



Universidad
Industrial de
Santander



GRUPO HALLEY DE ASTRONOMÍA Y
CIENCIAS AEROSPAZIALES

Astronomía Planetaria

Clase 19 – Nacimiento Estelar

Mauricio Suárez Durán

Escuela de Física

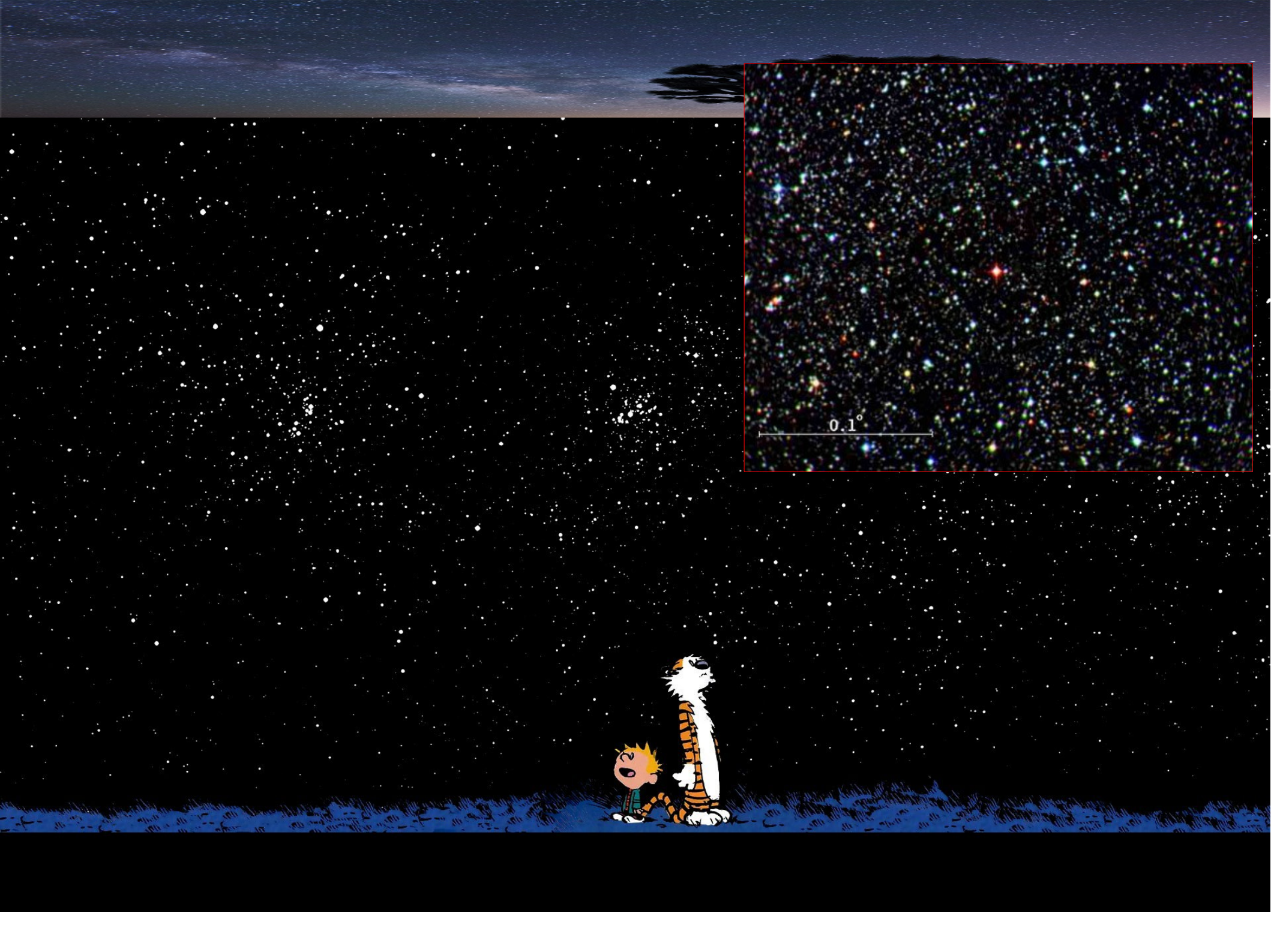
Grupo Halley de Astronomía y Ciencias Aeroespaciales

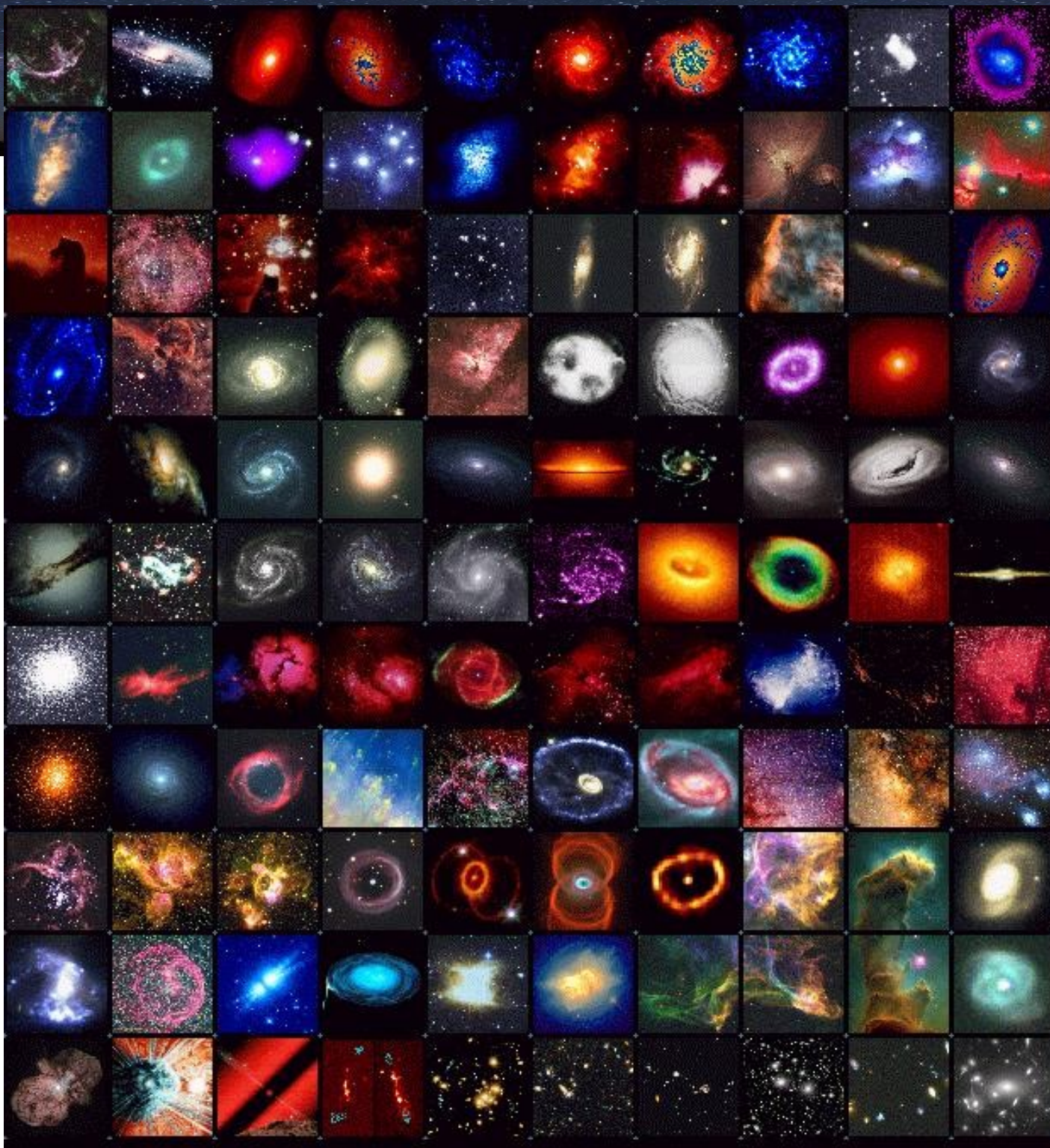
Universidad Industrial de Santander

Bucaramanga, II semestre de 2013



En nuestro capítulo anterior



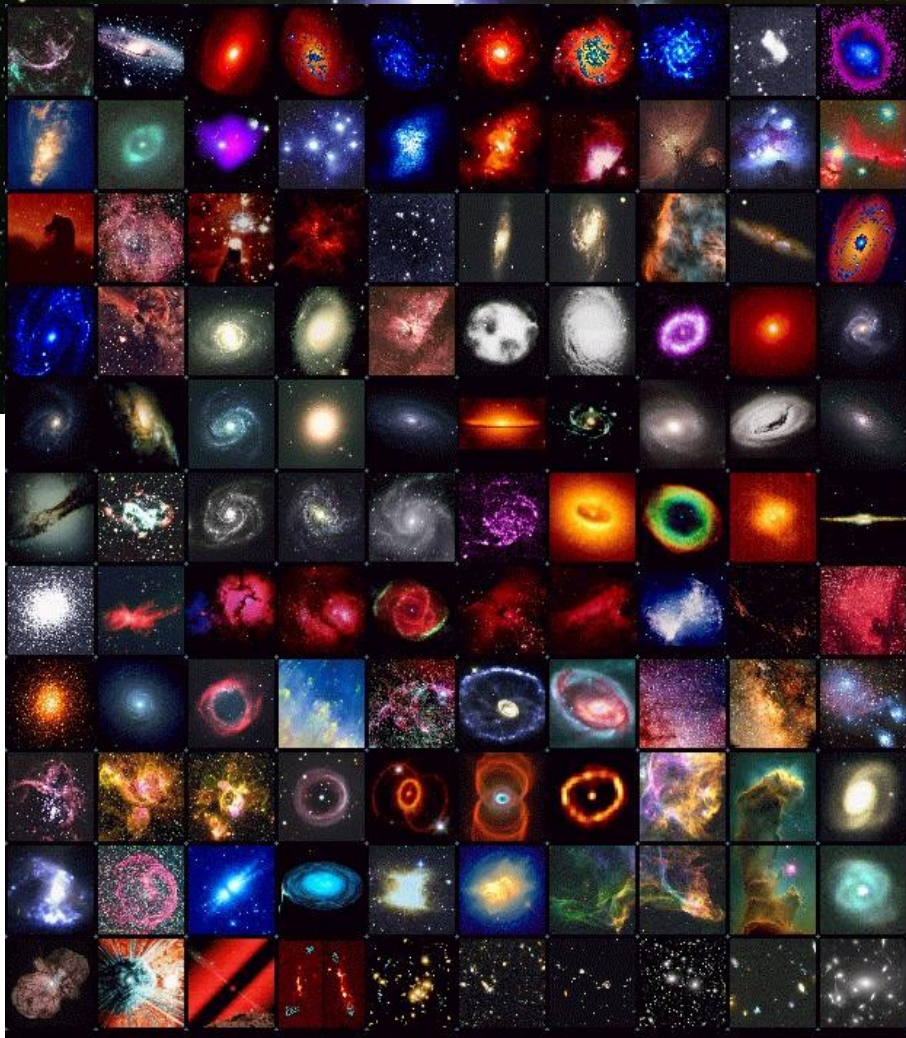


Si no son estrellas, ¿qué son?





Se donomina Medio Interestelar a la materia existente entre las estrellas



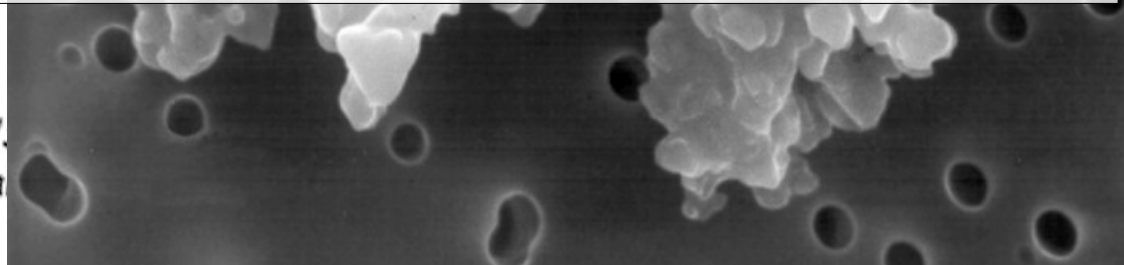
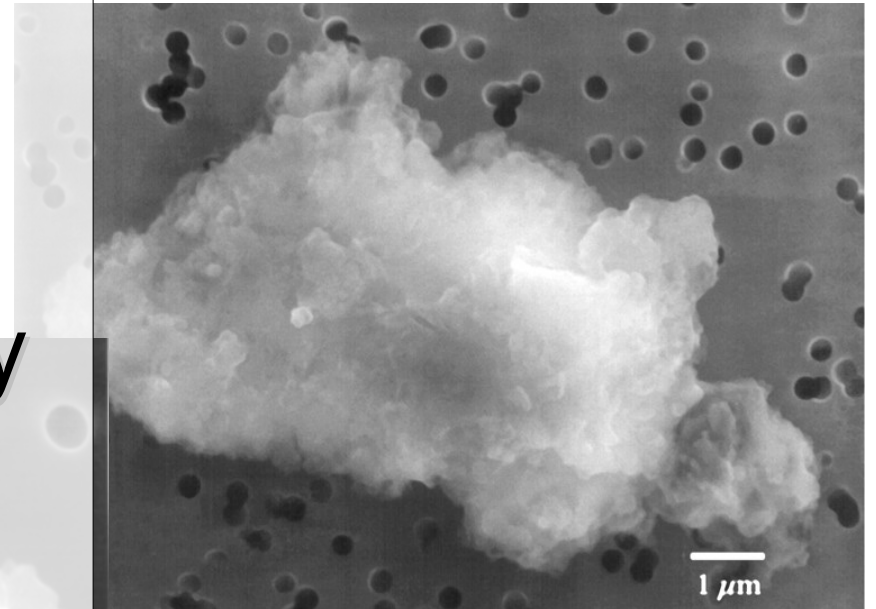
The Horsehead Nebula
(VLT KUEYEN + FORS 2)

http://en.wikipedia.org/wiki/List_of_Messier_objects

Polvo interestelar

Fenómenos asociados:

