



Istituto Nazionale di Astrofisica
Osservatorio astronomico di Brera



Universo in fiore
Evoluzione stellare



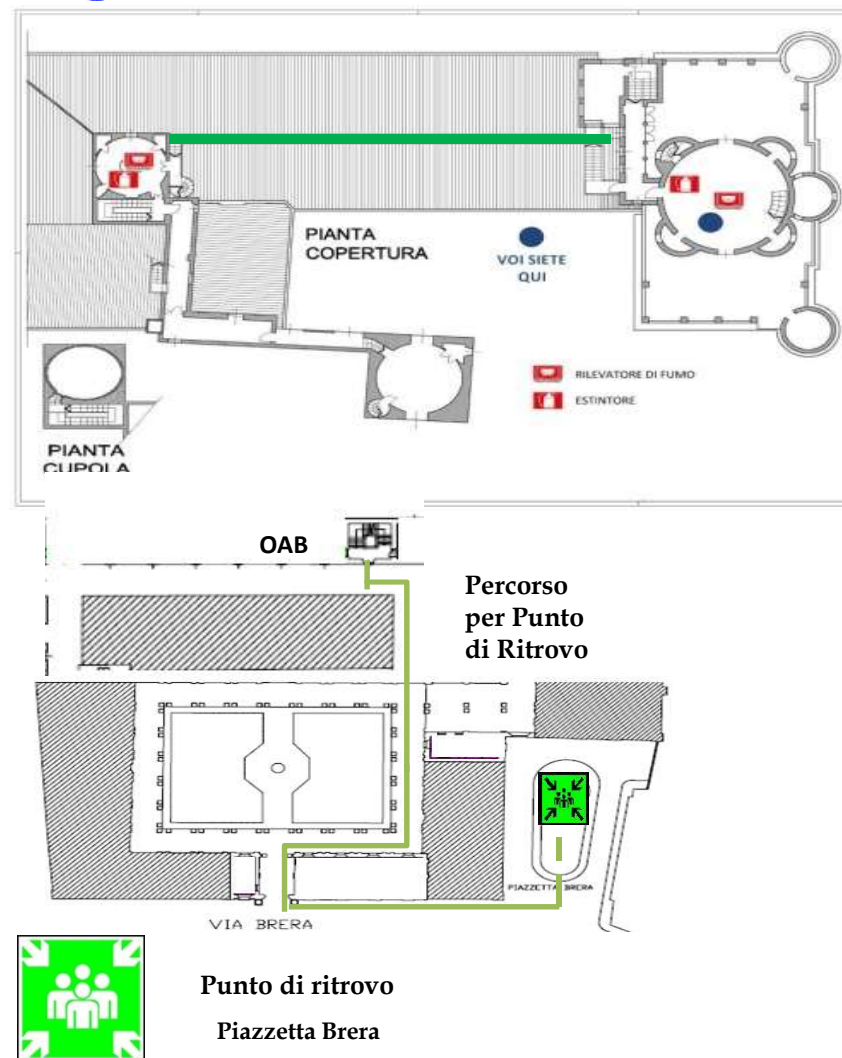
Ilaria Arosio

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INAF-Osservatorio Astronomico di Brera

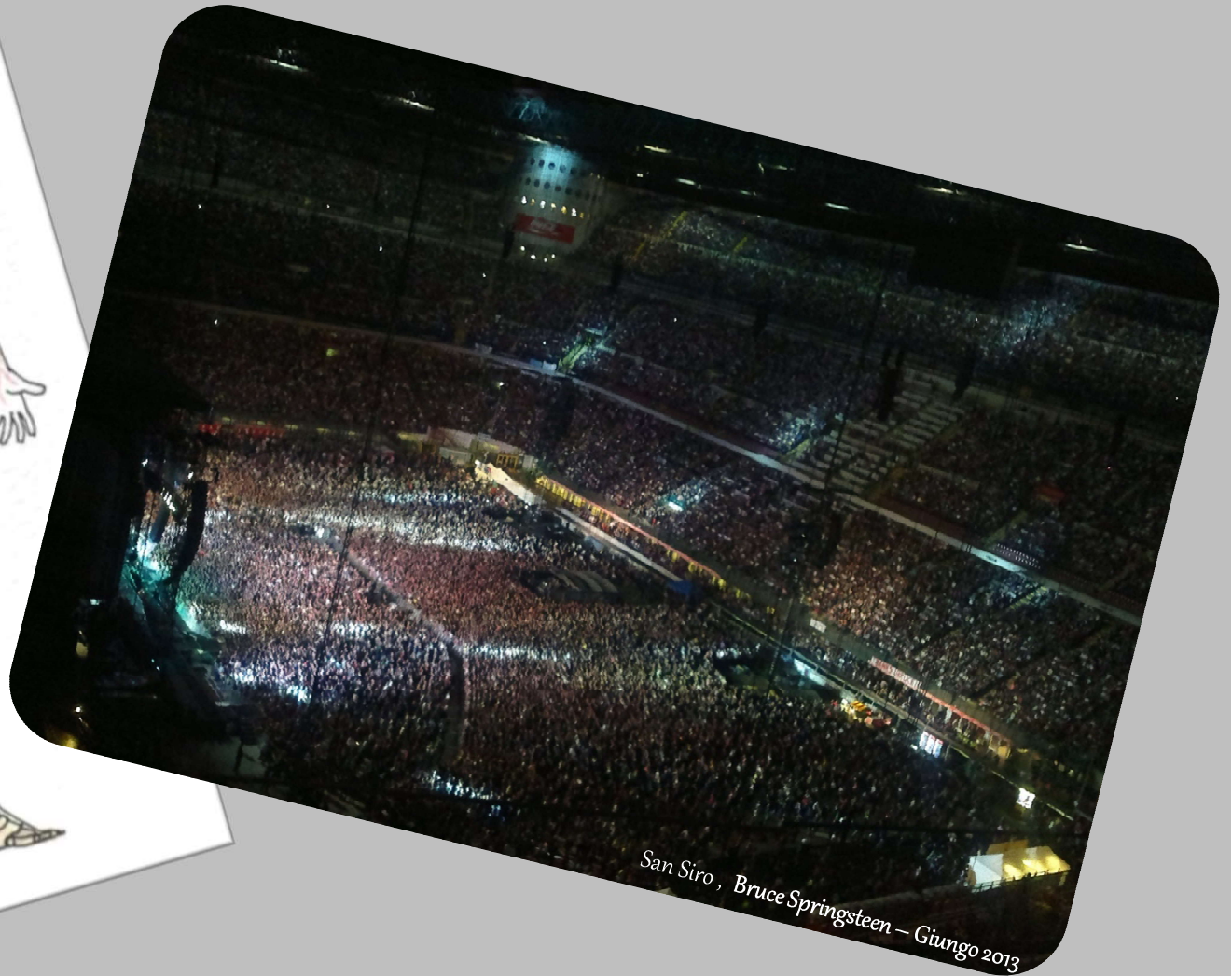
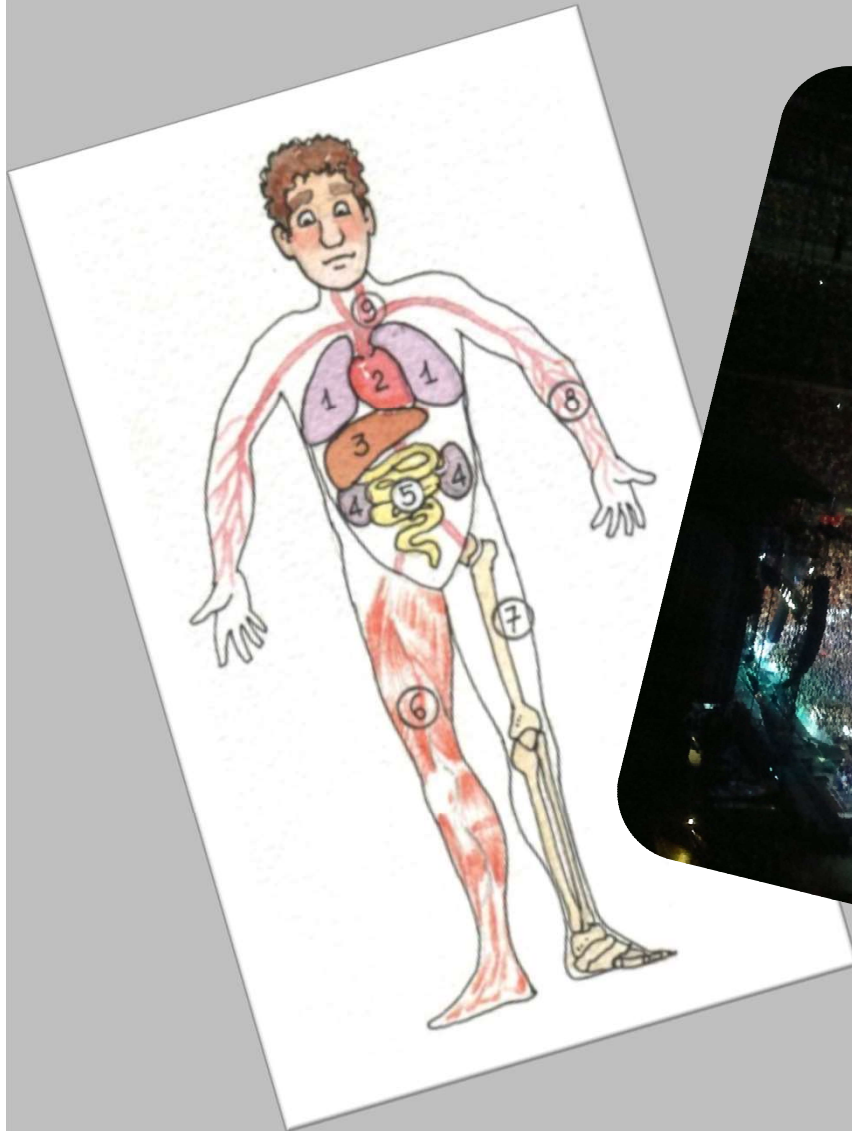


