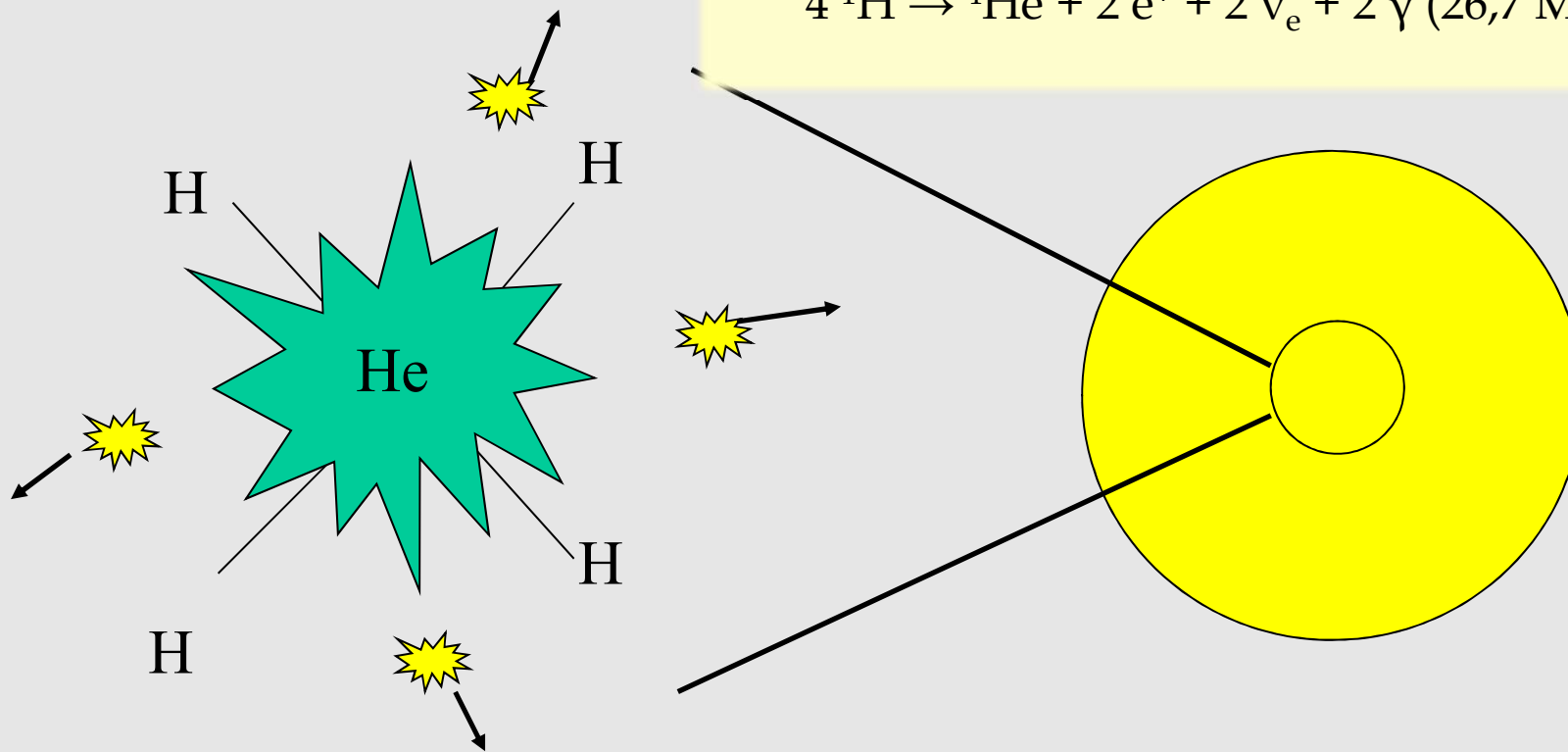
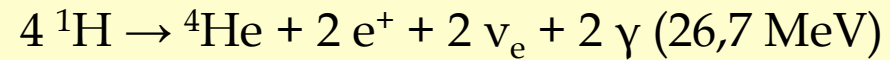
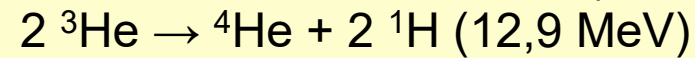
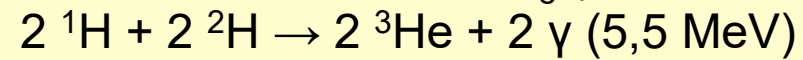
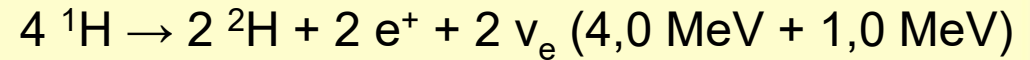
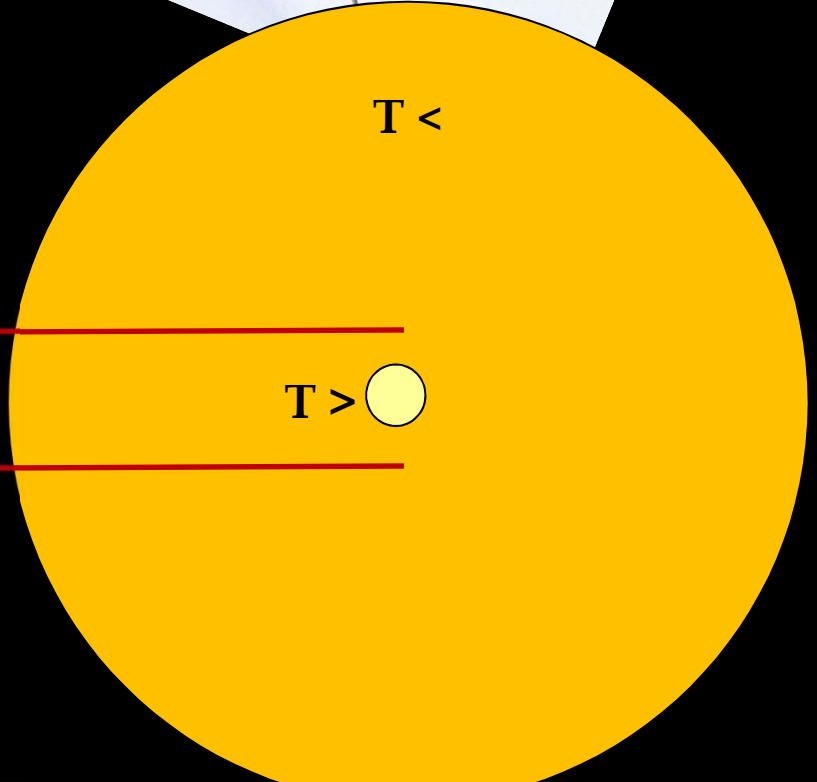
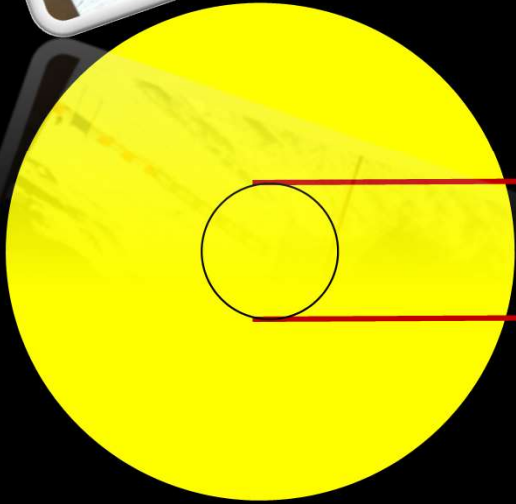