- Extinción y absorción
- Dispersión (Scattering) y enrojecimiento
- Polarización
- Emisión IR



$$m - M = 5 \log(d) - 5$$

$$m - M = 5 \log(d) - 5 + A$$

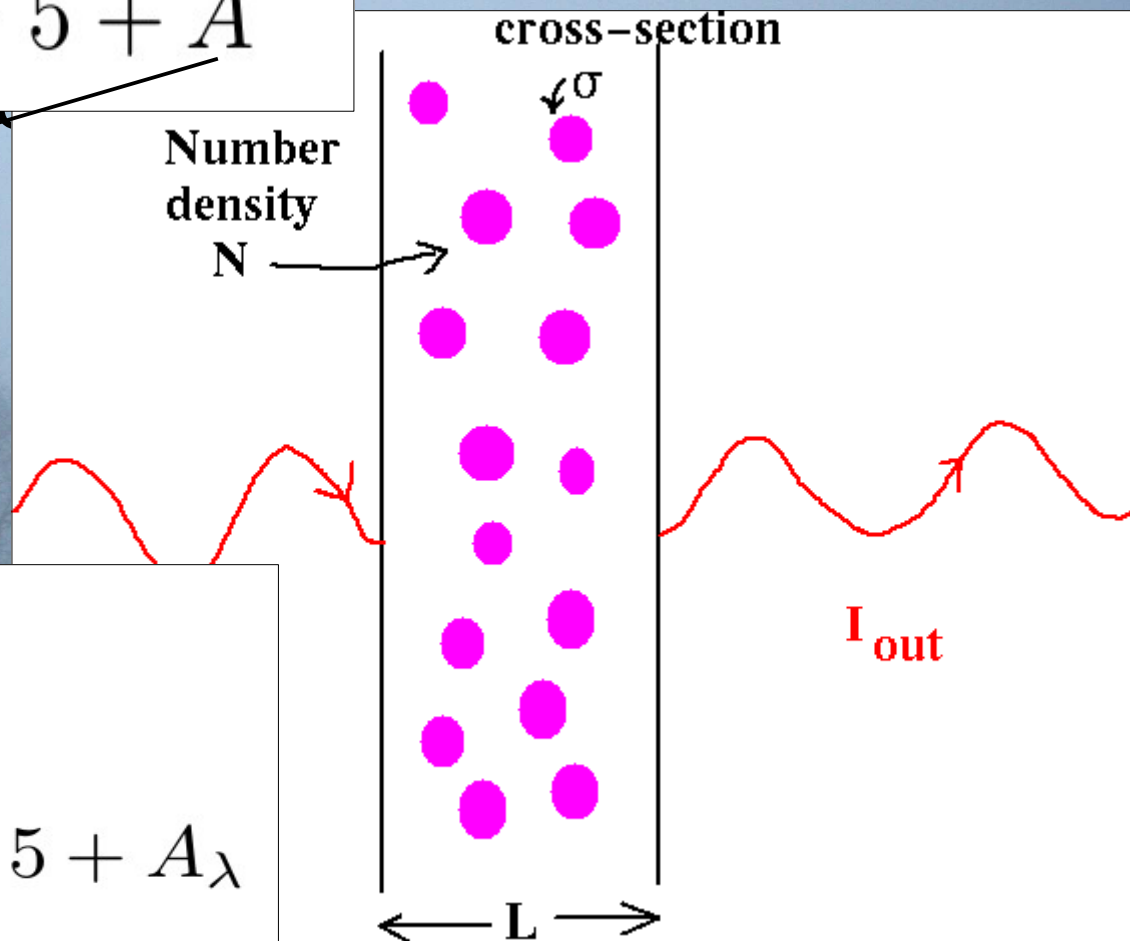
EXTINCTION & ABSORPTION

$$A_v \approx 3(CE)$$

$$m_\lambda - M_\lambda = 5 \log(d) - 5 + A_\lambda$$

$$A_\lambda = \kappa_\lambda d$$

stellar



$$m - M = 5 \log(d)$$

$$m - M = 5 \log(d) -$$

EXTINCTION y / ABSOR

Grafito ~ 220 nm

$$A_v \approx 3(CE)$$

$$m_\lambda - M_\lambda = 5 \log(d) - 5 + A_\lambda$$

$$A_\lambda = \kappa_\lambda d$$

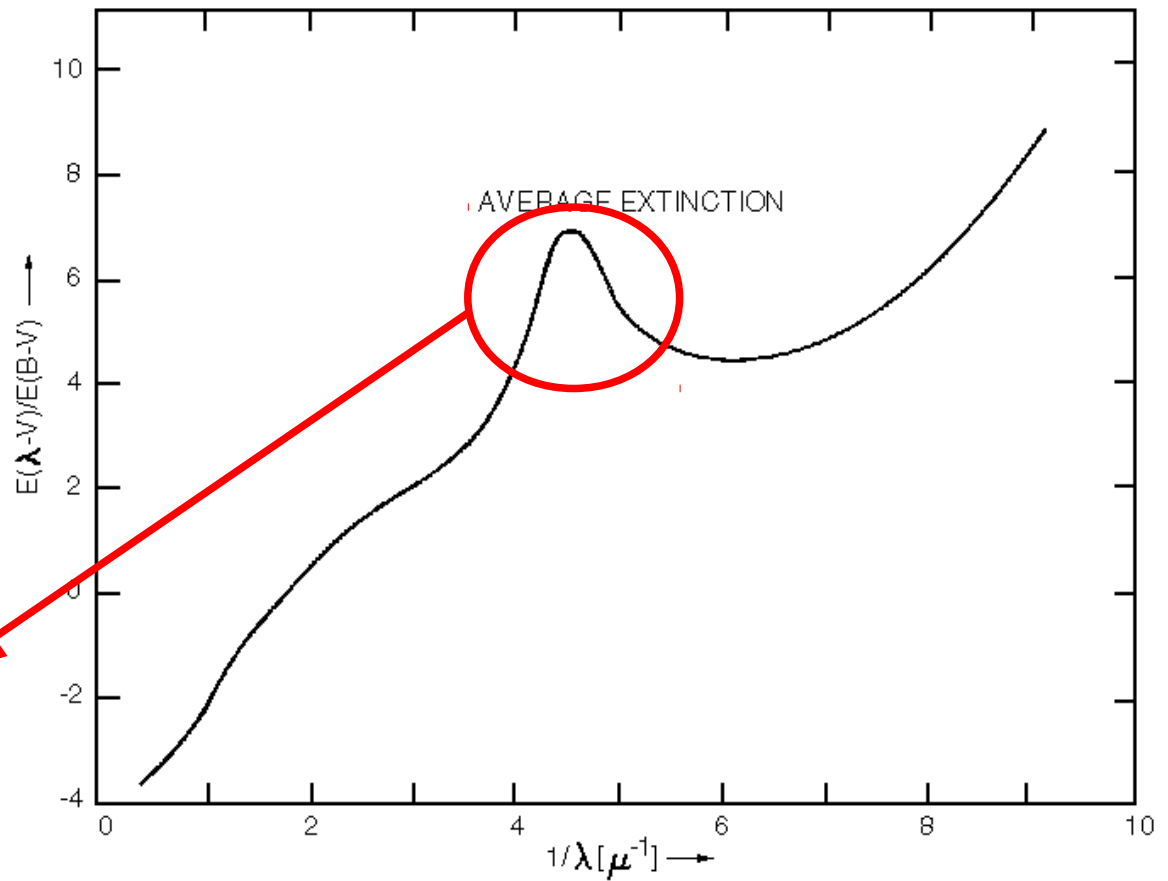
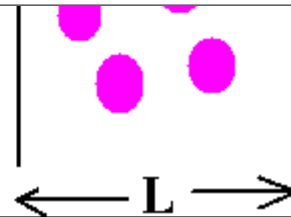
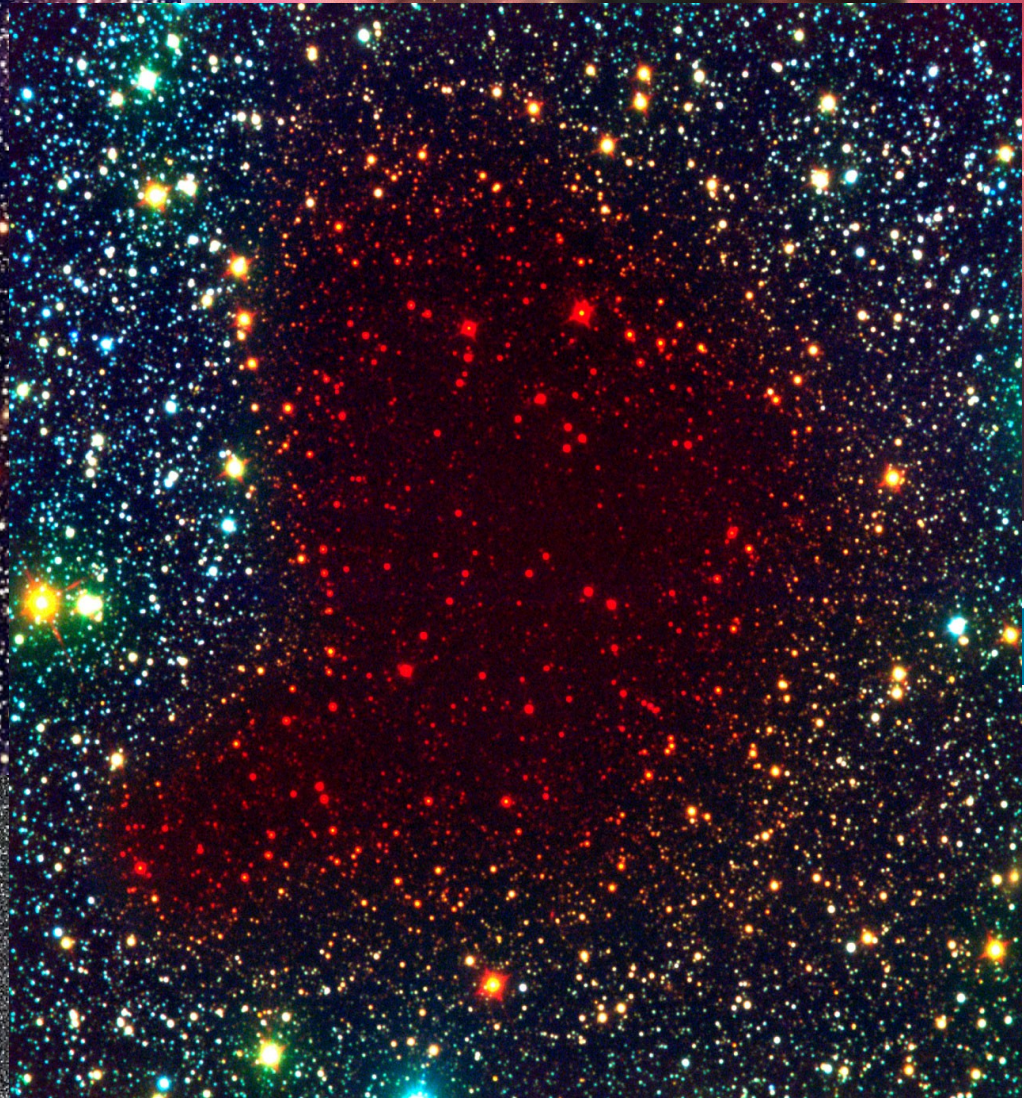
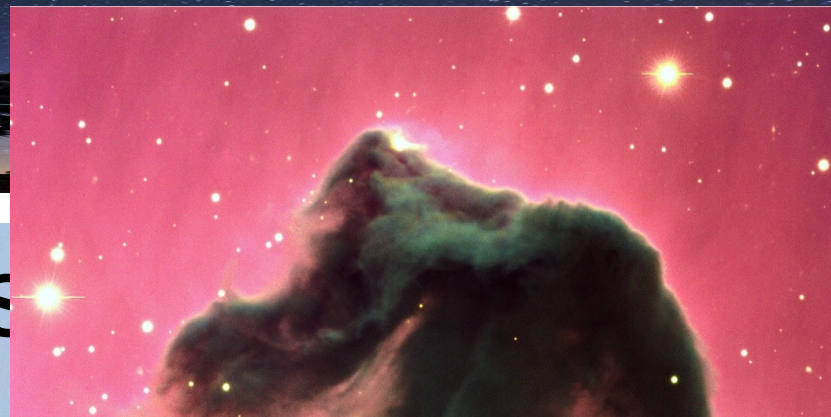
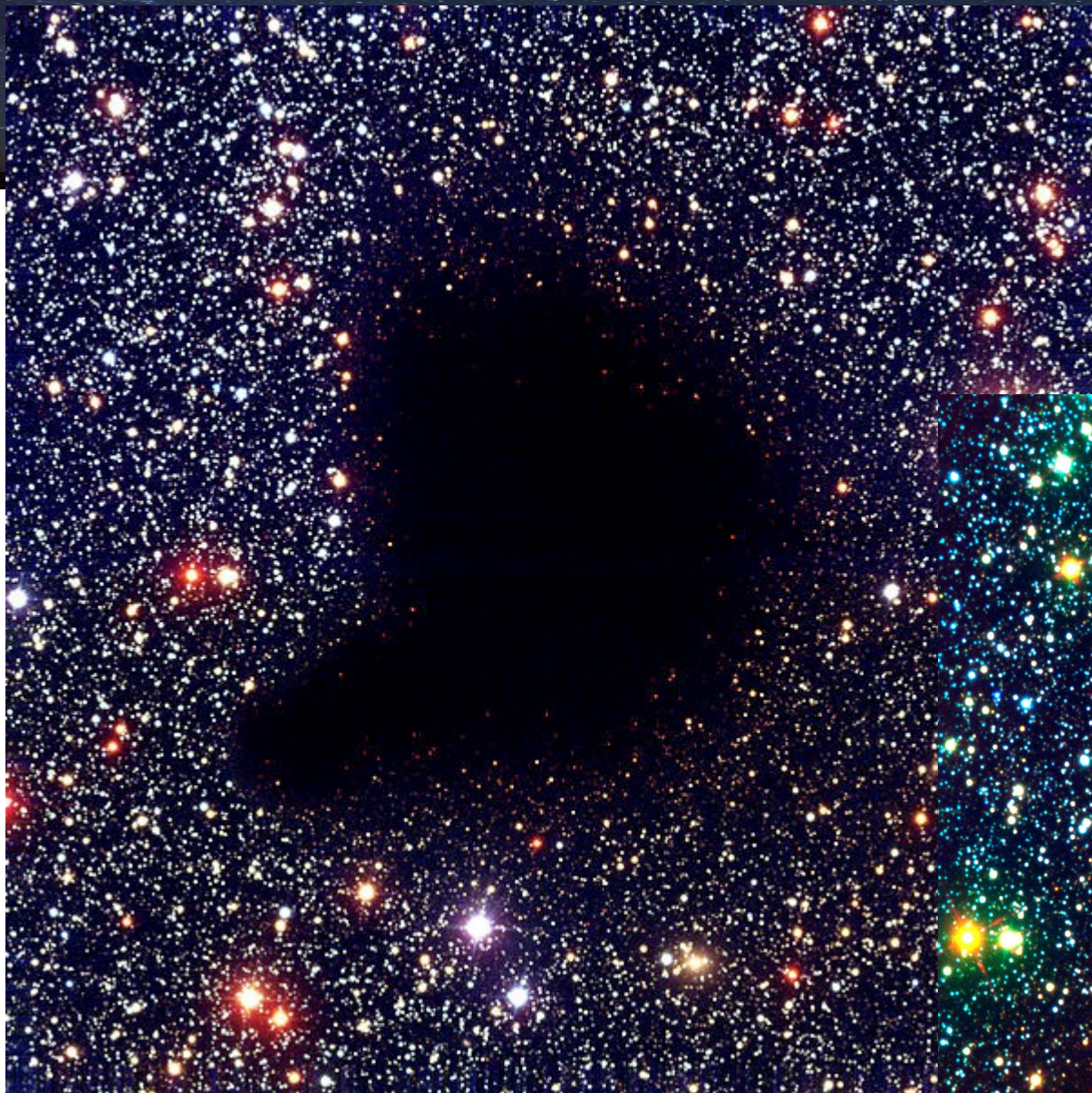


