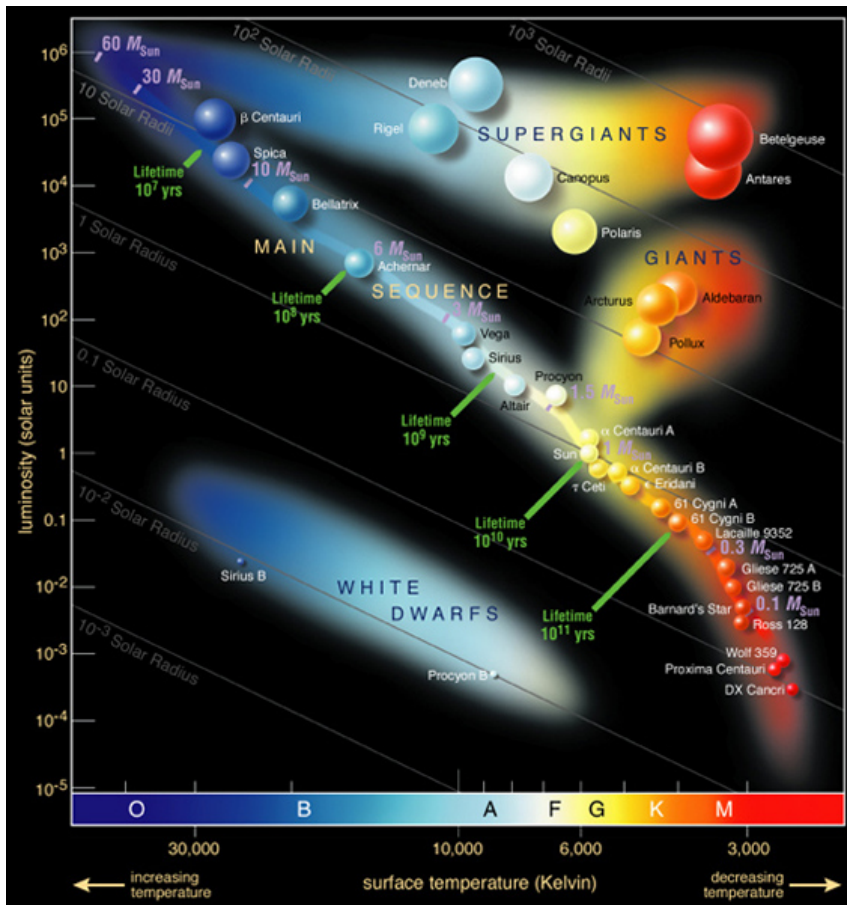


Magnitude and Luminosity*

Luminosity is an intrinsic measurable property of a star independent of distance. The concept of magnitude, on the other hand, incorporates distance. First conceived by the Greek astronomer Hipparchus in the second century BC, the original concept of magnitude grouped stars into six categories depending on how bright they appeared. The brightest first magnitude stars were twice as bright as the next brightest stars, which were second magnitude; second was twice as bright as third, third twice as bright as fourth and so on down to the faintest stars, which Hipparchus categorized as sixth magnitude. The system was but a simple delineation of stellar brightness into six distinct groups and made no allowance for the variations in brightness within a group. With the invention of the telescope at the beginning of the seventeenth century, researchers soon realized that there were subtle variations among stars and millions fainter than the sixth magnitude—hence the need for a more sophisticated system to describe a continuous range of values beyond what the naked eye could see.

In 1856 Norman Pogson, noticing that measurements had established first magnitude stars as being about 100 times brighter than sixth magnitude stars, reformed the Hipparchus system by creating a logarithmic scale, with every interval of one magnitude equating to a variation in brightness of roughly 2.512 times. Consequently, a first magnitude star is about 2.5 times brighter than a second magnitude star, 2.5 brighter than a third magnitude star, 2.5 brighter than a fourth magnitude star, et cetera. If you do the math, a 1st mag star is ~100 brighter than a 6th mag star $\rightarrow 2.512 \times 2.512 \times 2.512 \times 2.512 \times 2.512 = 100$ or $2.512^5 = 100$

Luminosity in Solar Units plotted against Surface Temperature



Hertzsprung–Russell diagram identifying stellar luminosity as a function of temperature for many stars in our solar neighborhood. Solar units (left ordinate) are the based on the luminosity of the Sun. In *astronomy*, *luminosity* is the amount of *electromagnetic energy* (photons) a body radiates per unit of time.

Most stars are currently classified using the letters **O**, **B**, **A**, **F**, **G**, **K**, and **M**, where **O** stars are the hottest and the letter sequence indicates successively cooler stars up to the coolest **M** class. Useful mnemonics for remembering the spectral type letters is "Oh Be A Fine Girl Kiss Me" or "Oh Be A Fine Guy Kiss Me". According to informal tradition, **O** stars are called "blue", **B** "blue-white", **A** stars "white", **F** stars "yellow-white", **G** stars "yellow", **K** stars "orange", and **M** stars "red", even though the actual star colors perceived by an observer may deviate from these colors depending on visual conditions and individual stars observed.

* Wikipedia was the source of this info