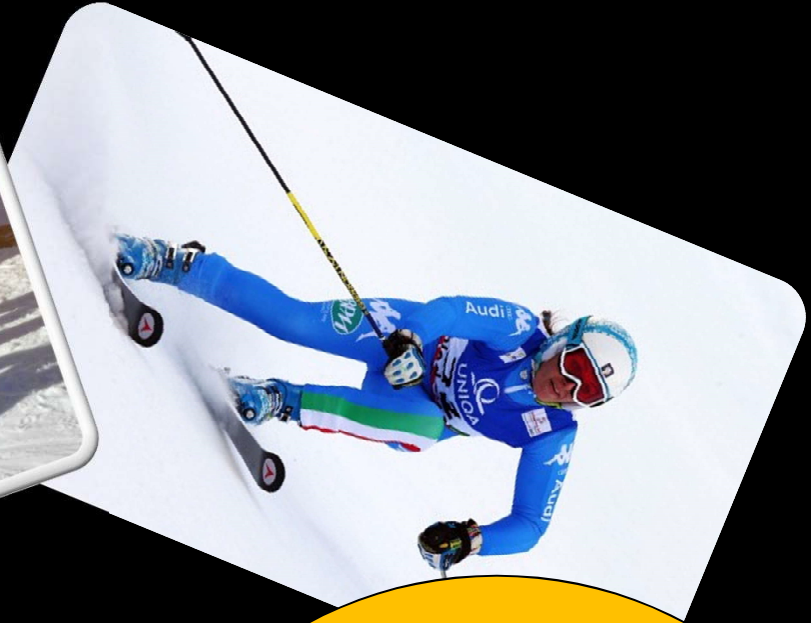
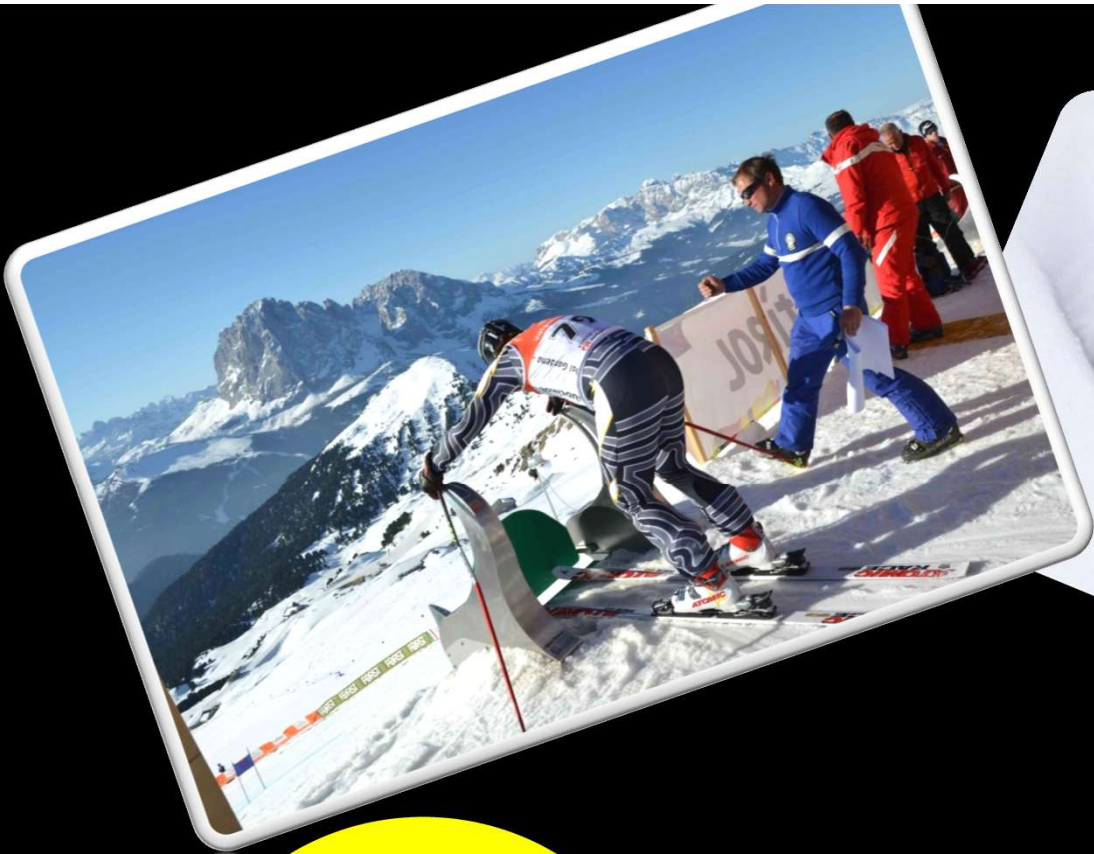
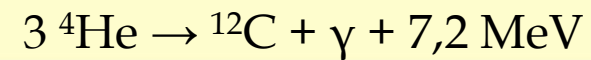
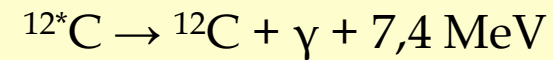
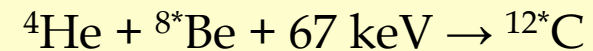
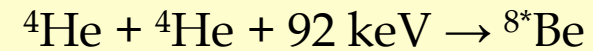
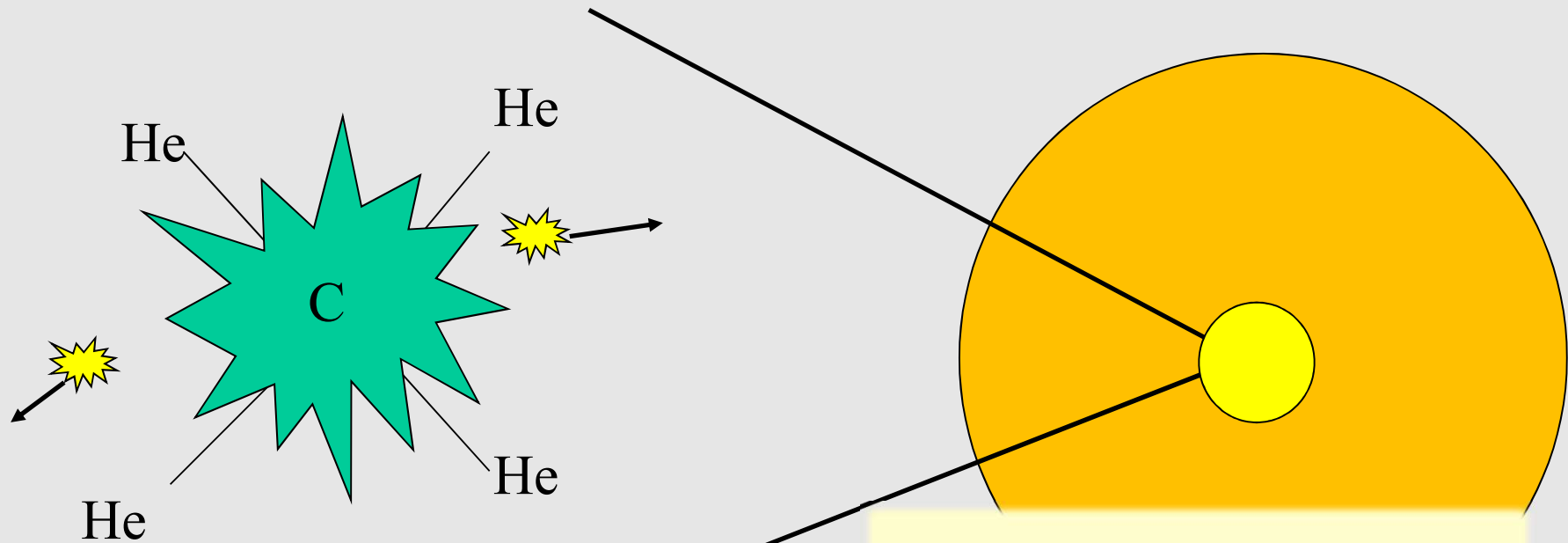