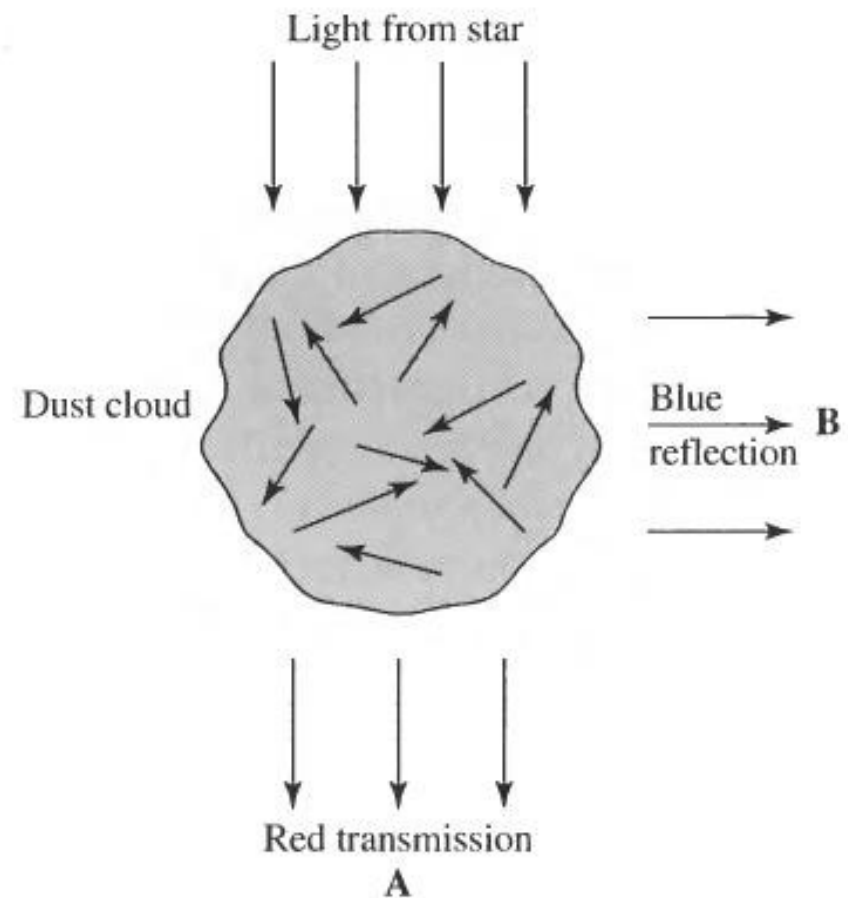
Figure 5. The mean for UV interstellar extinction curve of Bless and Savage. Curves for individual stars can deviate significantly from this mean, especially in cases of stars associated with nebulosity.





Polvo interestelar

- Dispersión (Scattering)





- Pre
- amon
- Alta
- orden
- Gra
- el es
- estela



Cone Nebula

Hubble Space Telescope • Advanced Camera for Surveys

NASA, H. Ford (JHU), G. Illingworth (UCSC/LO), M. Clampin (STScI), G. Hartig (STScI)
and the ACS Science Team • STScI-PRC02-11b

no

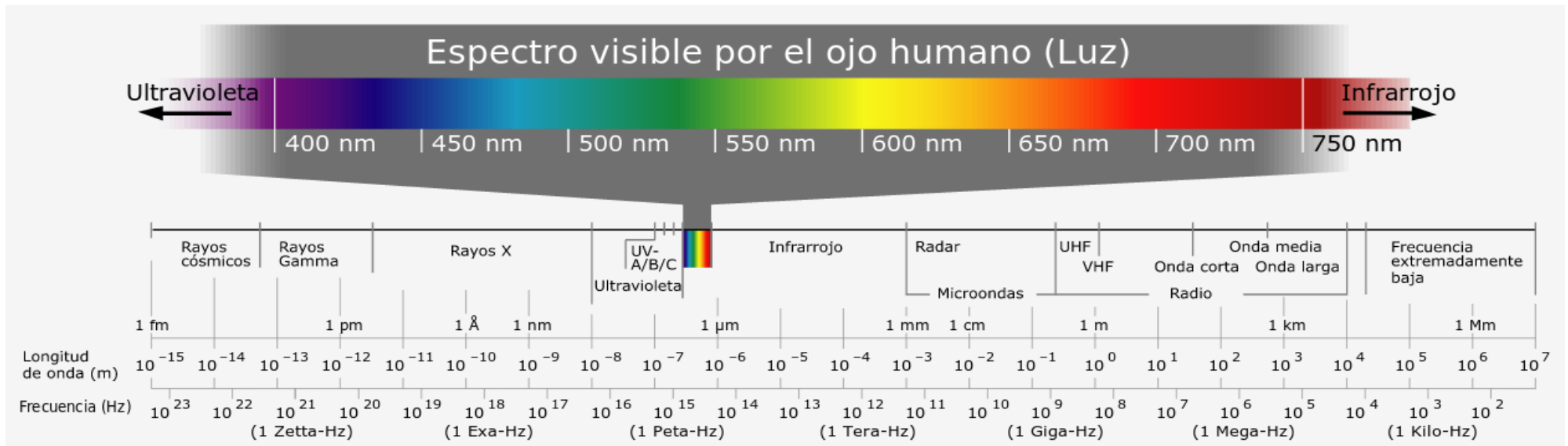
el

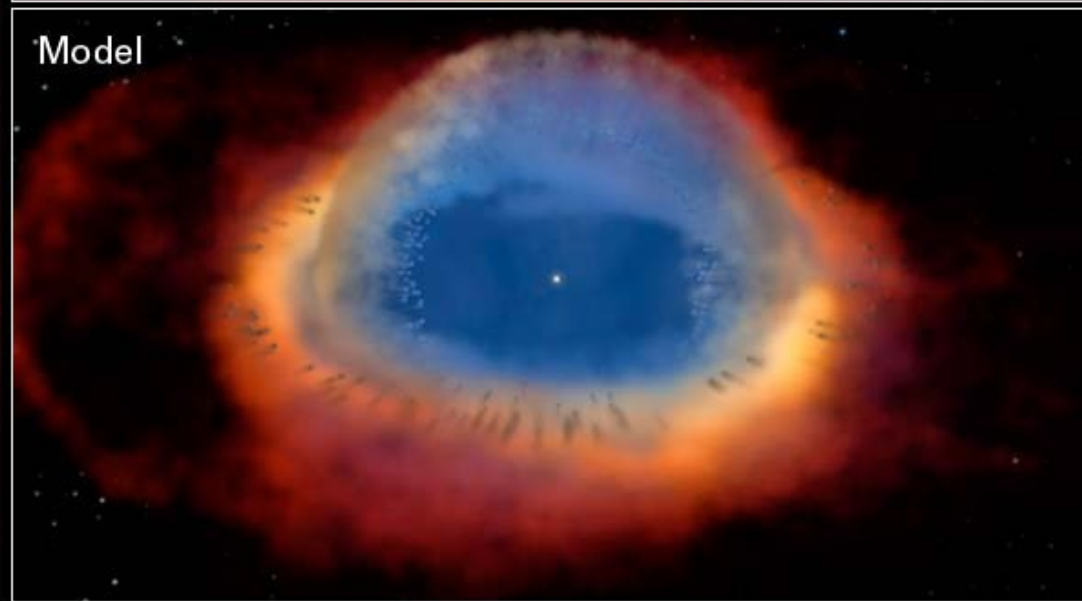
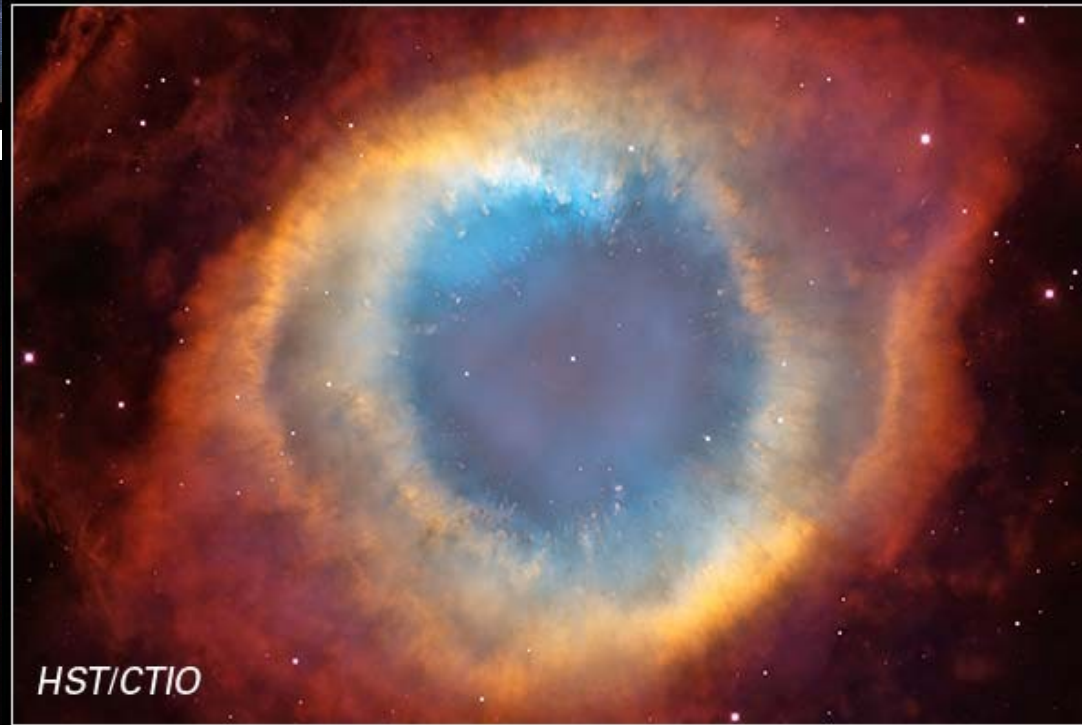
on

