Space

Learning Objective:
To investigate some of the ways in which astronauts explore space today.

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How many ways are there of exploring space today?

Think, pair, share your ideas.

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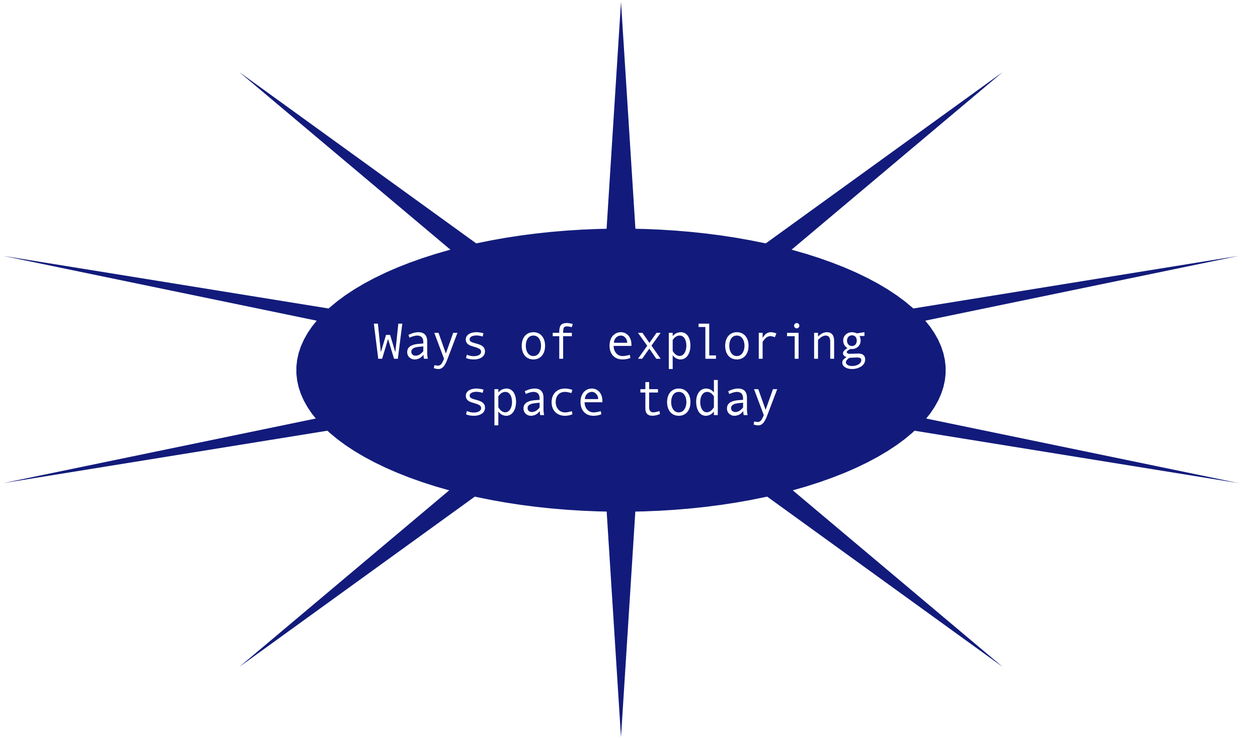
How many ideas did you think of?



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The Hubble Telescope

Since the time of Galileo, astronomers have used telescopes of increasing power to explore the universe. Yet the launch of the Hubble Telescope in 1990 by NASA has by far exceeded any other telescope in history. The Hubble Telescope is unique because it orbits the earth outside of the earth's atmosphere.

This means that images are not distorted by the atmosphere as they would be if the telescope was on Earth. The telescope beams images it collects on its journey (it travels around Earth once every 97 minutes) to satellites which then are beamed to Earth. Have a look at some of the images produced by the Hubble Telescope on the next slides...

