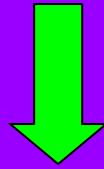


ORIGEM DOS ELEMENTOS

118 Elementos

**90 elementos
naturais**

28 artificiais



**Elementos 94-96
isolados em
quantidades apreciáveis**

H <										
--	--	--	--	--	--	--	--	--	--	--

Ce ⁵⁸	Pr ⁵⁹	Nd ⁶⁰	Pm ⁶¹	Sm ⁶²	Eu ⁶³	Gd ⁶⁴	Tb ⁶⁵	Dy ⁶⁶	Ho ⁶⁷	Er ⁶⁸	Tm ⁶⁹	Yb ⁷⁰	Lu ⁷¹
Th ⁹⁰	Pa ⁹¹	U ⁹²	Np ⁹³	Pu ⁹⁴	Am ⁹⁵	Cm ⁹⁶	Bk ⁹⁷	Cf ⁹⁸	Es ⁹⁹	Fm ¹⁰⁰	Md ¹⁰¹	No ¹⁰²	Lr ¹⁰³

Origem dos Elementos

Teoria do Big - Bang



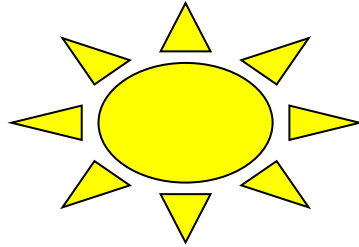
**Explosão
Primordial**

Resfriamento

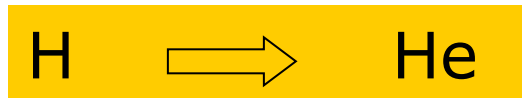


Atração Gravitacional H

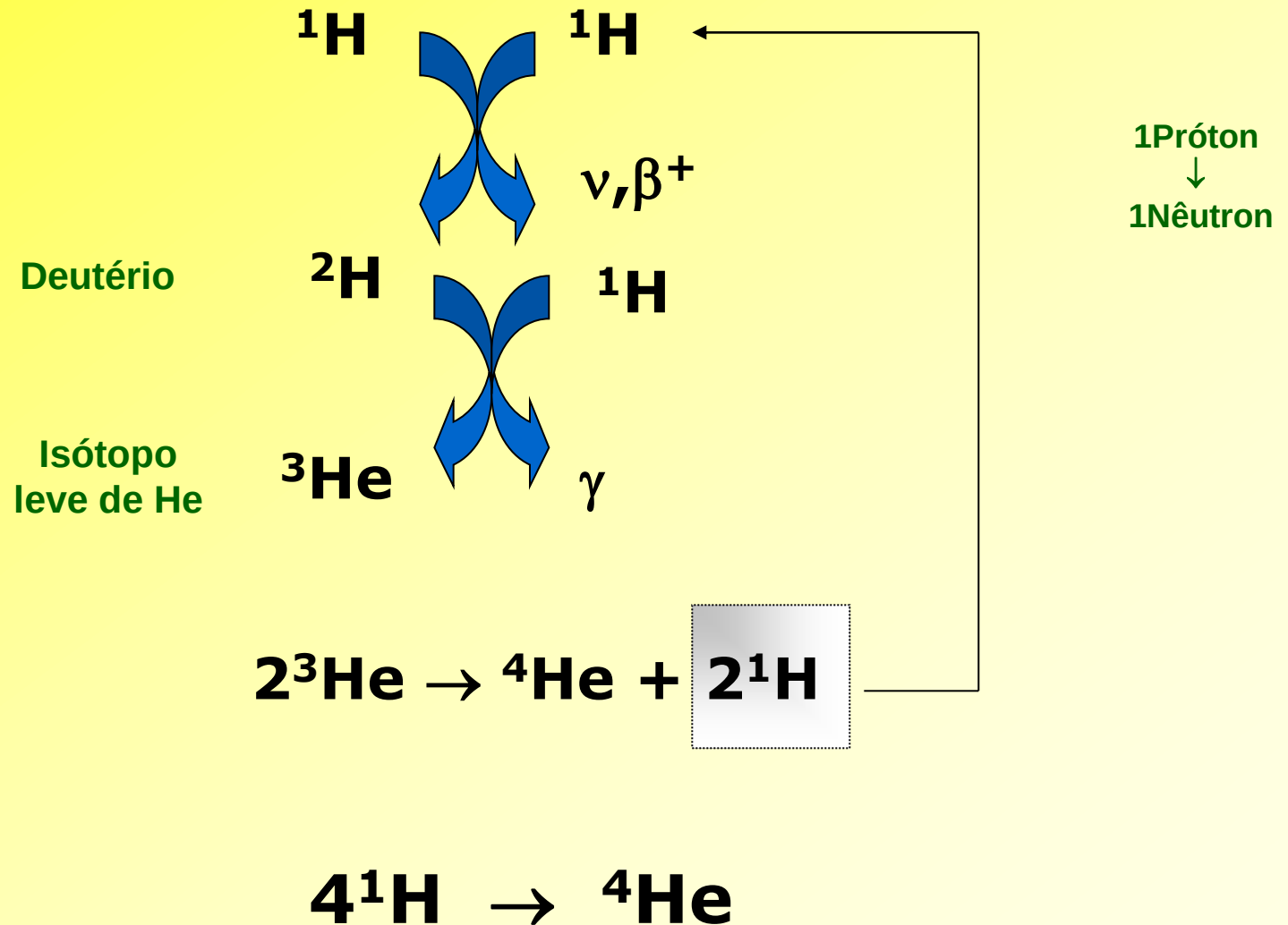
Atração Gravitacional

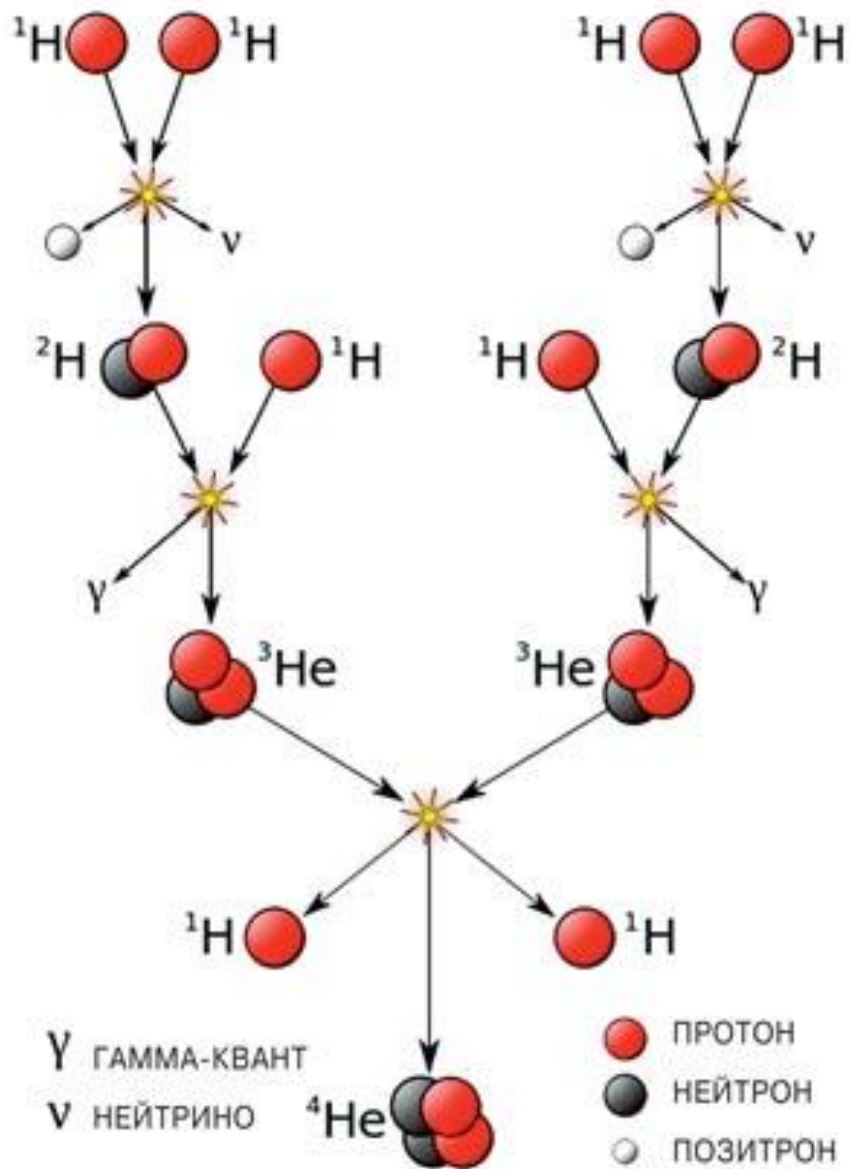


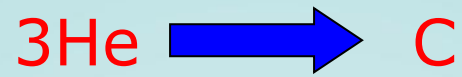
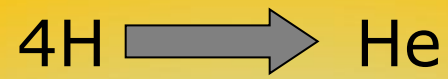
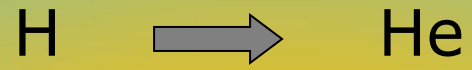
Estrelas