ón

Gas interestelar

- ¿Cómo puede el polvo interestelar causar los fenómenos de extinción, absorción y enrojecimiento, si el gas es mucho más





Em

Est

L

L

Est

pro

Em

$$R_s = \left[\frac{N_{uv}}{(4\pi/3)n_e n_H \alpha(2)} \right]^{1/3}$$

Em

Est

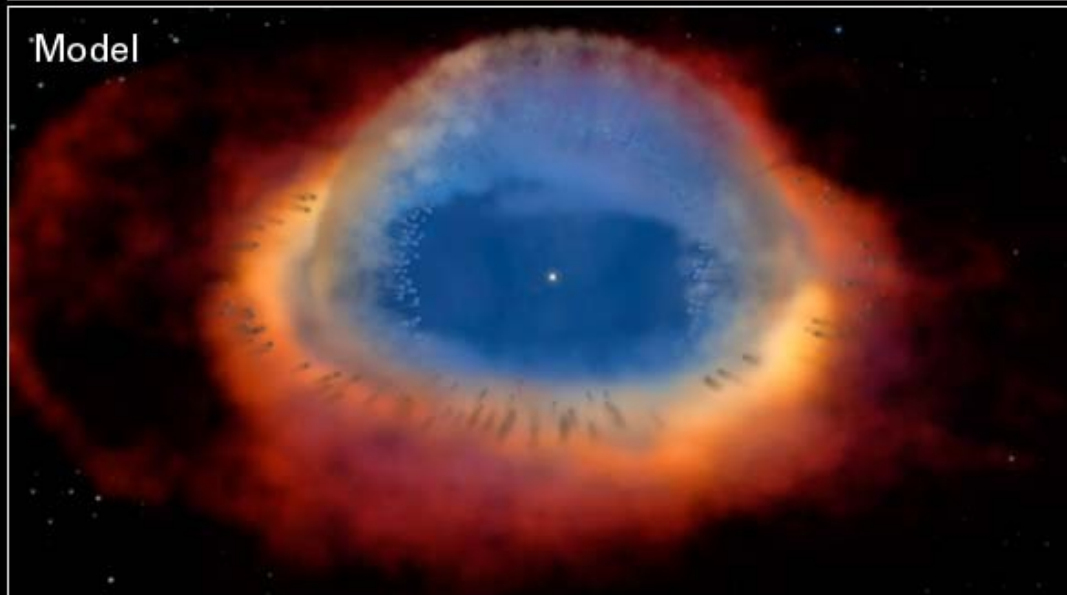
L

L

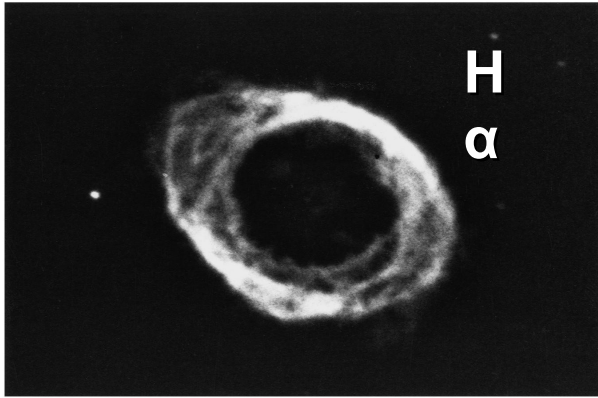
Est

pro

Em

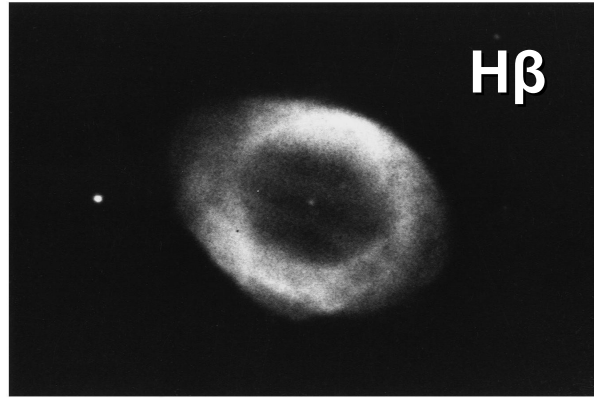


NGC 6720



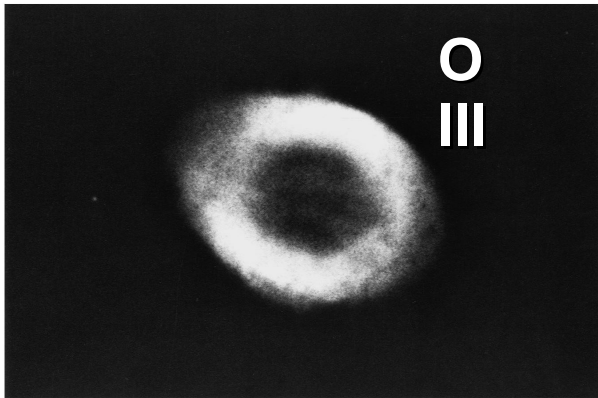
H
 α

λ 6300



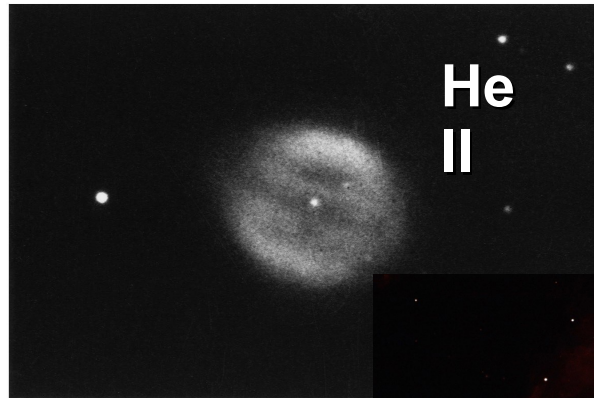
H β

λ 4861



O
III

λ 5007



He
II

λ 4686

3

Mosaic II



prohibidas.

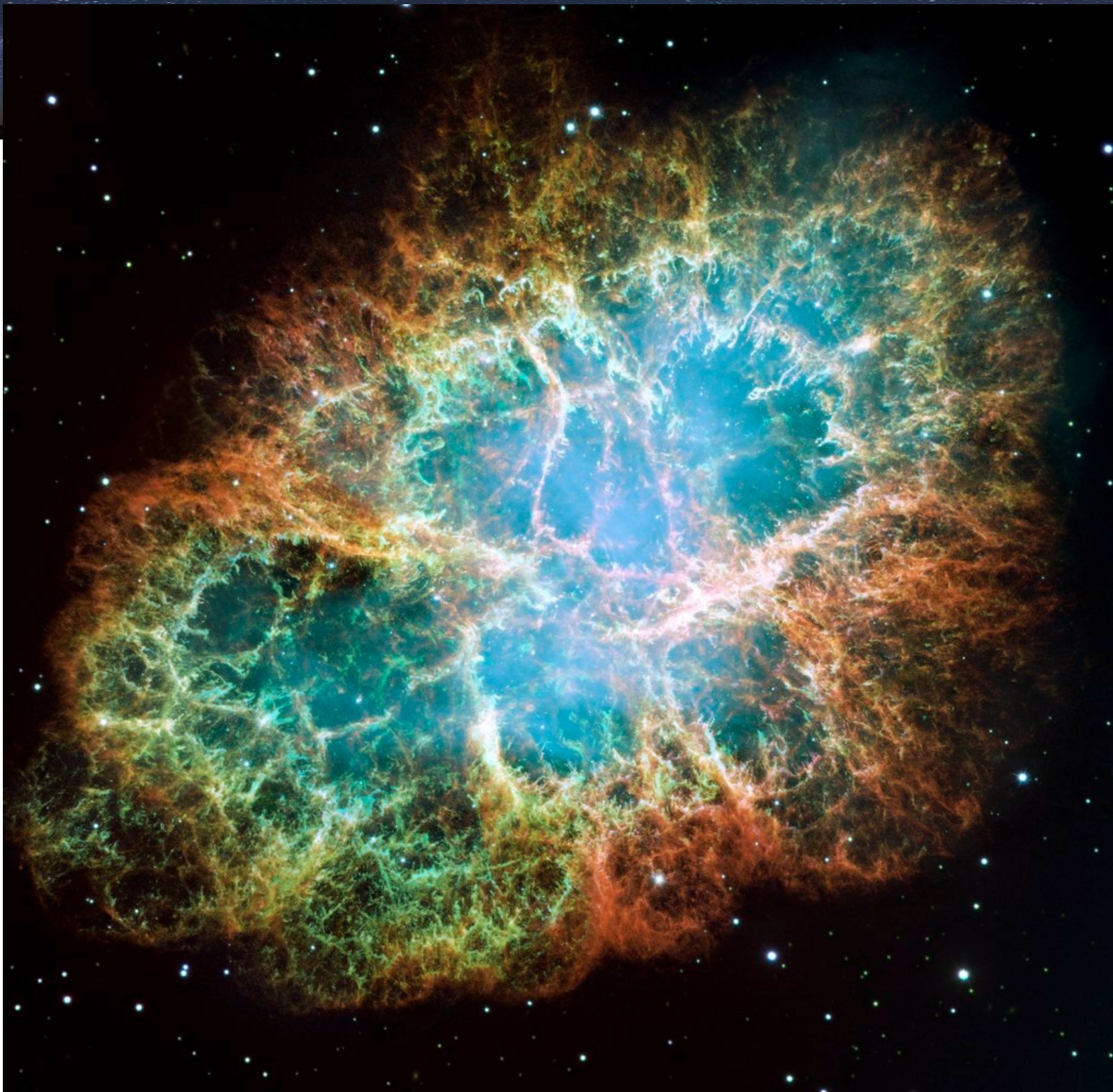
Emisión en o

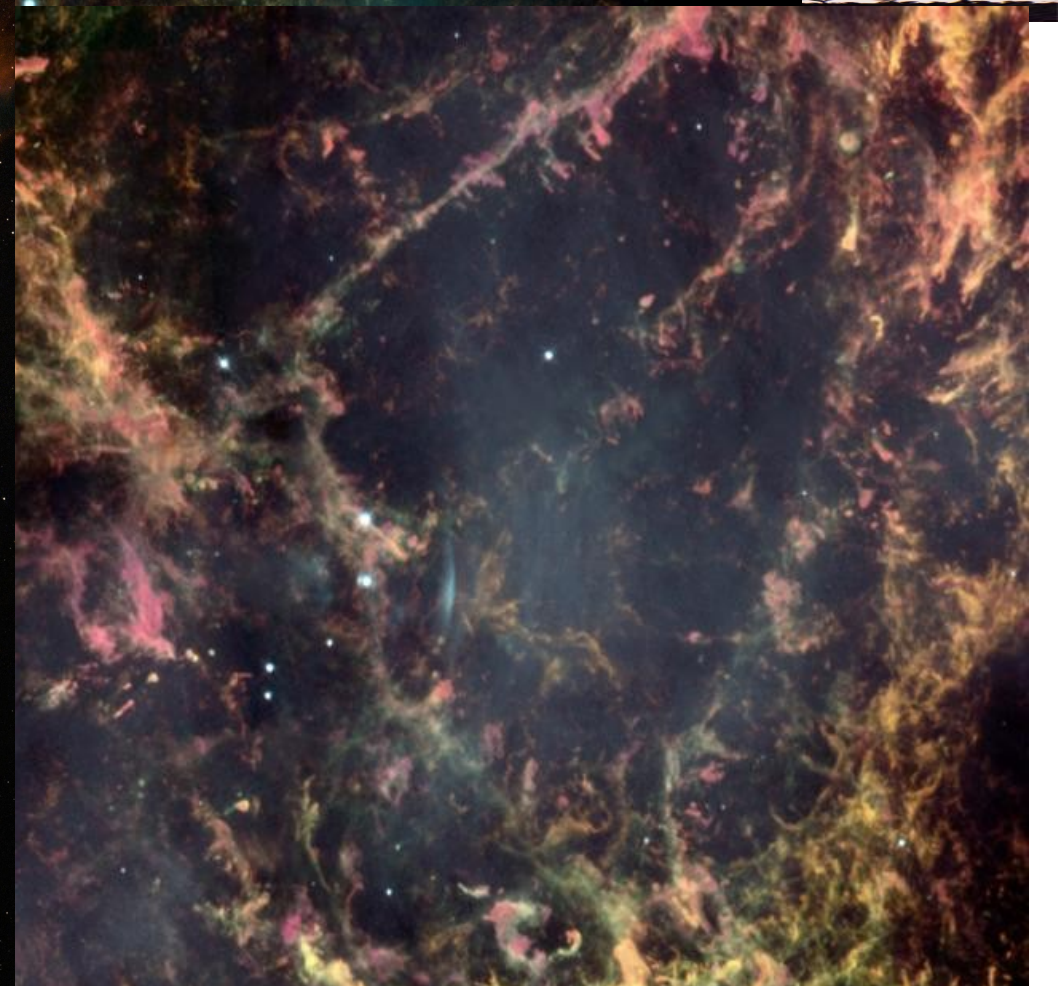


NASA, ESA, and C.R. O'Dell (Vanderbilt University)