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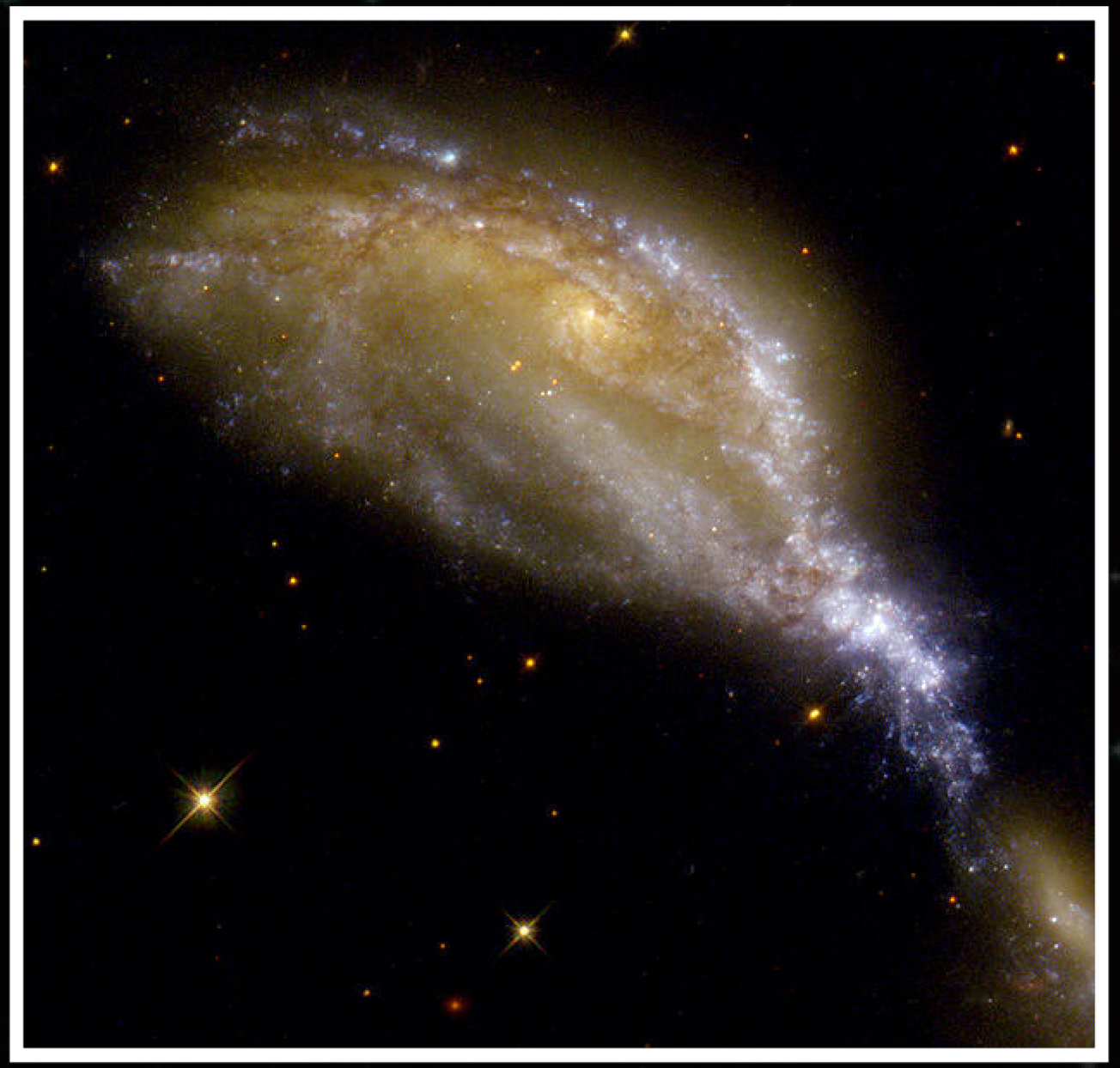

A galaxy collision

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The ‘Sombrero Galaxy’

