

Is there life beyond Earth?

with Dame Dr Maggie Aderin-Pocock

Royal Institution Christmas Lectures Activities

[Catch up on the 2025 Lectures now on BBC iPlayer](#)

In this year's CHRISTMAS LECTURES from the Royal Institution (Ri) supported by CGI, Dr Dame Maggie Aderin-Pocock will take us on an epic voyage through time and space.

Scientists in 2025 detected the 'strongest hint yet' of biological activity outside our solar system on exoplanet K2-18b, sparking growing excitement about the real possibility of extraterrestrial life. In this series of lectures, Maggie sets out on a journey to find it.



CHRISTMAS LECTURES from
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat

KS3 Space Mini Activity: Telescopes

Time: 20 minutes

This is a Key Stage 3 activity examining how telescopes changed our understanding of the universe.

Learning Objectives

- Understand how telescopes collect light to observe distant objects in space.
- Recognise how telescope discoveries have changed scientific theories over time.

Introduction (3–5 mins)

Discuss as a class:

“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?”

Explanation:

Telescopes gather more light than the human eye and magnify distant objects. They’ve helped astronomers discover moons, other planets, and galaxies, changing our view of the universe—from an Earth-centred model to a large and expanding universe.

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, weather conditions or satellites orbiting around the Earth.

Main Activity (7–8 mins): Historical Guessing Game – Telescope Discoveries

Instructions:

Read each clue aloud. Pupils try to guess what major discovery is being described. Encourage them to explain how telescopes helped in each case.

Clue 1:

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

Answer: Jupiter and four of its moons (Io, Europa, Ganymede, Callisto)

Scientific impact: Showed not everything revolves around Earth. This discovery provided evidence that the Sun is the centre of the solar system – not the Earth. Nowadays we know Jupiter has many more moons – currently 95

Commented [AM1]: Could add in a little extra part to say nowadays we know Jupiter has many more moons (95 known at the min)



CHRISTMAS LECTURES from
The Royal Institution

supported by
CGI

aberdeen
Investments



UK Research
and Innovation

Viasat

Clue 2:

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

Answer: The Andromeda Galaxy

Scientific impact: Changed our view of the universe—there are billions of galaxies.

Clue 3:

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

Answer: The Hubble Space Telescope

Scientific impact: Helped measure the age of the universe and discover dark energy.

Wrap-up (3–5 mins): Reflection and Extension Questions

Discussion prompts

“How have telescopes changed what scientists believe about space?”

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

Fun Fact:

The James Webb Space Telescope observes infrared light, allowing it to see stars and galaxies that are billions of years old—light from the early universe.

Optional Extension (Homework or Extra Task):

Task: Research one of these telescopes and write a paragraph on what it discovered:

- Galileo’s telescope
- Hubble Space Telescope
- James Webb Space Telescope

Commented [AM2]: Think this activity would deffo benefit from an accompanying powerpoint - could easily see it being an activity delivered in tutor time