Stars

Spectral Types
Luminosity Classes
Composition
Stellar Evolution

spectral types: OBAFGKM

Example(s)	Temperature Range	Key Absorption Line Features	■ Brightest Wavelength (color)	J 1	Typical Spectrum	
Stars of Orion's Belt	> 30,000 K	Lines of ionized helium, weak hydrogen lines	√97 nm (ultraviolet)*	0	hydrogen	0
Rigel	30,000 K- 10,000 K	Lines of neutral helium, moderate hydrogen lines	97–290 nm (ultraviolet)*	В		В
Sirius	10,000 K- 7,500 K	Very strong hydrogen lines	290–390 nm (violet) **	Α		A
Polaris	7,500 K- 6,000 K	Moderate hydrogen lines, moderate lines of ionized calcium	390–480 nm (blue)*	F		F
Sun, Alpha Centauri A	6,000 K- 5,000 K	Weak hydrogen lines, strong lines of ionized calcium	480–580 nm (yellow)	G		G
Arcturus	5,000 K- 3,500 K	Lines of neutral and singly ionized metals, some molecules	580–830 nm (red)	к		K
Betelgeuse, Proxima Centauri	63,500 K	Molecular lines strong	7 830 nm (infrared)	II ionized calcium	titanium sodium oxide	titanium oxide

ove 6,000 K look more or less white to the human eye because they emit plenty of radiation at all visible wavelengths.

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spectral types

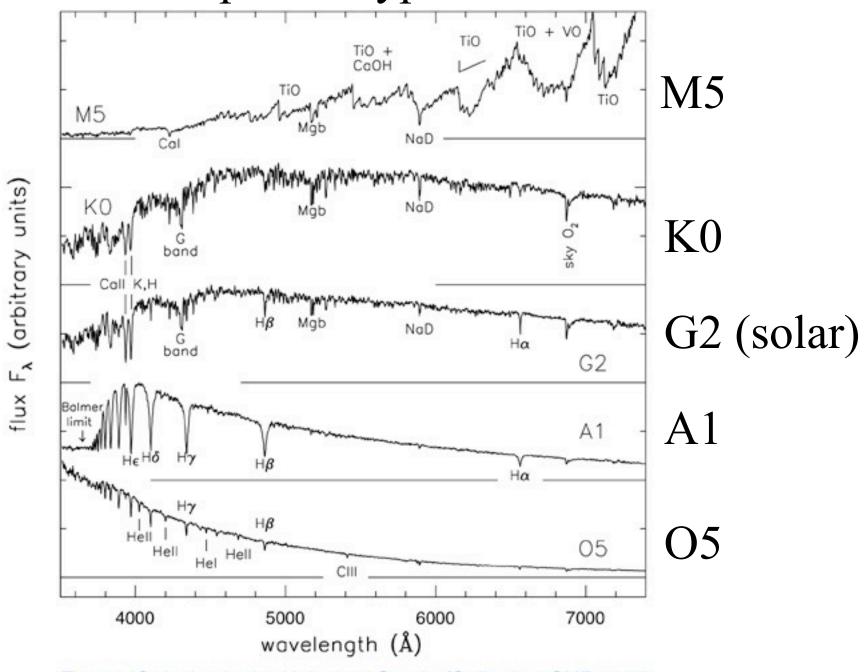


Fig 1.1 'Galaxies in the Universe' Sparke/Gallagher CUP 2007

A star's full classification includes a **spectral type** (OBAFGKM) and a **luminosity class** (related to the size & surface gravity of a star - bigger is brighter):

I — supergiant

II — bright giant

III — giant

IV — subgiant

V — main sequence

Examples: Sun — G2 V

Sirius — A1 V

Proxima Centauri — M5.5 V

Betelgeuse — M2 I

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The width of lines varies with surface gravity

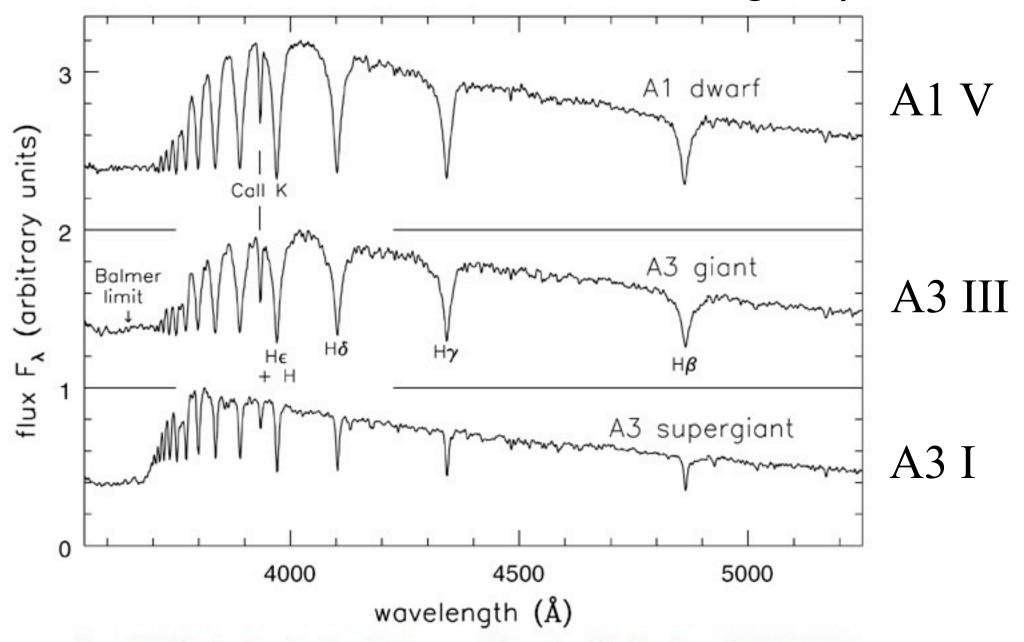


Fig 1.2 'Galaxies in the Universe' Sparke/Gallagher CUP 2007

Problem 1.7