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## SUMMARY

The Moses Holden Telescope at Alston Observatory is still in the process of being commissioned, but it has already been used to image some deep-sky objects, such as nebulae, globular clusters and distant galaxies. The telescope has a very large collecting area, which allows it to detect these faint objects that would be undetectable to smaller telescopes, or would at best appear as no more than a faint fuzzy patch on the sky. However, with the MHT we are able to detect the spiral arms in spiral galaxies, and even the 'jets' in active galaxies. We can also pick out individual stars in globular clusters.

## GALAXIES

Galaxies come in three main types: spiral, elliptical, and irregular, depending on their shape and appearance. However, these different shapes tell astronomers about a galaxy's formation and past history, especially in terms of whether it has suffered a collision or merger with another galaxy.

## ACTIVE GALAXIES

An active galaxy has a black hole at its centre, which in turn has a disc around it, through which material spirals onto the black hole. A disc can launch a 'jet' of material in a specific direction, indicating the presence of the black hole.



**Figure 1:** A picture of the spiral galaxy M51. The image is made up of three filters, red, green and blue. In combination they create the colour image that we see. In this picture we can see the spiral arms in red, and dotted along the arms, the bright blue dots of newly-formed massive stars, strung out along the spiral arms. It is believed that our own Milky Way Galaxy may look something like this if we could photograph it from far enough away. *Image credit: Mark Norris.*

## GLOBULAR CLUSTERS

Globular clusters are huge collections of stars, that have a roughly spherical shape. They typically inhabit the 'halo' regions of galaxies.



**Figure 2:** An image of the active galaxy M87. The core of the galaxy can be seen at the centre of the picture. Just below this, a short thin structure appears to be pointing away from the galaxy. This galaxy is believed to have a black hole at its centre. Black holes are accompanied by other phenomena, such as accretion discs, which channel material onto the black hole itself, and eject material into space in huge linear features, which astronomers call 'jets', because of their extreme velocities. In this picture the jet from the centre of M87 can be clearly seen. Jets such as this were astronomers' first clues as to the existence of black holes in the centres of active galaxies. *Image credit: Mark Norris.*



**Figure 3:** The globular cluster M31. The various colours of the stars can be clearly seen in this three-colour image, with the majority of stars being bright, blue stars, with a few red giant stars interspersed among them. *Image credit: Mark Norris.*