Uscite di Sicurezza vie di fuga in caso di Emergenza



Osservazione

Ci sono due modi per studiare una specie:



San Siro , Bruce Springsteen – Giungo 2013

Sole

Lista

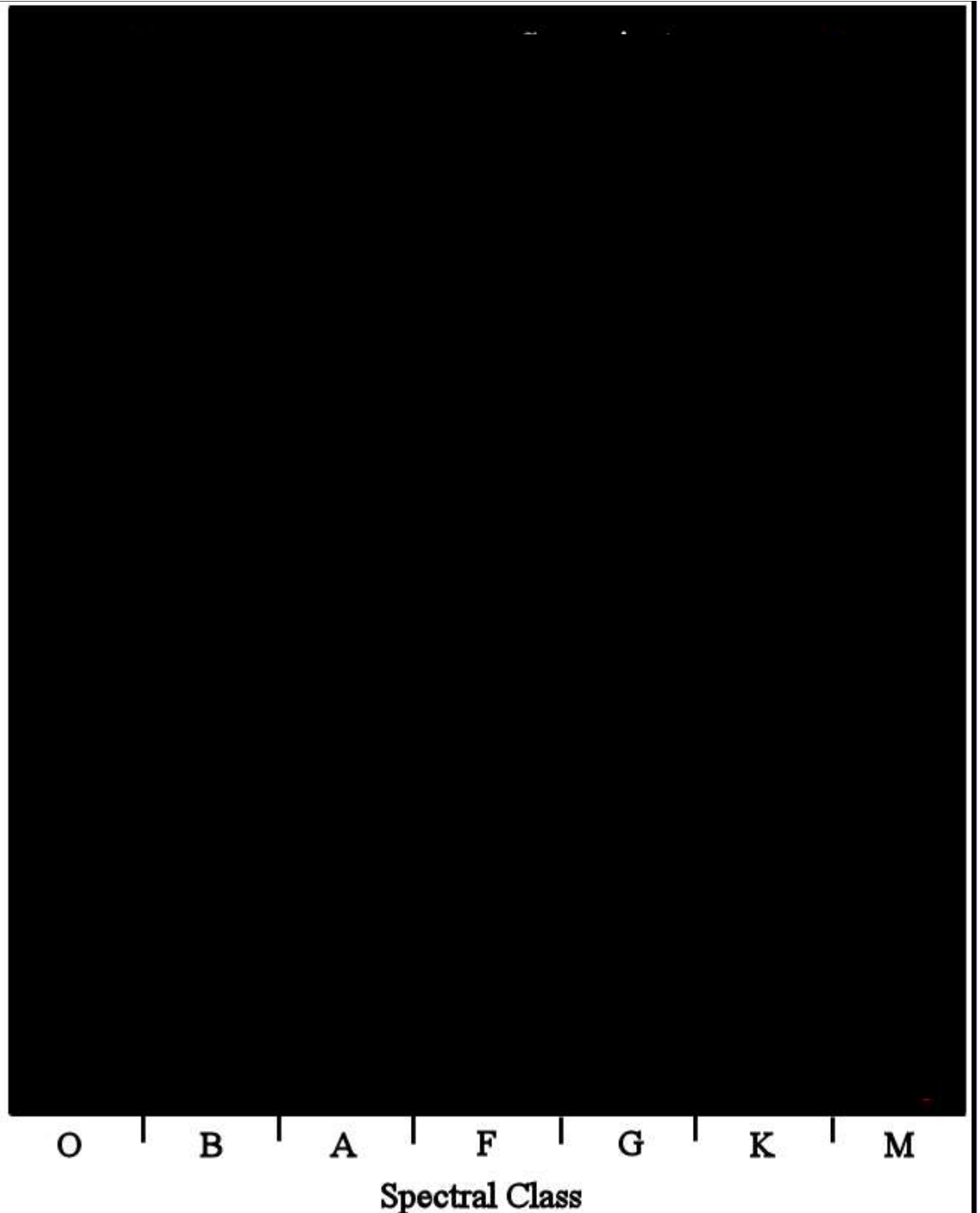
1910

Ejnar Hertzsprung e
Henry Norris Russell

idearono

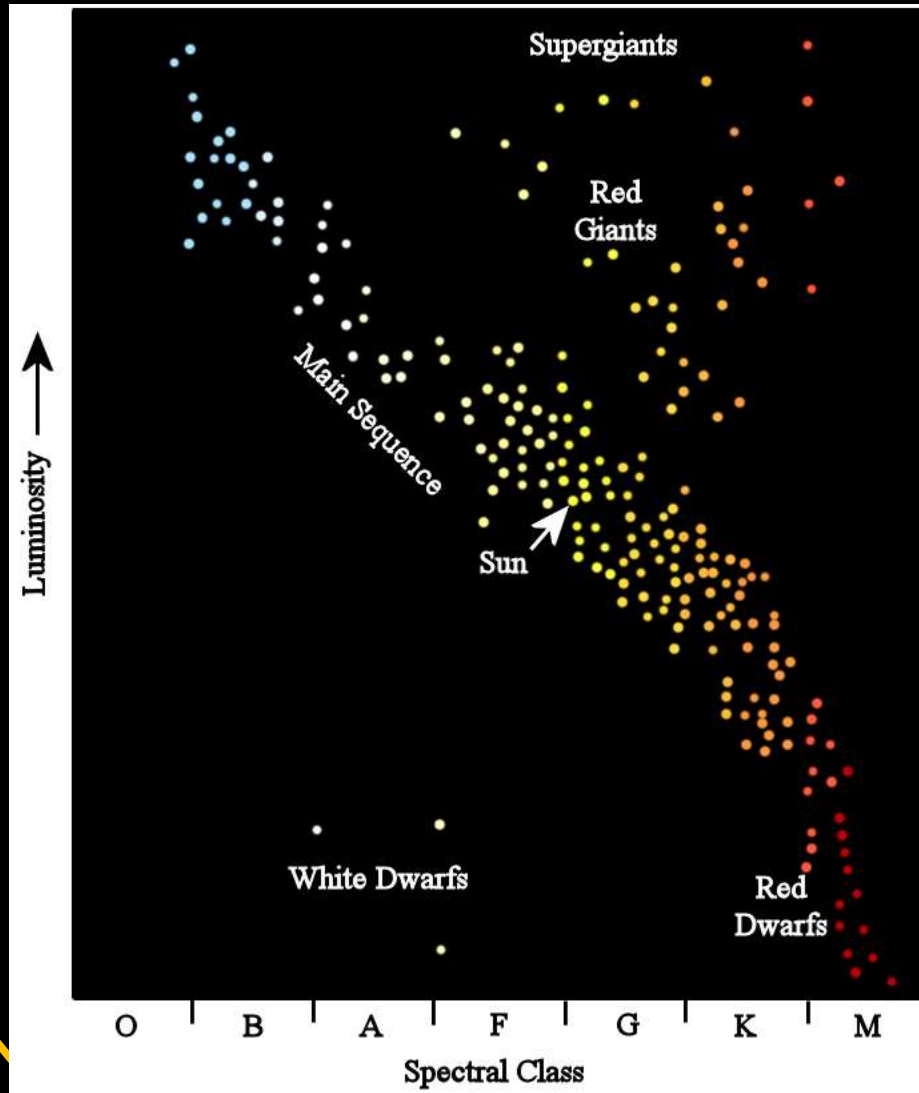
indipendentemente il
grafico che da loro prende
il nome

