

Vientos Estelares en Estrellas Masivas

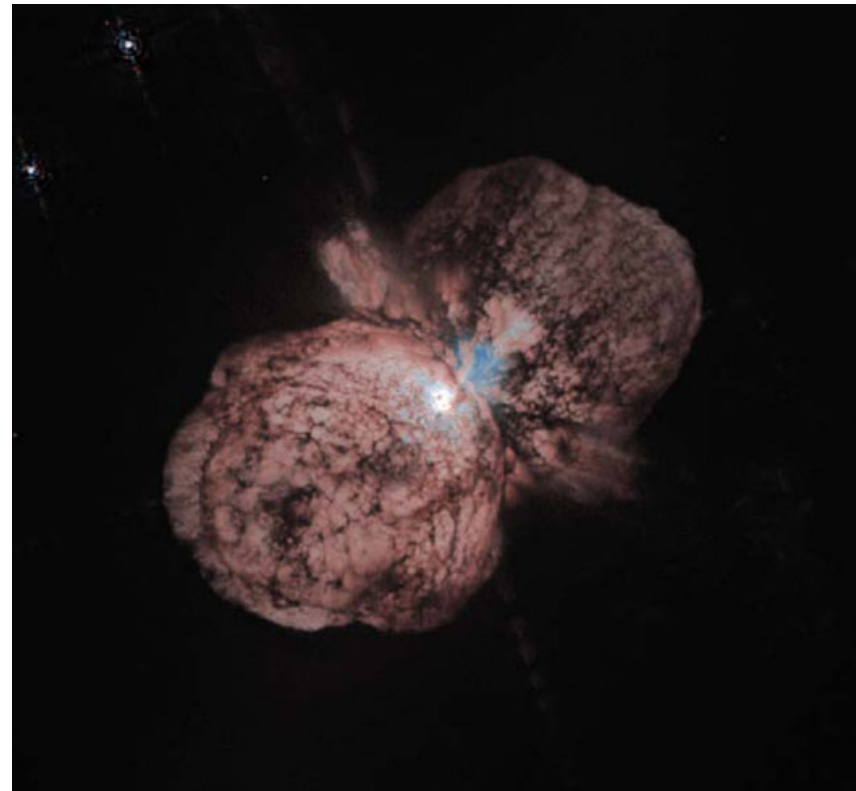
Charla CCD

Jesús A. Toalá Sáenz



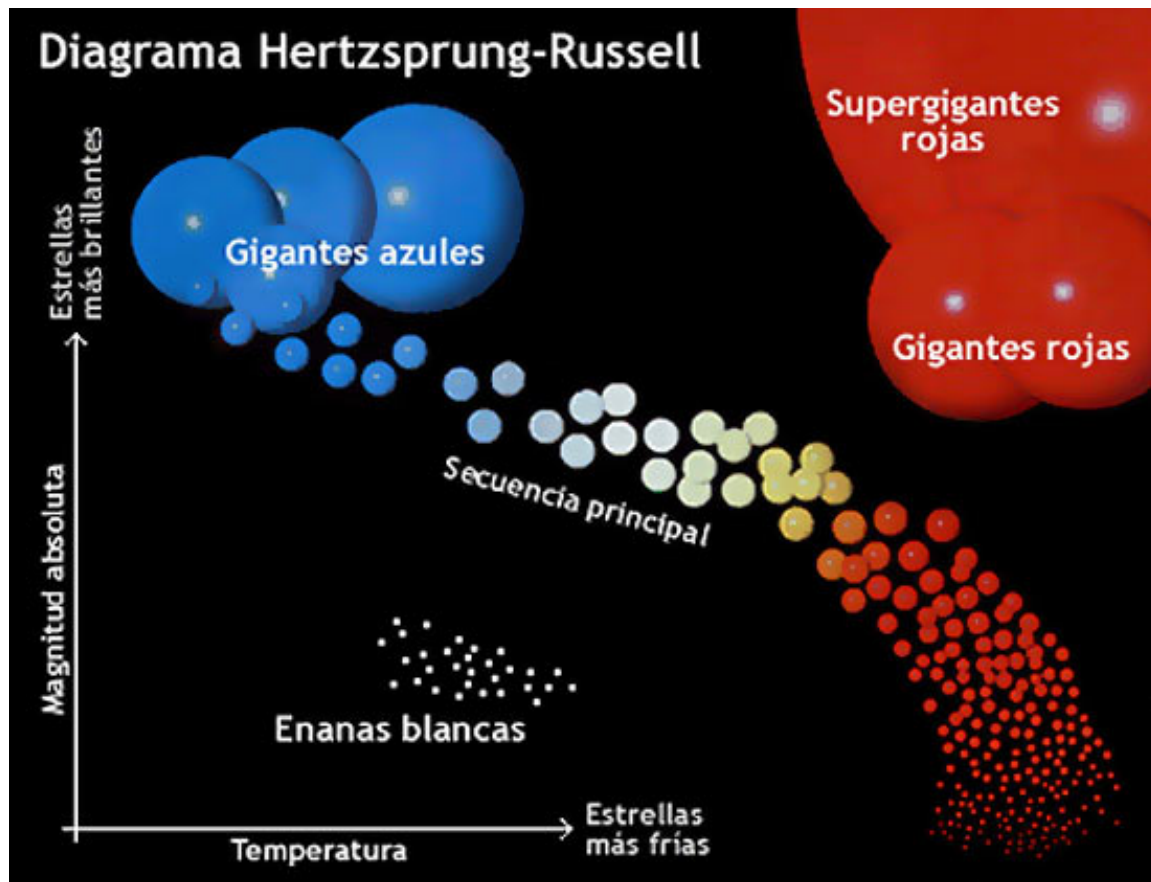
Vientos Estelares en Estrellas Masivas

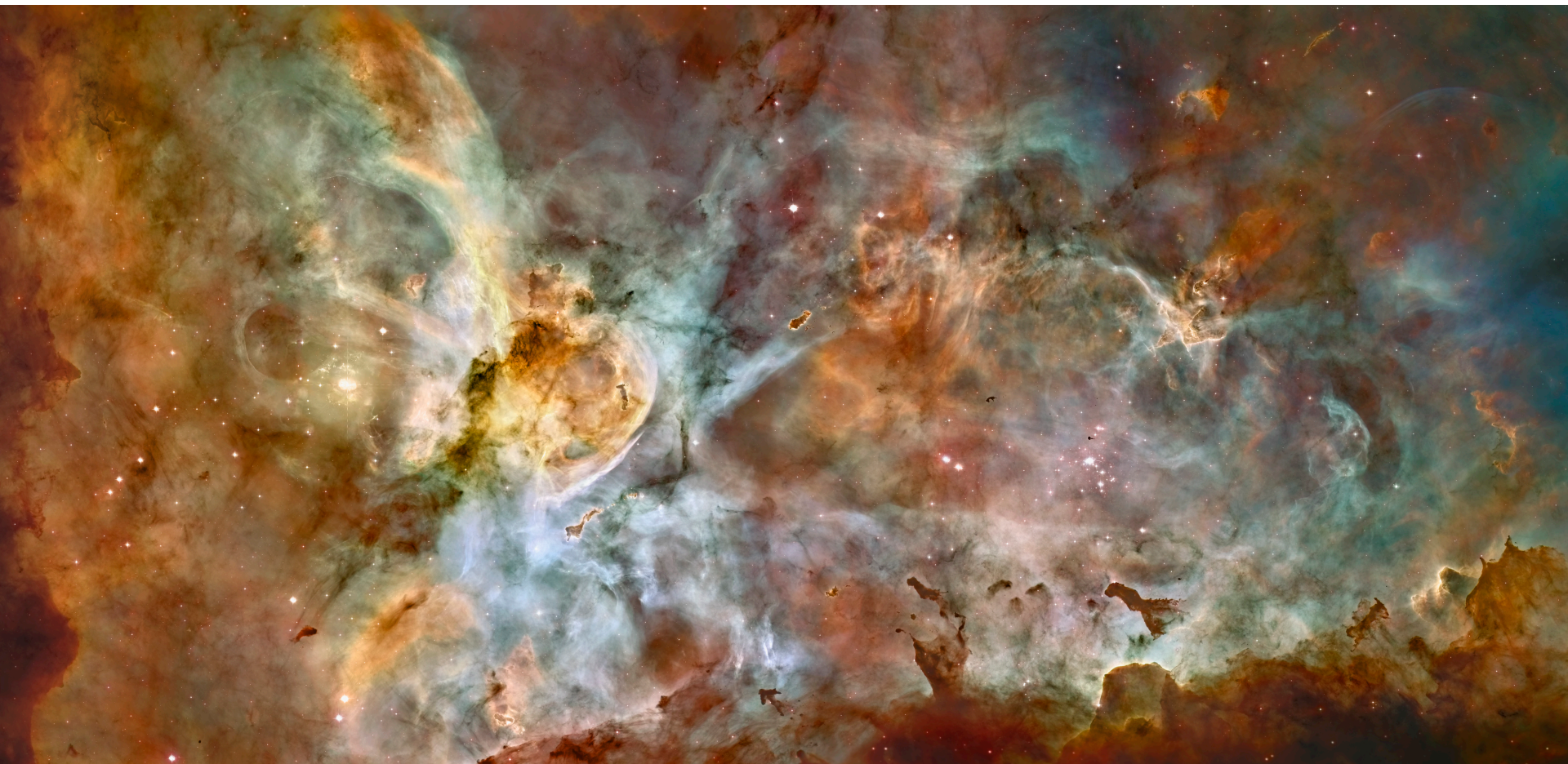
- ¿Qué es una Estrella Masiva?
- ¿Qué es el *Viento Estelar*?
Burbuja Estelar
- ¿Cómo modifican el medio?
- Burbujas Wolf-Rayet
- Emisión de rayos X

