BRIEF

HR DIAGRAM
Variable Stars and the HR Diagram

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Overview

In a continuing series on the HR Diagram, this lesson combines knowledge of the Diagram and adds the location of varying classes of variable stars.

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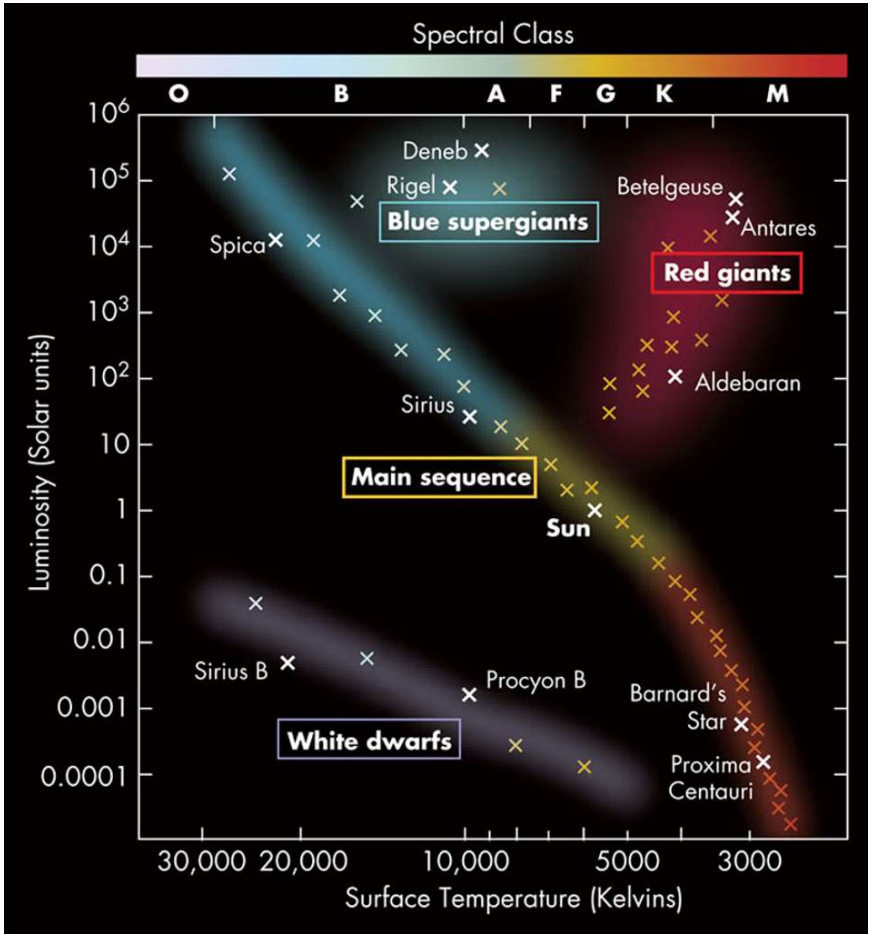
Hertzsprung-Russell Diagram Review

The H-R diagram is a plot of stellar temperature vs luminosity. Temperature is further classified by Spectral Class

The main areas of the HR Diagram are:

- Main sequence,
- Blue Supergiants
- Red Giants
- White Dwarfs



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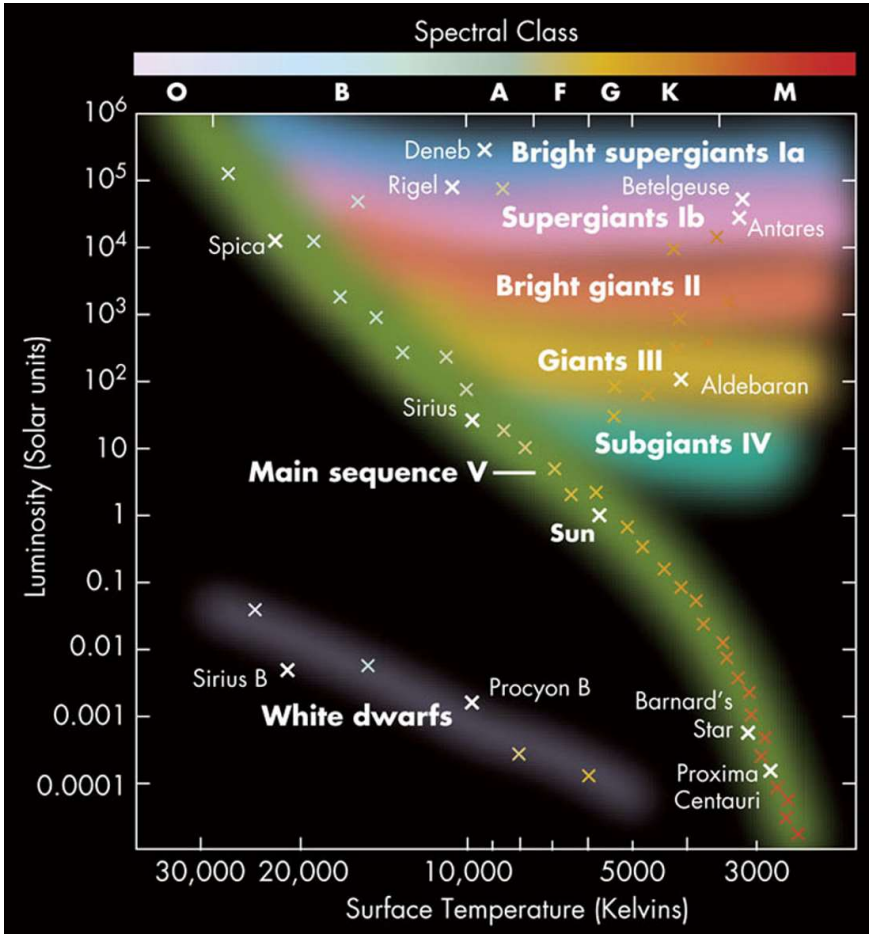
Hertzsprung-Russell Diagram: Spectral Class and Luminosity Type

