

Stars: Properties

ASTR 1220, Summer 2010

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Outline

Bennett Ch 15

Properties of Stars

History of Stellar Classification

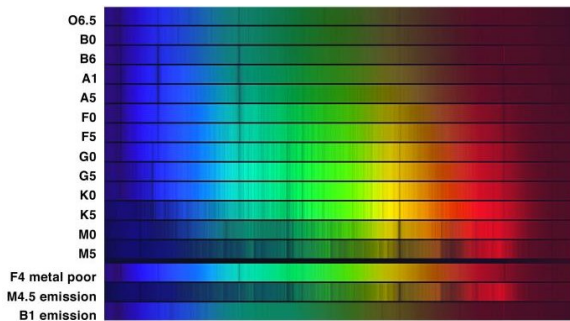
Stellar Masses

Placing Stars on a Sequence

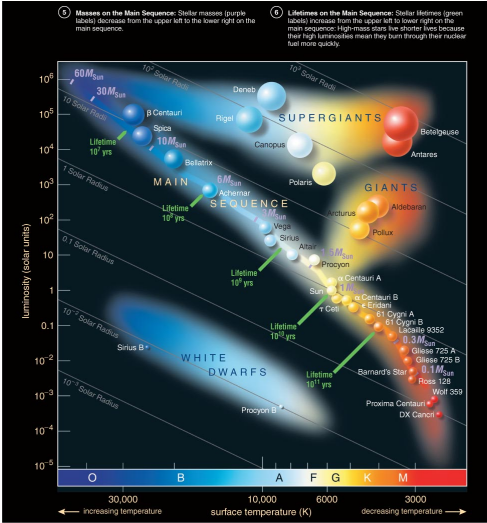
Goals

- ▶ Learn the (observable) properties of stars
- ▶ What ranges of these properties are seen

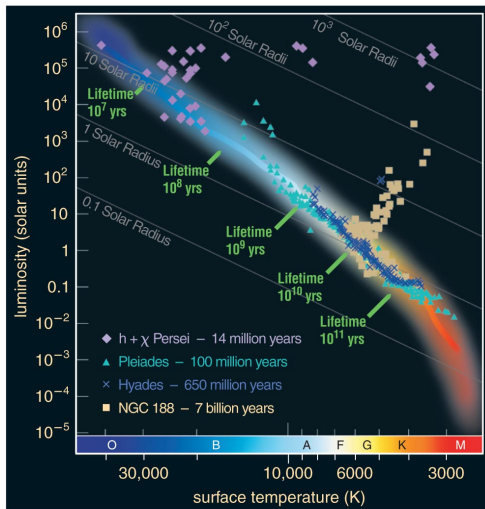
Classification based on temperature



Hertzsprung Russell Diagram



Ages of star clusters



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Sample Stellar Properties

TABLE 15.1 The Spectral Sequence

Spectral Type	Example(s)	Temperature Range	Key Absorption Line Features	Brightest Wavelength (Color)	Typical Spectrum
O	Stars of Orion's Belt	>30,000 K	Lines of ionized helium, weak hydrogen lines	<97 nm (ultraviolet)*	O
B	Rigel	30,000 K–10,000 K	Lines of neutral helium, moderate hydrogen lines	97–290 nm (ultraviolet)*	B
A	Sirius	10,000 K–7500 K	Very strong hydrogen lines	290–390 nm (violet)*	A
F	Polaris	7500 K–6000 K	Moderate hydrogen lines, moderate lines of ionized calcium	390–480 nm (blue)*	F
G	Sun, Alpha Centauri A	6000 K–5000 K	Weak hydrogen lines, strong lines of ionized calcium	480–580 nm (yellow)	G
K	Arcturus	5000 K–3500 K	Lines of neutral and singly ionized metals, some molecules	580–830 nm (red)	K
M	Betelgeuse, Proxima Centauri	<3500 K	Strong molecular lines	>830 nm (infrared)	M

*All stars above 6000 K look more or less white to the human eye because they emit plenty of radiation at all visible wavelengths.