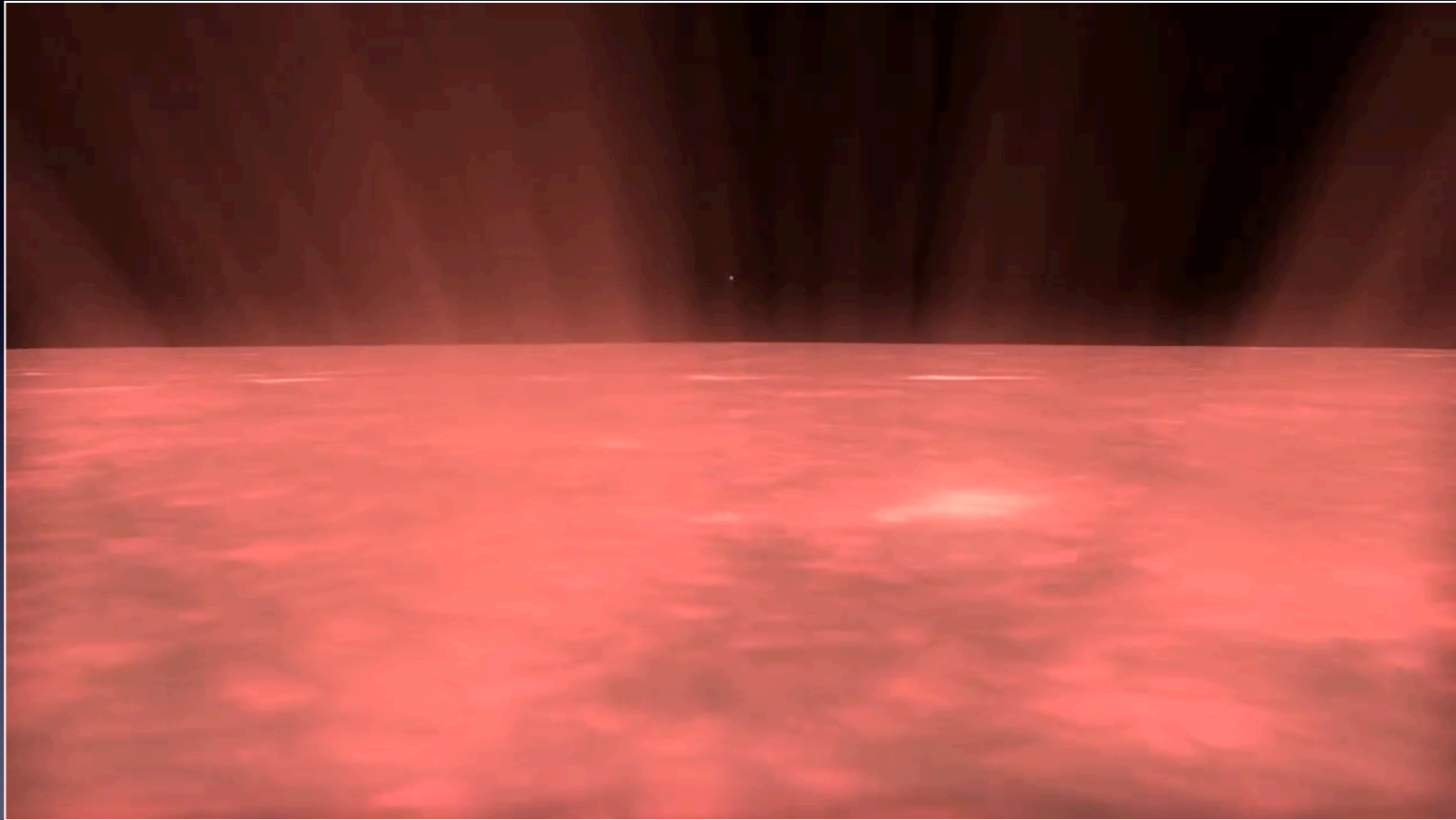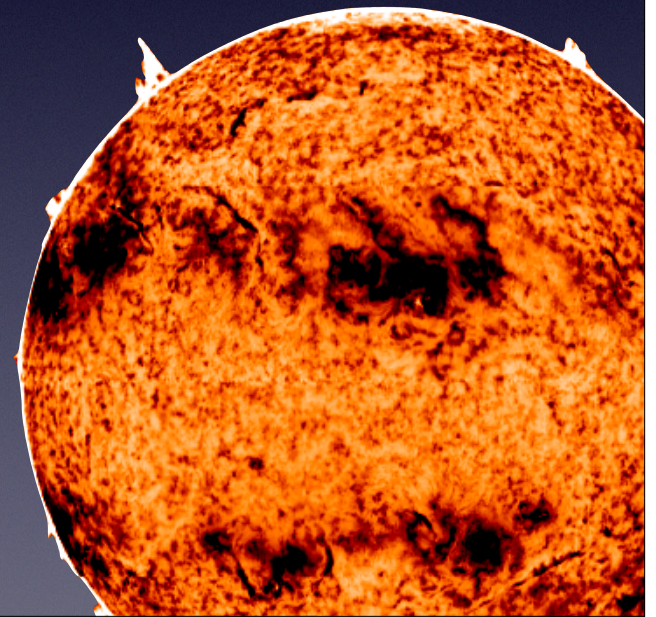# Classification of Stars

How do we classify the billions of stars that exist in our galaxy and Universe?

