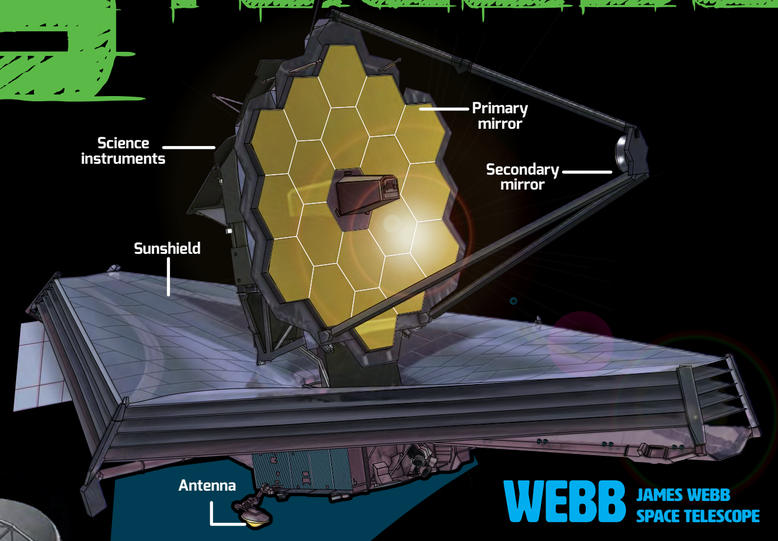
LITTLE POSTER OF BIG TELESCOPES

Science and Technology Facilities Council

WHY DO WE NEED BIG TELESCOPES?

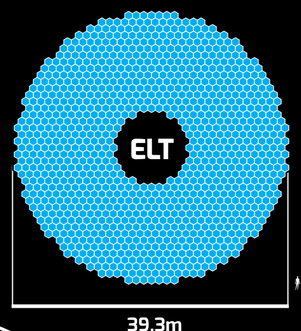
Telescopes allow us to see distant objects that would be invisible to the naked eye. Telescopes are like light buckets – they collect light – so, the bigger the bucket, the more light the bucket can collect and the more clearly we can see a distant object.

A big telescope can collect enough light to see some of the most distant objects in the Universe. It also allows us to see dimmer objects. A very dim object needs a very large mirror to collect enough light for astronomers to analyse.

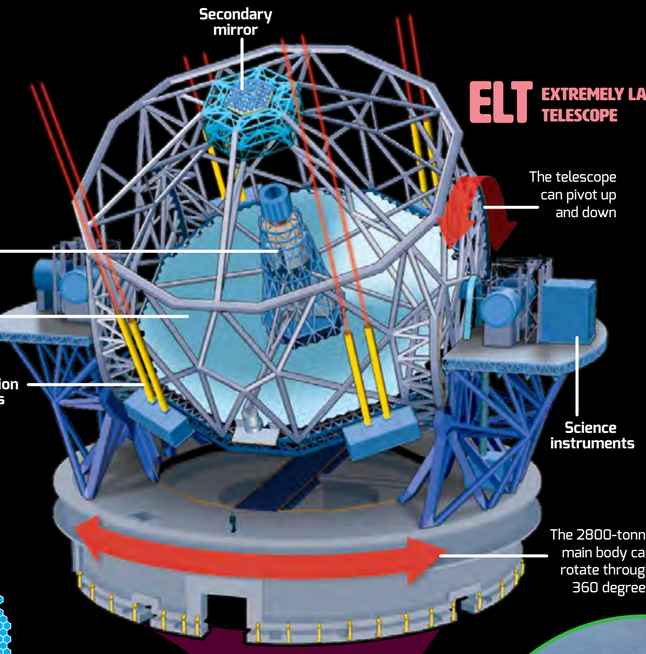


WEBB JAMES WEBB SPACE TELESCOPE

James Webb Space Telescope's (Webb) huge mirror means it can detect more ancient than its predecessors and will reveal more information about the origins of the universe than ever before.
Where? Lagrange 2 (1.5 million km from Earth).



BIG MIRRORS



ELT EXTREMELY LARGE TELESCOPE

The ELT will be the largest visible to mid-infrared telescope ever built. It will gather 217 times more light than the Hubble Space Telescope and produce images 15 times clearer.
Where? Chile.

XMM NEWTON

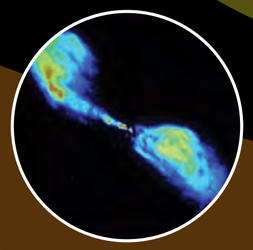
XMM-Newton is designed to study some of the most violent space phenomena. It has three advanced X-ray telescopes. Each contains 58 30cm high-precision mirrors, giving it a total X-ray collection area the size of a tennis court.
Where? Earth orbit.

SKAO SQUARE KILOMETRE ARRAY OBSERVATORY

The SKAO will be the world's largest radio telescope.
It will use thousands of dishes and antennae to mimic a telescope that measures one square km.
It will map millions of galaxies and tell us more about the birth of the Universe than ever before.
Where? South Africa, Australia, HQ in UK.

ALMA ATACAMA LARGE MILLIMETER ARRAY

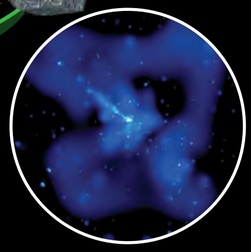
ALMA is giant array of 66 dishes that, when linked together produce images equivalent to a single 16 km-wide telescope.
Where? Atacama desert Chile.



This is the galaxy Centaurus A seen in radio waves.

This is Centaurus A seen in Infrared. Each wavelength reveals new details.

This is Centaurus A in visible light.



This is Centaurus A seen in X-rays

RADIO TO MICROWAVE

MICROWAVE TO FAR-INFRARED

INFRARED TO VISIBLE LIGHT

X-RAYS

RADIO | MICROWAVE | INFRARED | VISIBLE LIGHT | ULTRAVIOLET | X-RAYS | GAMMA RAYS

ELECTROMAGNETIC SPECTRUM

100% Atmospheric opacity (percentage of light blocked by the atmosphere) 0%

Parts of the spectrum not blocked by the Earth's atmosphere

Parts of the spectrum blocked by the Earth's atmosphere

Wavelength: 100m | 10m | 1m | 10cm | 1cm | 1mm | 100µm | 10µm | 1µm | 100nm | 10nm | 1nm | 0.1nm