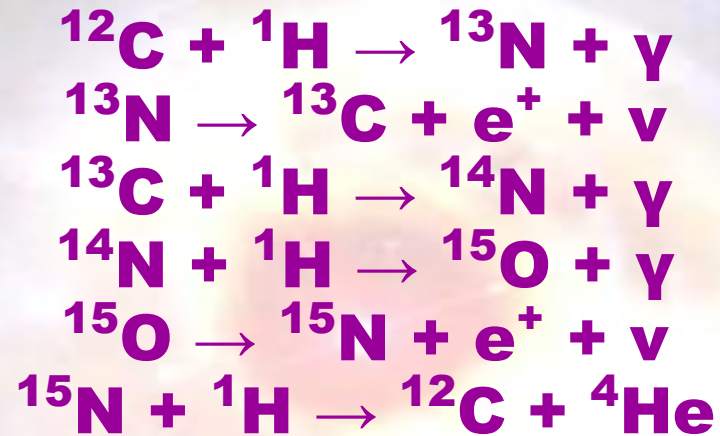
Conversão $\text{H} \rightarrow \text{He}$ nas Estrelas $T < 10^7 \text{K}$ (Ciclo de Prótons)







O Ciclo CNO



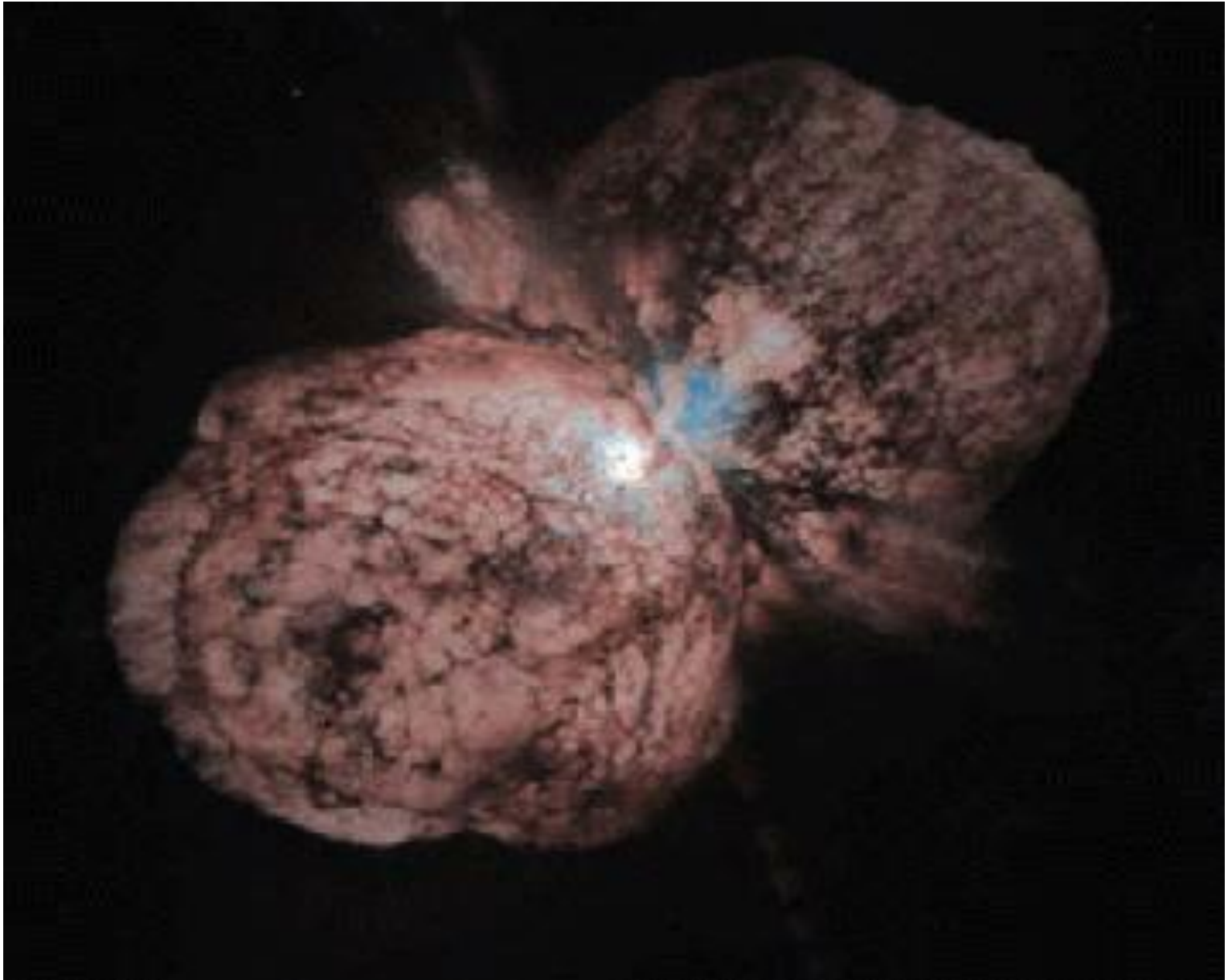
Temperatura 20×10^6 K

Envelhecimento das Estrelas



Supernova

ETA CARINAE