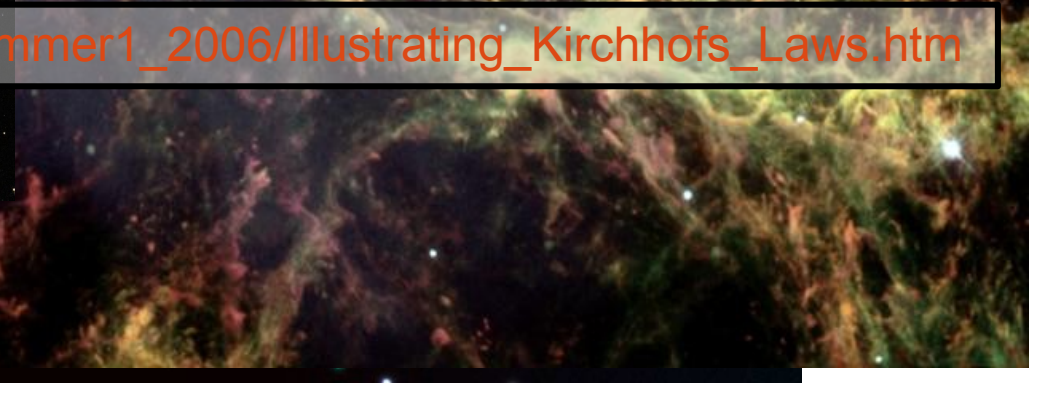
Astronomía planetaria,







http://sirius.bu.edu/withers/teaching/as101_summer1_2006/Illustrating_Kirchhofs_Laws.htm





Los objetivos para hoy

- Conocer la teoría actual de formación estelar.
- Definir que es un estrella.
- Mostar cómo evolucionan las estrellas.



Guarderías estelares



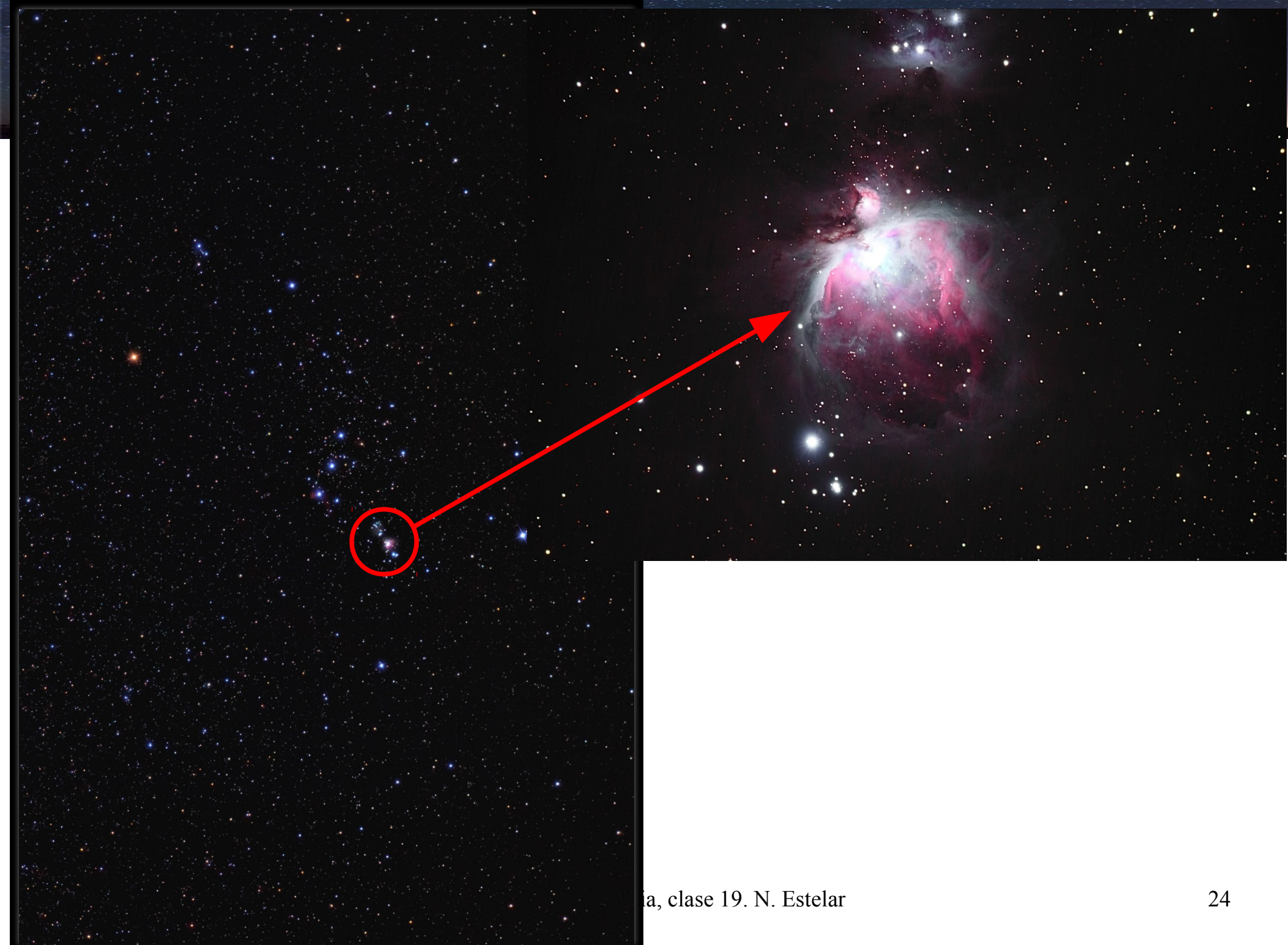
s estelares



Orion Wide Field

Noel Carboni, NCarboni@att.net
Canon EOS-20D and Canon 17-40 Zoom @ 31mm f/4
Piggybacked on 10" LX200 GPS UHTC, 11 x 15 second ISO 1600 Exposures

...a, clase 19. N. Estelar



...a, clase 19. N. Estelar



¿Cómo se forman las estrellas?



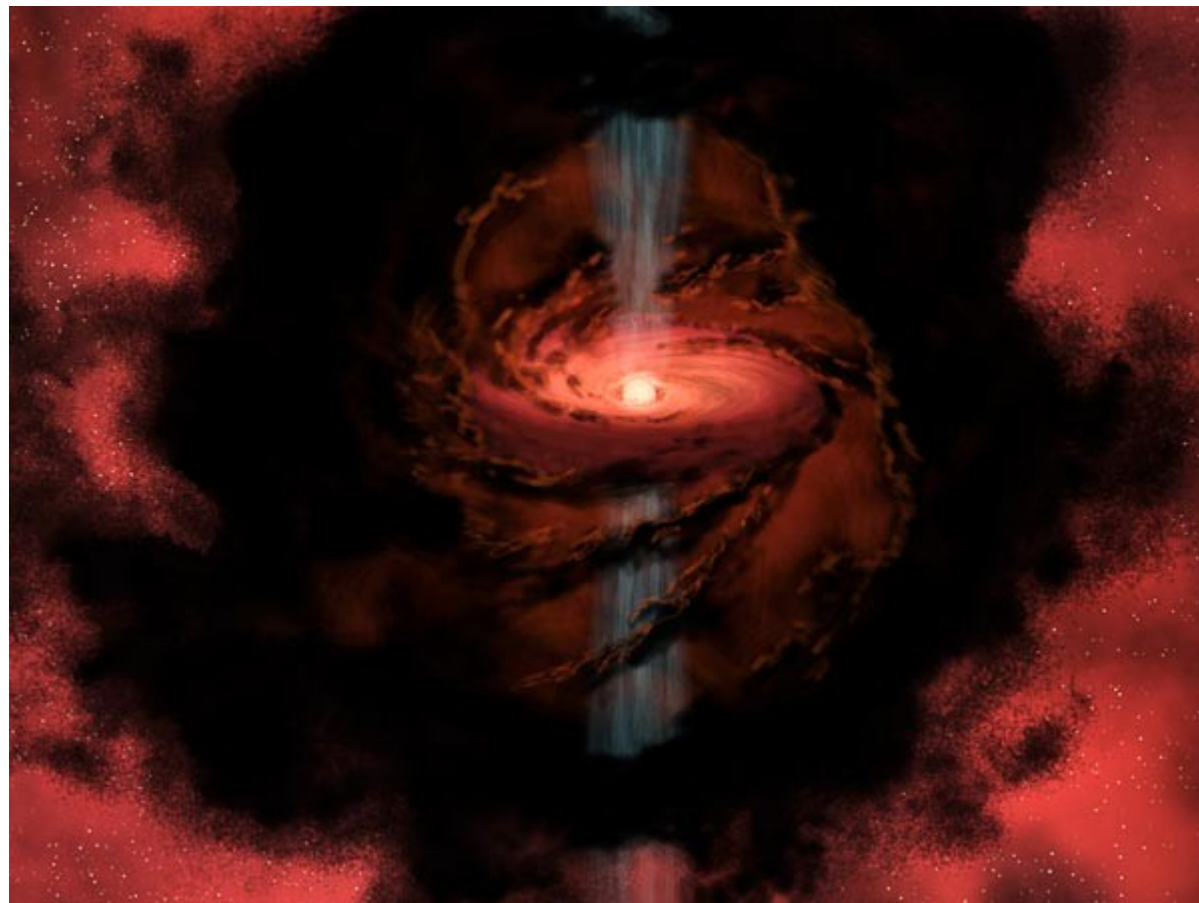


¿Cómo se forman las estrellas?





¿Cómo se forman las estrellas?



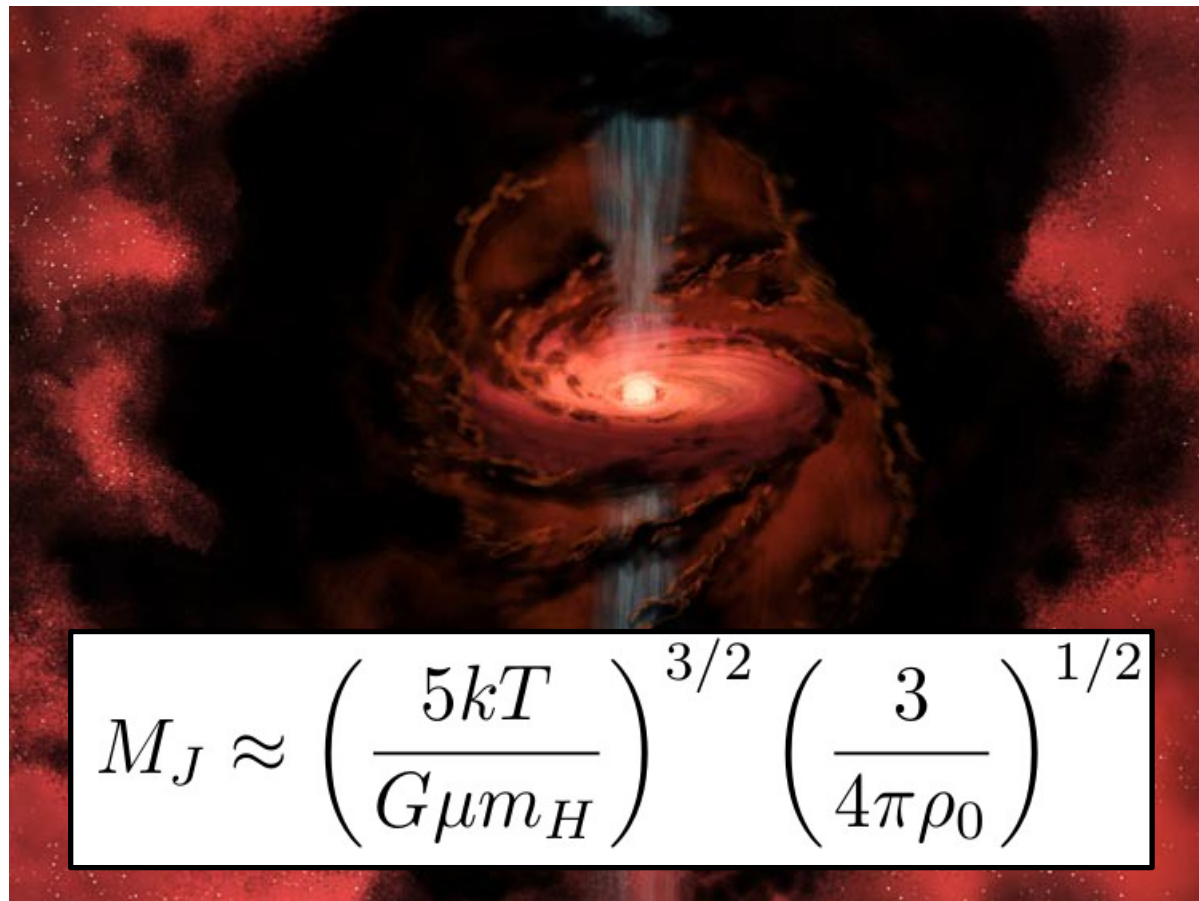
$$2K + U = 0$$

¿Cómo se forman las estrellas?

$$2K + U = 0$$

$$M_J \approx \left(\frac{5kT}{G\mu m_H} \right)^{3/2} \left(\frac{3}{4\pi\rho_0} \right)^{1/2}$$

¿Cómo se forman las estrellas?

