The Brightness of Stars

1

The luminosity of an object is how much energy it emits (in all directions) every second

Light bulb: 60 W

Sun: 4×10^{26} W

Sirius: 1×10^{28} W, or 25 L_{sun}

2

The apparent brightness of an object is how bright it *appears* to an observer

Apparent brightness depends on luminosity *and* distance

3

The Greek astronomer Hipparchus devised a system for classifying the apparent brightness of stars visible to the naked eye:

1st magnitude: brightest
6th magnitude: dimmest

4

Modern decimal magnitude system quantifies apparent brightness, based loosely on Hipparchus' system.

- For two stars, a difference of 5 magnitudes (eg, magnitude 1.0 vs 6.0) corresponds to a factor 100 difference in apparent brightness
- Less positive/more negative magnitudes are brighter