

# Introduction to Astronomy

## Summary Questions Week 15

27 January 2020

1. The Hubble Sequence identifies three main types of galaxies. Mention them along with their basic characteristics.

**Solution:**

***Elliptical galaxies:*** *Spherical balls of stars, much like globular clusters. Little or no gas, no star formation; all old stars.*

***Lenticular galaxies:*** *Elliptical galaxies with a disc component, without spiral arms. Little or no gas, no star formation.*

***Spiral galaxies:*** *A bulge that is very similar to elliptical galaxies, but now combined with a disc with spiral arms in which gas and dust exist and star formation takes place.*

2. What are the main components of the unified scheme for AGNs? (Name at least 5.)

**Solution:**

The main components of the unified scheme are:

- a *central supermassive black hole*
- an *accretion disc around the black hole*
- a *torus of gas and dust surrounding the disc*
- *jets*, emanating from nearby the black hole
- *hotspots* where the jet material crashes into the intergalactic medium
- and finally, *lobes* of highly relativistic material from the jets, which is being slowed down by the shockwave against the IGM.