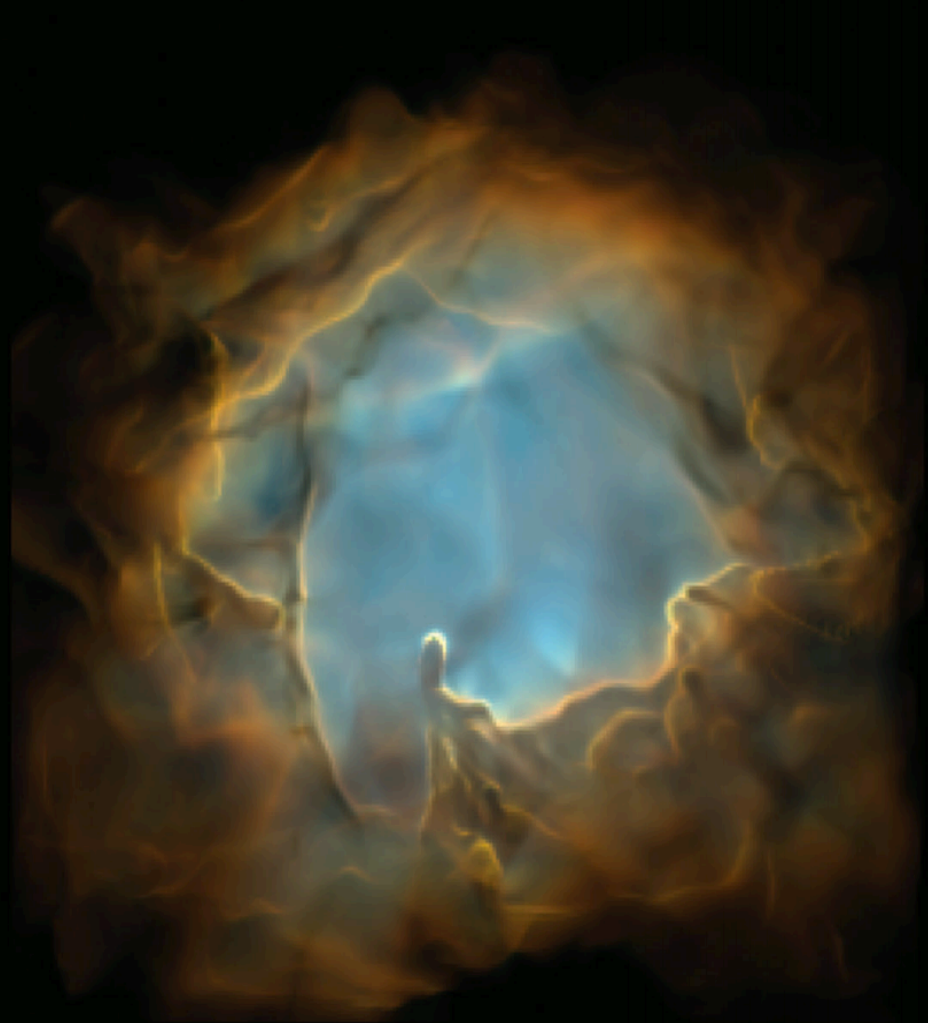


¿Qué es una **Estrella Masiva**?

$$M > 8 M_{\odot}$$





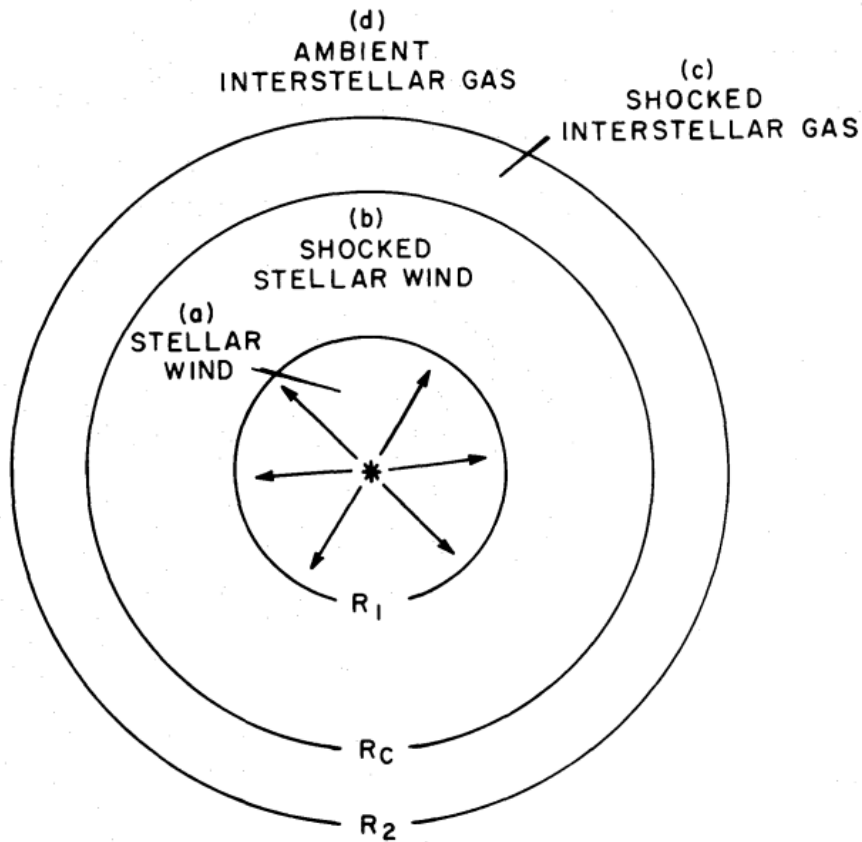


Arthur et al. 2011

¿Qué es un **Viento Estelar**?

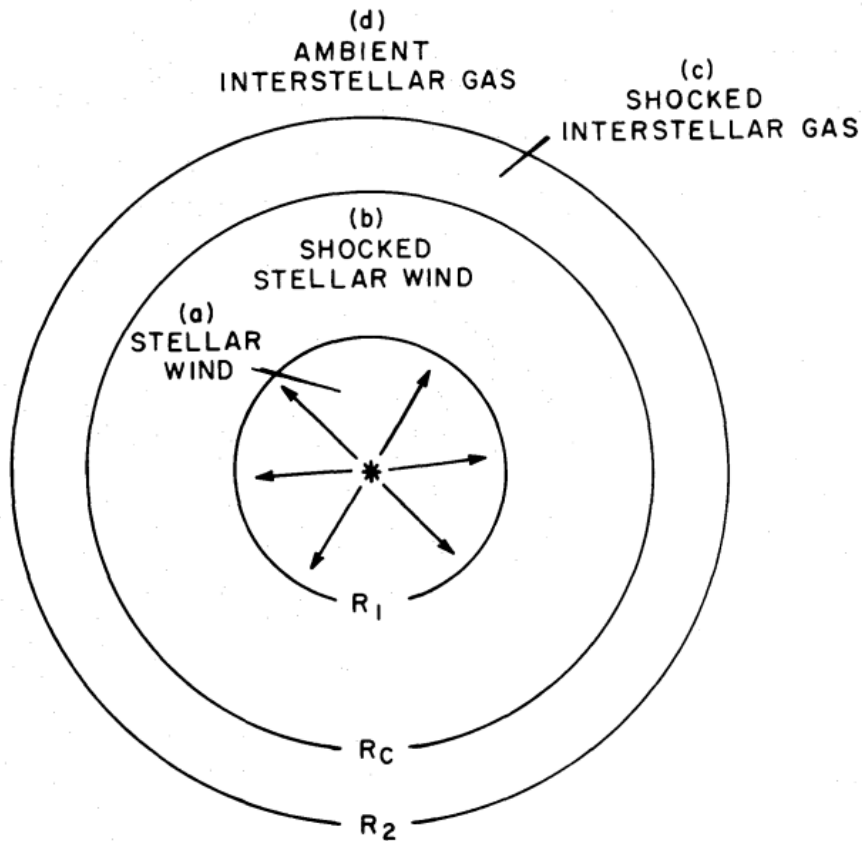
¿Qué es un **Viento Estelar**?

Flujo continuo de materia . . .



¿Qué es un Viento Estelar?

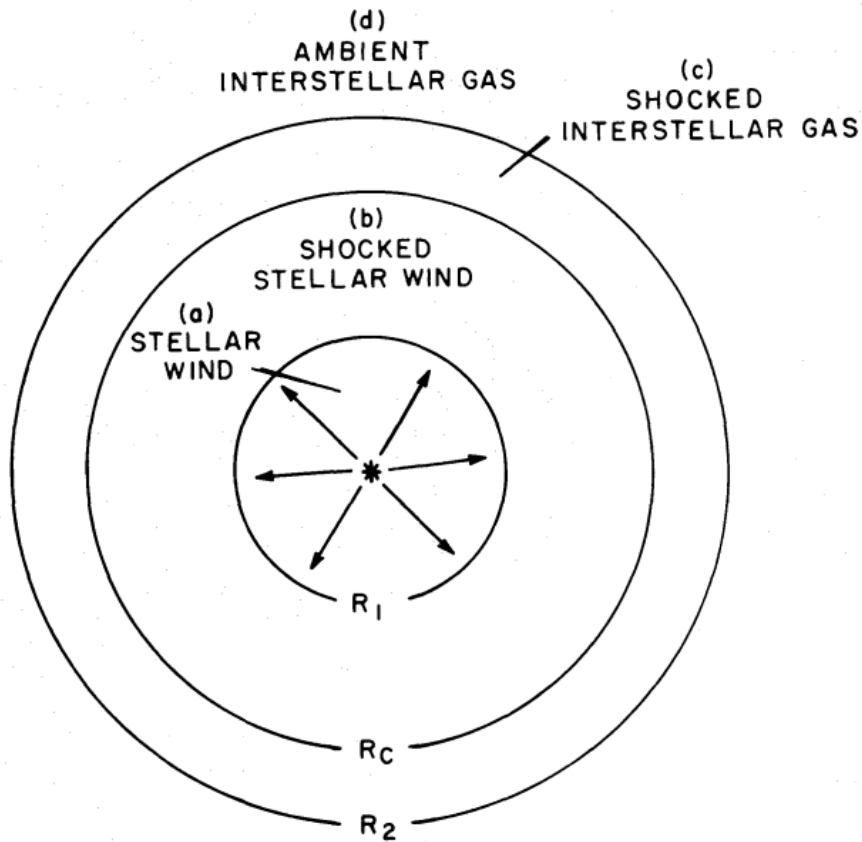
Flujo continuo de materia . . .



