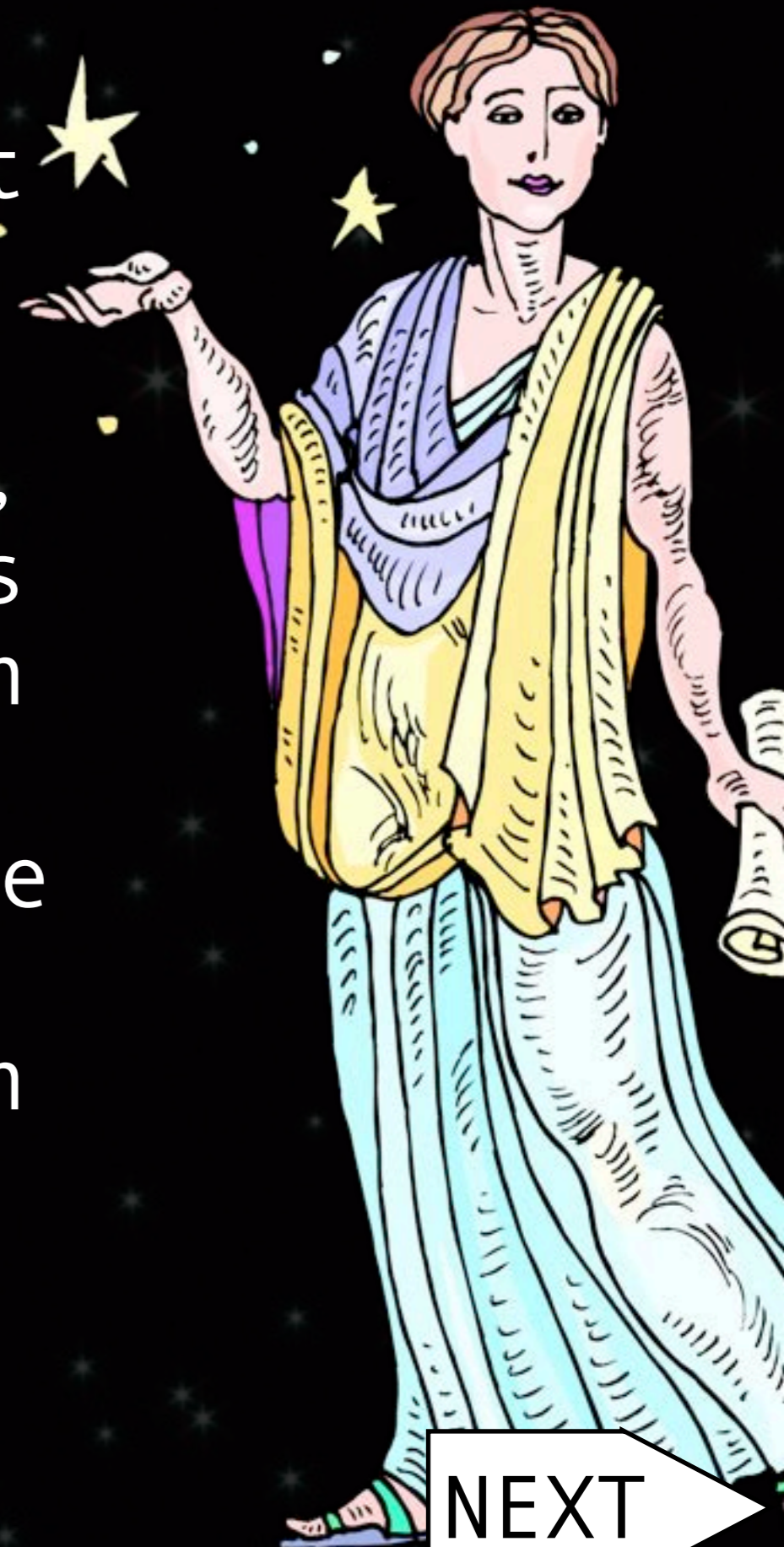


Space

Learning Objective:

To learn about the discovery of the telescope and how it changed astronomy.

People have looked up at the stars since the earliest civilisations and wondered at the universe. Ancient civilisations, such as the ancient Egyptians and Romans, believed the stars to be gods who looked over the people on earth. They knew that the stars changed positions in the sky and could use this information to tell them when the seasons changed and when to plant and harvest crops.