H-R diagram broken into luminosity classes:

- Ia (bright supergiant),
- Ib (supergiants),
- II (bright giants),
- III (giants),
- IV (subgiants),
- V (main sequence)
- White Dwarfs



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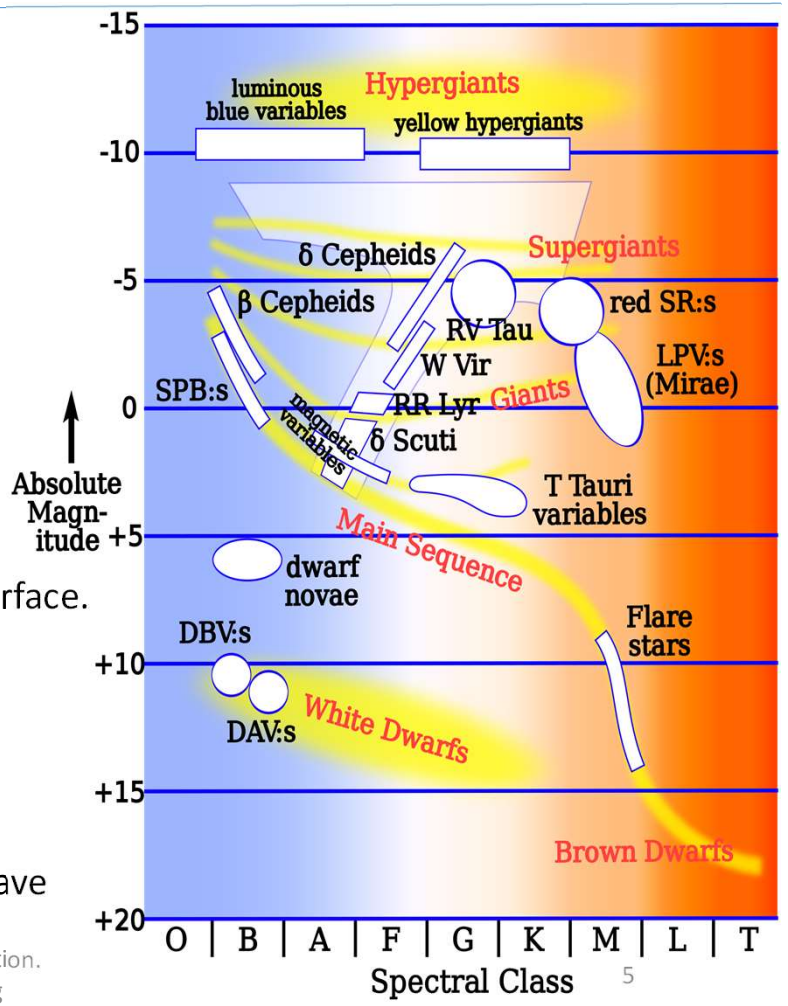
Variable Stars and the HR Diagram

- Luminous Blue Variables : massive, evolved stars with unpredictable variations . S Doradus common type.
- Cepheids: Standard candles used to measure distance.
- RR Lyrae: Cluster stars with regular periods
- LPVs: Cool, luminous, pulsating stars.
- T Tauri: young, pre-main sequence in molecular clouds
- Delta Scuti: similar to Cepheid with radial & non-radial pulsations of surface.
- SPBs: Slow pulsating B-stars with multiple periods of oscillations
- Flare Stars: Believed to be solar flares with periods of rapid increase in brightness
- DBV/DAVs: Pulsating White Dwarfs with variations caused by gravity wave pulsations



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Summary

Variable Stars exist throughout the stellar life cycle. Their pulsations and variations are not limited to one particular segment.

For an excellent, more detailed, description on stellar evolution, consult the outstanding AAVSO article: Stellar Evolution located at: https://www.aavso.org/stellar-evolution

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Questions?

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