\dot{M} = Tasa de pérdida de masa

V_∞ = Velocidad del viento

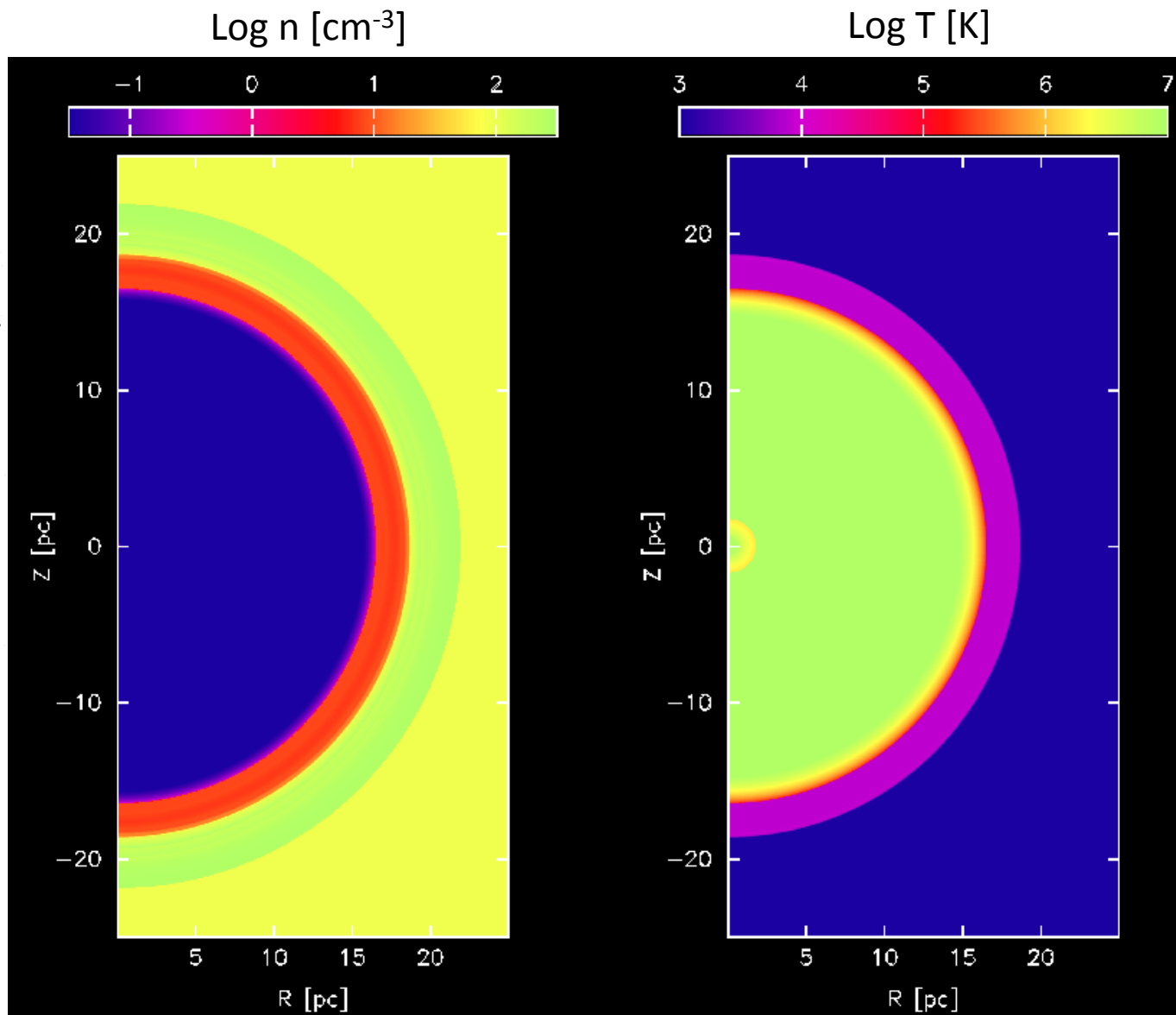
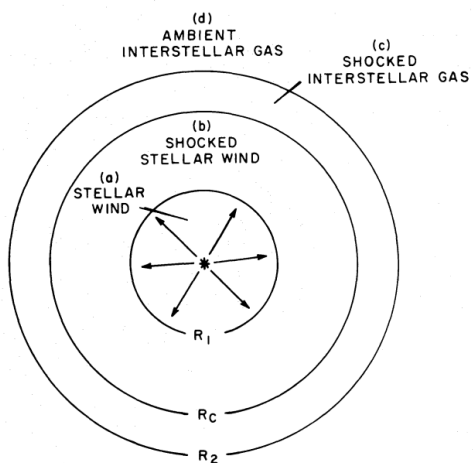
¿Qué es un Viento Estelar?



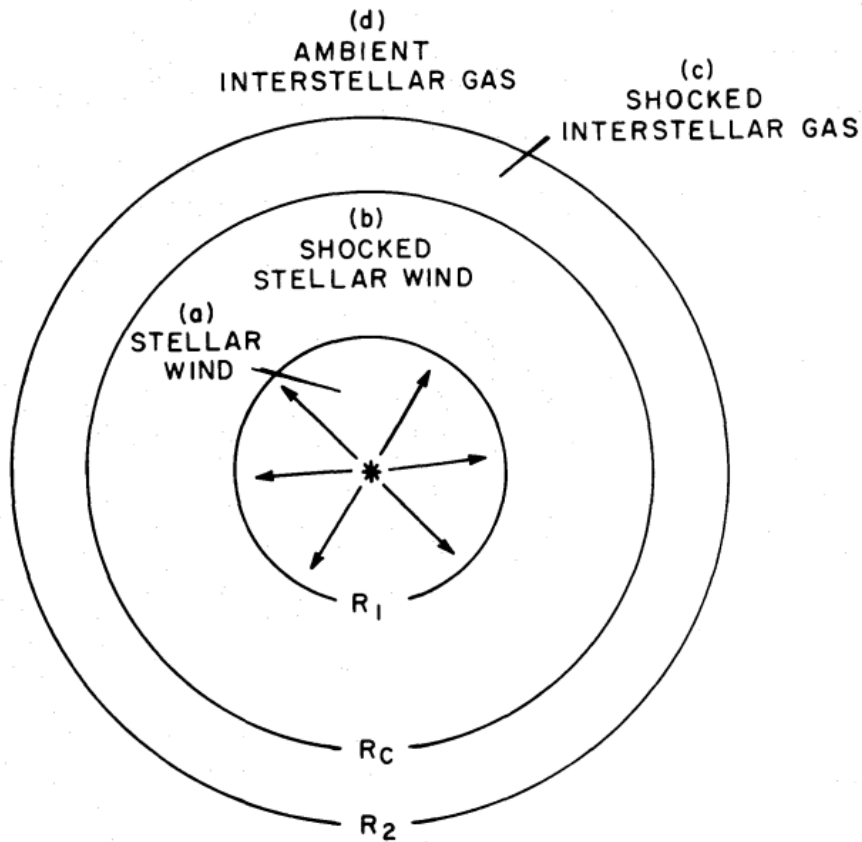
Burbujas!



¿Qué es un Viento Estelar?



¿Qué es un Viento Estelar?



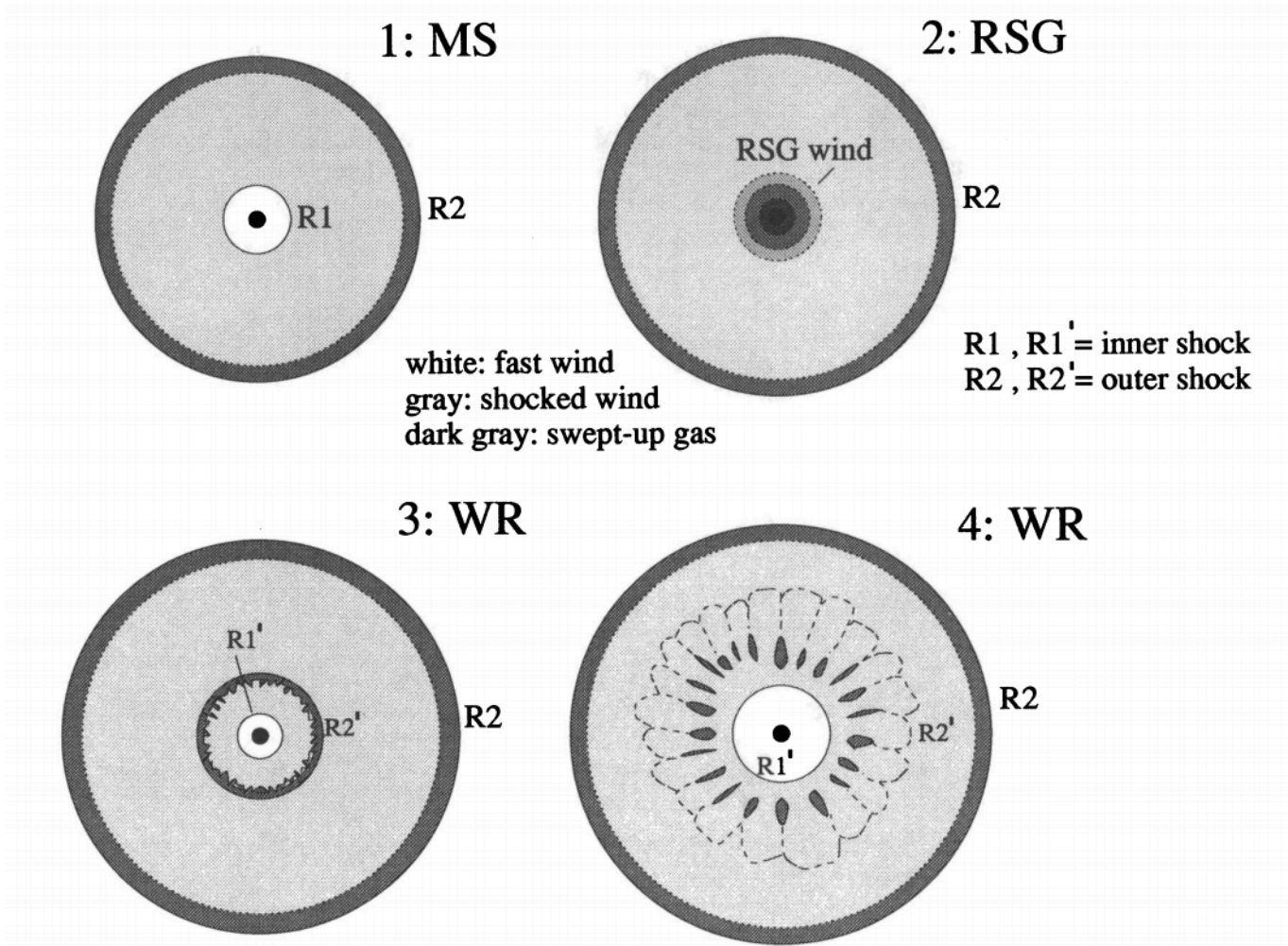
¿Cómo modifican el medio?

