Definition of the parsec (pc)

Compare one parsec with one light-year

Stellar distances are huge. The <u>parsec</u> is the distance from which the radius of the orbit of the Earth subtends an angle of one second of arc.

1pc = distance of a star the parallax of which is one second of arc

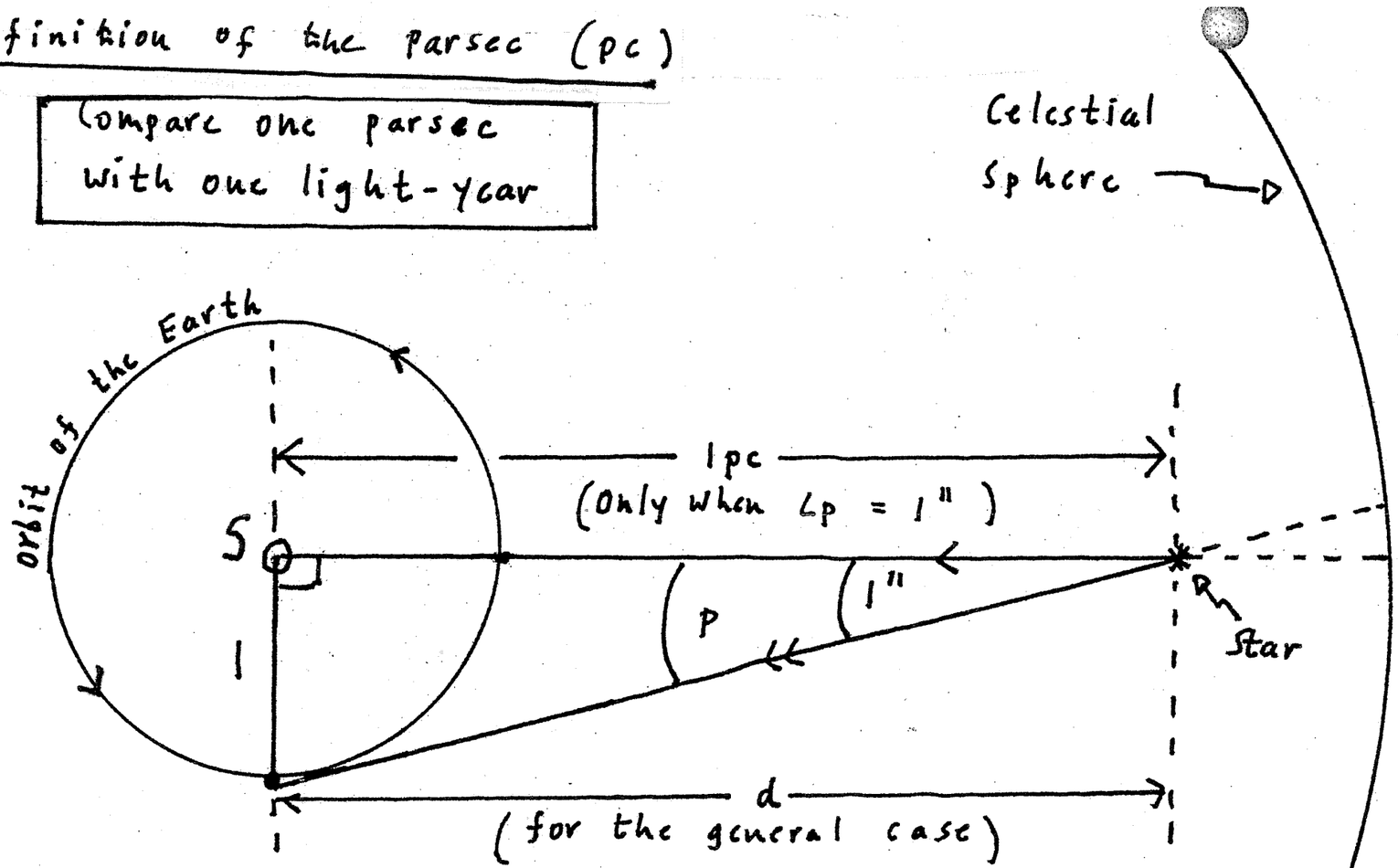
"parsec" : combination of "parallax" and "one second of arc"

If the Earth-Sun distance is represented by 1 (A.U.), then,

$$\frac{1}{d} = \tan p$$

$$\therefore \boxed{d = \frac{1}{\tan p}}$$

d will be in <u>Astronomical Units</u>



If the Earth-Sun distance is measured in metres,

then, $\frac{1 \cdot 5 \times 10^{11}\ m}{d} = \tan p \quad \therefore d = \frac{1 \cdot 5 \times 10^{11}\ m}{\tan p}$

Now, from the definition of the parsec, $\angle p = 1''$

and $d = \frac{1 \cdot 5 \times 10^{11}\ m}{\tan 1''}$

$= \frac{1 \cdot 5 \times 10^{11}\ m}{4 \cdot 8 \times 10^{-6}}$

$\therefore \underline{d_{1pc} = 3 \cdot 1 \times 10^{16}\ m}$

Clearly, if $\angle p = 0'' \cdot 5\ (0 \cdot 5'')$ then, $d = 2$ pc; if $\angle p = 0 \cdot 1''$ then $d = 10$ pc, and so on.

D.F.

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