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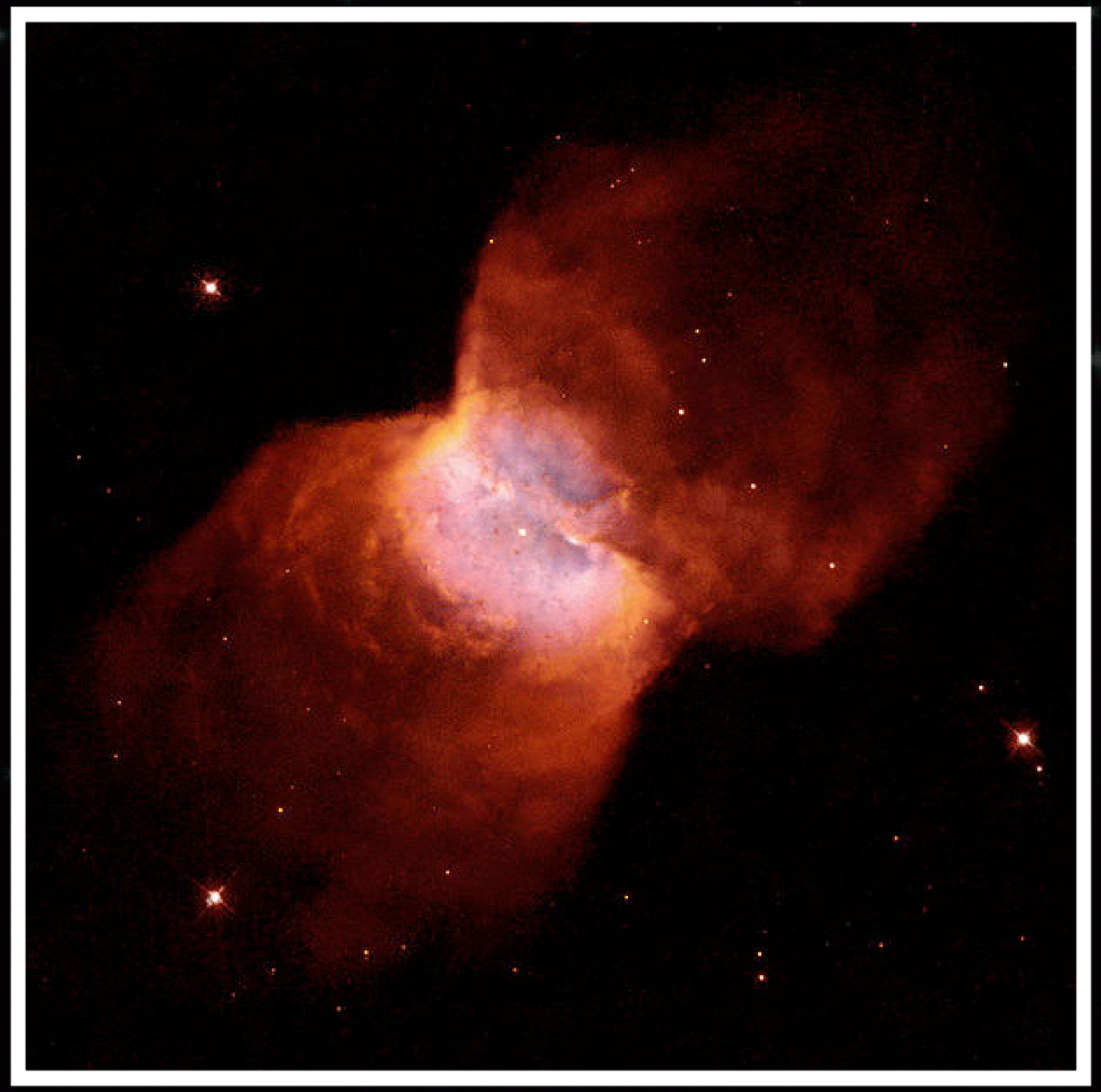