↑
Luminosity



Luminosità

temperatura



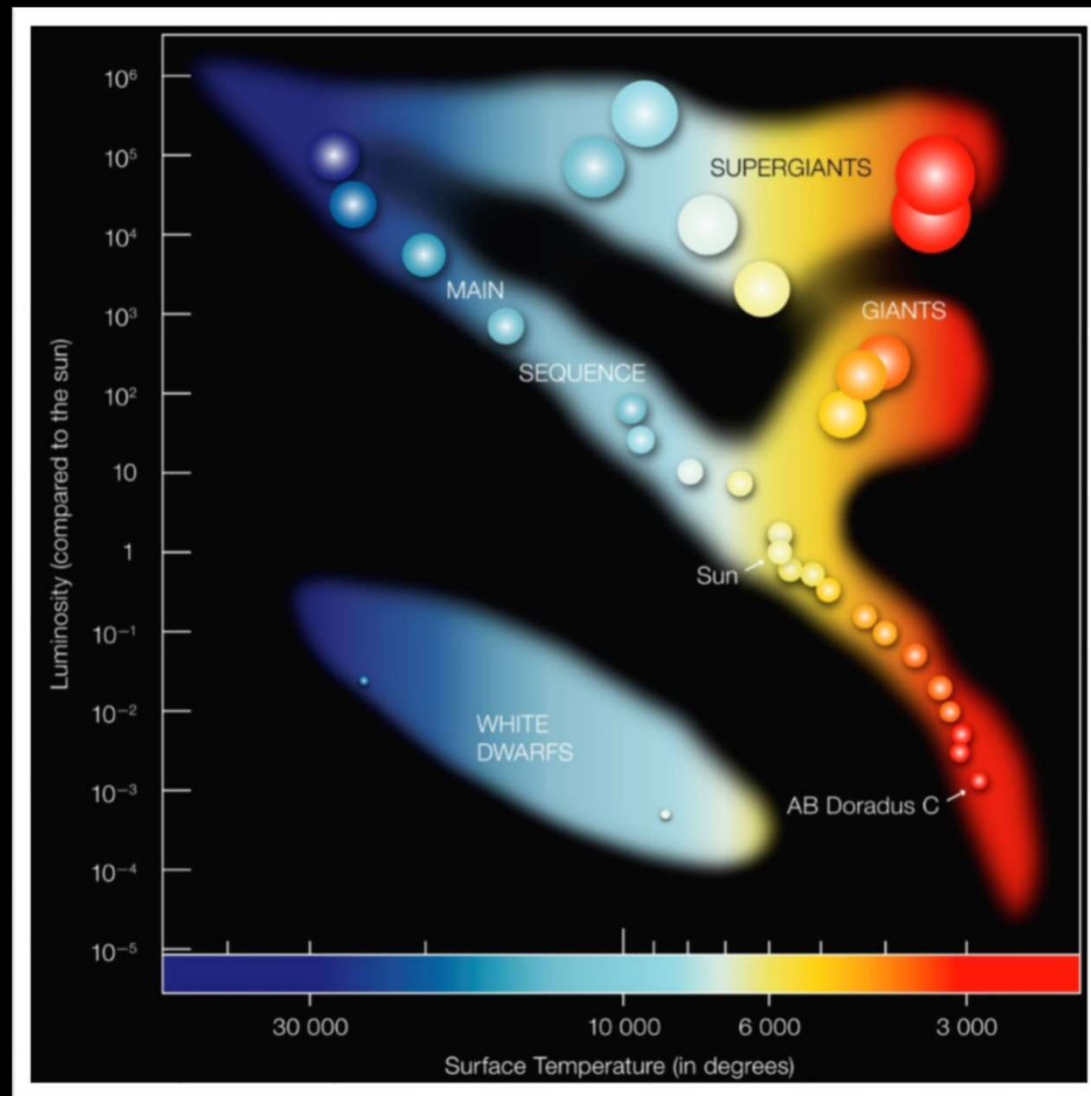
Classe spettrale

colore

equilibrio

composizione

luce

