

DESCRIZIONE HR DIAGRAM

The HR (Herzsprung - Russel) diagram is a very useful way to study stars. It can be used to show the relation between the absolute magnitude and the spectral types of stars (and related to that, the temperature and the luminosity with respect to the Sun). It allows to subdivide the stars into dwarfs, main sequence, giants and supergiants and to show their life cycle.

DEFINIZIONE MAGNITUDE

Stars show different luminosity and the magnitude is a way to express them in a logarithmic scale according to the human perception of light brightness. Originally was introduced in 150 b.C., and the scale was from 1 (brightest stars) to 6 (faintest stars, just visible at naked eye). Now, the scale improve its dimensions, infact we achieve a minimum value of 25 (faintest star visible from Earth telescopes) and the most luminous star achieve negative values, such as the Sun (-26.8) or Sirius (-1.5). This scale is according to the apparent magnitude that consider also the distortion of luminosity due to distance and interstellar absorption.

LUMINOSITÀ VARIABILE

Variable stars are stars which show a variation in their brightness (and so, a changing magnitude).

Strictly speaking, all stars are variable: the structure and brightness of a star change as it evolves. Although these changes are usually slow, some evolutionary phases may be extremely rapid. Small variations in stellar brightness are also caused by hot and cool spots on a star's surface, appearing and disappearing as it rotates about its axis.

The magnitude variation as a function of time is called the lightcurve of a star. From it, it's possible to obtain the amplitude of the magnitude variation and its period, if the variation is periodic.

Variable stars are classified in:

- Intrinsic variables, whose luminosity actually changes due to periodically swells and shrinks.
- Extrinsic variables, whose apparent changes in brightness are due to changes in the amount of their light that can reach Earth; for example, because the star has an orbiting companion that sometimes eclipses it.