A ‘butterfly’ nebula

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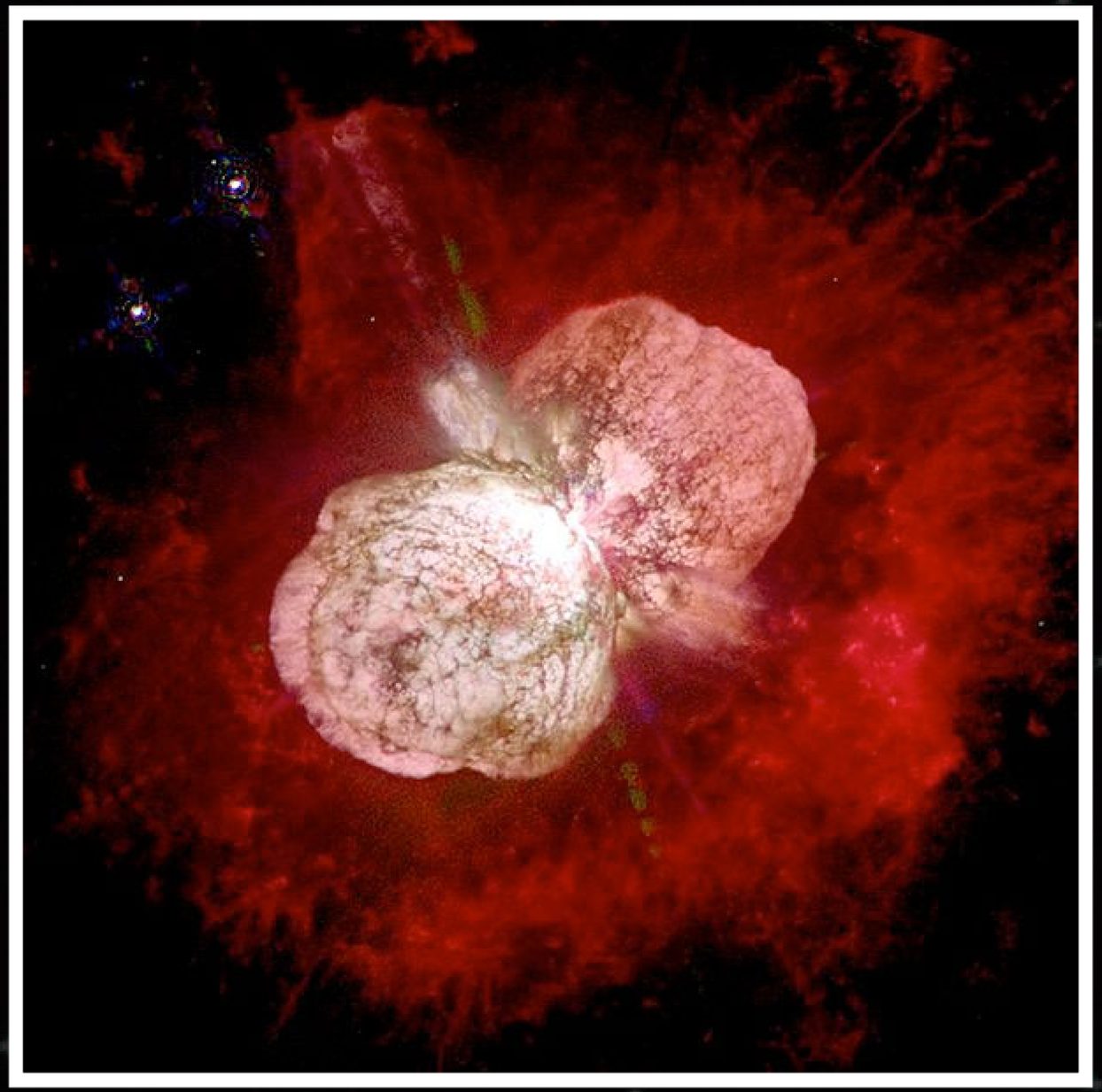