All'interno della stella avvengono delle reazioni tra le particelle chiamate reazioni nucleari:

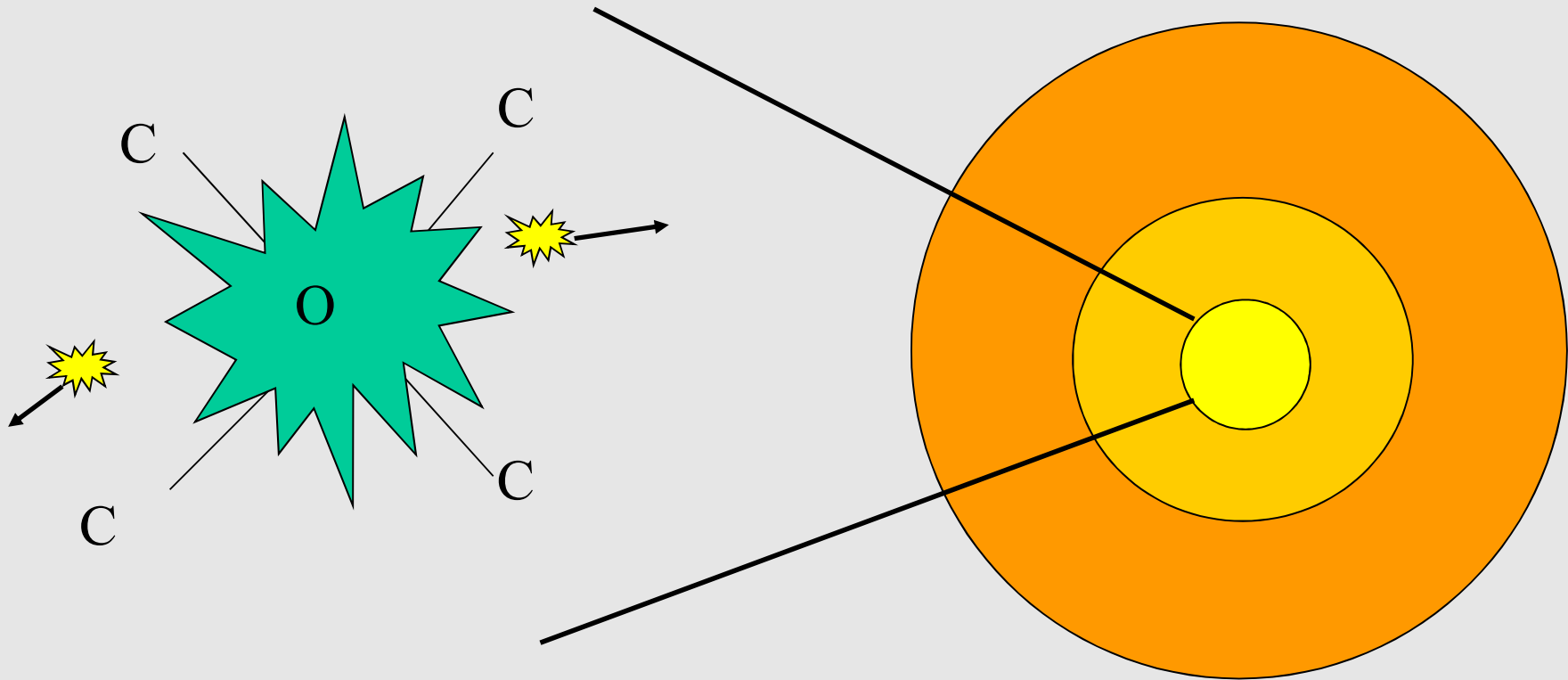


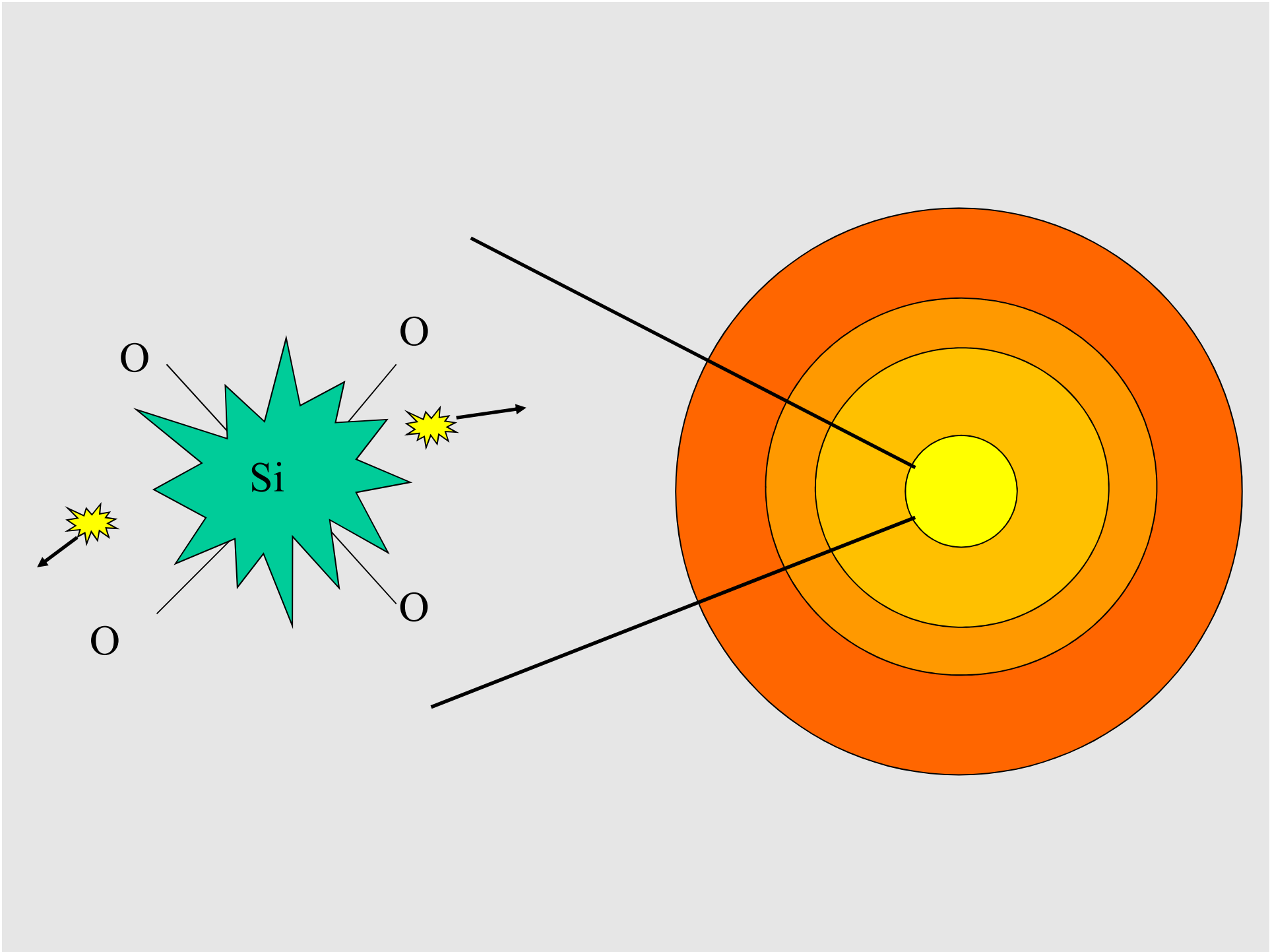


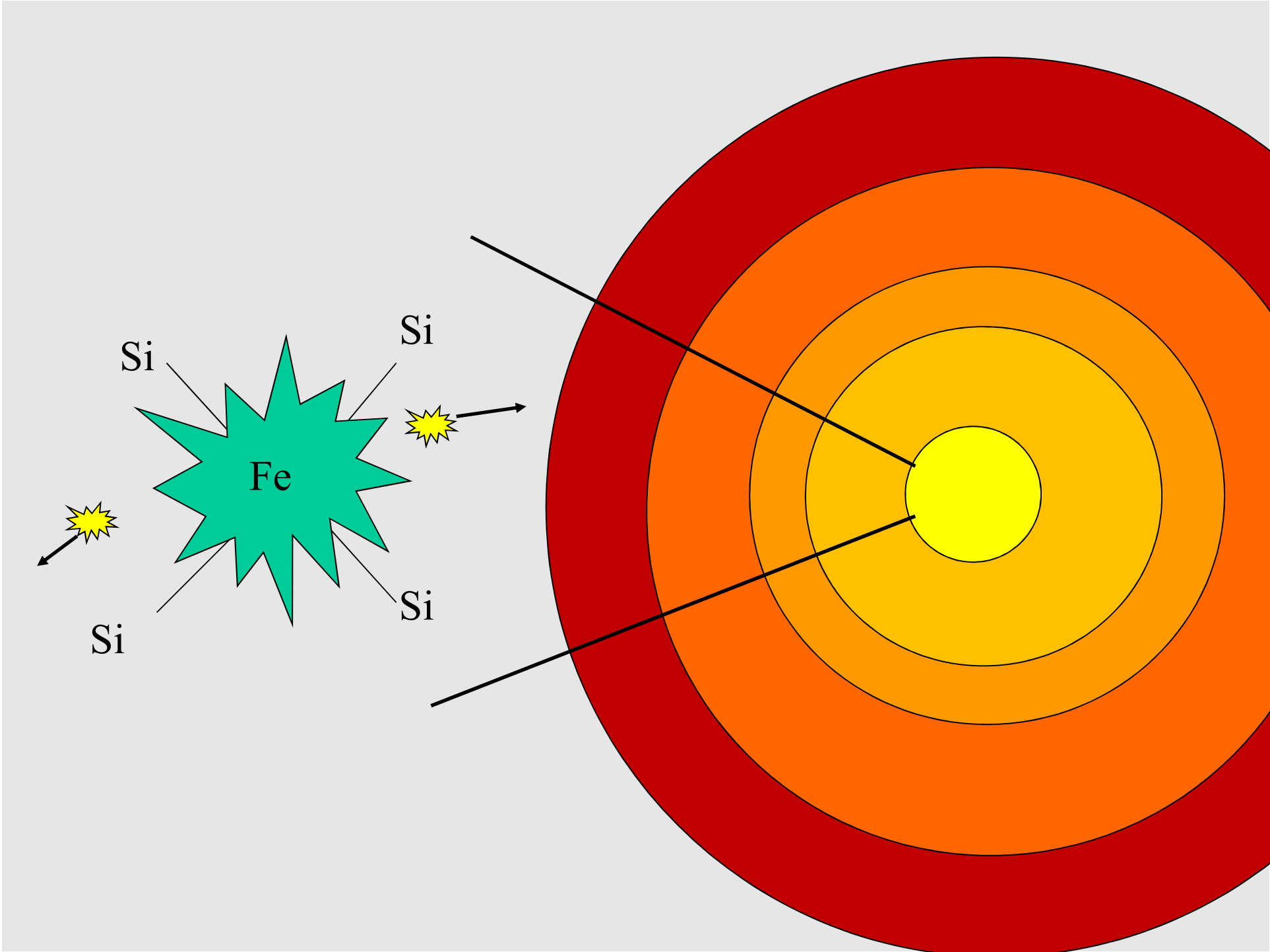
Il Sole non andrà oltre queste reazioni nucleari e terminerà il combustibile tra miliardi di anni

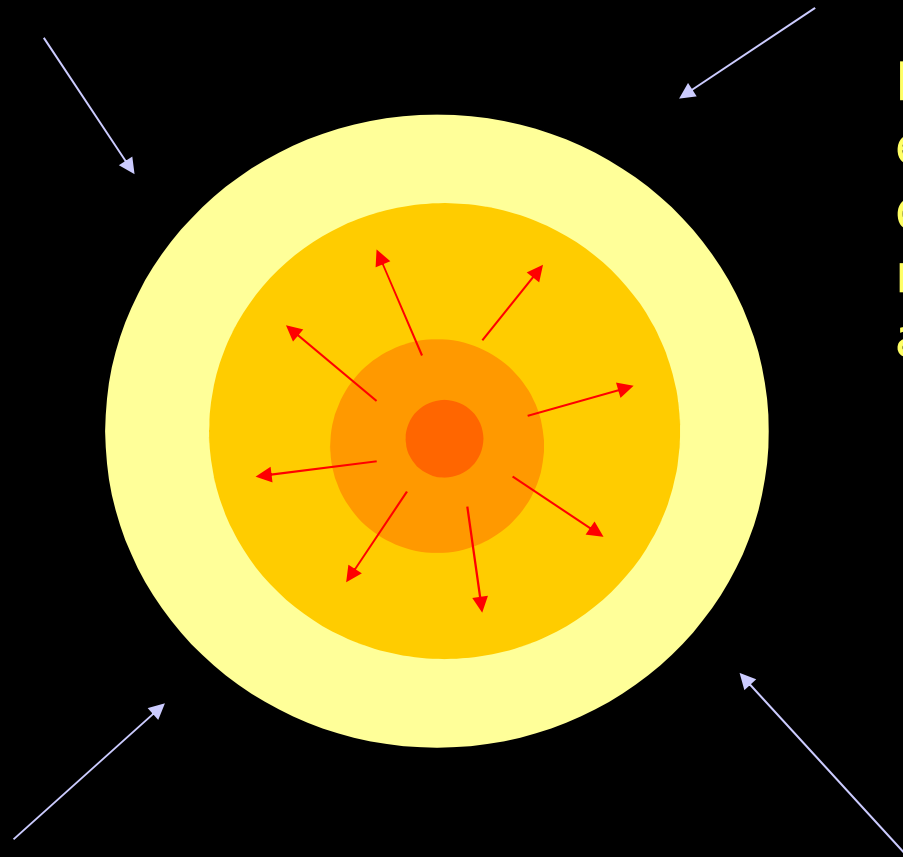


Se però la stella ha una **massa > 8 volte la massa del sole**









La temperatura diventa così elevata che quando gli atomi di idrogeno si urtano non rimbalzano più ma si fondono assieme a formare elio

L'energia liberata durante queste reazioni aumenta la pressione del gas che controbilancia l'attrazione gravitazionale