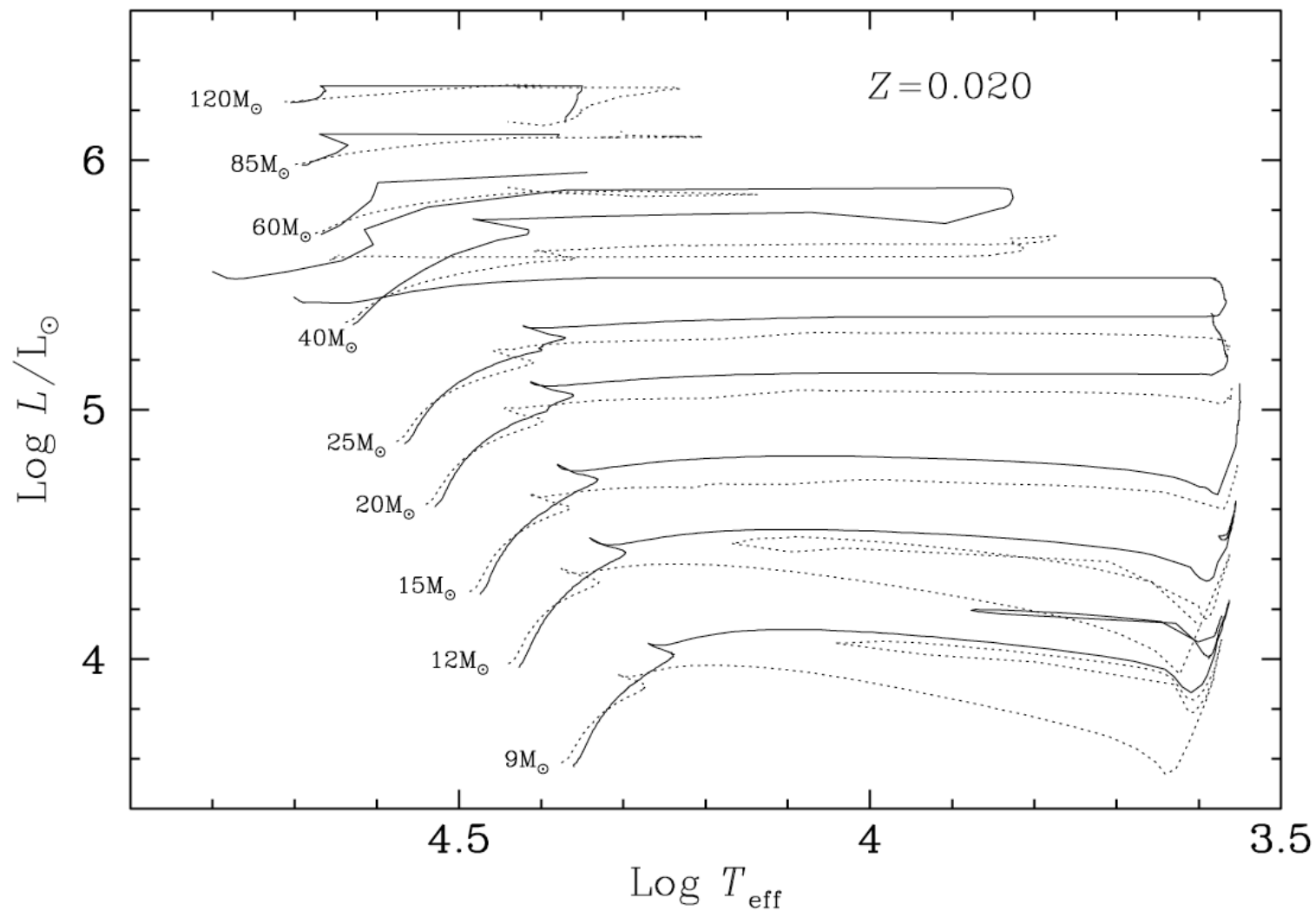




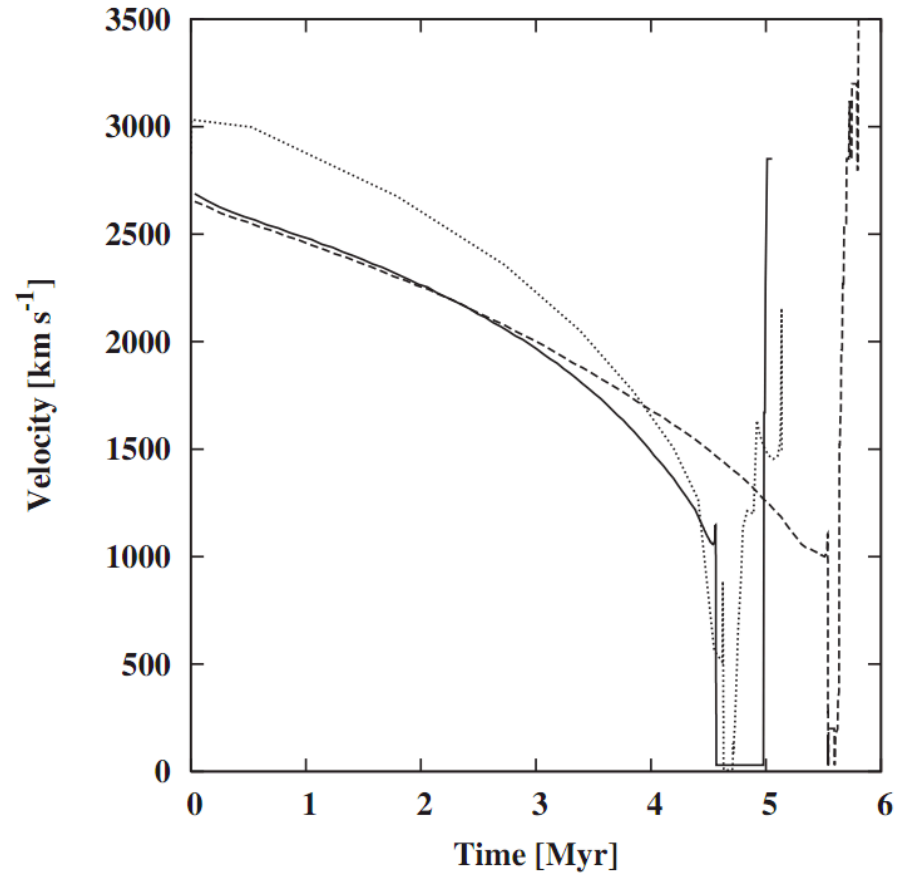
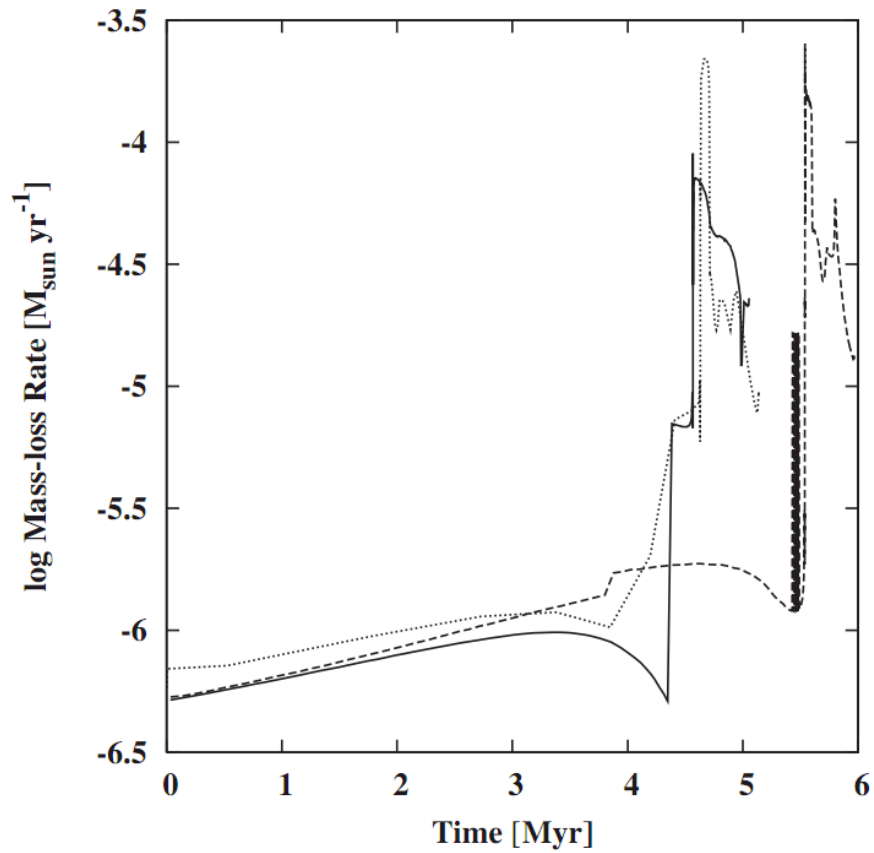