How Big?

Classification of Stars

- <u>Star</u> - sphere of gas held together by gravity that produces tremendous amounts of energy and shines

  - Creates energy by nuclear fusion

  - Majority of known matter in the galaxy
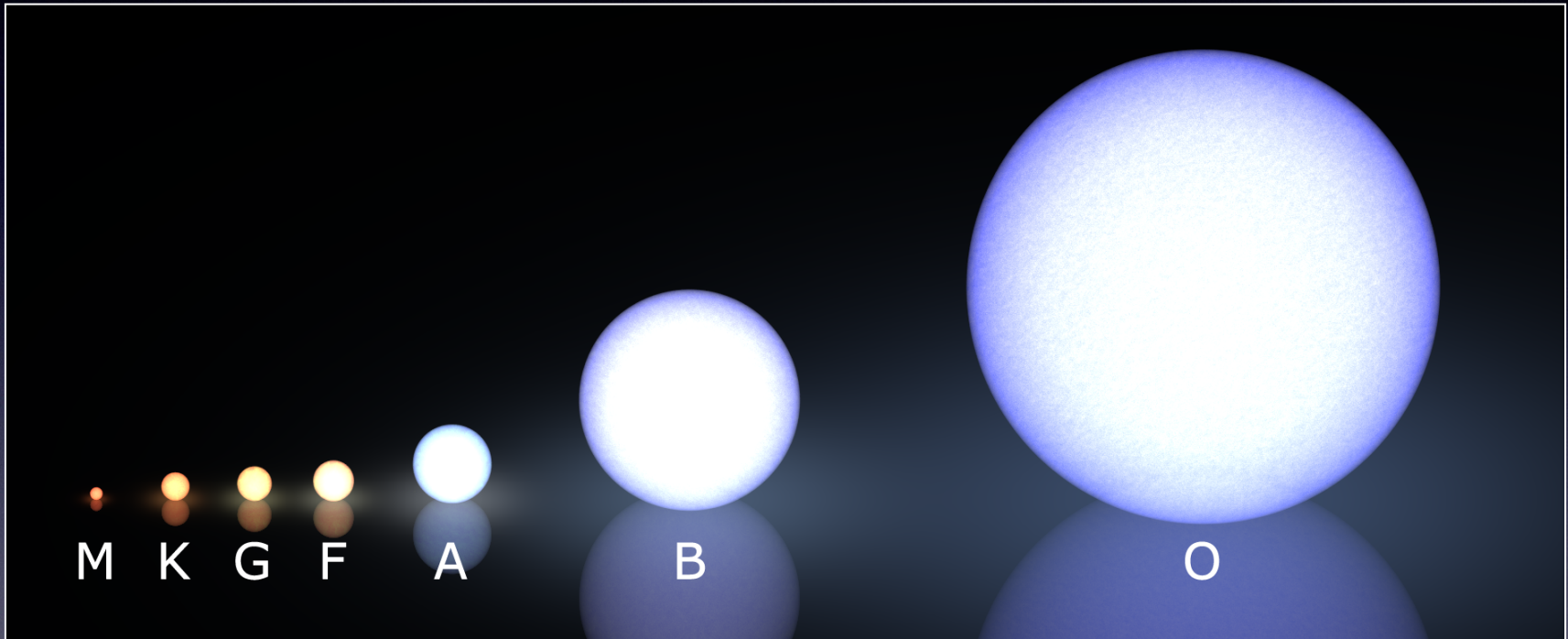
Classification of Stars

- Absolute Magnitude - how bright a star appears to an observer on Earth

  - Factors that Affect Absolute Magnitude:

    - Temperature

    - Size

    - Distance

Classification of Stars

- Absolute Brightness - the actual brightness of stars compared at a distance of 32.6 light years

  - Factors that Affect Absolute Brightness:

    - Temperature

    - Size

Classification of Stars

- Spectral Class - classification of stars based on analyzing the electromagnetic radiation emitted

  - Electromagnetic radiation is split with a prism into the rainbow of colors and spectral lines