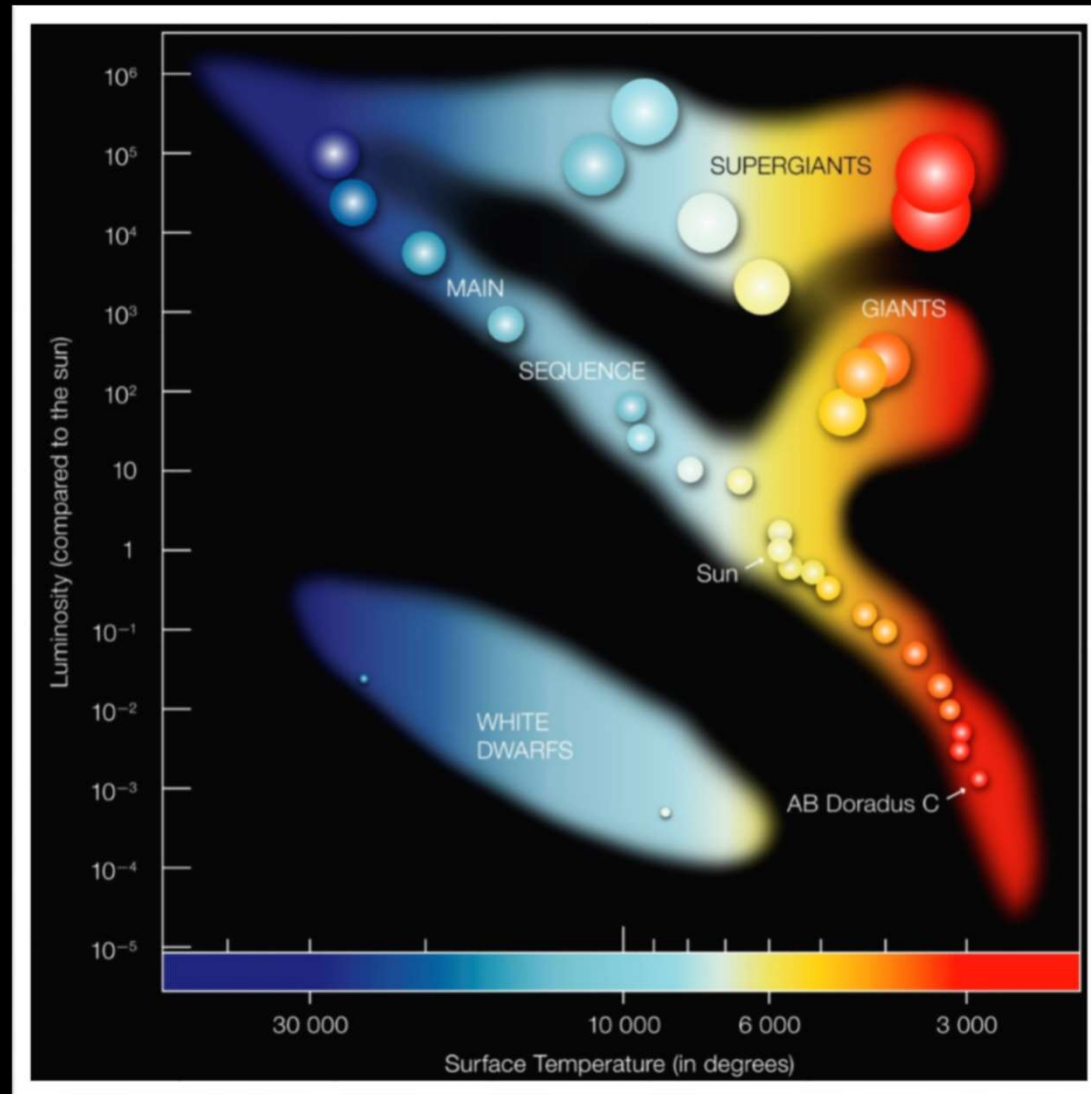


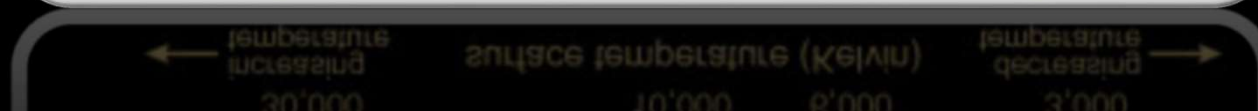
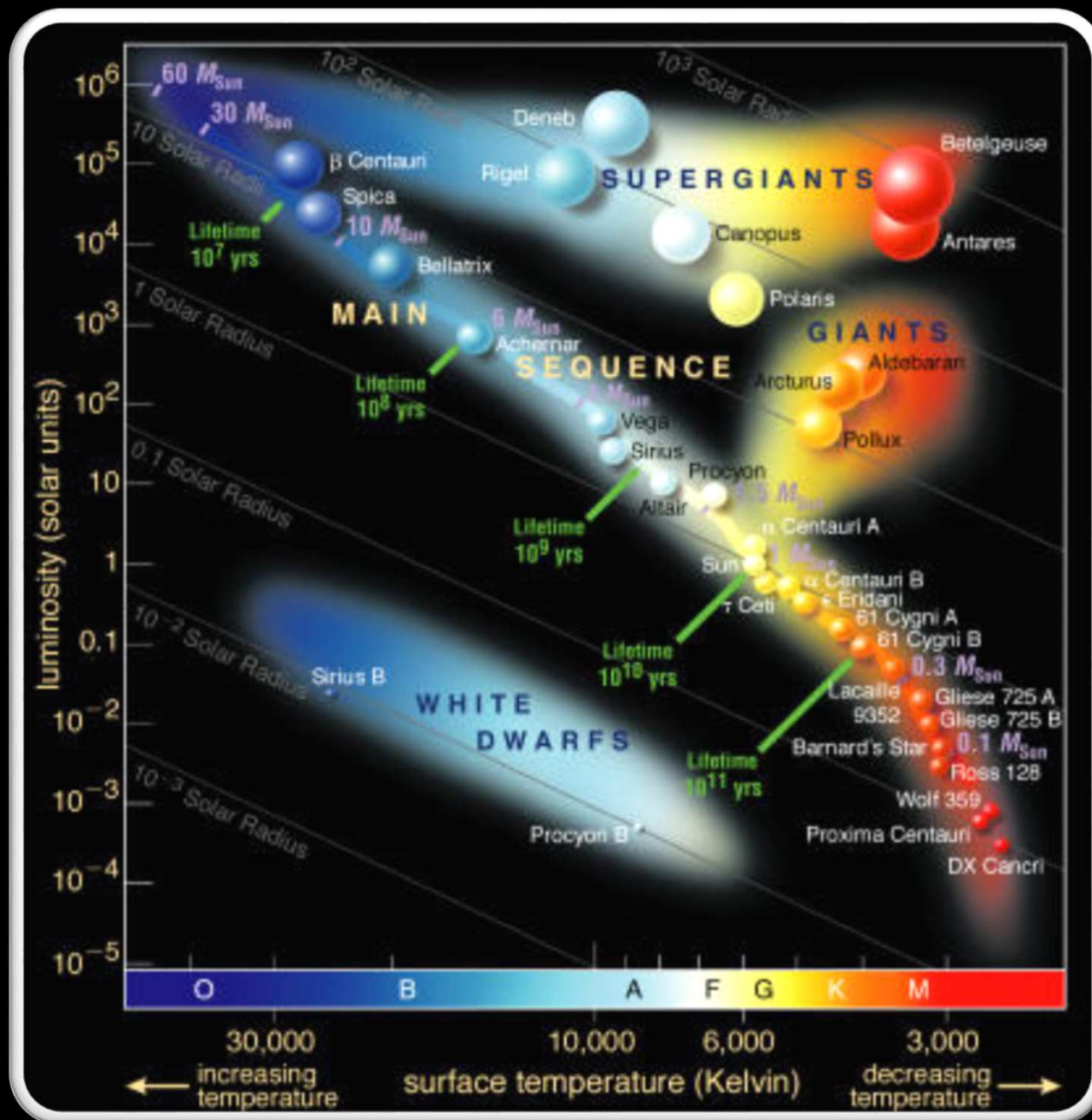
equilibrio