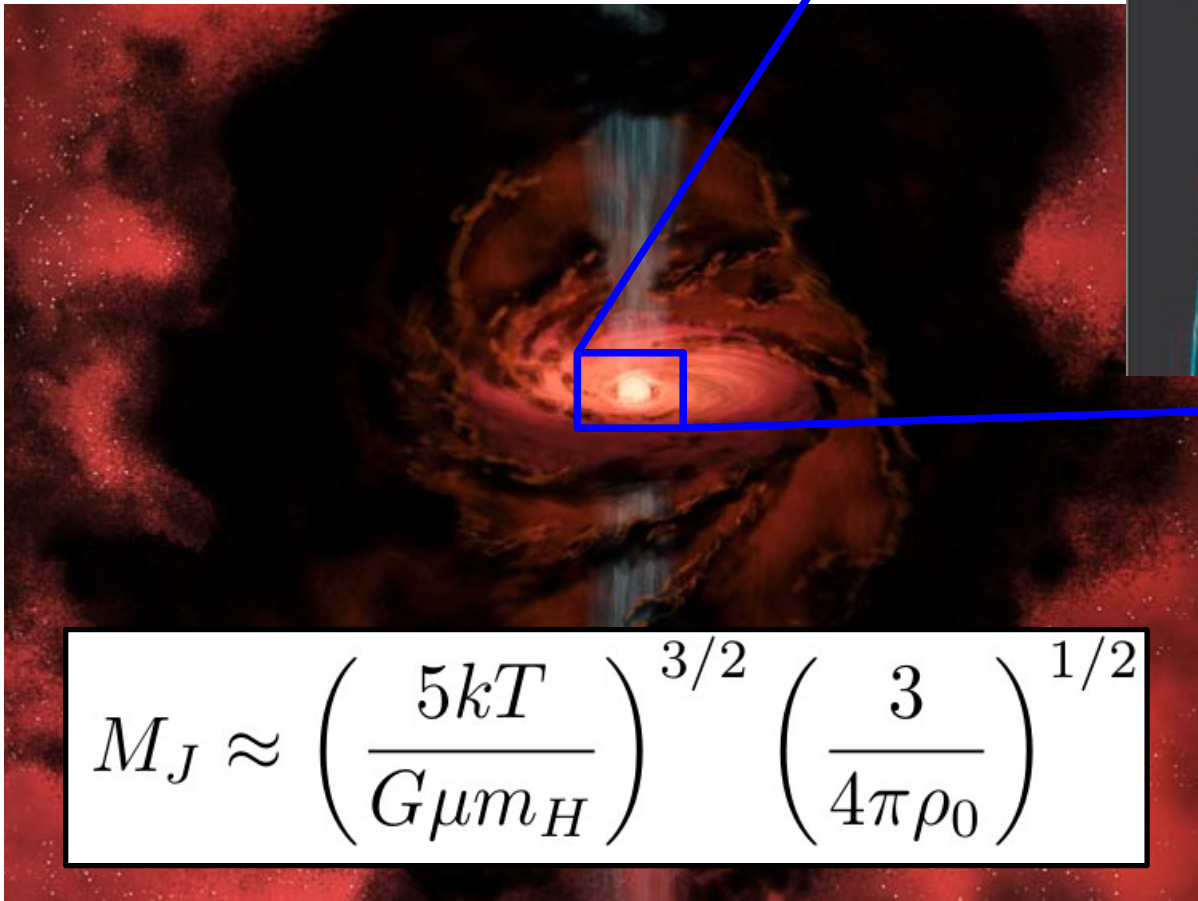
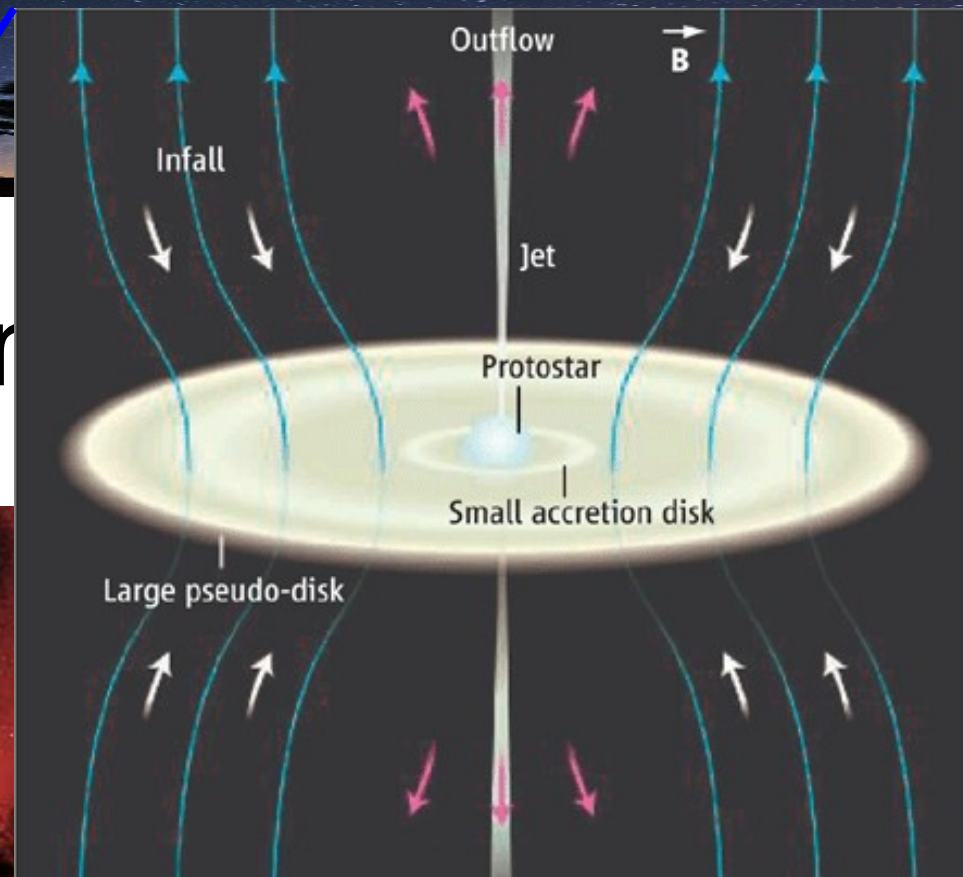


$$2K + U = 0$$

$$M_J \approx \left(\frac{5kT}{G\mu m_H} \right)^{3/2} \left(\frac{3}{4\pi\rho_0} \right)^{1/2}$$

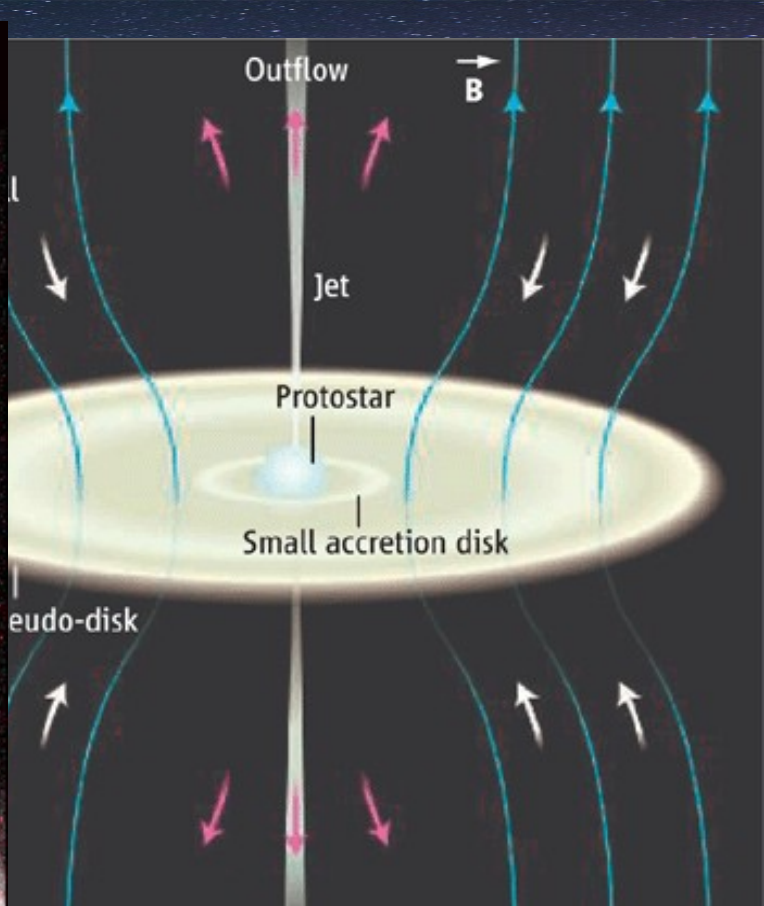
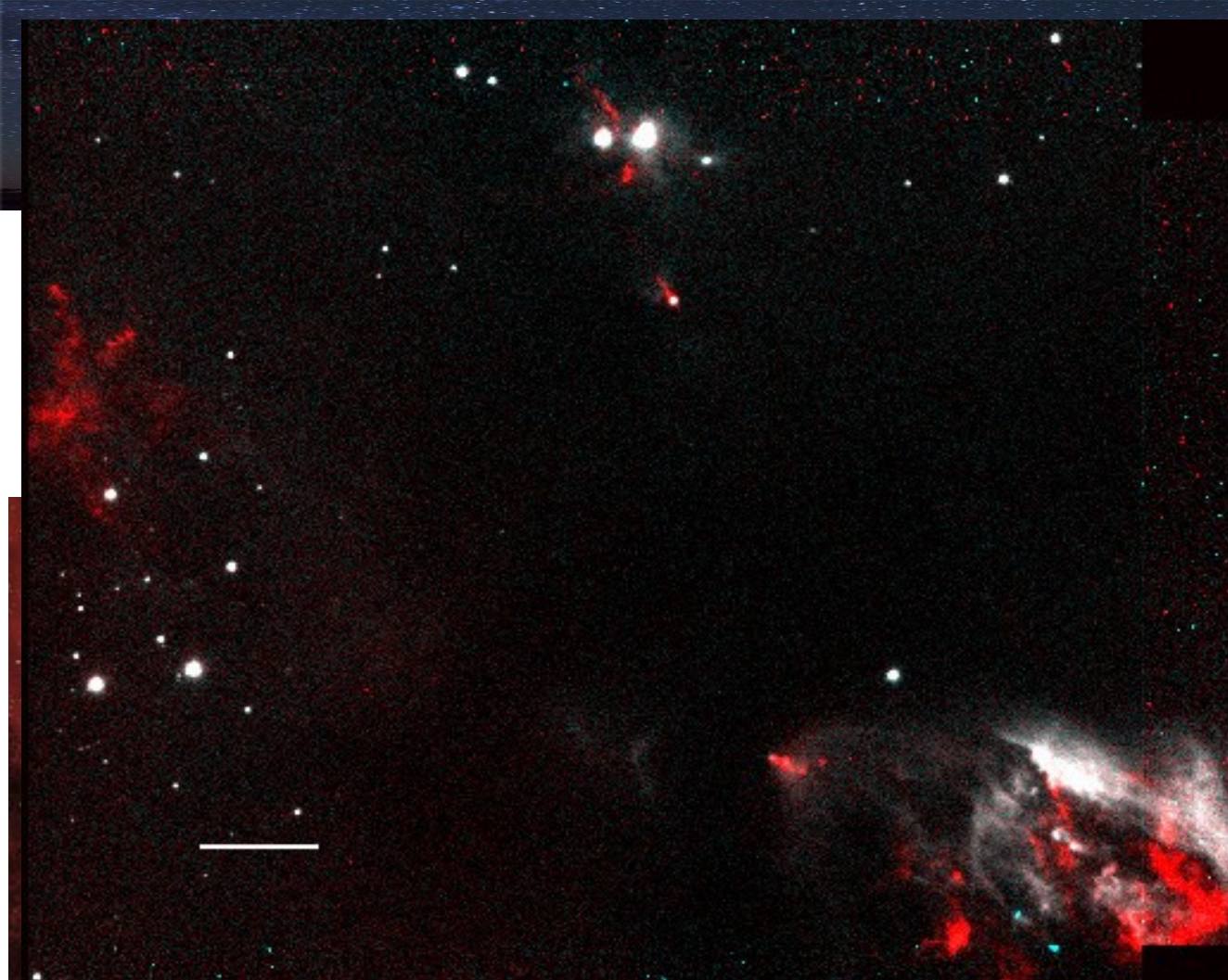
$$R_J \approx \left(\frac{15kT}{4\pi G\mu m_H \rho_0} \right)^{1/2}$$