M K G F A B O

Spectral Class

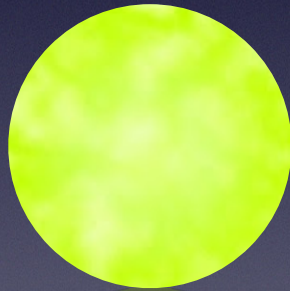Spectral Class O
28,000 K - 50,000 K

Spectral Class B
10,000 K - 28,000 K

Spectral Class A
7,500 K - 10,000 K

Spectral Class F
6,000 K - 7,500 K

Spectral Class G
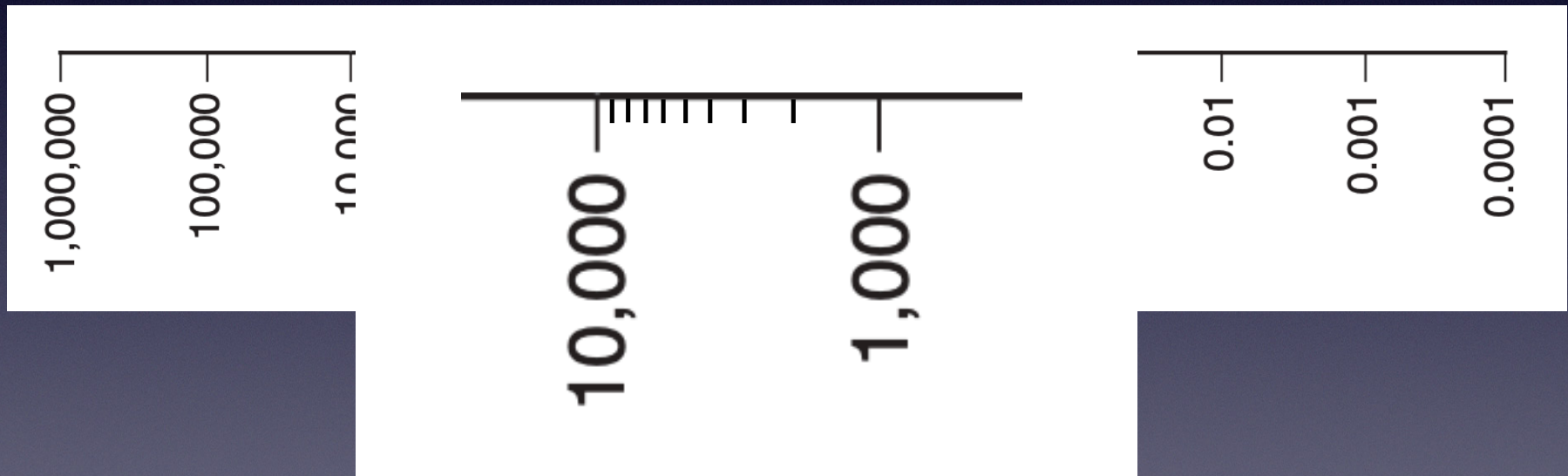5,000 K - 6,000 K

Spectral Class K
3,500 K - 5,000 K

Spectral Class M
2,500 - 3,500 K

Classification of Stars

- <u>Luminosity</u> - a measure of the rate of energy output
  - Our Sun is the baseline with 1 energy unit
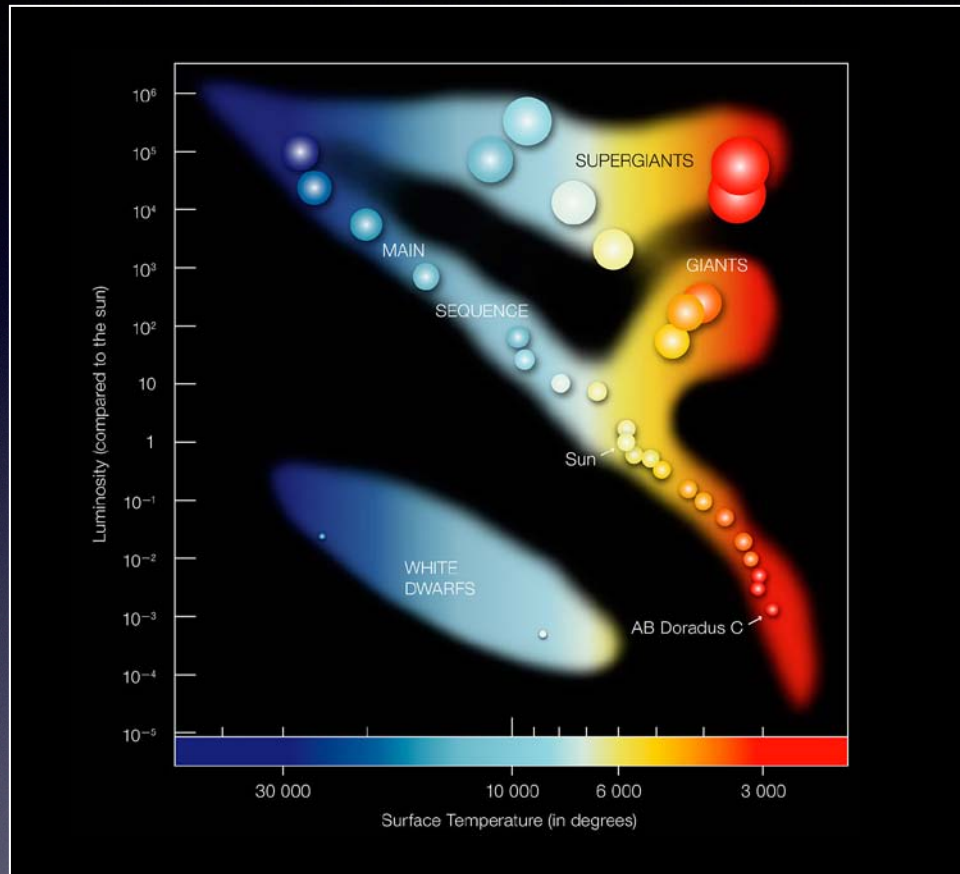 - Graphed on a logarithmic [non-linear] scale