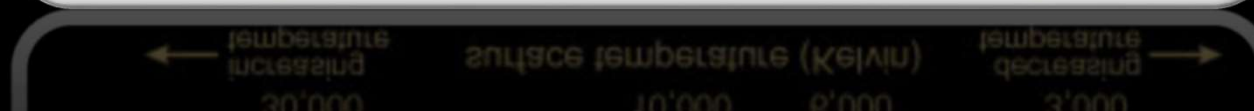
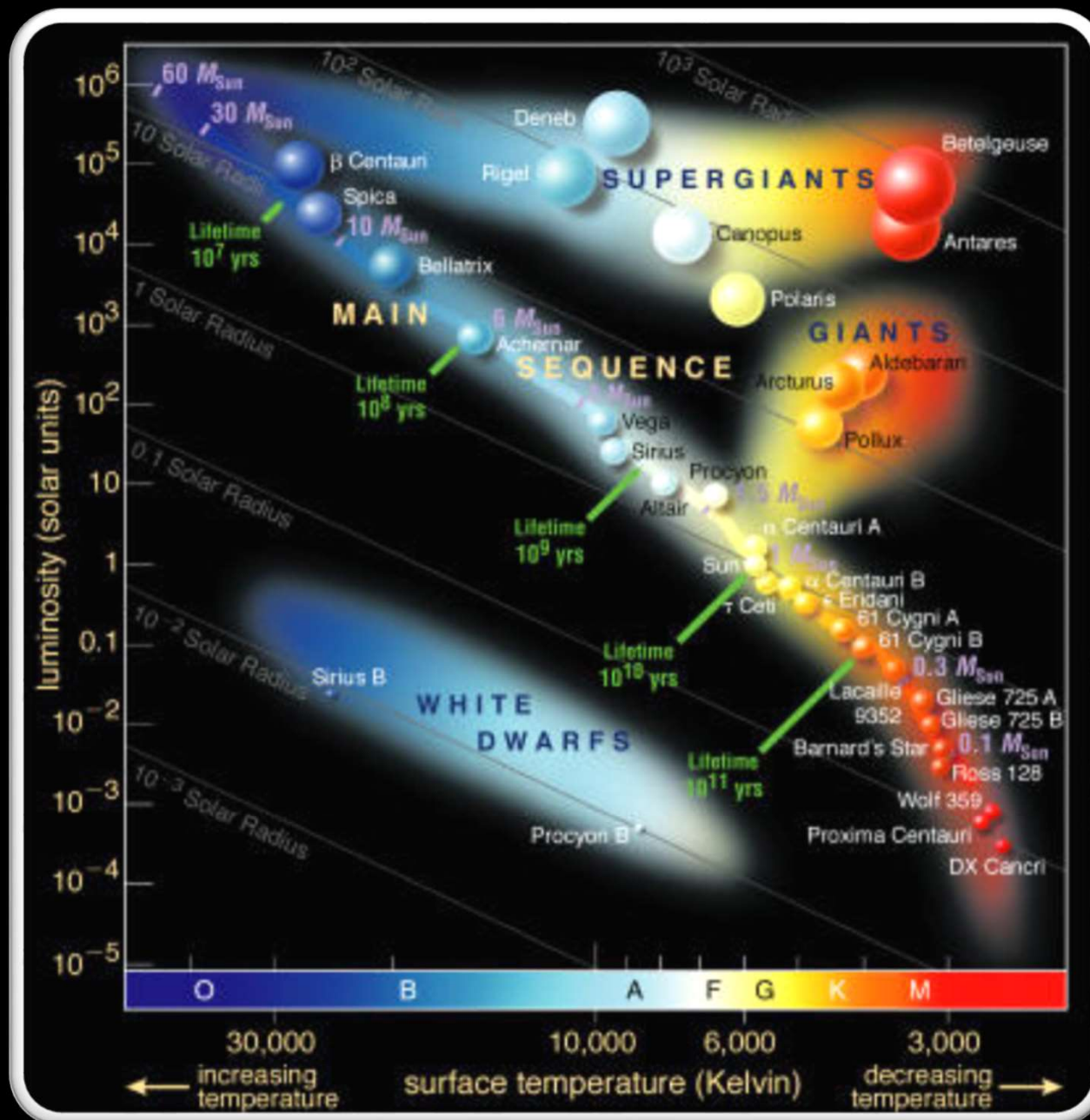
composizione