Estrellas Evolucionadas

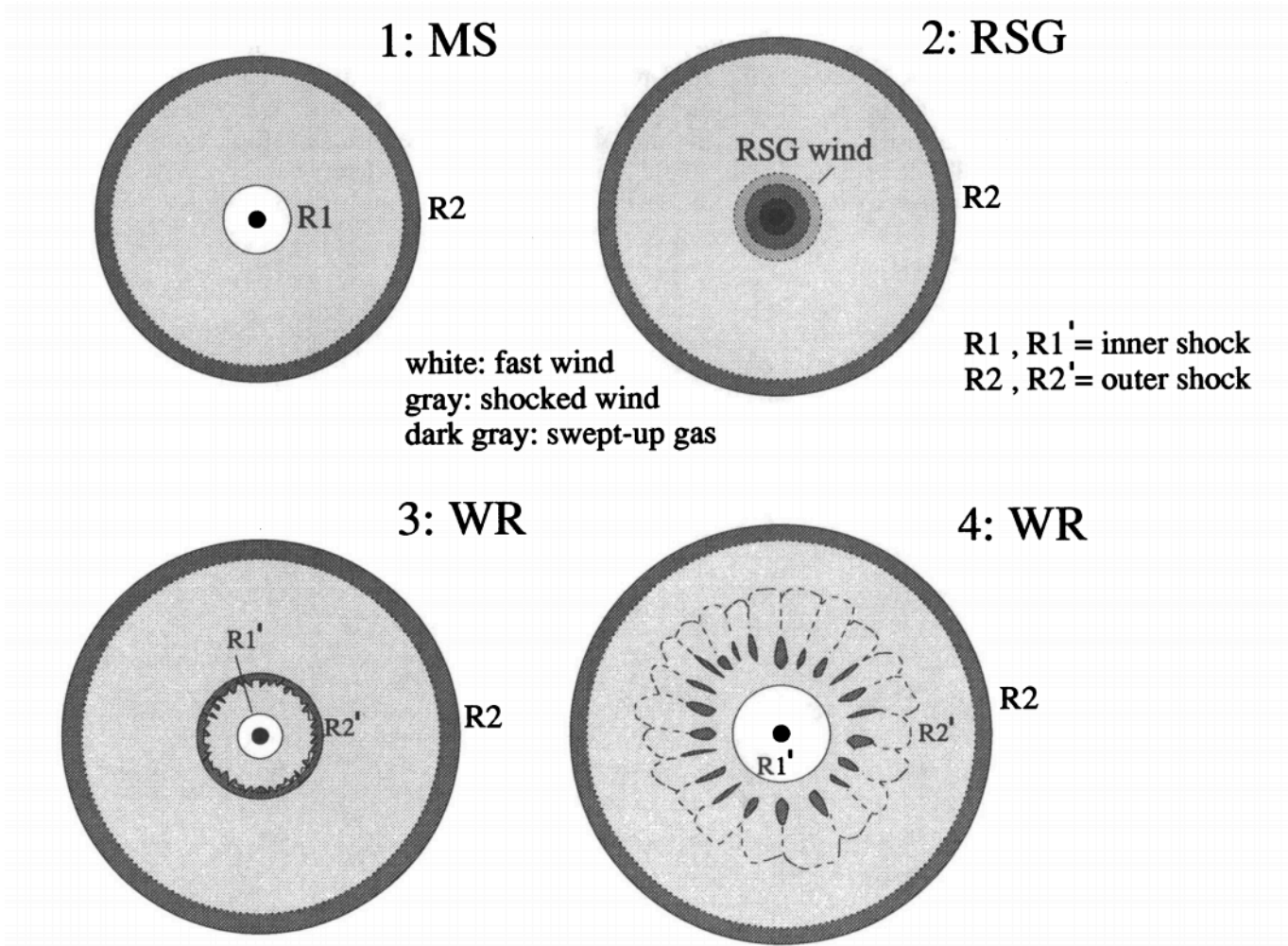




$M_i = 40 M_\odot$

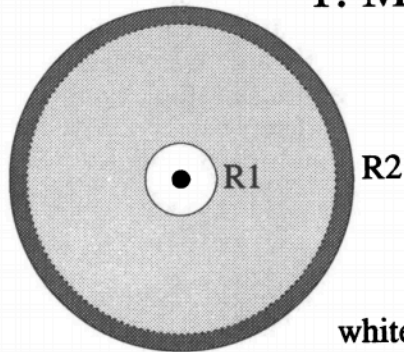


Meynet & Maeder (2003)
STARS

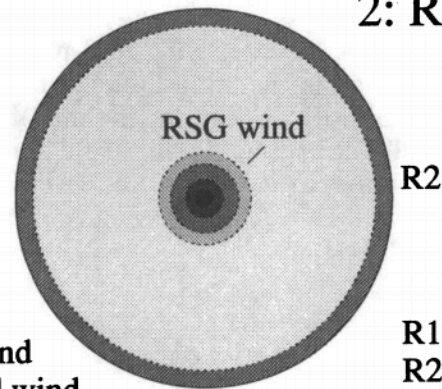


Burbujas Interestelares

1: MS



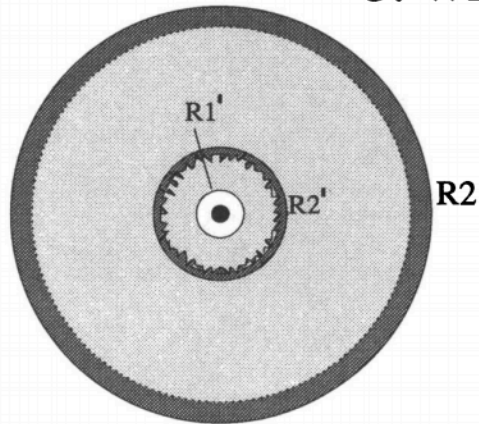
2: RSG



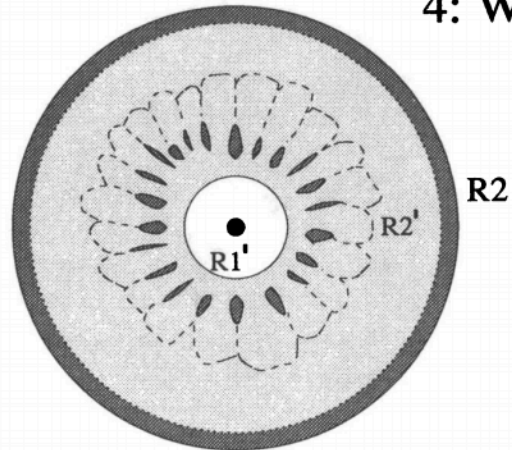
white: fast wind
gray: shocked wind
dark gray: swept-up gas

$R1, R1'$ = inner shock
 $R2, R2'$ = outer shock

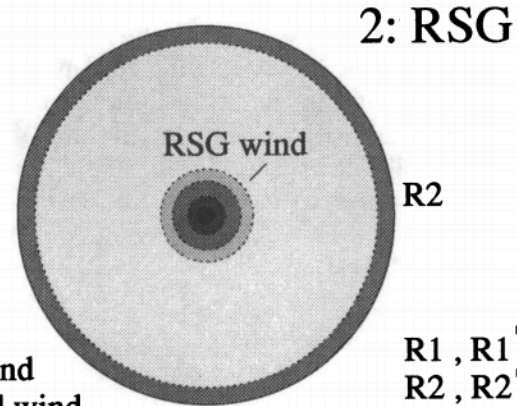
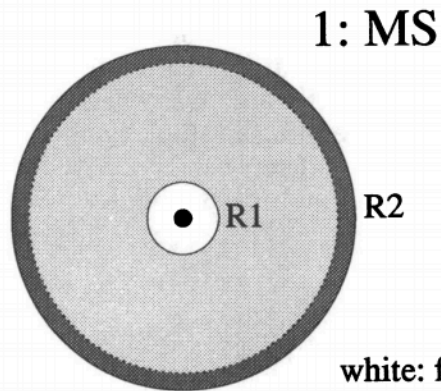
3: WR



4: WR

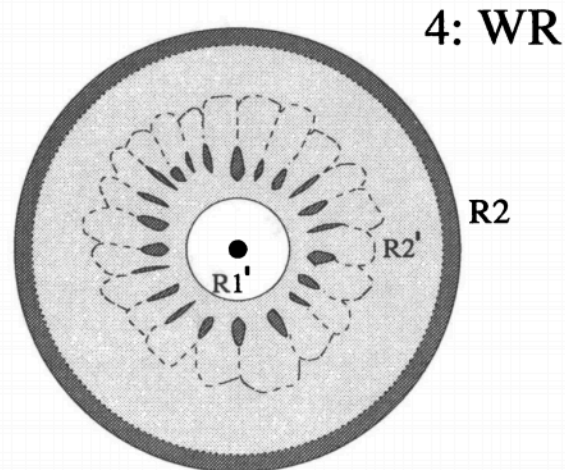
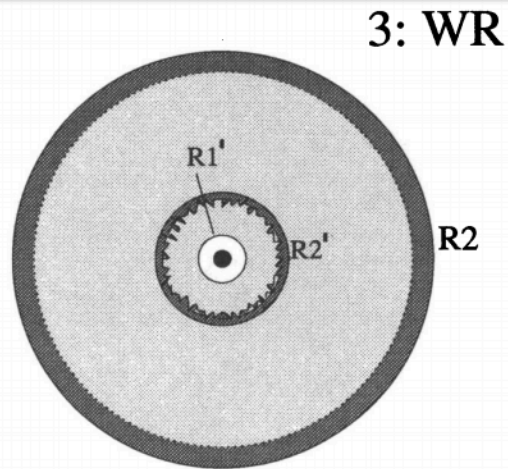


Burbujas Interestelares

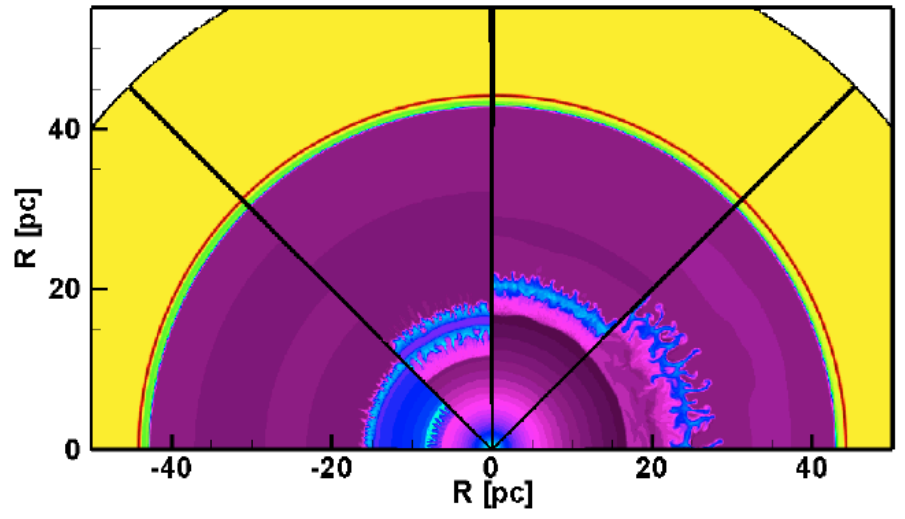
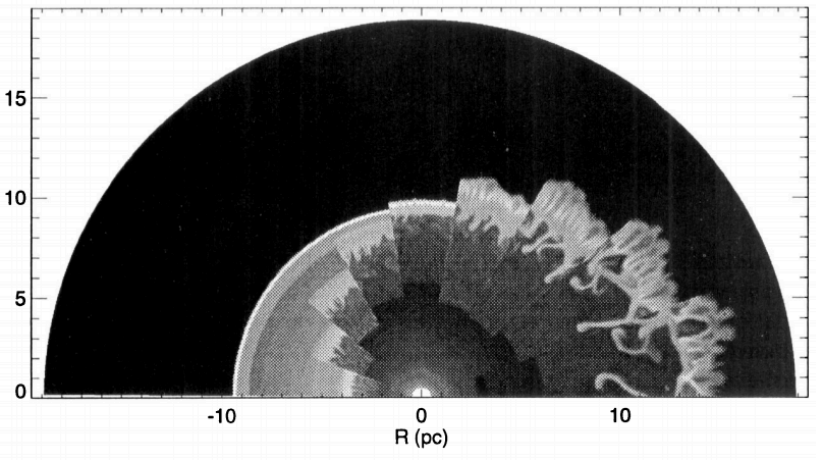


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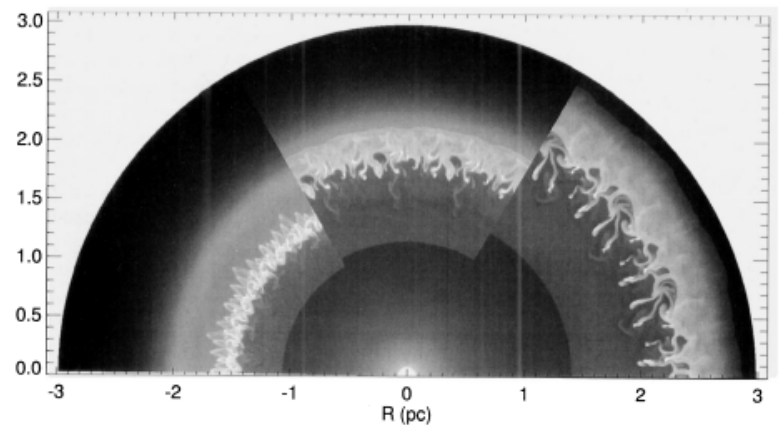
$R1, R1'$ = inner shock
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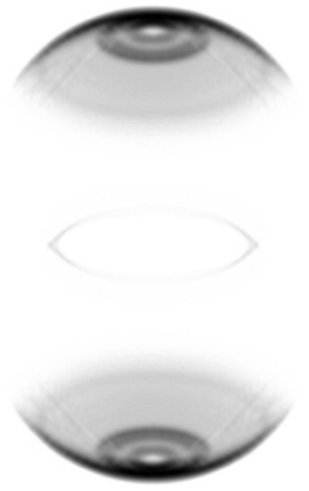
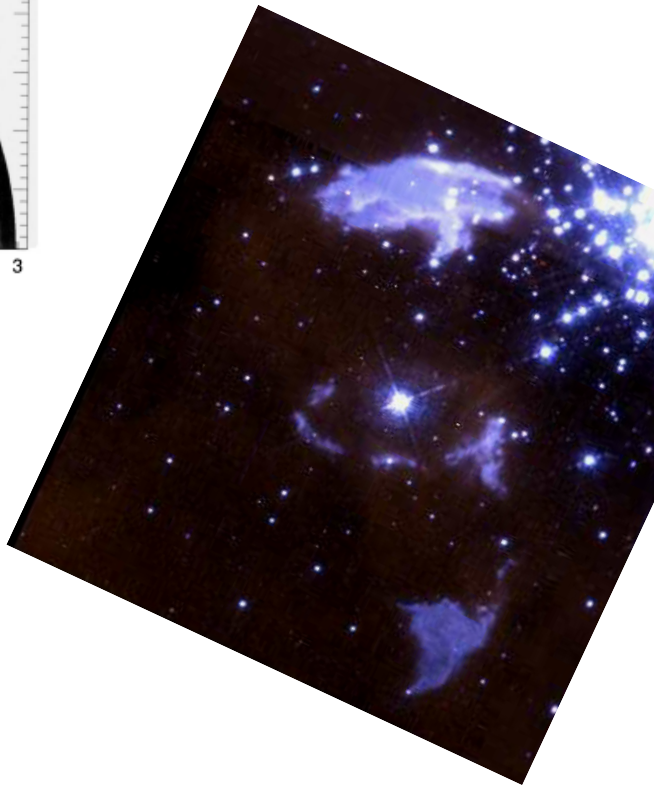
Burbujas Wolf-Rayet (WR)



van Marle (2007)