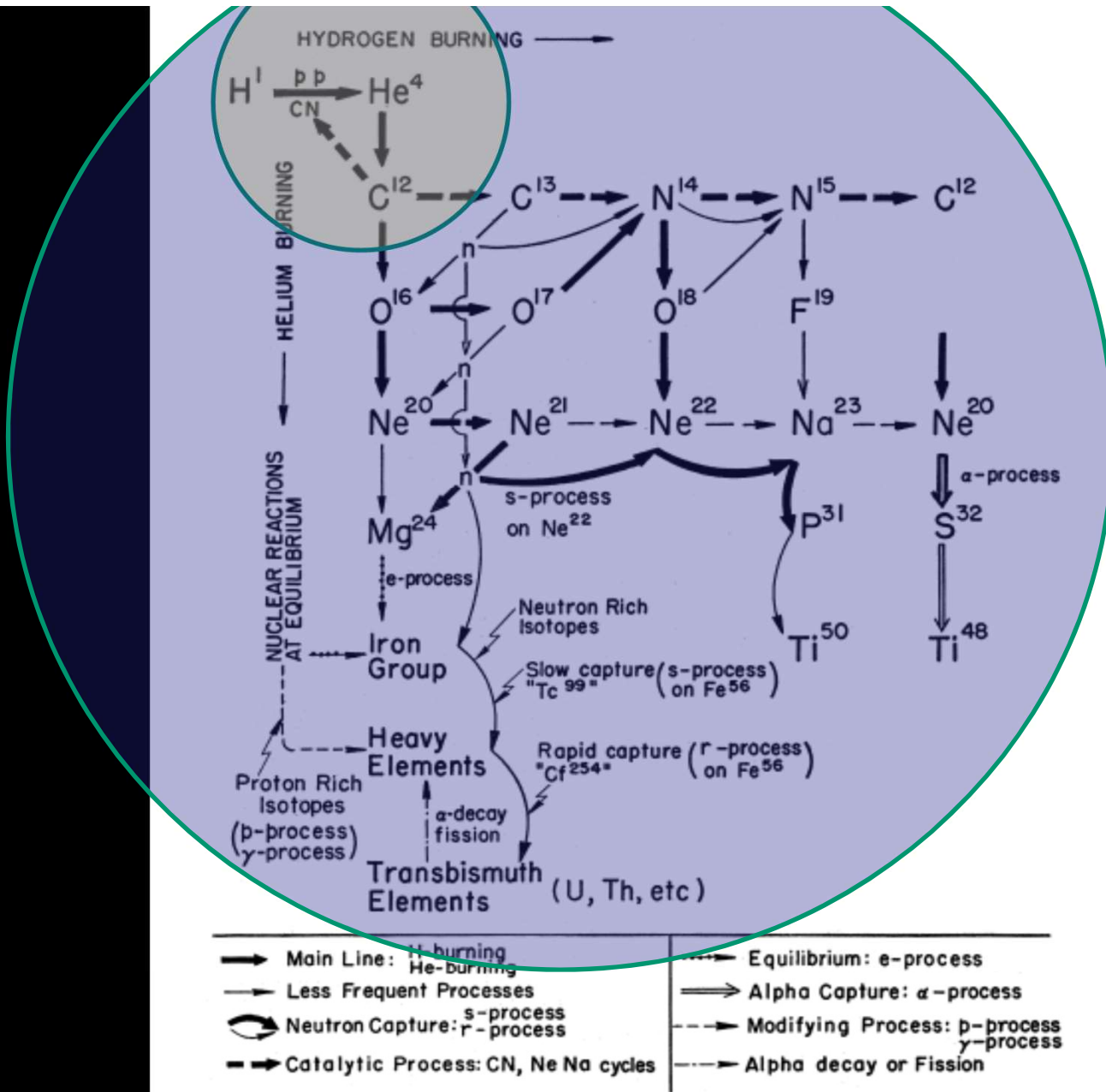
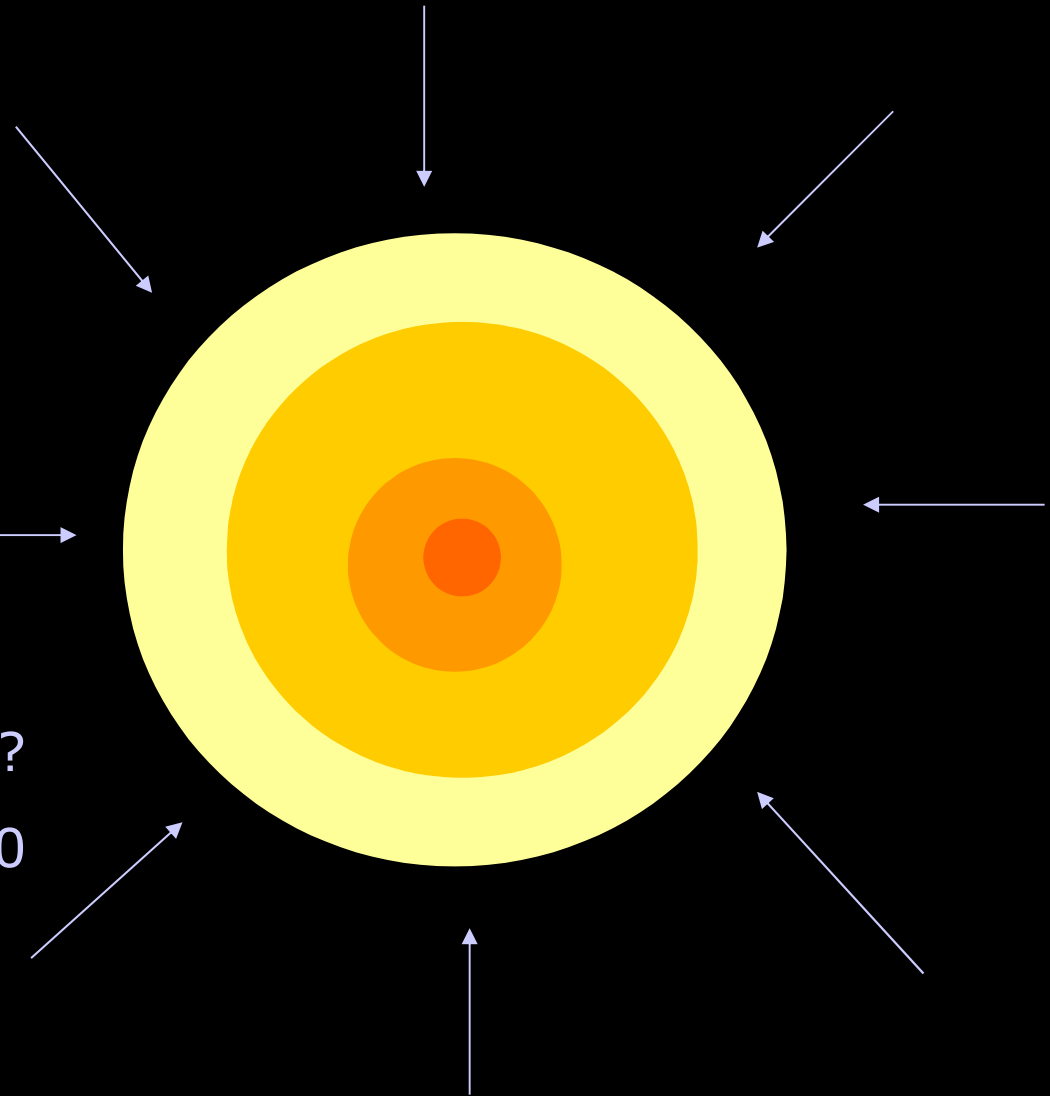


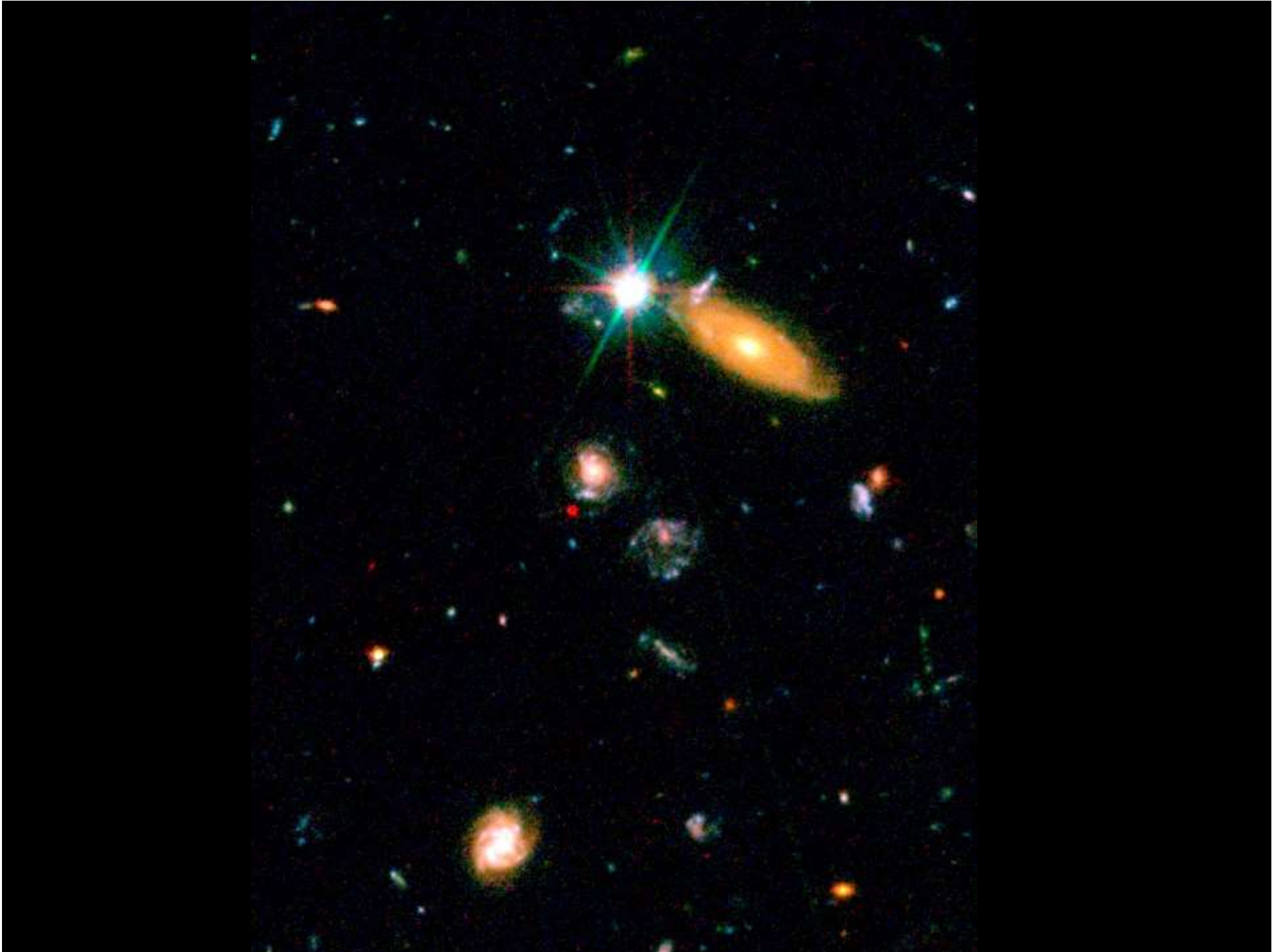
FIG. 1.2. A schematic diagram of the nuclear processes by which the synthesis of the elements in stars takes place. Elements synthesized by interactions with protons (hydrogen burning) are listed horizontally. Elements synthesized by interactions with alpha particles (helium burning) and by still more complicated processes are listed vertically. The details of the production of all of the known stable isotopes of carbon, nitrogen, oxygen, fluorine, neon, and sodium are shown completely. Neutron capture processes by which the highly charged heavy elements are synthesized are indicated by curved arrows. The production of radioactive Tc^{99} is indicated as an example for which there is astrophysical evidence of neutron captures at a slow rate over long periods of time in red giant stars. Similarly Cf^{254} , produced in supernovae, is an example of neutron synthesis at a rapid rate. The iron group is produced by a variety of nuclear reactions at equilibrium in the last stable stage of a star's evolution.