A supernova

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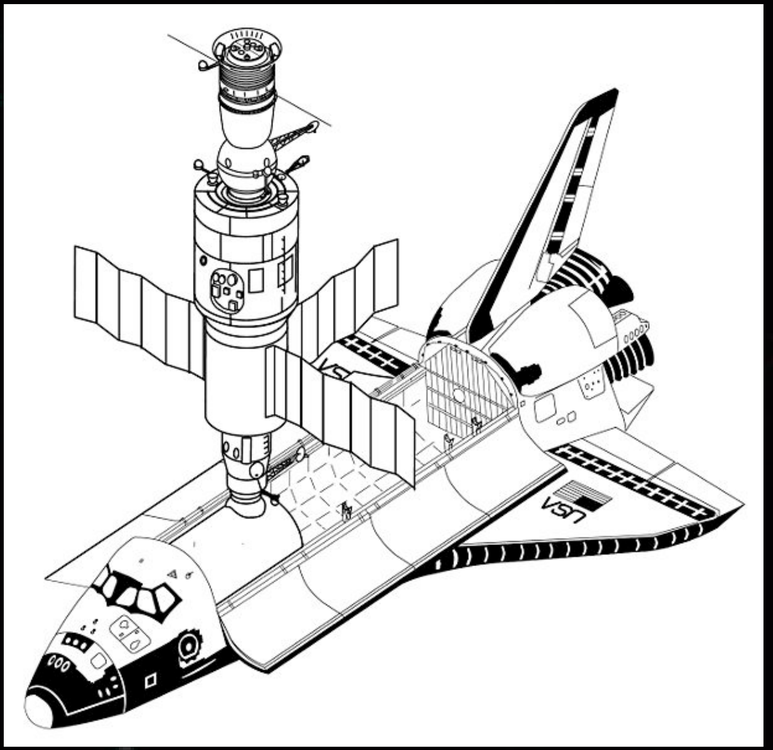
Space Stations

After the landing on the moon by American astronauts in 1969, the Soviet Union wanted to prove that it too could push the boundaries of space exploration. In 1971, the first space station, Salyut 1, was launched.



Space stations are manned satellites that are specifically designed to enable other space crafts to dock to them. Space stations allow astronauts to live and work in space, exploring the effects of long-term space travel on the body as well as other space research and exploration.

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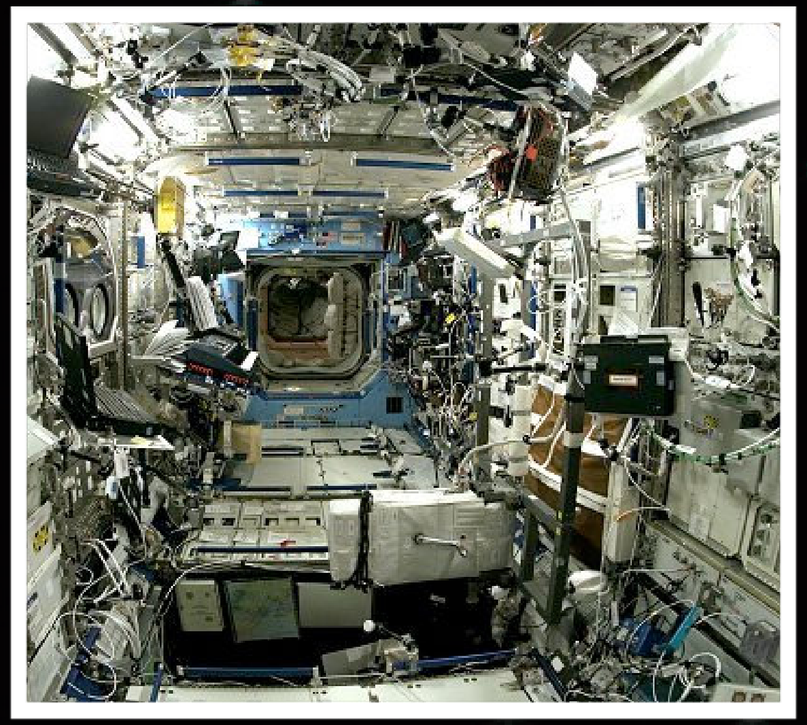
Because of their unique design, space stations are able to have rotating crews. Sometimes astronauts will live on a space stations for weeks or months at a time. A few astronauts have stayed on a space station for more than a year. When the crews change, other spacecrafts dock the station enabling personnel to change places.