¿Cómo se forman



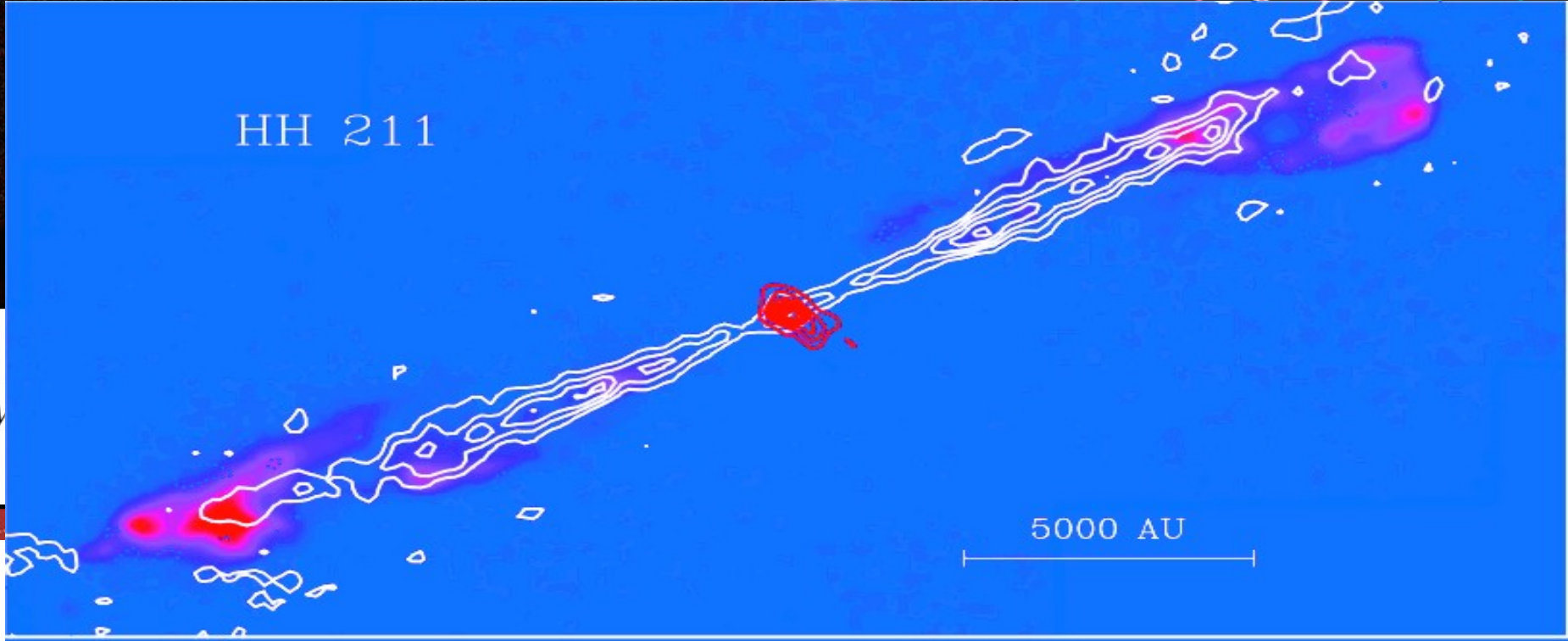
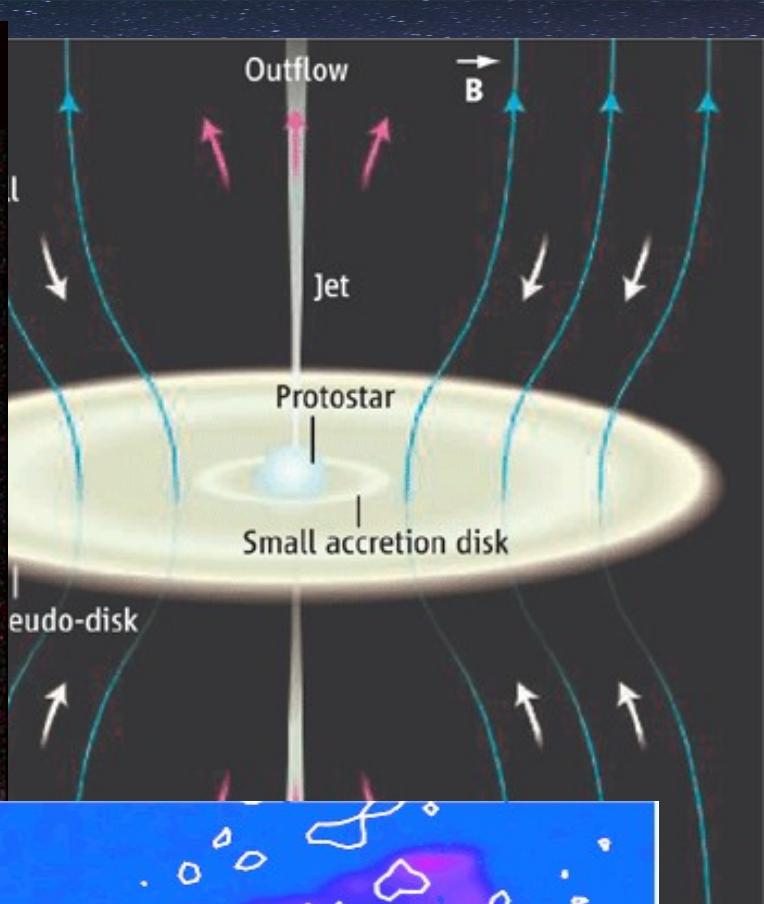
$$M_J \approx \left(\frac{5kT}{G\mu m_H} \right)^{3/2} \left(\frac{3}{4\pi\rho_0} \right)^{1/2}$$

$$R_J \approx \left(\frac{15kT}{4\pi G\mu m_H \rho_0} \right)^{1/2}$$

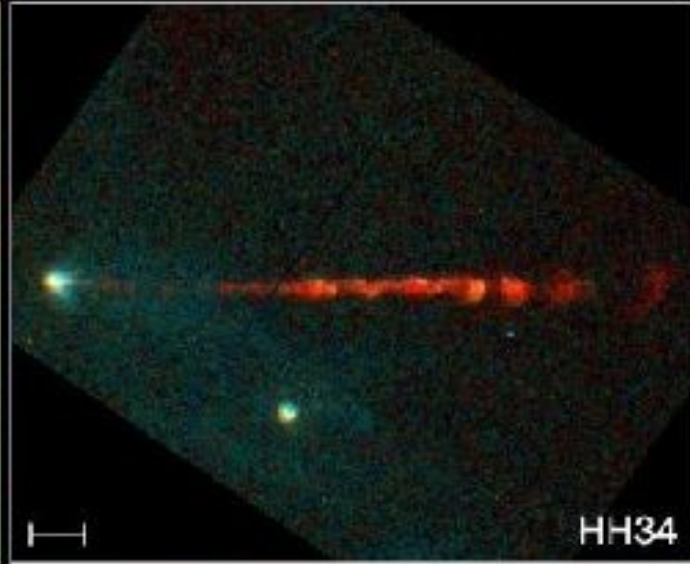
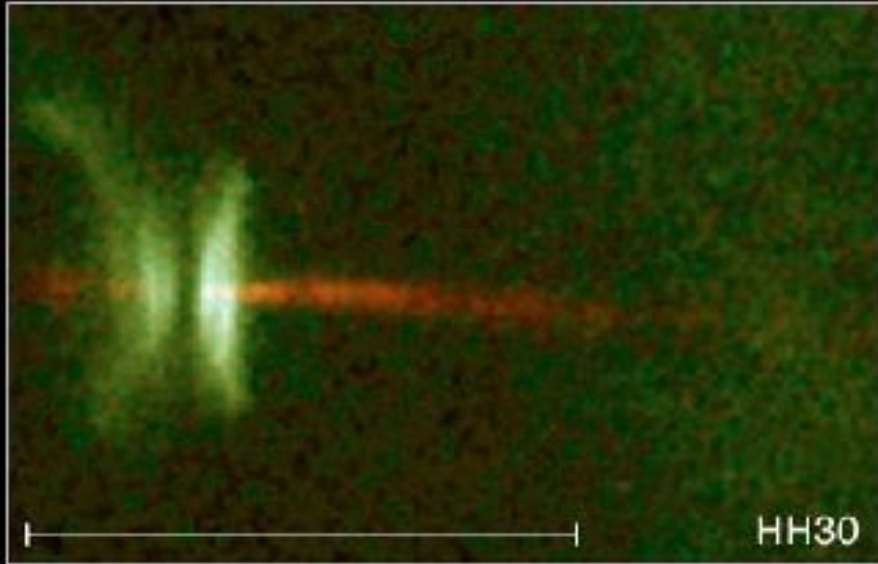


$$M_J \approx \left(\frac{5kT}{G\mu m_H} \right)^{3/2} \left(\frac{3}{4\pi\rho_0} \right)^{1/2}$$

$$R_J \approx \left(\frac{15kT}{4\pi G\mu m_H \rho_0} \right)^{1/2}$$



M



?

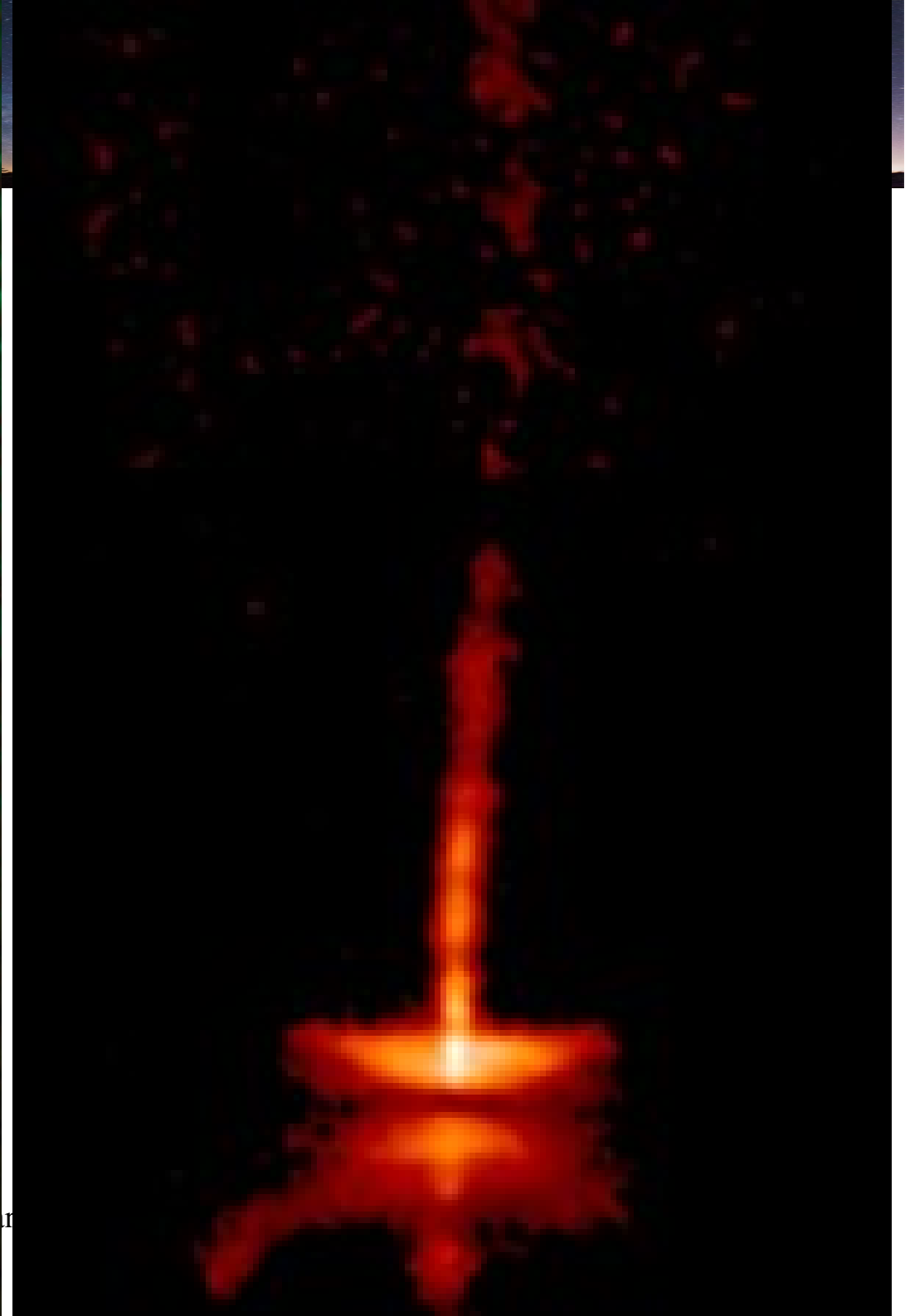
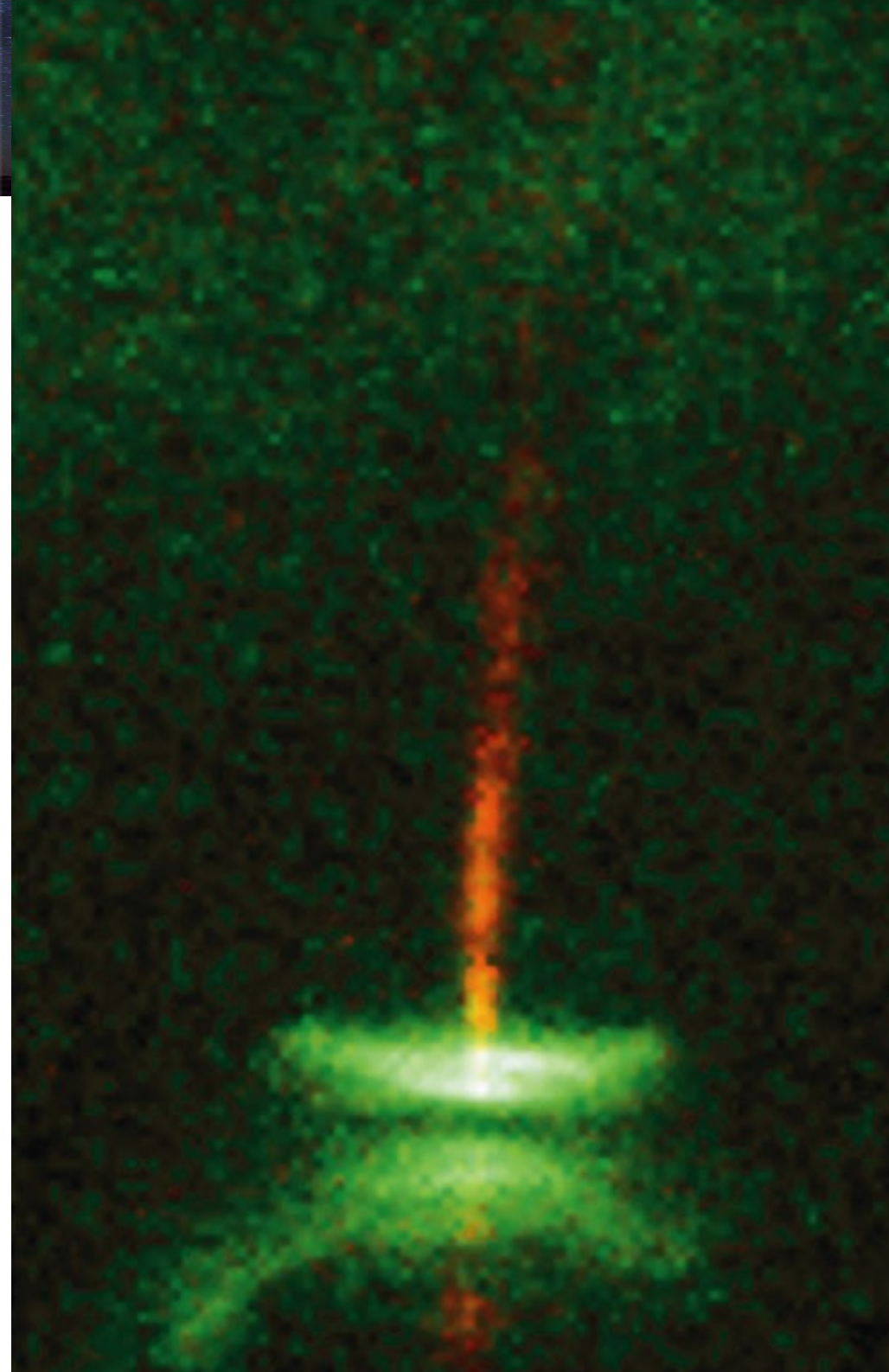