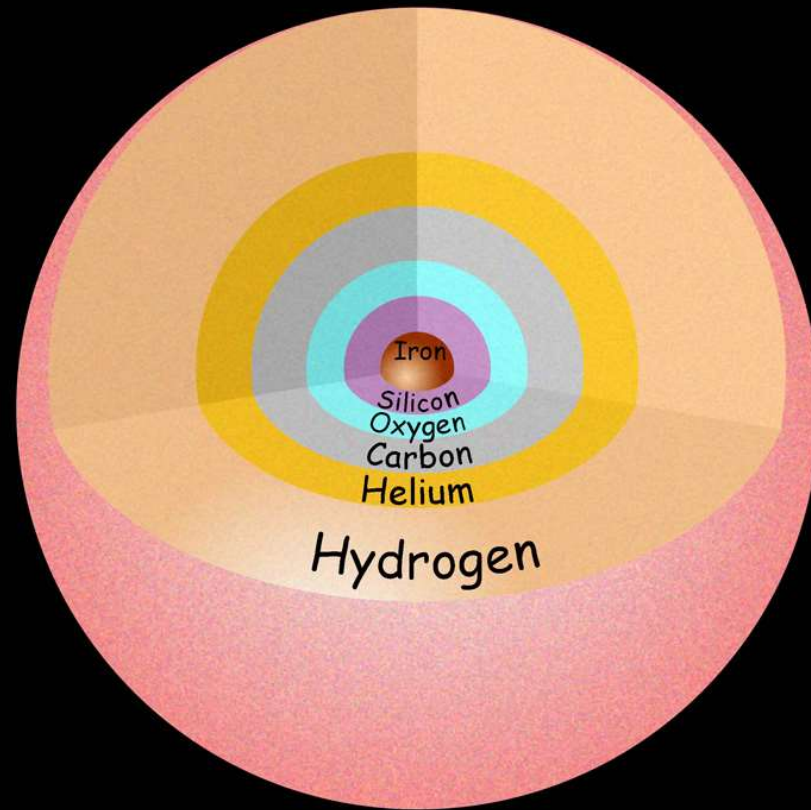
Alla fine esaurirà la riserva di idrogeno ed altri combustibili nucleari

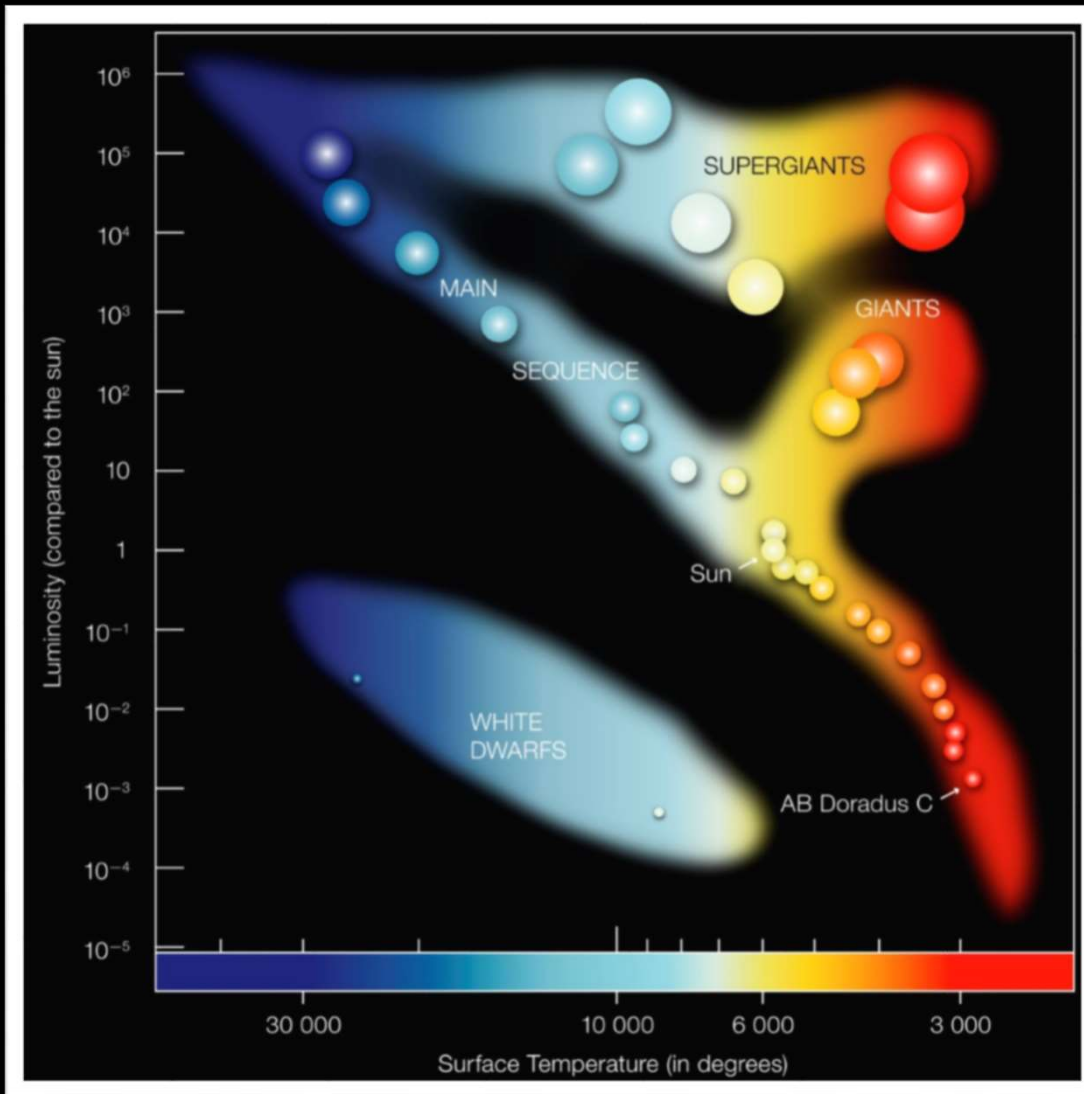
La stella in balia della sola attrazione gravitazionale comincia a raffreddarsi e contrarsi...