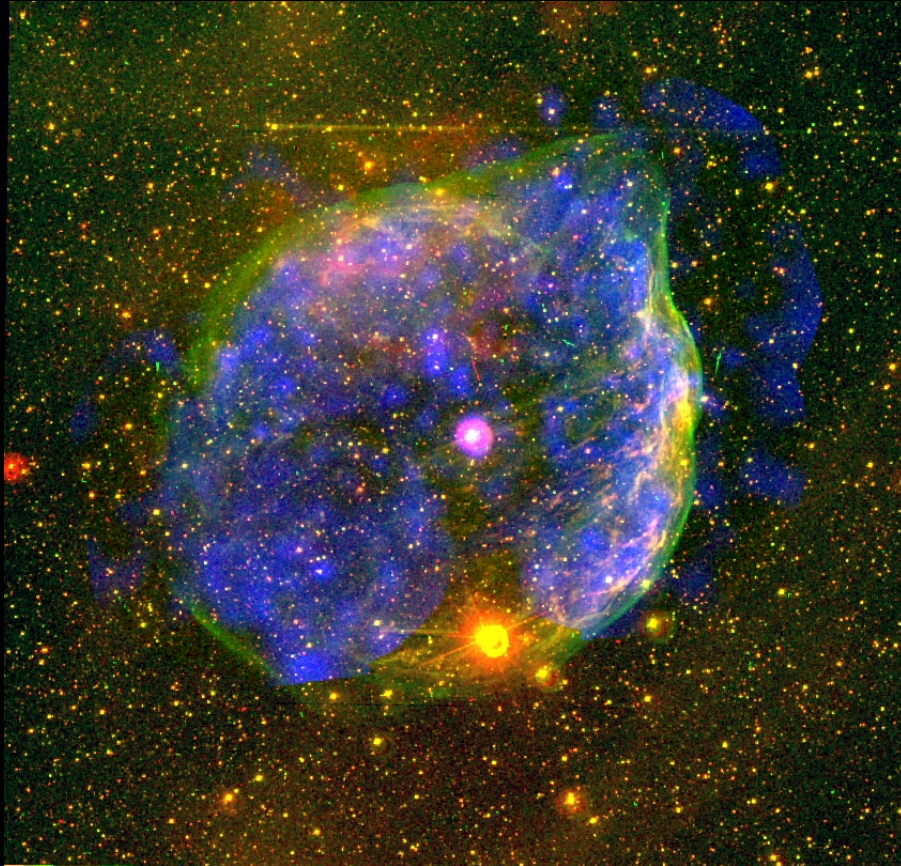


García-Segura et al. (1996)



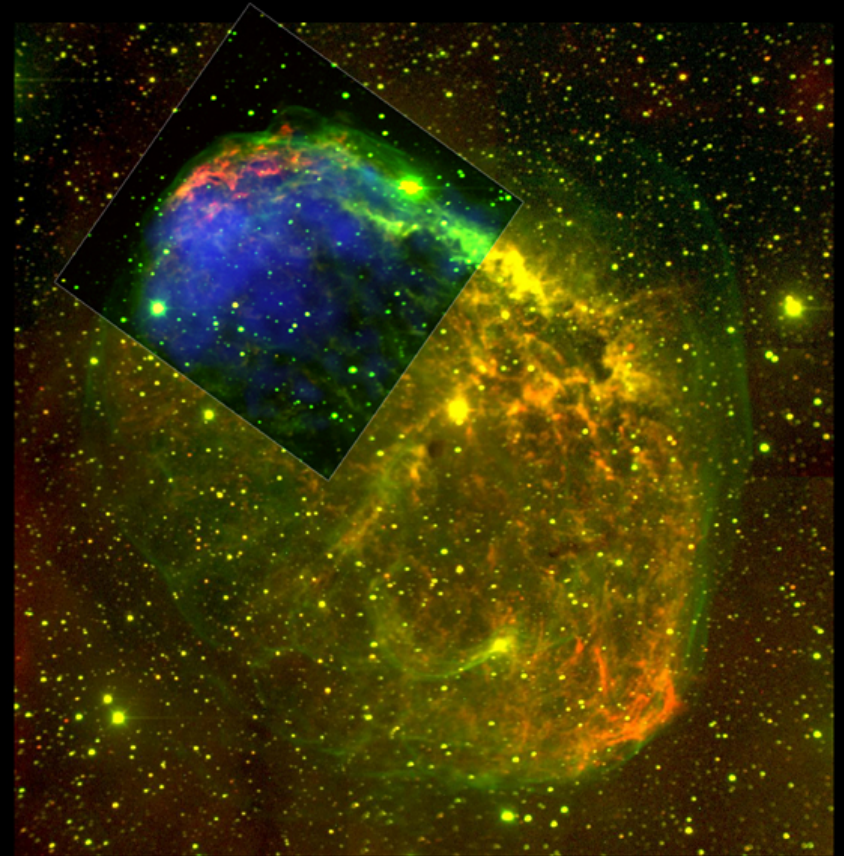
Chita et al. (2008)

Emisión de Rayos X



S308

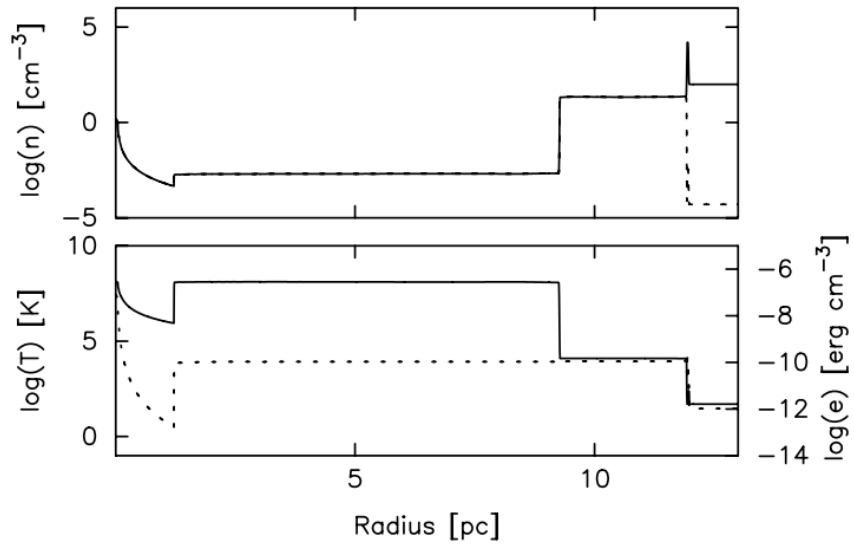
Toalá et al. en prep.



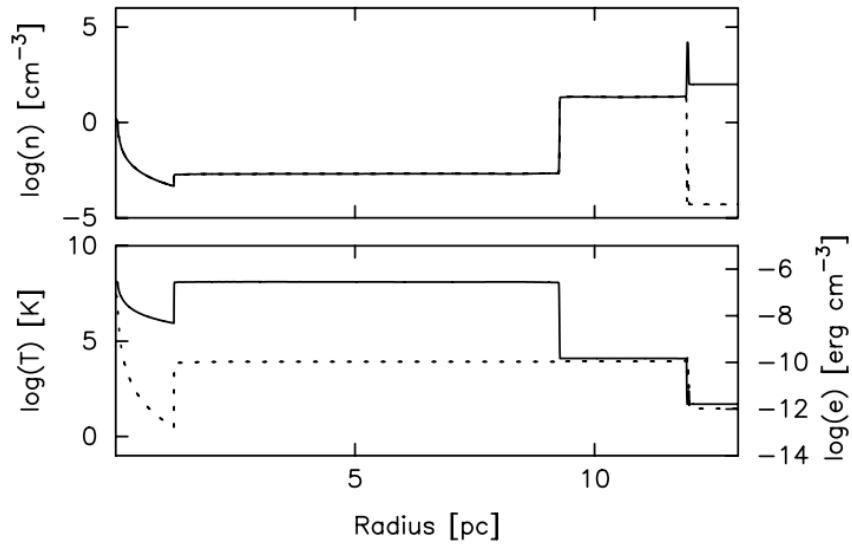
NGC 6888

Chu et al. 2006

EL PROBLEMA!



EL PROBLEMA!



Modelos:

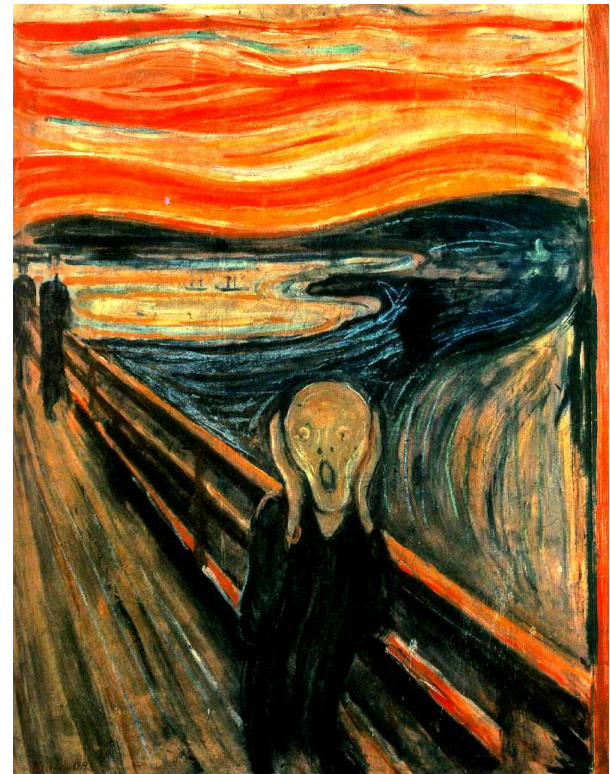
$$T \sim 10^7 \text{ K}$$

$$n < 10^{-2} \text{ cm}^{-3}$$

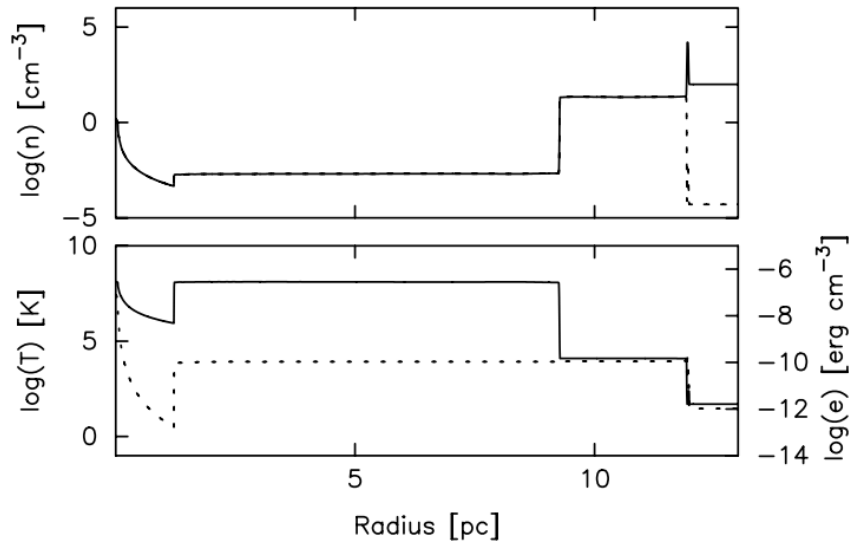
Observaciones:

$$T \sim 10^6 \text{ K}$$

$$n \sim 0.1 \text{ cm}^{-3}$$



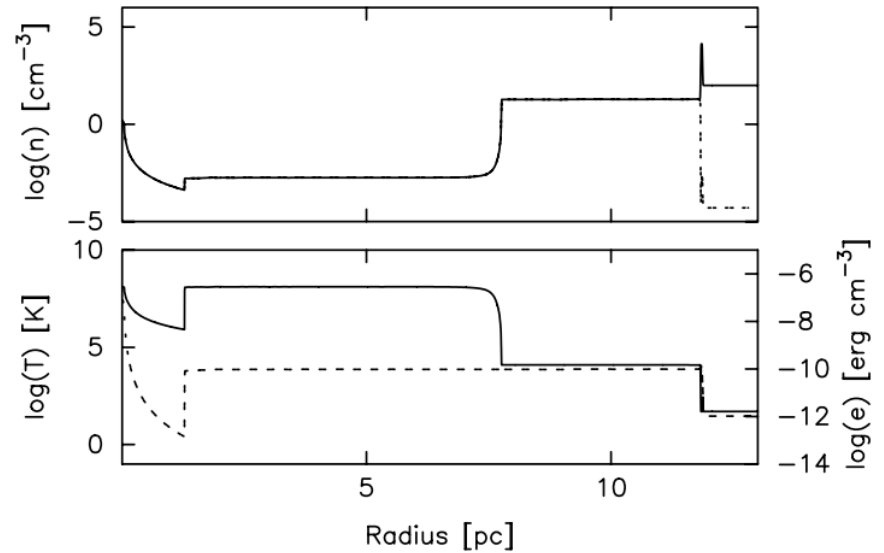
EL PROBLEMA!

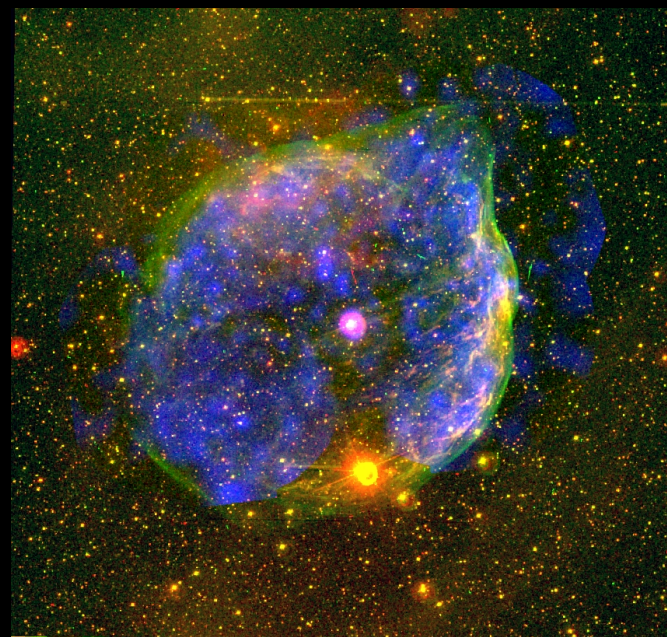
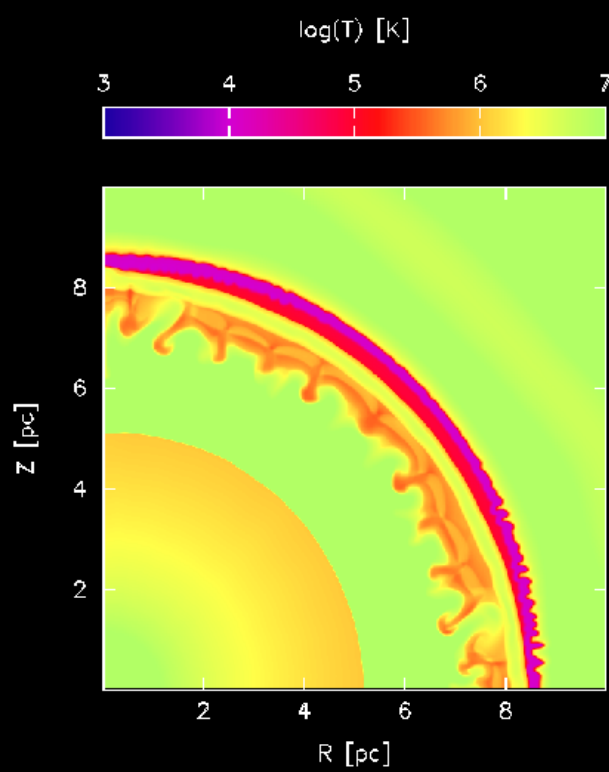
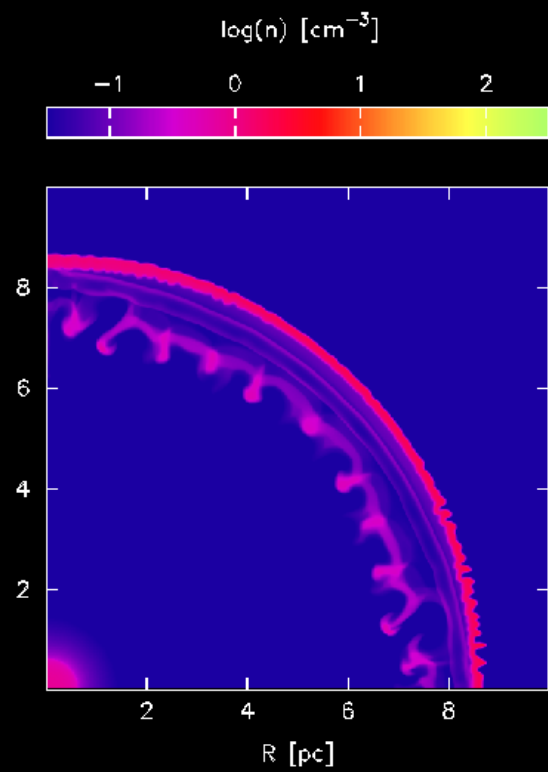


Conducción Térmica:

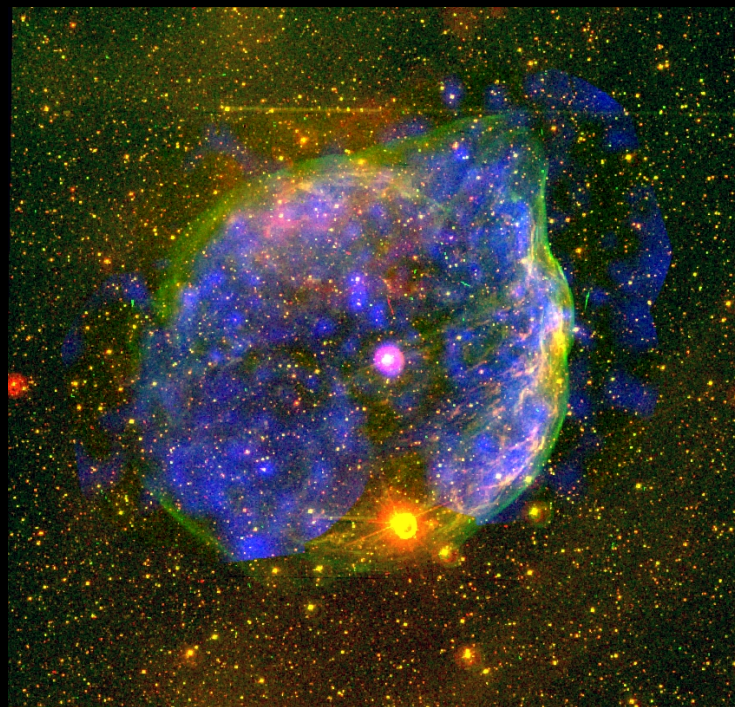
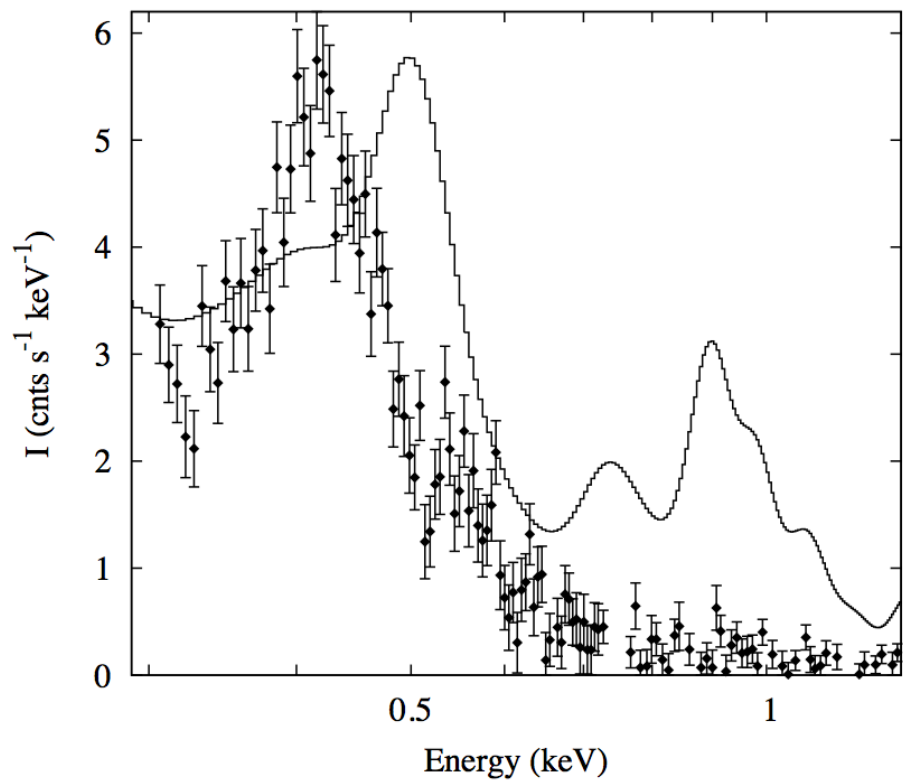
BAJA Temperatura
SUBE la densidad

LA SOLUCIÓN!