Classification of Stars
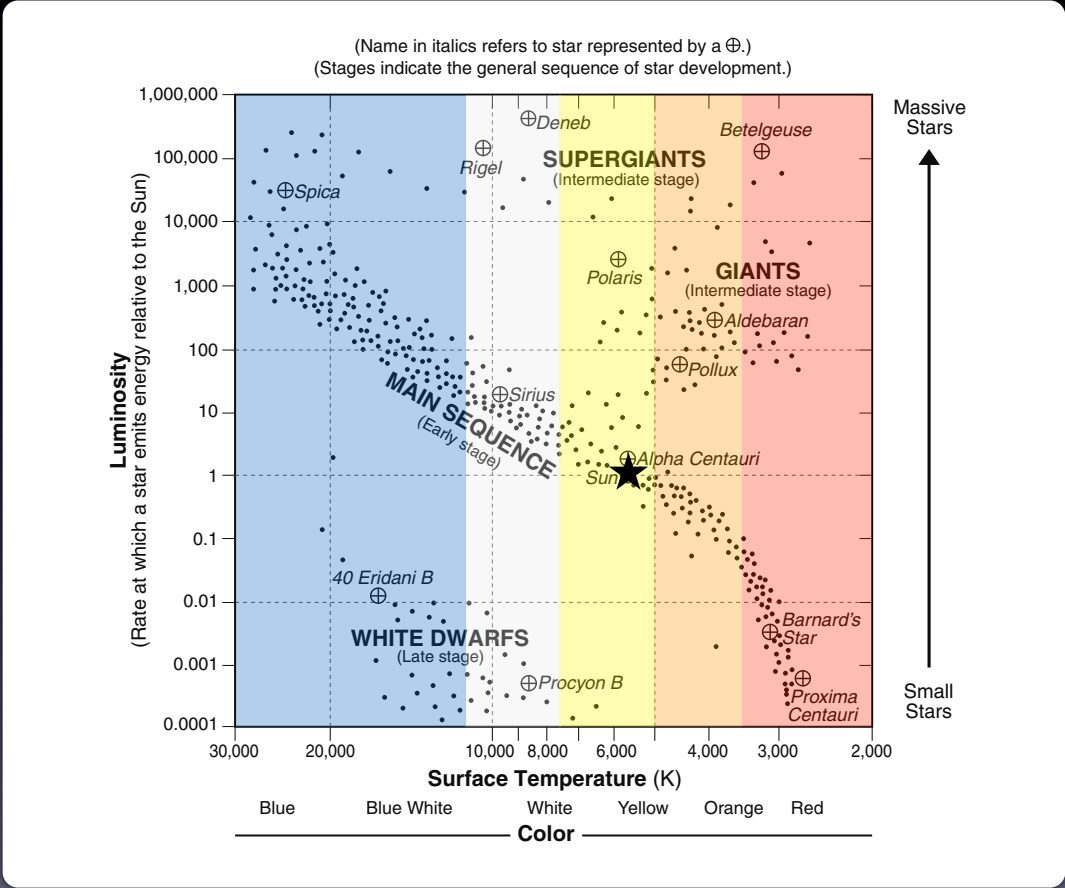
- Logarithmic [non-linear] Scale:

Classification of Stars

- <u>H-R Diagram</u> - chart used to describe the relationship between a star's surface temperature and luminosity

  - Developed by Ejner Hertzsprung of Denmark and Henry N. Russell of the United States

H-R Diagram

Earth Science Reference Tables