

Coordinate systems in astronomy

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Horizontal or Alt-az Coordinate System (A, a)

For an observer at a given location with the azimuth directly above and the horizon marking the limits of visibility, the location of an object in the sky can be given by its azimuth (A; angle in degrees, usually clockwise from North (i.e. increasing towards the east), and its altitude (a; angle in degrees above the horizon: also called its elevation).

Celestial or Equatorial Coordinate System (d, RA)

Considering the sky as the inner surface of an imaginary sphere (the Celestial Sphere), the north and south celestial poles are the points around which the stars apparently rotate due to the daily rotation of the earth; they are projections onto the Sphere of the north and south poles respectively. The projection of the Equator on the Sphere is accordingly called the Celestial Equator. The Celestial latitude of an object, called its 'declination' (δ), is given in degrees from 0 at the Celestial Equator to ± 90 at the Pole. Its 'hour angle' (H) is that between the observer's meridian through the poles and the object's meridian, measured westwards in time units (one hour per 15 degrees of equatorial longitude). Celestial longitude, called 'right ascension' (RA), is measured *easterly* from a zero point defined on the celestial equator, also in time units. The zero longitude point of the celestial coordinate system, defined by Hipparchus, is called the First Point in Aries. It lies at 0 hours RA and is currently within the constellation Pisces. It lies on the Ecliptic as well as on the Celestial Equator and is the point where the sun crosses the Ecliptic at the Vernal (northern Spring) equinox.

See also, Ecliptic Coordinate system (Earth-based), Ecliptic Coordinate system (Sun-based), Galactic Coordinate system.