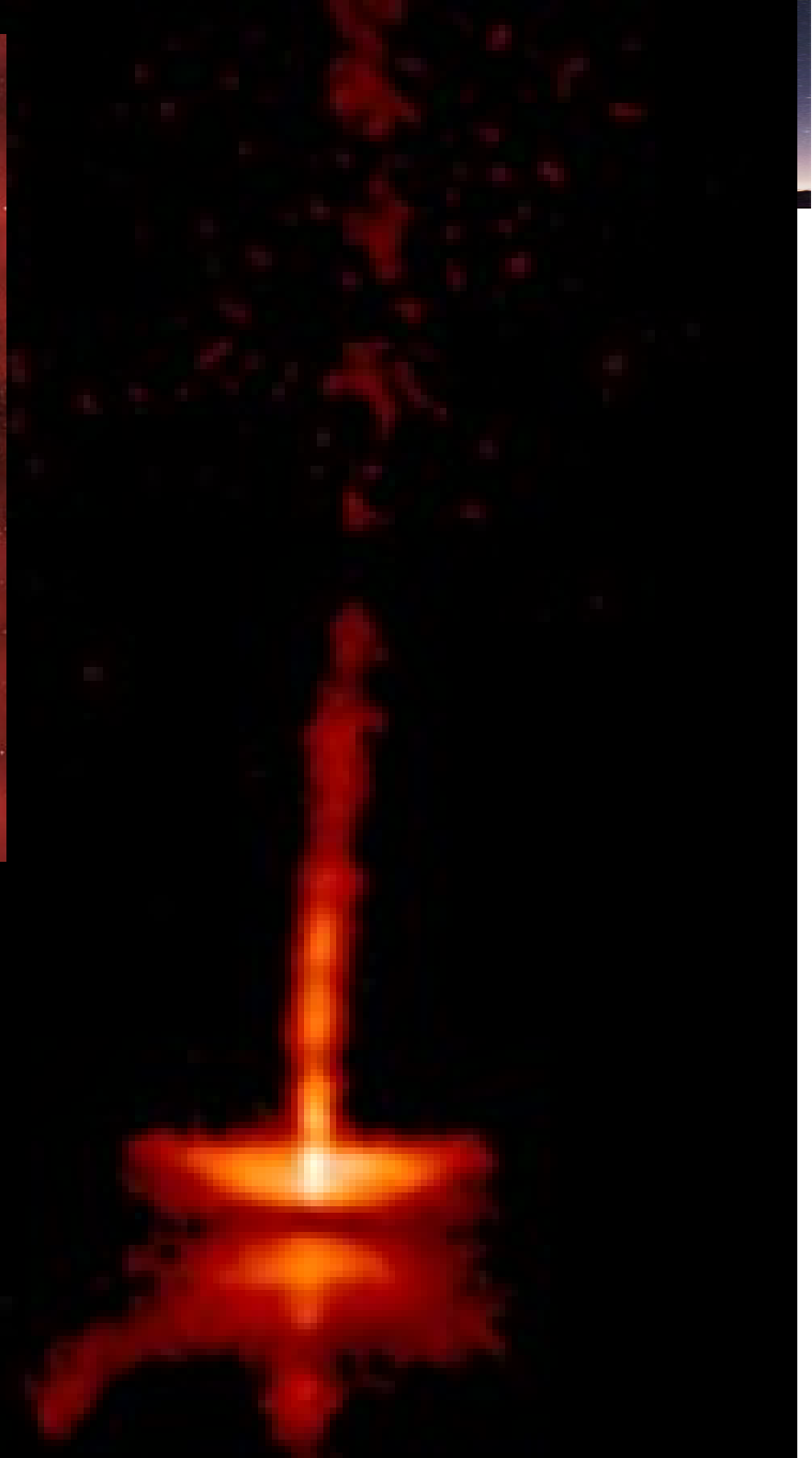
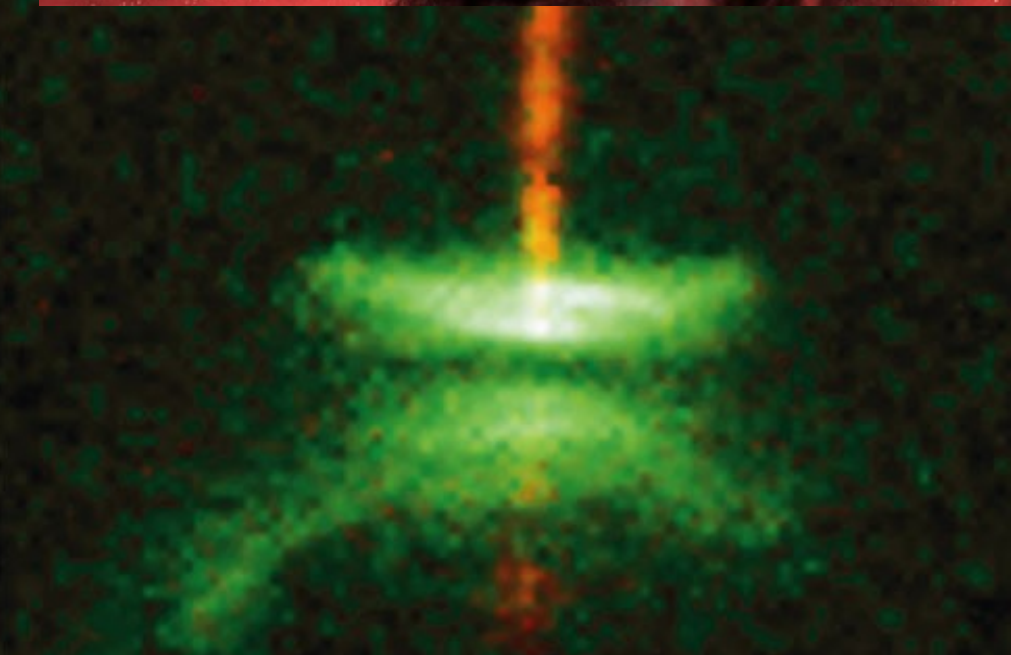
Jets from Young Stars

HST · WFPC2

PRC95-24a · ST ScI OPO · June 6, 1995

C. Burrows (ST ScI), J. Hester (AZ State U.), J. Morse (ST ScI), NASA

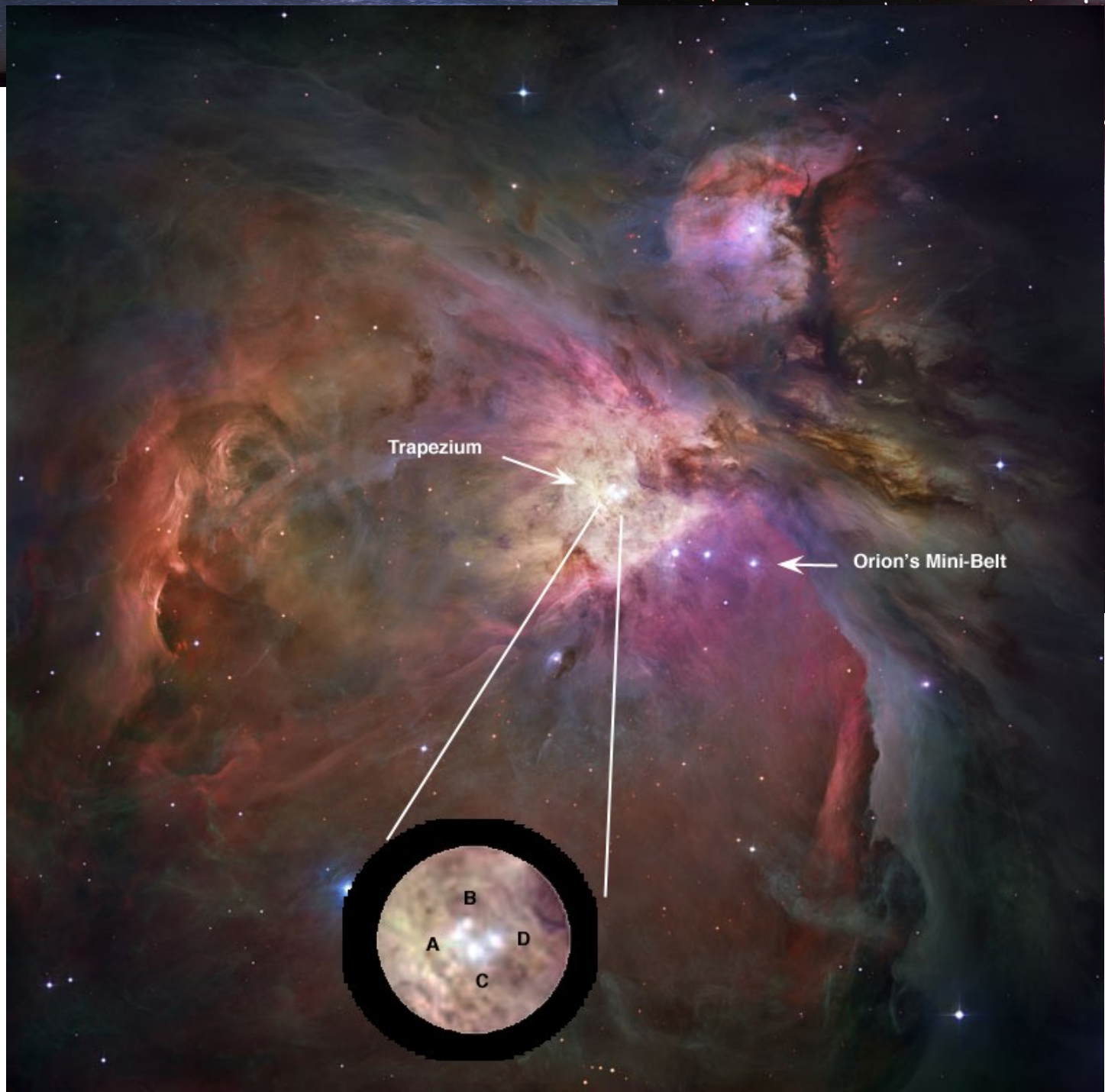




an

¿Cómo se fo







¿Y luego qué?