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Satellites

There are more than 2500 artificial satellites orbiting the earth. Some of these satellites (like the Hubble Telescope) are used to explore further into space but most of them are used for our benefit on Earth. Satellites are able to transmit information around the globe by sending signals from space to receivers on Earth.

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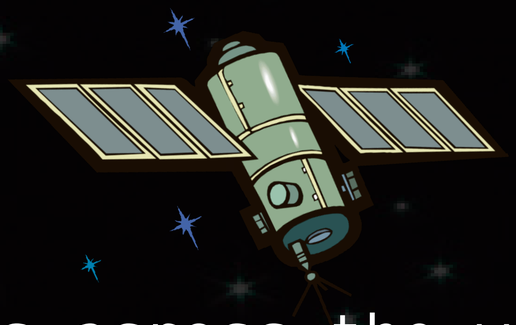
What are satellites used for?



★Meteorologists are able to study weather patterns across the world

★TV satellites are used to broadcast worldwide from a central station

★Satellites enable us to have mobile phones without the need for phone lines

★Satellites are used for Global Positioning Systems (GPS)

★Satellites enable scientists to study climate change by looking at the level of the sea, the positions on glaciers, etc.

Can you think of anything else satellites are used for?

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Observatories

Observatories are used to study the universe from earth. They are structures which house telescopes, allowing the astronomer to study the stars. Observatories are often dome-shaped to protect them from the elements.They vary greatly in size and the bigger the observatory, the bigger and more powerful the telescope it contains.

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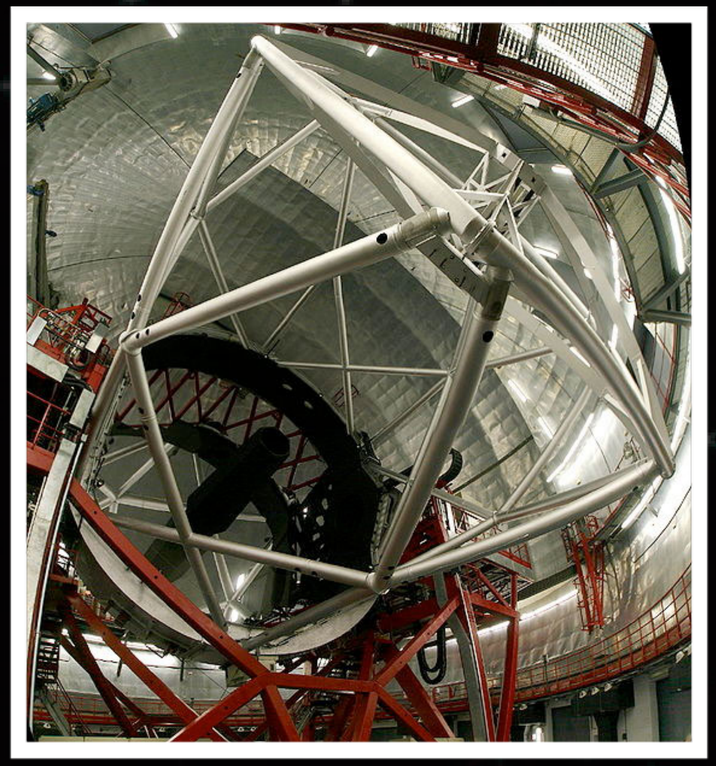
One of the largest observatories is the ‘Observatorio del Roque de los Muchachos’ in the Canary Islands. This houses a
10.4m telescope which is the largest telescope in the world.