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There were lots of important discoveries in astronomy during the time of the ancient Greeks. The Greeks applied logical thinking when studying the universe instead of simple observation. Here are some of the most famous Greek astronomers and what they discovered...

- ★ Anaxagorus worked out what causes eclipses
- ★ Thales found out that the earth was round
- ★ Aristarchus found out that the earth moved round the sun (although few people believed him)
- ★ Hipparchus found out how far the moon is from earth and how big it is



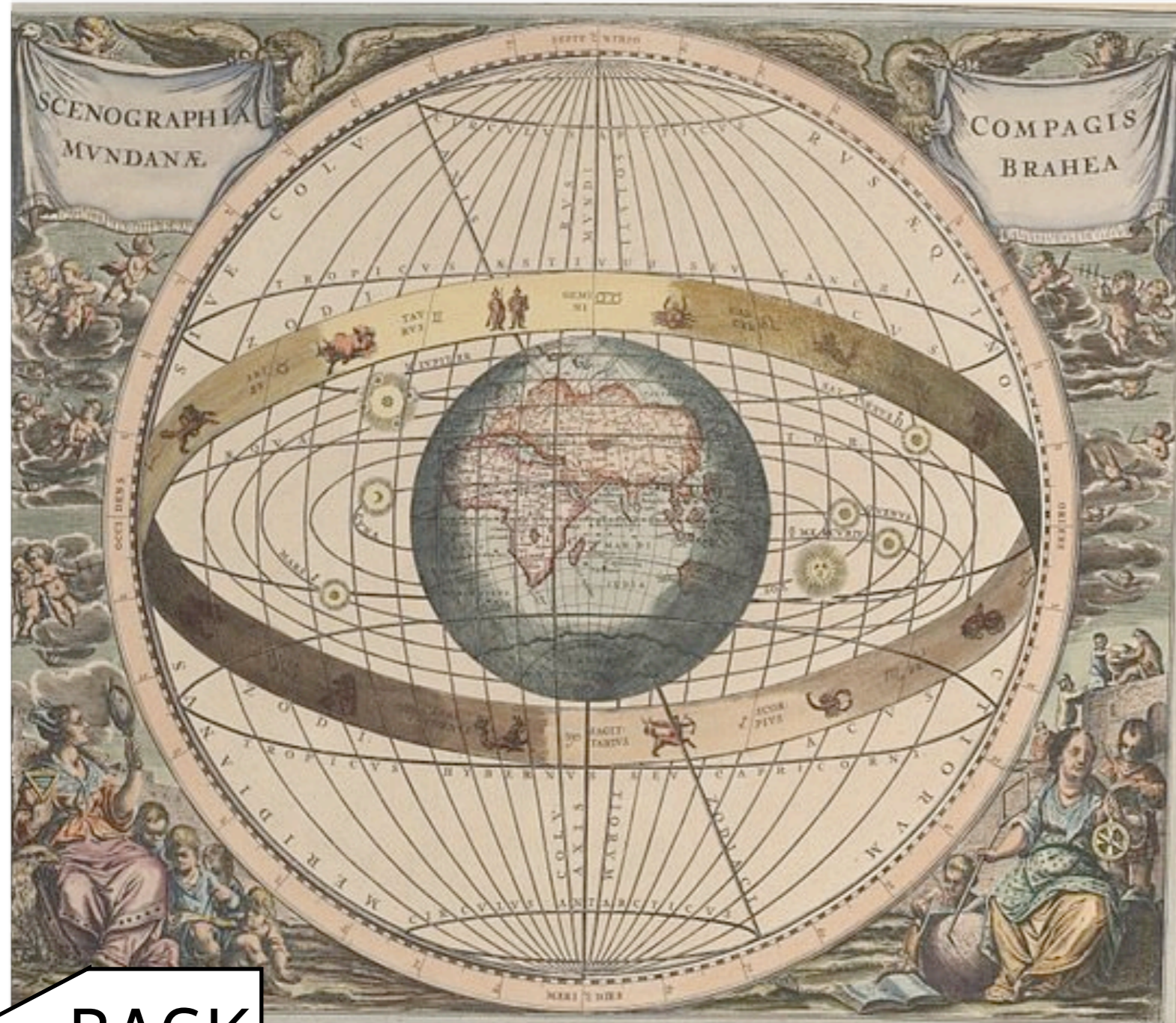
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Hipparchus 190 BC - 120 BC

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Despite several Greek astronomers claiming that the earth moved around the sun, most people rejected this theory and continued to believe that the earth was the centre of the universe



and that the sun, moon, stars and planets revolved around earth. This is called a geocentric view. Without any of the instruments for exploring space we have today, the geocentric model was difficult to disprove.

