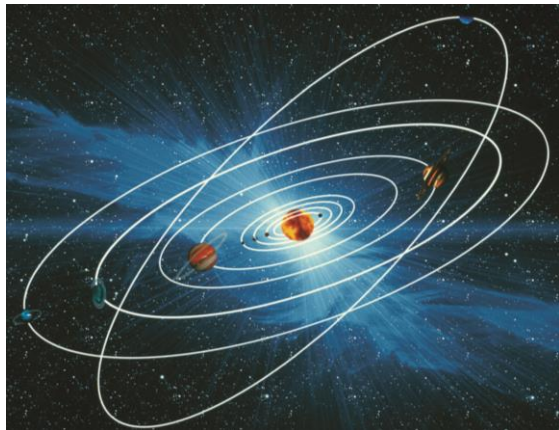


Astronomy Summary Knowledge Organiser – Chapter 6 (Topic 5) Solar System Observation



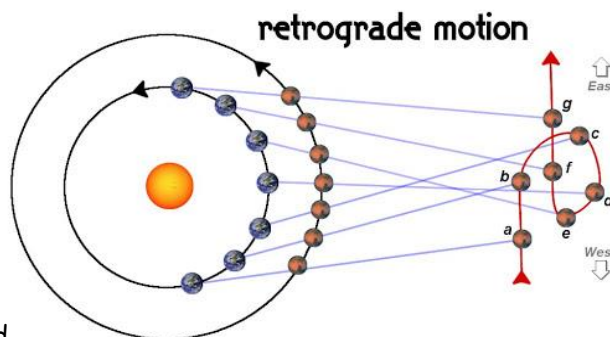
The ancient Greeks called stars that appeared to change position in the night sky '**wanderers**' (**planets** in Greek). This is why planets are called planets!

The motion of the planets is confined to a narrow band in the sky called the **Zodiacal Band**. Planets will never be seen outside this region of the sky. They are found in this band because they all **orbit the Sun on roughly the same plane** as the Earth. Pluto's orbital plane is highly **inclined** to the planes of the true planets as shown on the image left. Mercury is the planet with the largest orbital inclination compared to the Earth, its inclination is 7° . Due to this the Zodiacal Band covers an area of sky 8° below and above the ecliptic.



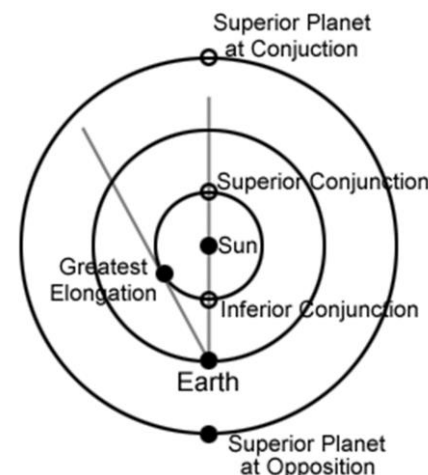
A **transit** is a rare event in which an **inferior planet** passes in front of the **Sun's disc**. It is rare because planets have differing orbital inclinations so often pass above or below the Sun's disc.

Night to night **planets usually appear to move slowly eastwards** but occasionally they appear to travel backwards, from East to West in a loop or zig-zag motion. This is called **Retrograde Motion**. Retrograde motion occurs because the **faster moving Earth overtakes a visible superior planet (usually Mars) on the inside of its orbit**, and this means it appears to change position for us on Earth (goes backwards and creates a loop).

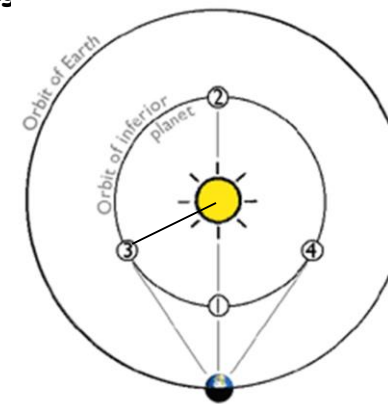
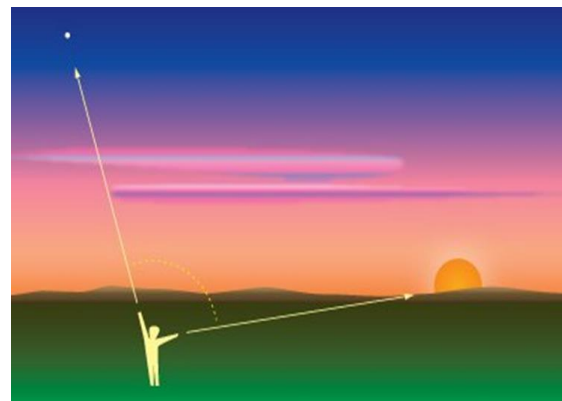


The best time to observe a planets is in the **darkest sky** but will also depend on the orbital position of the planet compared to Earth.

For a **superior planet** (outside of Earth's orbit) it is simply best to observe when the planet is **closest to Earth** and in **full phase** - at **OPPOSITION** (see below).



The best time to observe an **inferior planet** is when it **appears furthest from the Sun in the sky** (see below left) when it is at **GREATEST ELONGATION** and the **Sun-planet-Earth angle is 90°**



The Sun's apparent motion in the sky over a year is caused by the **Earth's orbital motion and 23.5° tilt of the equator to the ecliptic**.

If the position of the Sun is plotted on a graph over a whole year, it appears as below. **The path is called the ECLIPTIC**.