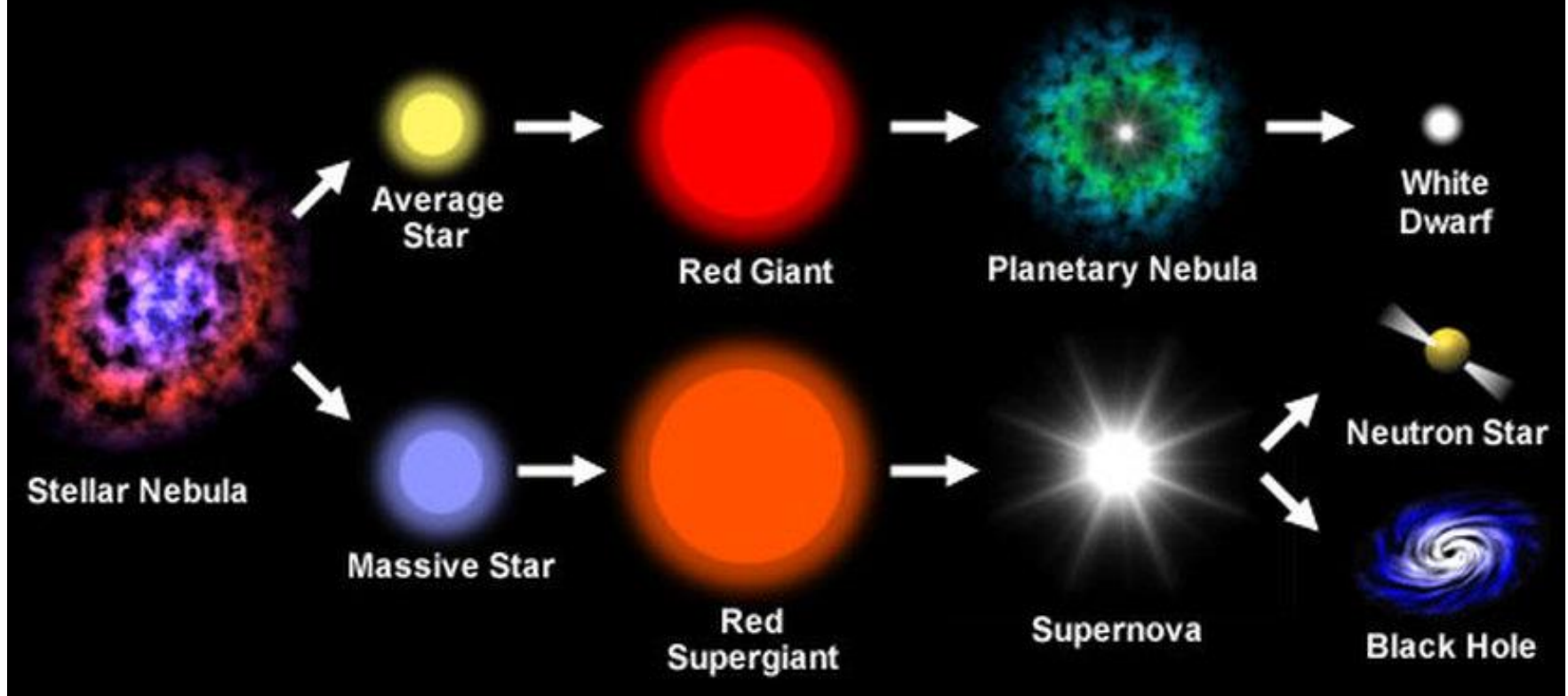


Supernova

Nebulosa { **Espalhamento de Matéria**
+
H

→ **Novas Estrelas + Planetas**

Life Cycle of a Star

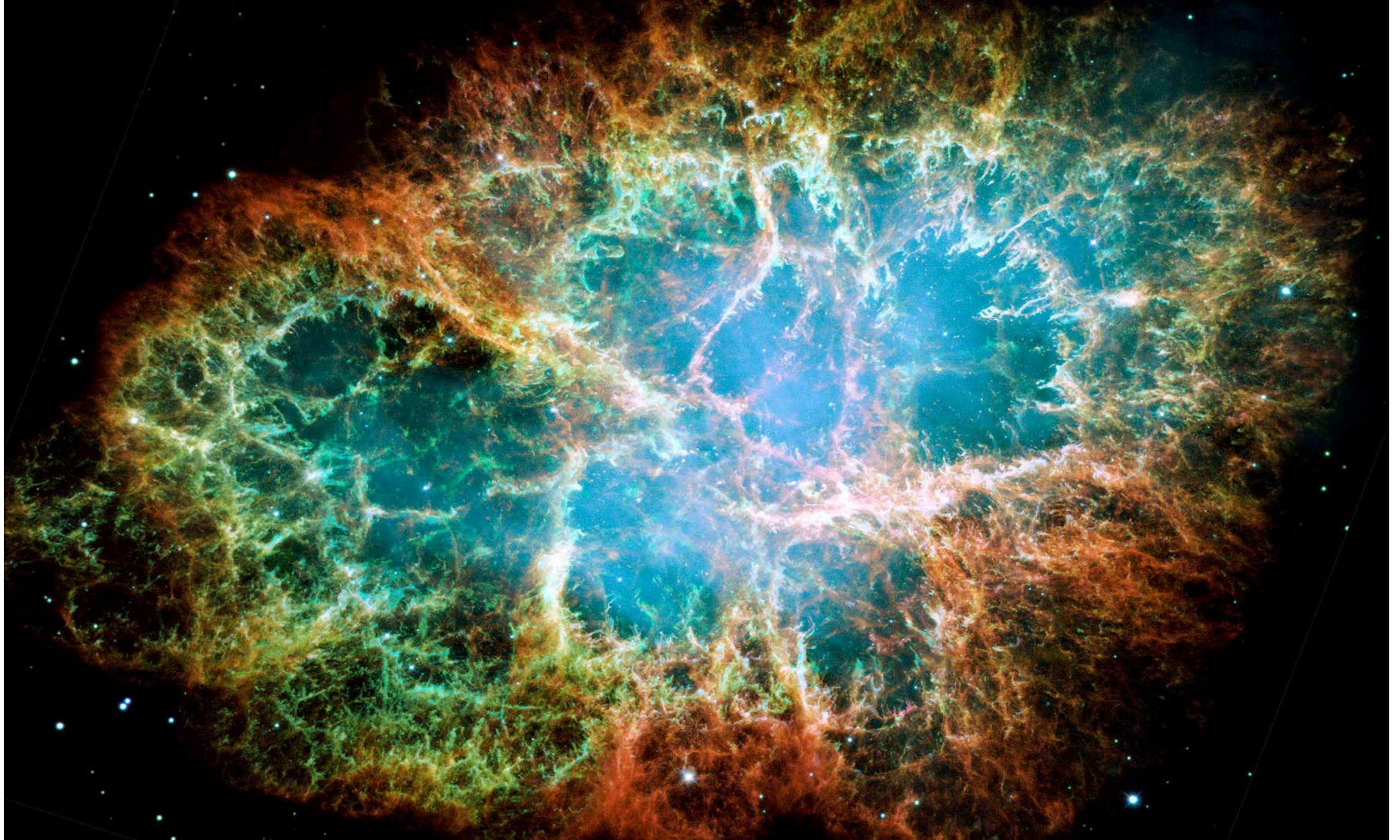




NEBULOSA DE ORION



NEBULOSA DO CARANGUEJO



Documentário:

Hubble os Segredos do Universo

<https://www.youtube.com/watch?v=CehTJyPeua8>

<https://www.dailymotion.com/video/x6bmioI>

Documentário:

Como Funciona o Universo: Estrelas

https://www.youtube.com/watch?v=_1vZyIfYmZA

Documentário na Netflix:

The Universe Temporada 2

Episódio: Supernovas