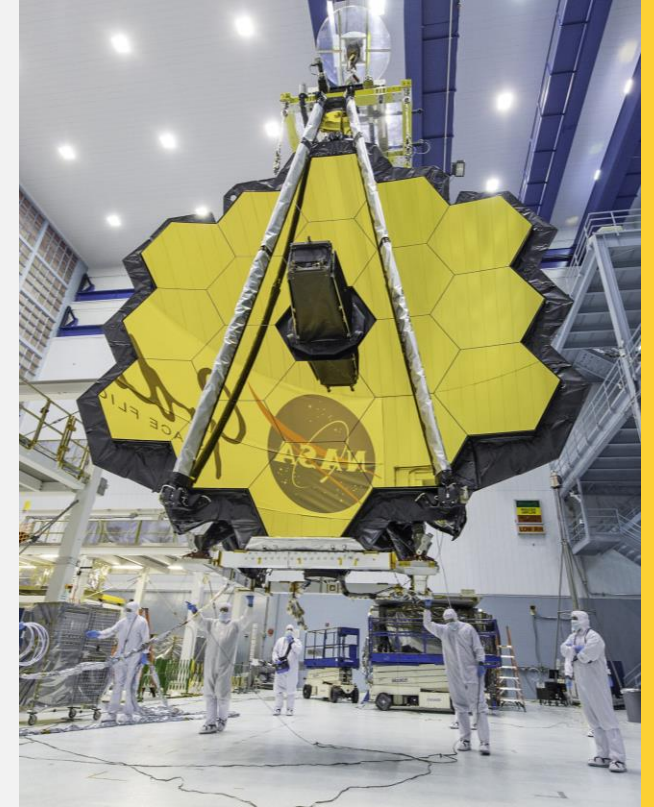


Image credit: NASA/Desiree Stover

Telescope discoveries game

You'll be given a clue for each telescope discovery – try to guess what they have helped discover



Image credit: Science Museum



CHRISTMAS LECTURES *from*
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat



@Ri_Science

Clue one

In 1610, Galileo turned his telescope to the night sky and discovered that this planet has four moons orbiting it



Image credit: Science Museum

Clue one

Answer: Jupiter

Impact: showed that not everything revolves around Earth

This discovery provided important support to the idea that the Earth is not the centre of the Solar System.



Image credit: NASA

Clue two

In the early 20th century, Edwin Hubble used a telescope to prove that this wasn't just a cloud of gas – but a whole galaxy outside the Milky Way



Image credit: Science Museum

Clue two

Answer: Andromeda Galaxy

Impact: Changed our view of the universe – there are billions of galaxies, not just ours

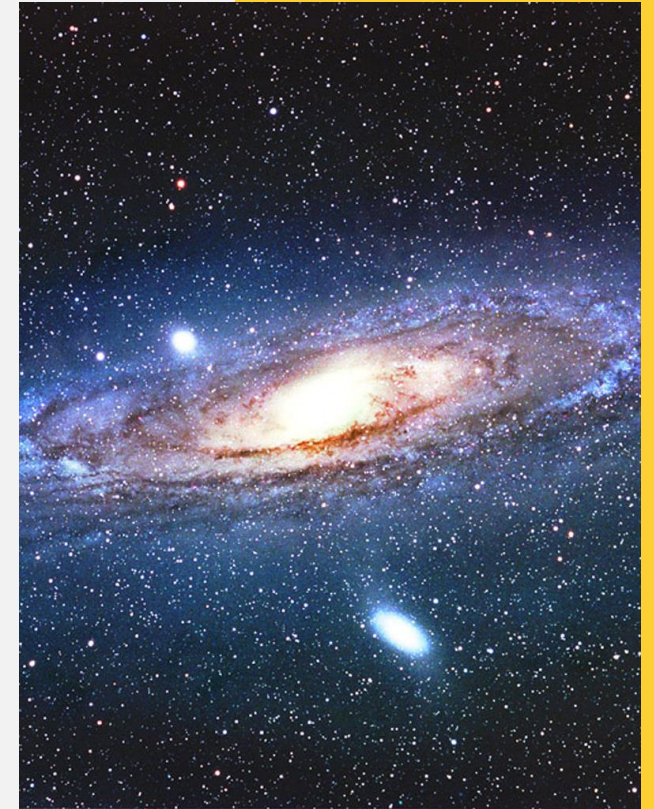


Image credit: ESA



CHRISTMAS LECTURES *from*
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat 



@Ri_Science

Clue three

Launched in 1990, this space telescope sent back detailed images from outside Earth's atmosphere, showing deep space objects in sharp detail



Image credit: Science Museum



CHRISTMAS LECTURES from
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat



@Ri_Science

Clue three

Answer: The Hubble Space Telescope

Impact: Helped measure the age of the universe and discover dark energy



Image credit: NASA



CHRISTMAS LECTURES *from*
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat 



@Ri_Science

Wrap up

How have telescopes changed what scientists believe about space?

What advantages do space telescopes have over ground-based ones?

What kind of information do modern telescopes like James Webb collection – light, heat, or something else?



Image credit: Science Museum