Astronomy From Å to ZZ — Howard L. Cohen

A Brief Column for the Beginning Stargazer Introducing a New Astronomical Term Each Month

Astronomy is rich with terminology. This column will help beginning stargazers ease into the world of astronomy by *briefly introducing* a new but *basic astronomical term* (word, acronym or abbreviation) each month. This list, which began January 1999 with the letter *a*, is alphabetical but uses successive letters for each month's entry. (We will return to the letter *a* after twenty-six months.)

Word of the Month for April 2000

parsec (symbol pc) A basic unit of stellar distance (like a mile or kilometer) used in professional astronomy to indicate stellar distances.

One parsec is the distance at which an object would have an *annual heliocentric trigonometric parallax* of one arc second. (An *arc second,* abbrev. arc sec or ", is 1/60 of an arc minute or 1/3600 of a degree.) See Figure 1 and end note.

This is equivalent to defining one parsec (1 pc) as the distance at which the Earth's mean distance from the Sun (*one astronomical unit* or 1 AU) would subtend an angle of one arc second (1"). See Figure 1.

One parsec is approximately:

3.2616	light years (ly)
206,265	astronomical units (AU)
30,857,000,000	kilometers (km)
19,174,000,000	miles (mi)

Multiples of the parsec include the kiloparsec (kpc, 1,000 pc) and the megaparsec (Mpc, 1,000,000 pc).

Both the parsec and light year are commonly used to designate stellar distances. (The light year is the distance light travels through a vacuum in an average Gregorian year of 365.2425 days.)

The light year is often preferred in nontechnical work. The parsec is often used in professional astronomy because it is easily and conveniently related to the

parallax of a star:

Distance (in parsecs) = 1 / parallax (in arc seconds)

(Example: If the parallax = 0.5 arc seconds, then the distance is 2 pc, which is about 6.5 ly.)

Example Distances in Parsecs and Light Years

Alpha Centauri	1.3 pc	4.2 ly
Sirius	2.6 pc	8.6 ly
Vega	7.7 pc	25 ly
Regulus	24 pc	77 ly
Antares	60 pc	197 ly
Pleiades Star Cluster	126 pc	410 ly
Polaris	132 pc	431 ly
Betelgeuse	160 pc	522 ly
Deneb	450 pc	1,467 ly
Orion Nebula	460 pc	1,500 ly
Hercules Globular Cluster	640 pc	21,000 ly

Fig. 1. Parallax. If parallax = 1 arc sec, distance = 1 pc
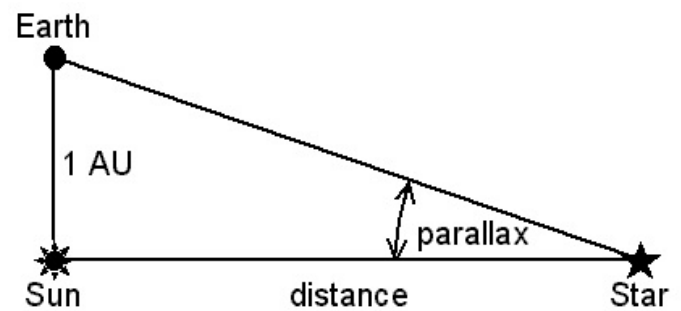
Note:

Parallax is the apparent change in the direction of an object, caused by a change in the observer's position.

The *annual heliocentric parallax* results from viewing the *angular shift* of an object by moving through a distance equal to the mean distance between the Earth and Sun (called *one astronomical unit* or 1 AU). ☼

References. J. Mitton 1991, *Concise Dictionary of Astronomy* (Oxford Univ. Press); I. Ridpath 1997, *A*

Dictionary of Astronomy (Oxford Univ. Press).