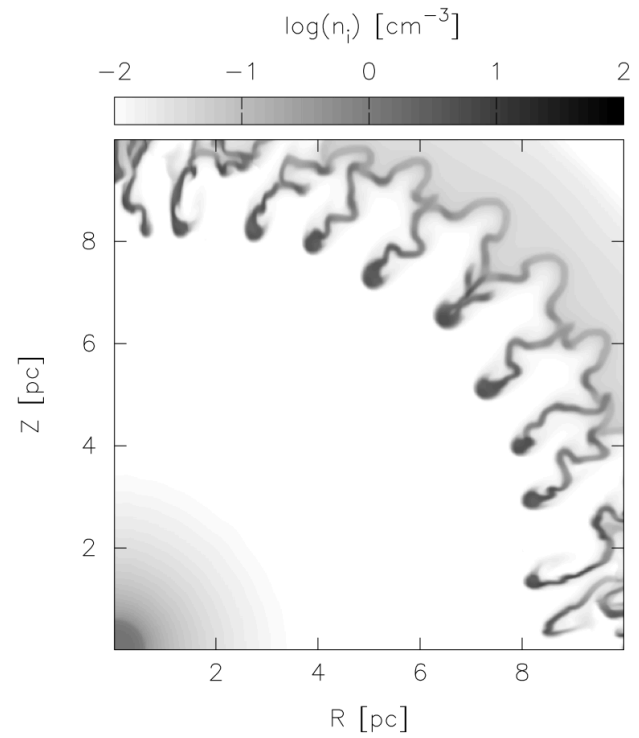
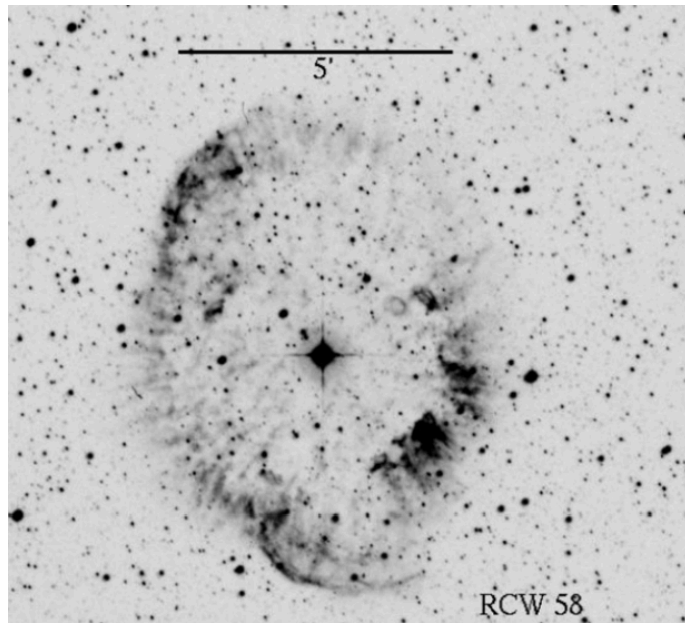


S308



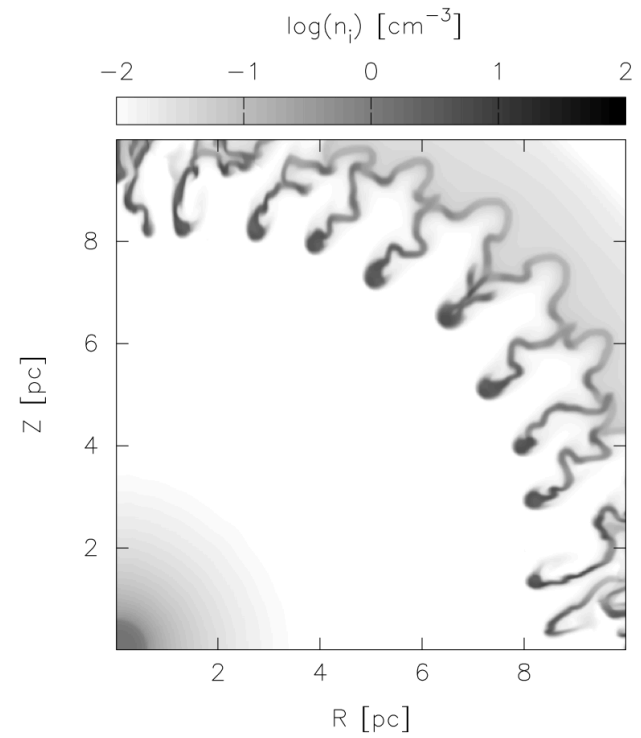
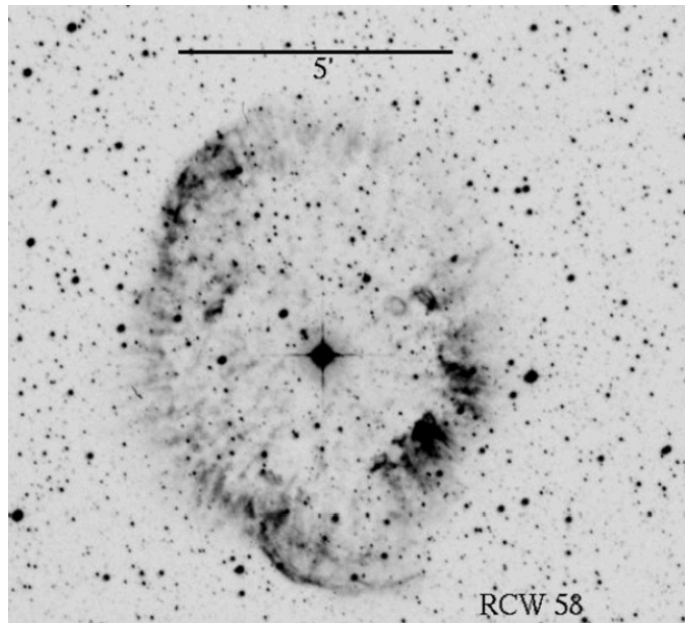
S308

RCW 58



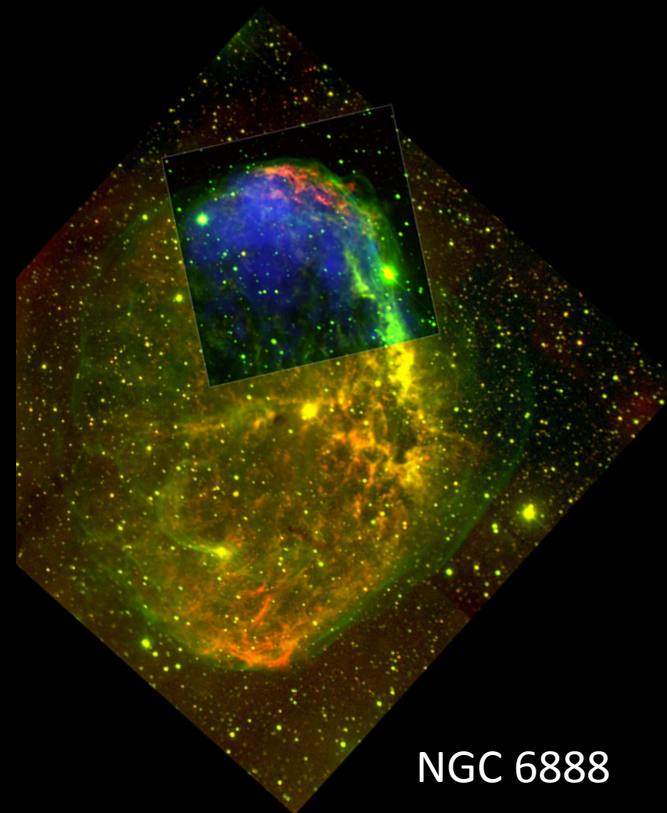
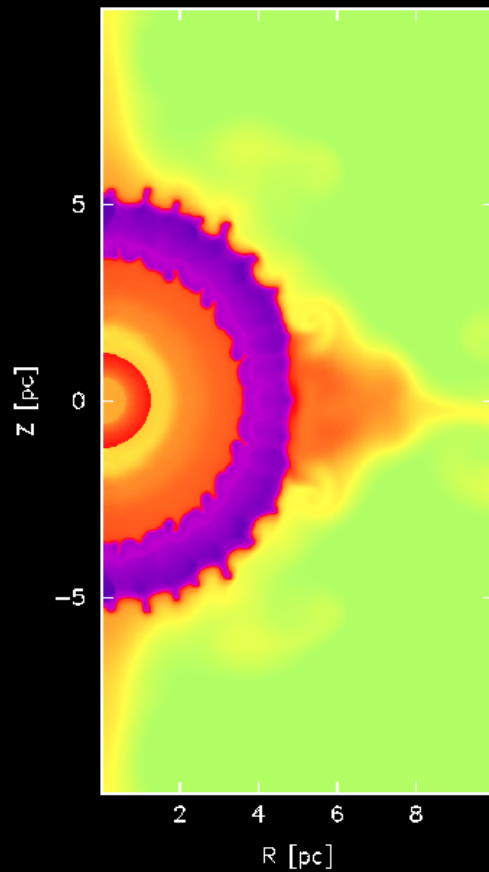
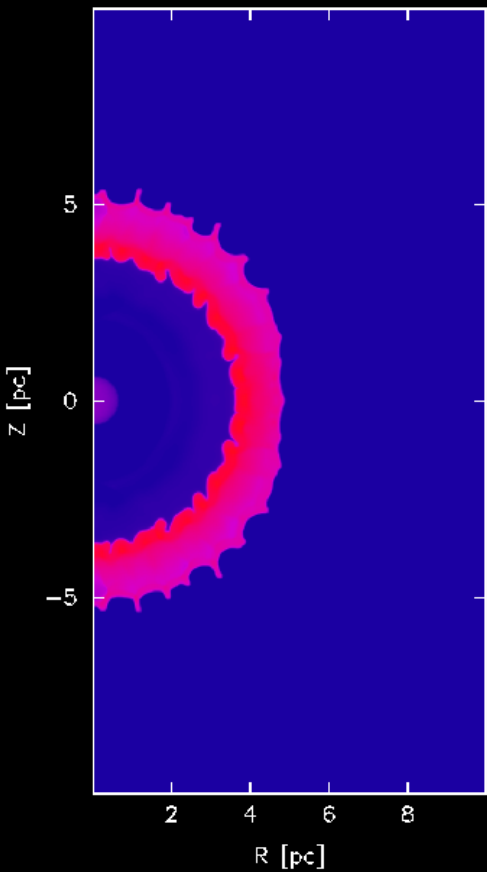
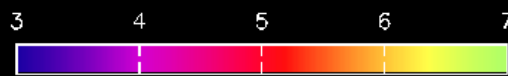
NO hay emisión detectable en rayos X

RCW 58



NO hay emisión detectable en rayos X

Gosset et al. (2005)



NGC 6888



GRACIAS