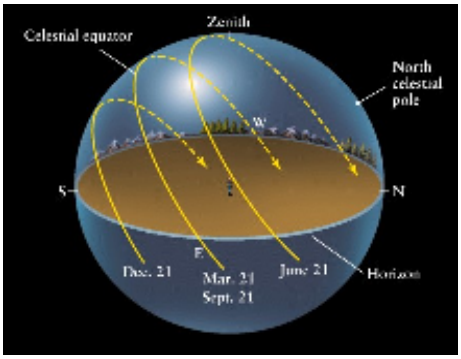
Celestial Coordinate Systems

- **Celestial Sphere** – imaginary sphere surrounding the Earth, onto which all the stars appear to be projected.
- **North Celestial Pole** (NCP) – projection of the north pole of the Earth's rotation axis onto the **celestial sphere**.
- **South Celestial Pole** (SCP) – projection of the south pole of the Earth's rotation axis onto the **celestial sphere**.
- **Celestial Equator** – projection of the Earth's equator onto the **celestial sphere**.

- **Ecliptic** – this is the path of the Earth's orbit around the sun. Because the Earth is tilted over from the path of its orbit by 23.5°, the **ecliptic** and the **celestial equator** are tilted by 23.5° with respect to each other.
- **Vernal Equinox** – one of the two intersection points between the **celestial equator** and the **ecliptic**. At this intersection the sun is moving from south of the **celestial equator** along the **ecliptic** to north of the **celestial equator**. This is defined as the first day of spring.
- **Autumnal Equinox** – one of the two intersection points between the **celestial equator** and the **ecliptic**. At this intersection the sun is moving from north of the **celestial equator** along the **ecliptic** to south of the **celestial equator**. This is defined as the first day of autumn.
- **Equinox** – time when the sun crosses the **celestial equator**.
- **Solstice** – time when the sun is farthest north (summer) and south (winter) of the **celestial equator** as it travels along the **ecliptic**.
- **Zodiac** – band of sky about 18° wide centered on the **ecliptic**. All the sun's planets are nearly in the same plane as that of the Earth's orbit, but tilted slightly. The **ecliptic** is the band which contains all the motions of the planets. The **Zodiacal Constellations** are those which are fall within the **zodiac**. The first use of the zodiac in the context of astrology was probably by the Babylonians around the 5th century BC.
- **Zenith** – The point directly overhead
- **Right Ascension** (RA) – the celestial equivalent of longitude on earth. The Earth-based longitude system has its starting point in Greenwich England. The RA system has its starting point as the **Vernal Equinox**
- **Declination** (δ) – the celestial equivalent of latitude on Earth. This is an angle on the celestial sphere measured from the celestial equator. **NCP**: δ = +90°, **SCP**: δ = -90°.



- **Horizon** – the boundary between the land and sky (idealized as a circle).
- **Altitude** – angular distance measured from the horizon, often interchanged with the term **elevation**.
- **Aziumth** – angular measurement along the horizon, measured north through east.
- **Horizon System** – **altitude** – **azimuth** coordinate system.
- **Equatorial Coordinate System** – coordinate system based on RA and δ.