luce

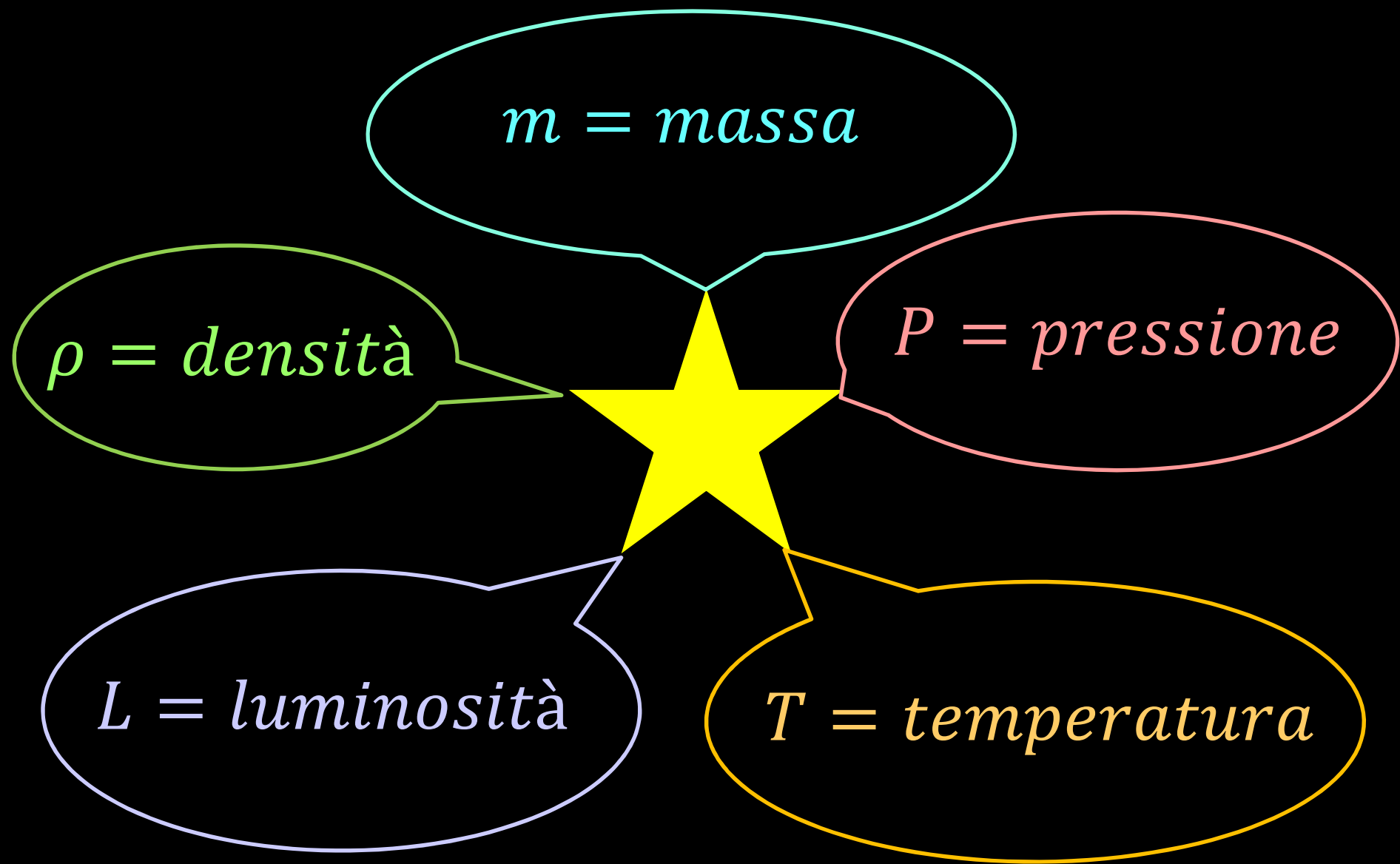
evoluzione







Modelli stellari – equilibrio stellare:



Modelli stellari – equilibrio stellare:

m

ρ

L

T

P

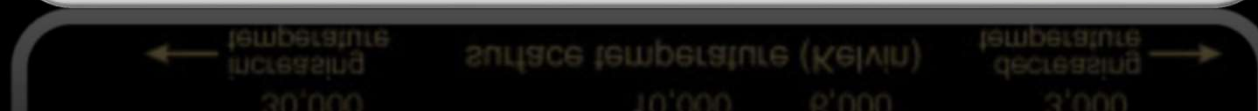
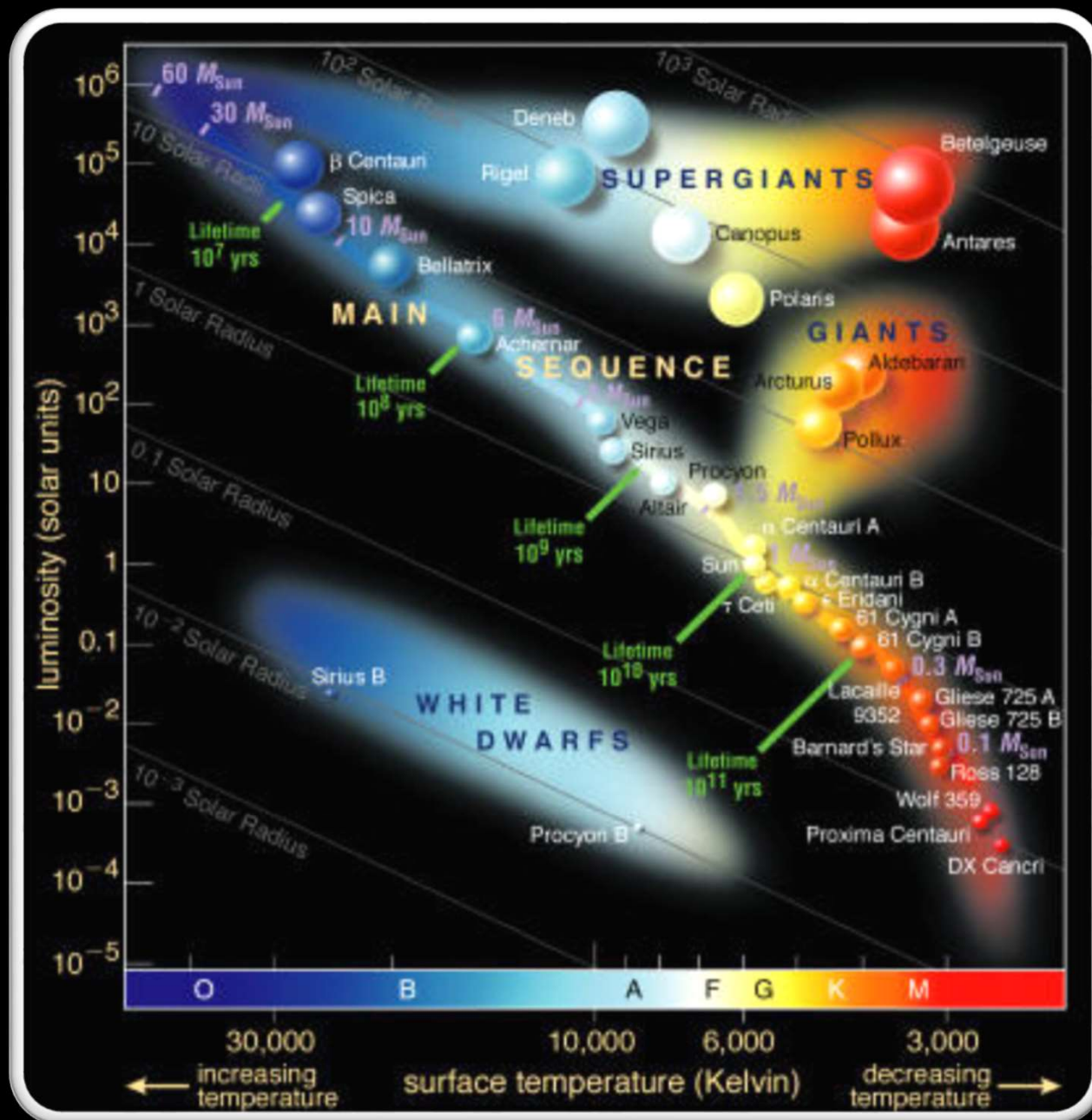
Equilibrio idrostatico: $\frac{dP}{dr} = -\rho \frac{Gm}{r^2}$