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However, the invention of the telescope began to change all that as for the first time people were really able to start exploring space.

Do you know when telescopes were invented?

Do you know who invented the telescope?



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The telescope was invented in the Netherlands in the early part of the 17th century. It was not a scientific invention but actually a creation by craftsmen. Lenses for spectacles had been used from the 14th century and a spectacle maker called Hans Lippershey took his invention for a “certain instrument to see far” to the prince to get a patent. However, several other craftsmen also claimed to have invented the telescope so no one person has been accredited.

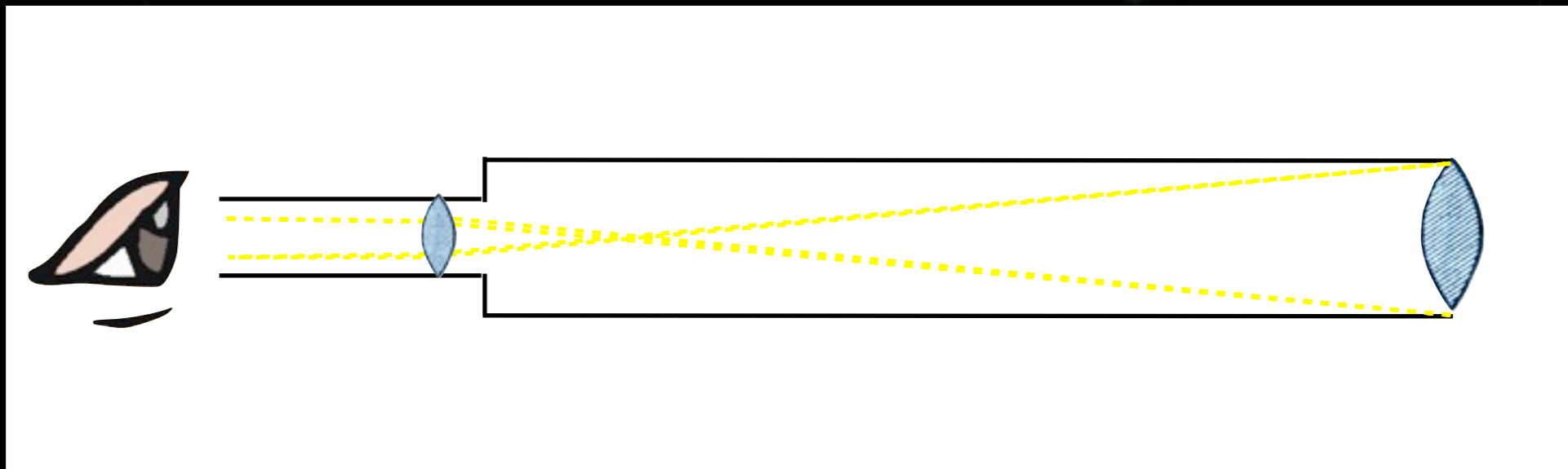


Do you know how telescopes work?

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A telescope uses two curved lenses, a small one by the eyepiece and a larger one at the opposite end. The curved lenses cause the light to bend and make objects appear closer than they really are.



This type of telescope is called a refractor telescope. Later, in 1668, Isaac Newton developed a reflector telescope that used mirrors instead of glass.

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Even though the telescope was invented by craftsmen it was Galileo Galilei who was the first to use the telescope to look into the night sky. Galileo had heard about the invention and had developed a more powerful telescope himself. He used his telescope to look into the sky and discovered many new things about the earth, moon, stars, sun and planets. He wrote his findings in a book called 'The Starry Messenger'.

