

Is there life beyond Earth?

with Dame Dr Maggie Aderin-Pocock

Royal Institution Christmas Lectures Activities

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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.



KS2 Space Mini Activity: Telescopes

Time: 15 minutes

The purpose of this activity is to examine how telescopes changed our understanding of the universe.

Learning Objective:

- Recognise how telescope discoveries have changed scientific theories over time

Warm-Up Questions (3 mins):

Discuss as a class:

- “What do you think people thought about space 500 years ago?”
- “What did they use to look up at the sky before telescopes existed?”

Explanation:

500 years ago people thought everything in space moved around Earth. From the early 1500s, mathematicians and astronomers began to consider that the Earth might move around the Sun, but they could not prove that their model was correct. They observed the heavens with the same instruments that sailors used to navigate at sea, which were not as accurate as the instruments that we use today.

When telescopes were invented, we started discovering craters on Earth’s moon, moons around other planets, new planets, and stars much farther away than we ever imagined. These discoveries helped astronomers to convince first the Church, and then the general public, that we live on just one planet in a solar system of planets and moons. This changed not only our view of the solar system, but our view of ourselves as the most important beings in creation.

Telescope Discoveries Guessing Game

Here are some clues about different things a telescope helped scientists discover. See if you can guess what it is.

Clue 1:

“I’m not a planet, but I go around one. Galileo saw four of me near Jupiter.”

Answer: A Moon

Clue 2:

I am a dark spot on the surface of the Sun. I was first seen by an English astronomer Thomas Harriot in 1610, through one of the first telescopes.

Answer: A sunspot

Clue 3:

I have been called the Evening Star but I am not a star. I show phases like the moon, but I am not a moon.

Answer: The planet Venus (one of the first planets identified by ancient astronomers more than 2000 years ago, but her phases were not recorded until the invention of the telescope.)

Clue 4:

“I’m not just a star—I’m a huge collection of stars, gas, and dust. The Hubble Telescope helped take pictures of me.”

Answer: A galaxy

Clue 5:

“I’m bright and have a long tail. Telescopes can track me as I fly through the Solar System.”

Answer: A comet

Wrap-up (3–5 mins)

- “What do you think we might discover next with telescopes?”
- “Why do you think telescopes are important for science?”

Fun fact:

The James Webb Space Telescope can see light from over 13 billion years ago—almost back to the beginning of the universe!

Optional Extension:

Let pupils imagine and describe or draw: “If you had a super telescope, what would you try to discover in space?”