Densità:
 $\frac{dm}{dr} = 4\pi r^2 \rho$

Pressione :
 $P = P_e + \frac{\rho kT}{m_h \mu} + \frac{1}{3} a T^4$

Equilibrio energetico:
 $\frac{dL}{dr} = 4\pi r^2 \rho \varepsilon_{nuc}$

Trasferimento di energia:
 $\frac{dT}{dr} = \text{radiativo o convettivo}$





Nebulosa della carena – formazione stellare



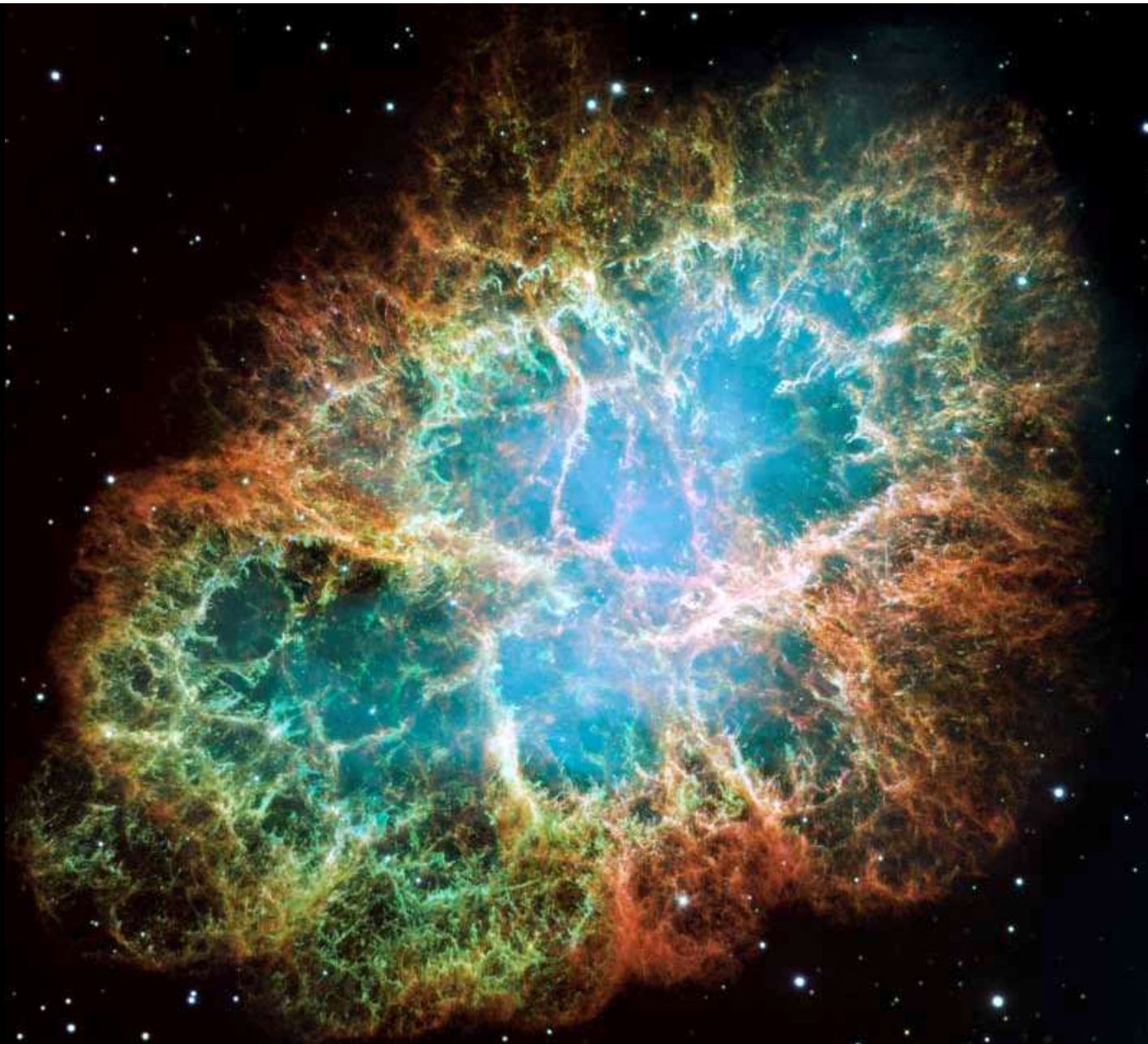
Ammasso aperto- NGC 3603



Nebulosa della carena – formazione stellare



Ammasso aperto – NGC 290



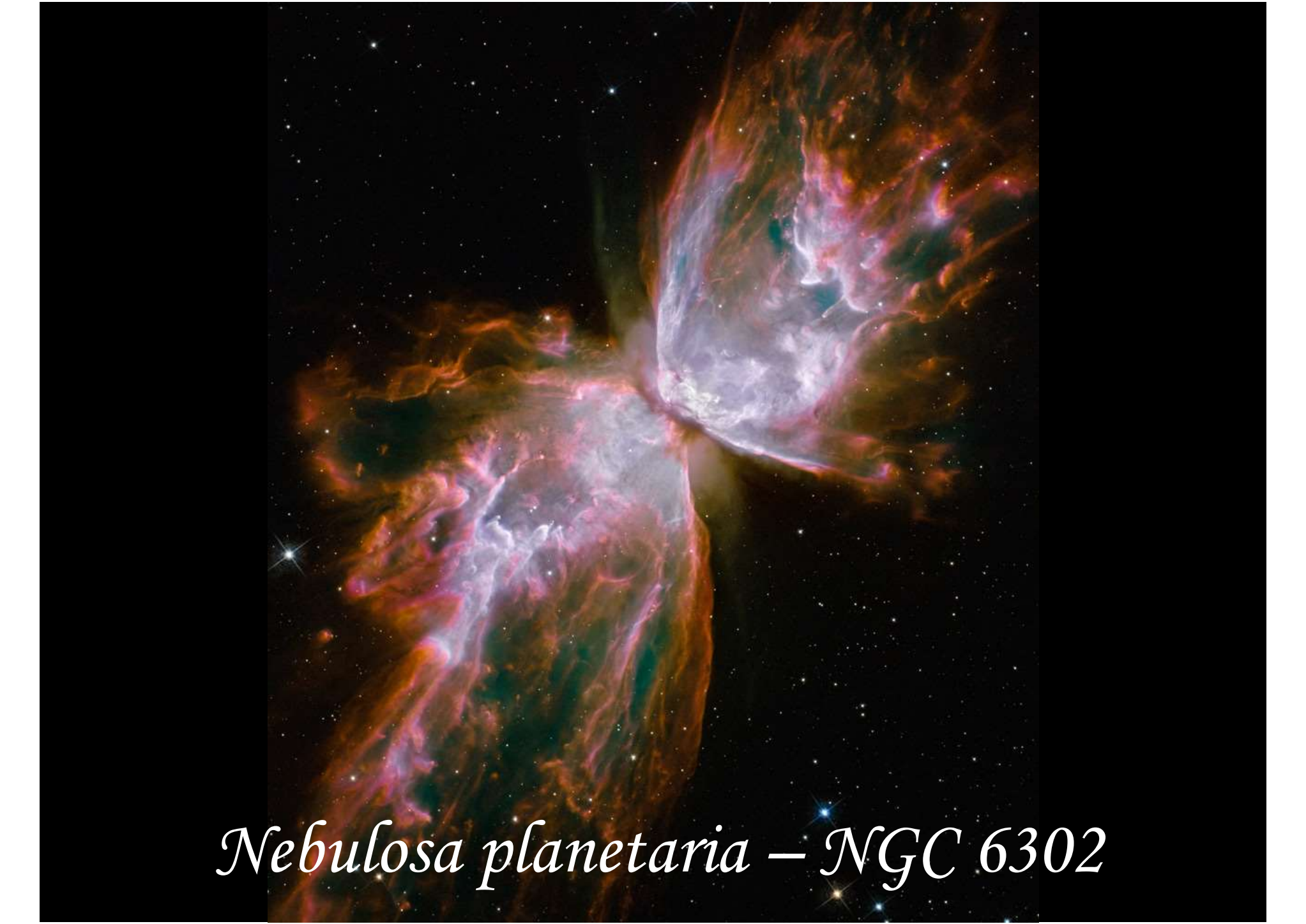
Nebulosa del granchio - Resto di supernova



Ammasso globulare – Omega Centauri



Getto di gas nella nebulosa della carena



Nebulosa planetaria – NGC 6302



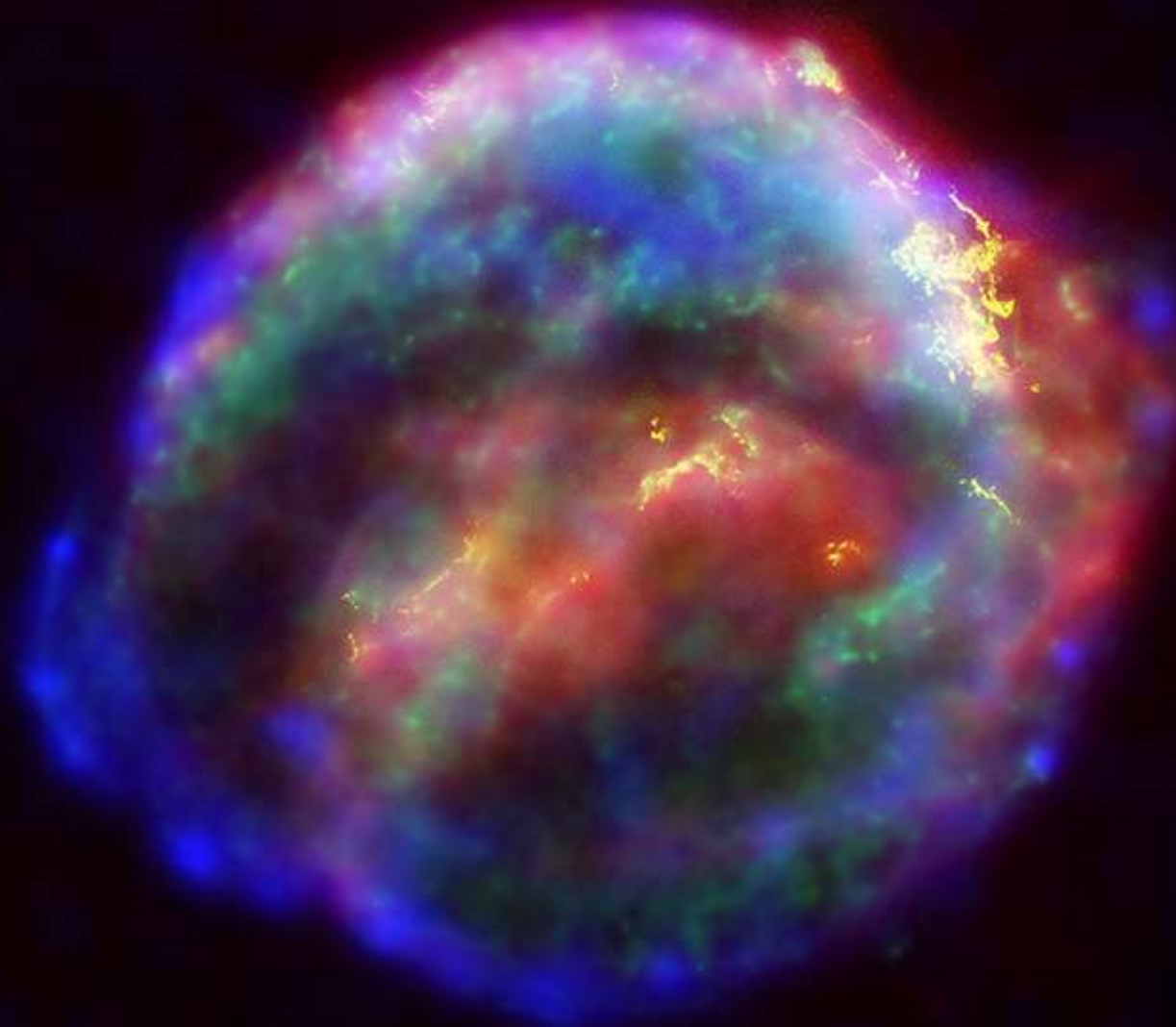
V838 Monocerotis – stella variabile



Ammasso globulare – M80



Nebulosa planetaria - Occhio di gatto



Resti della supernova Keplero



Formazione stellare nella piccola nube di Magellano

A deep-field astronomical image of a globular cluster, NGC 1846. The cluster is a dense, roughly spherical collection of stars, with a high concentration of stars in the center that gradually becomes sparser towards the edges. The stars appear in various colors, including white, yellow, orange, and blue, indicating different temperatures and stages of stellar evolution. The background is a deep black, punctuated by the light of the cluster's stars.

Ammasso globulare NGC 1846



Nebulosa planetaria – IC 418



Nebulosa testa di cavallo – formazione stellare



Nebulosa planetaria - Clessidra



*«La Chiocchetta per l'aia azzurra
va co suo pigolio di stelle»*

- Il gelsomino notturno - G. Pascoli