Other observatories are small enough to construct at home in the garden and are used by amateur astronomers to study the stars.

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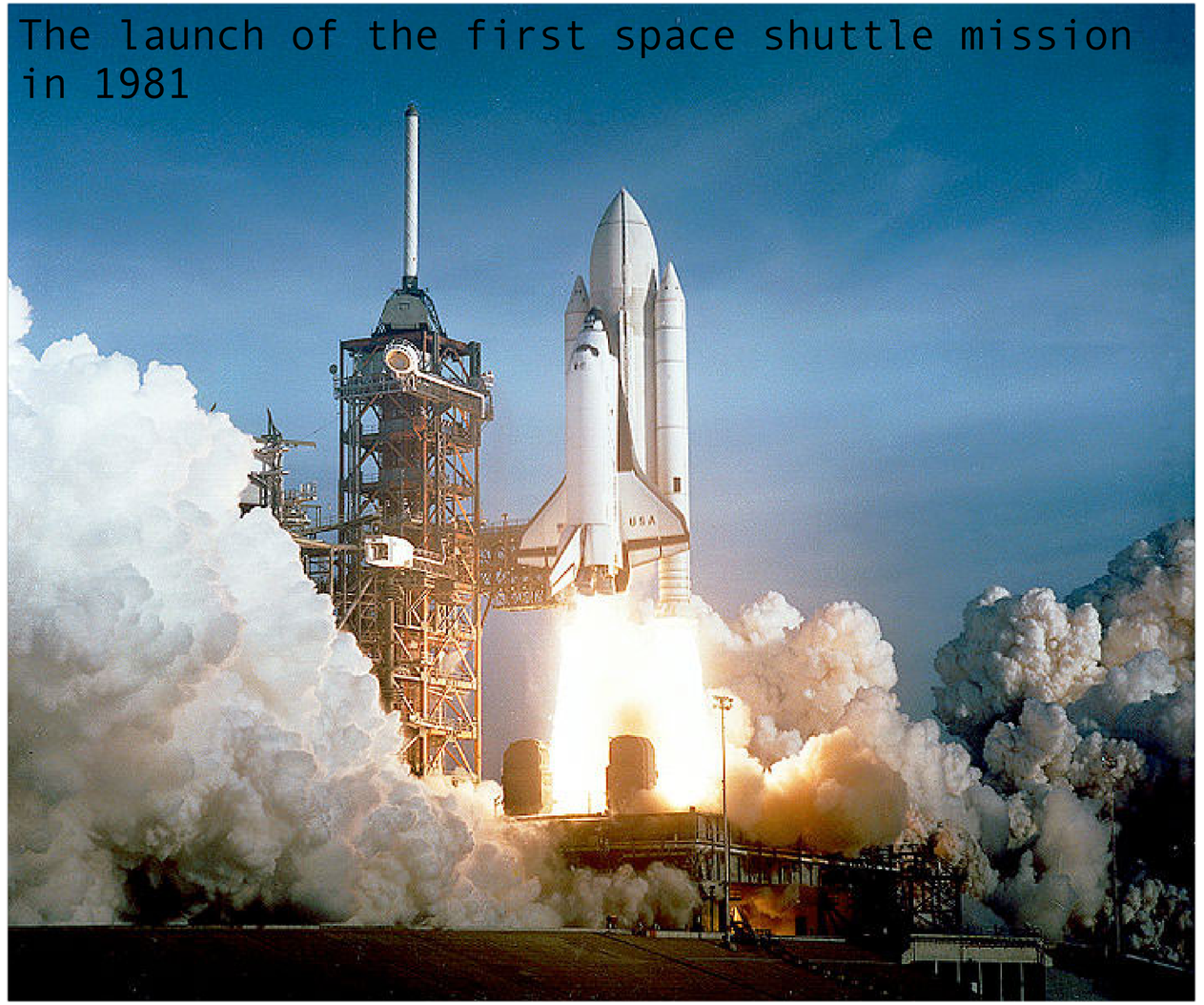
Space Shuttles

Space shuttles are used for human spaceflight missions. They are composed of three parts: the rocket launcher, the orbital spacecraft and a re-entry spaceplane. Before space shuttles, rockets could only be sent into space one. Space shuttles can be used again for different missions.