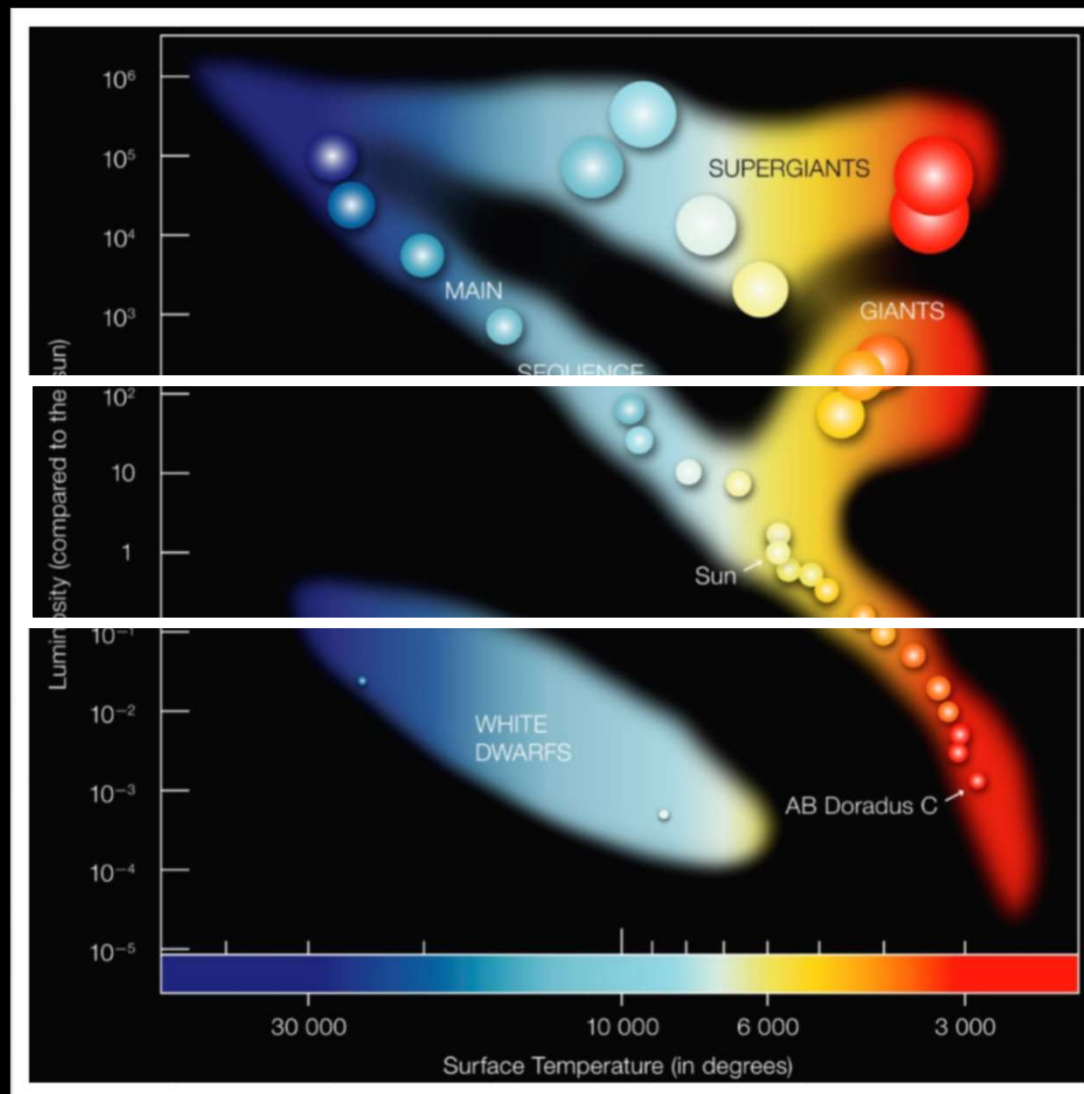
..cosa le accade dopo?
è la fine degli anni 20