Galileo Galilei

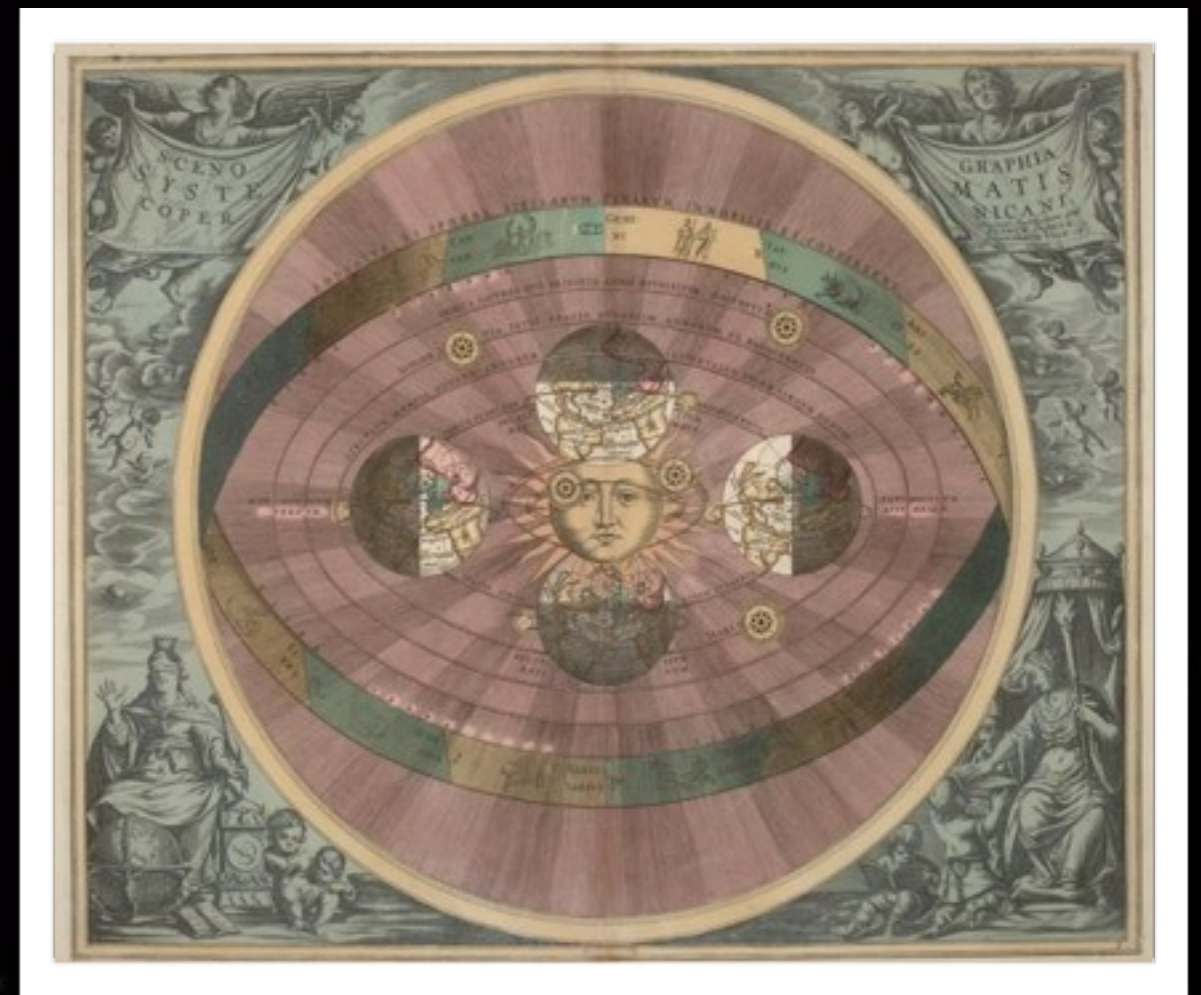


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What did Galileo discover with his telescope?

The most important thing he proved was that the earth was not the centre of the universe. Even though a few scientists and astronomers had tried to prove this theory before, most had regarded them as ludicrous, even heretical. Some were even put to death for trying to claim this theory. Now, Galileo had proof and this heliocentric system (as opposed to geocentric) was regarded as scientific fact.



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What else did he find out?

- ★ He studied the face of the moon and found out about its mountains and craters
- ★ He discovered four satellites of Jupiter that had never been seen before
- ★ He observed a supernova
- ★ He verified the phases of Venus
- ★ He discovered sunspots
- ★ He found out that stars are much further away than planets

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Can you think of some adjectives to describe how Galileo would have felt when he first pointed his telescope into the sky?

Adjectives:



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Since Galileo's discovery of how the telescope can be used to study the universe lots of advancements have been made that have allowed people to see further and further into space. There are now not only portable telescopes but large telescopes in observatories and other locations that can see further because of their

The Hubble Telescope



large size. Perhaps the most famous example of a telescope is the Hubble Telescope. This was launched into space on a shuttle in 1990 and can see a distance of several billion light years.

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