The launch of the first space shuttle mission in 1981

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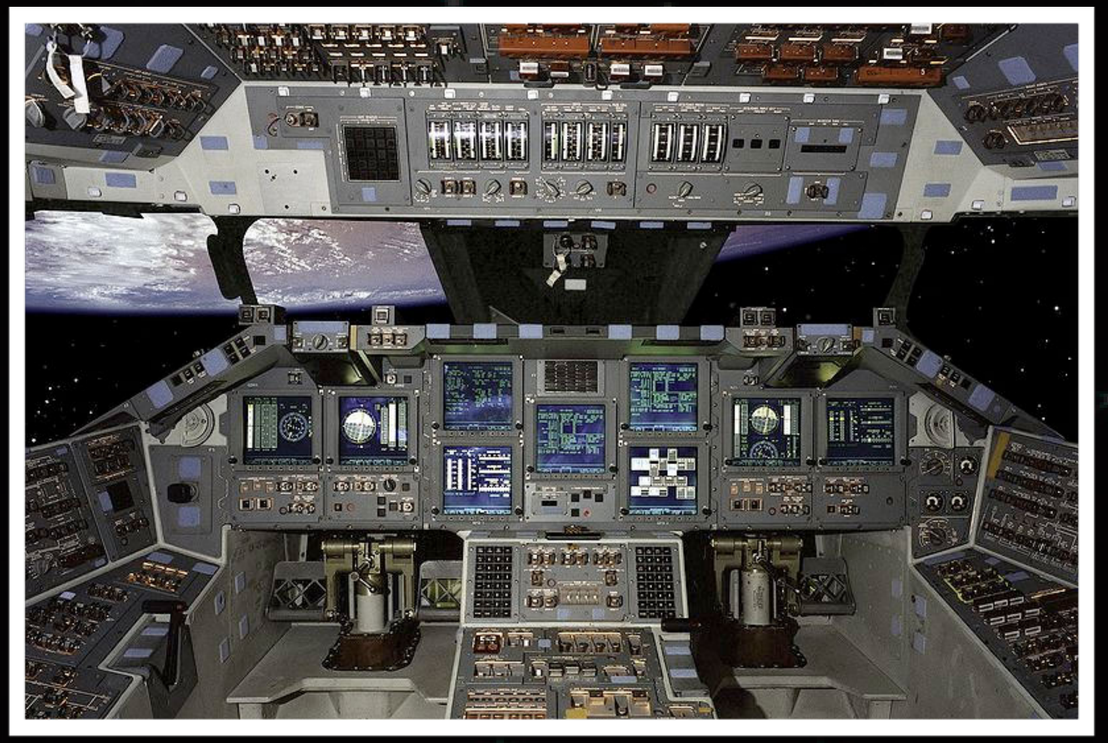
The other advantage of using space shuttles are their ability to be driven like a plane. This means that now it is not only astronauts who are able to be sent into space. Doctors, scientists and other people can be sent into space to carry out experiments and research. This has enabled us to find out even more about the universe and how it works. Shuttles are also used to transport goods to space, such as satellites or supplies for space stations.



There are so many buttons.

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We have found out so much about space during the last century but there is still so much for us to find out. What do you think scientists might discover in the future?

We live in an age when space exploration is more exciting than ever before. Can you explain how you think the contributions of previous ages have helped us to develop our knowledge of space?

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