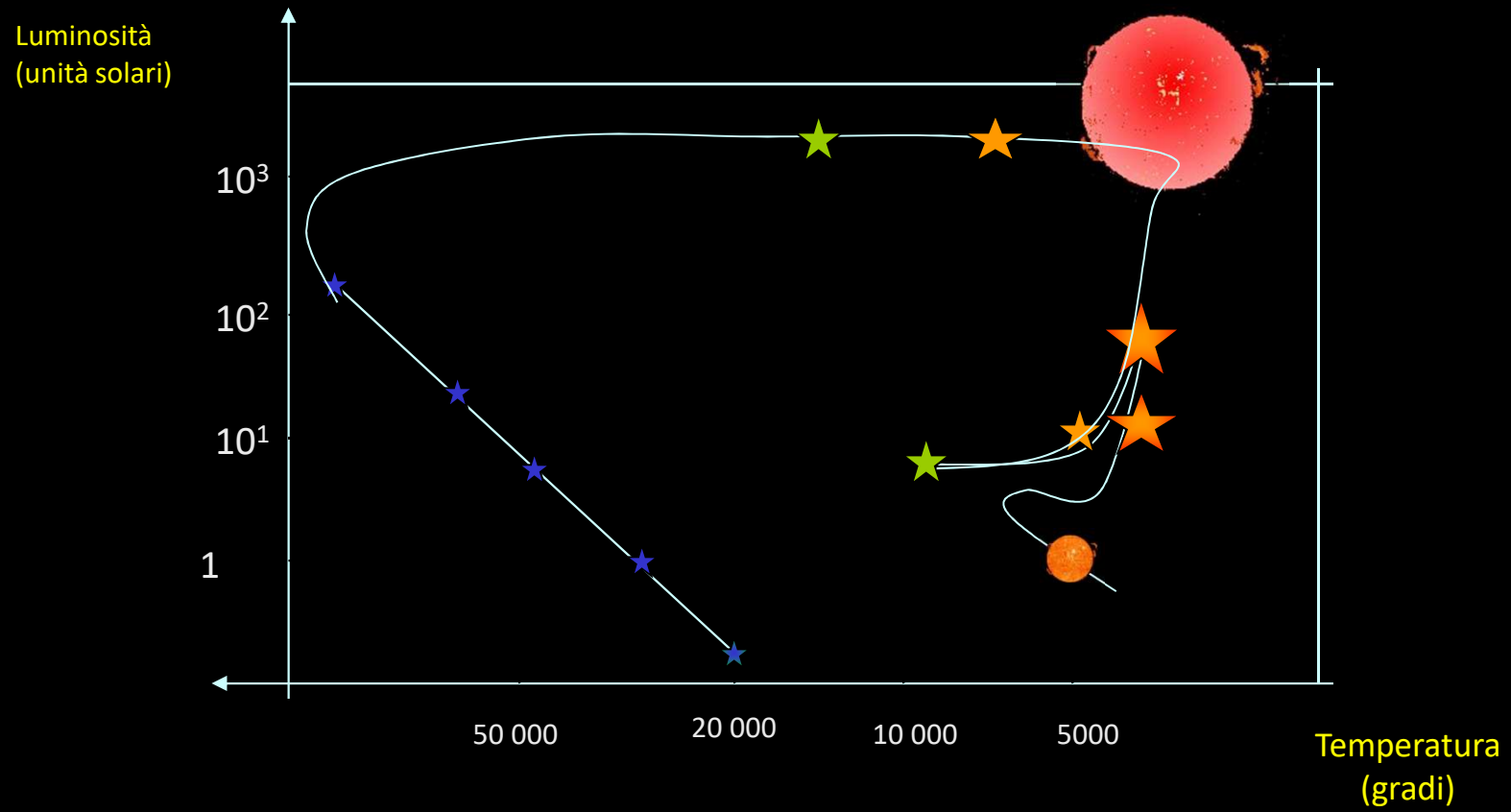


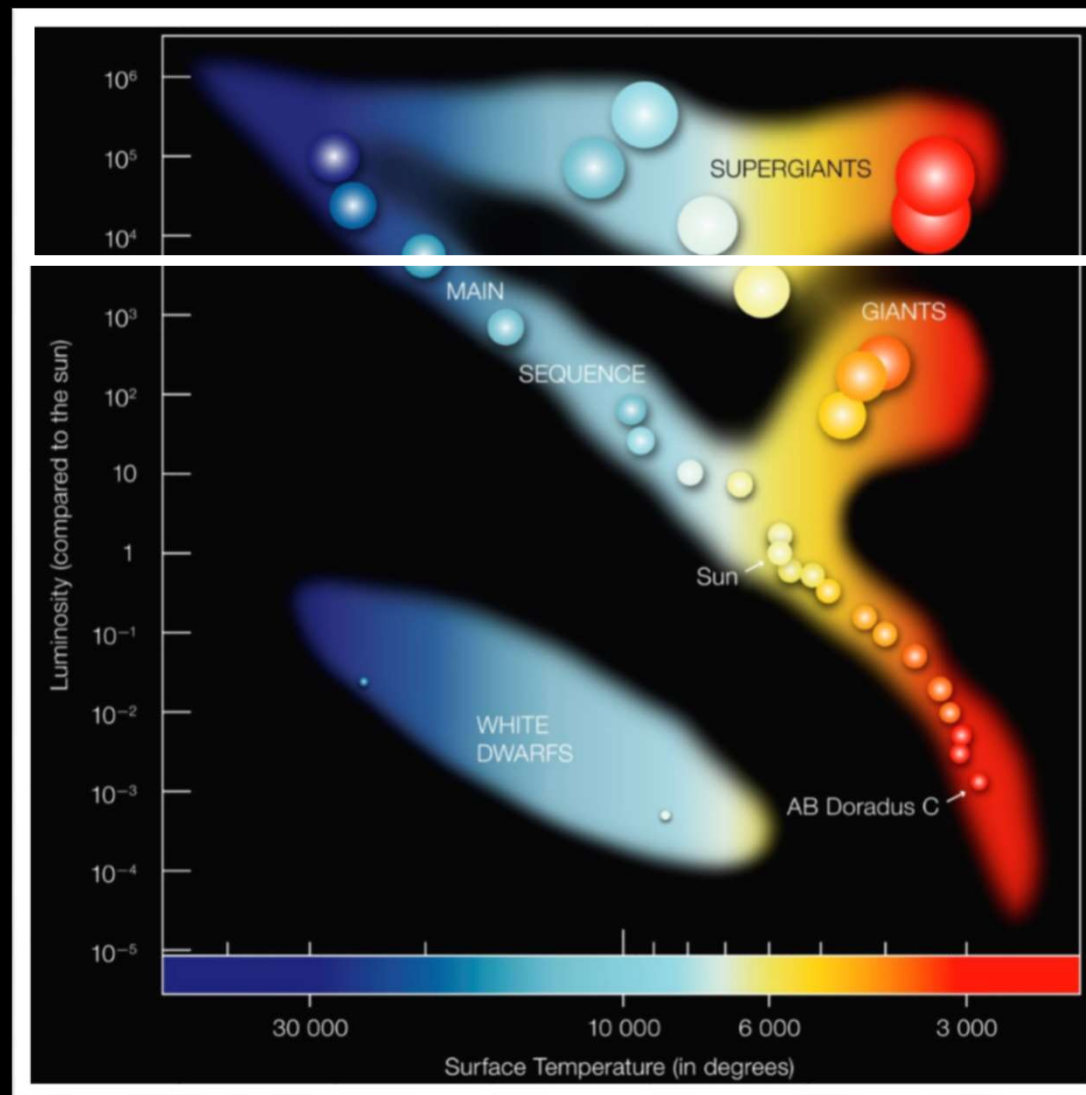




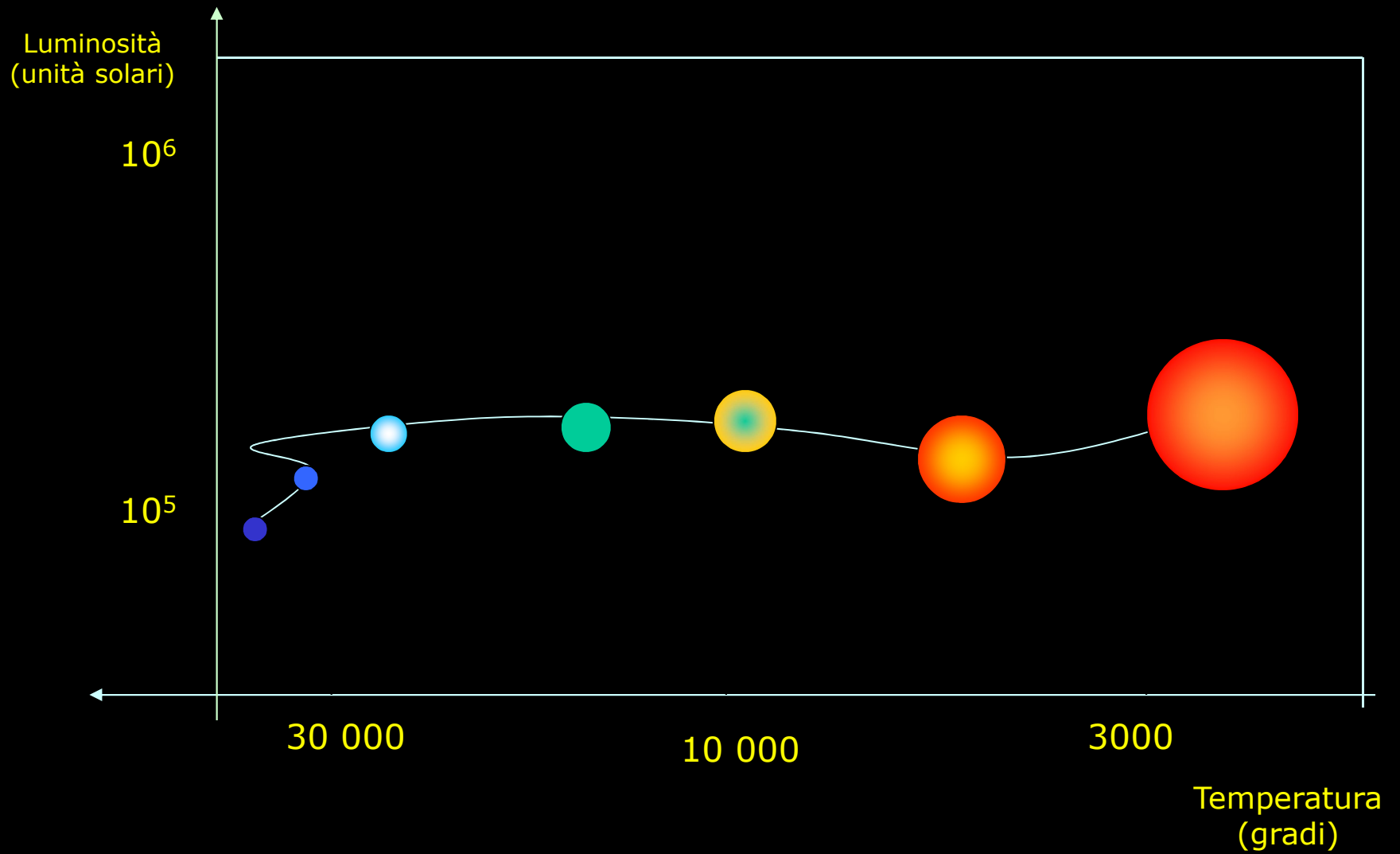


L'evoluzione di una stella come il Sole





L'evoluzione di una stella di 25 masse solari



Massa originale (in M_{\odot})	Luminosità nella SP (in L_{\odot})	Durata della SP ($\times 10^9$ anni)	Prodotto finale della fusione	Fenomeno terminale	Massa espulsa (in M_{\odot})	Natura del residuo	Massa del residuo (in M_{\odot})	Densità del residuo ($\times 10^3 \text{ kg m}^{-3}$)	Raggio del residuo (in m)	Accel. di gravità (in m s^{-2})
30	10 000	0,006	ferro	supernova tipo Ib	24	buco nero	6	3×10^{15}	6192,21	$5,19 \times 10^{12}$
10	1 000	0,01	silicio	supernova tipo II	8,5	stella di neutroni	1,5	5×10^{14}	17861,44	$2,5 \times 10^{12}$
3	100	0,30	ossigeno	nebulosa planetaria	2,2	nana bianca	0,8	2×10^7	$2,67 \times 10^6$	$1,49 \times 10^7$
1	1	10	carbonio	nebulosa planetaria	0,3	nana bianca	0,7	10^7	$3,22 \times 10^6$	$8,99 \times 10^6$
0,3	0,004	800	elio	vento stellare	0,01	nana bianca	0,3	10^6	$5,22 \times 10^6$	$1,46 \times 10^6$