

# Astronomía para poetas (2014)

Universidad  
Industrial de  
Santander



- Unidad: 06
- Clase: 01
- Fecha: 20150129J
- Contenido: La Vía Láctea
- Web: <http://halley.uis.edu.co/astronomia>
- Archivo: 20150129J-HA-vialactea.opd

Escuela  
de Física

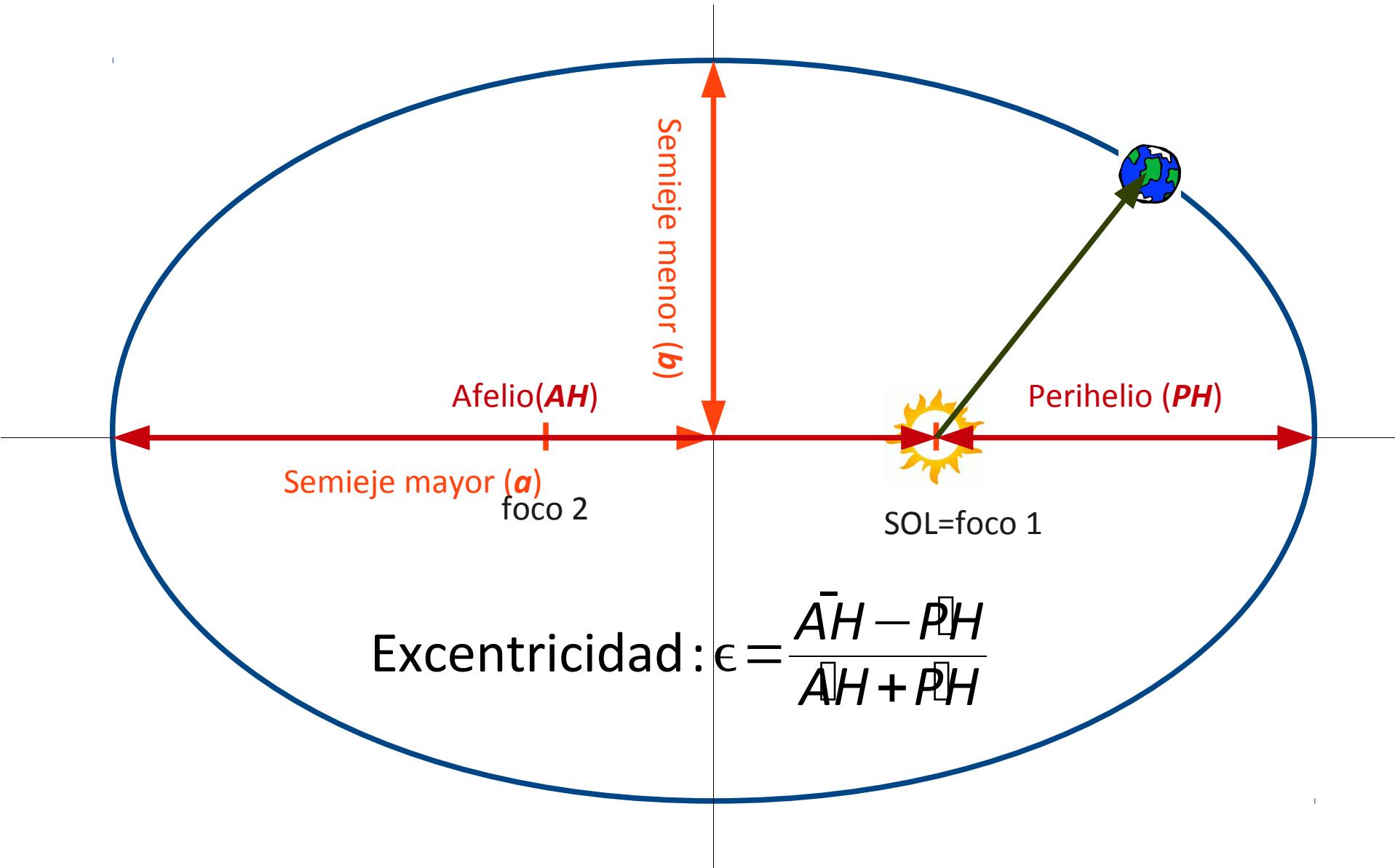


Universidad  
Industrial de  
Santander

**Grupo Halley**  
Astronomía y Ciencias Aeroespaciales



# Primera ley



# En el episodio anterior...

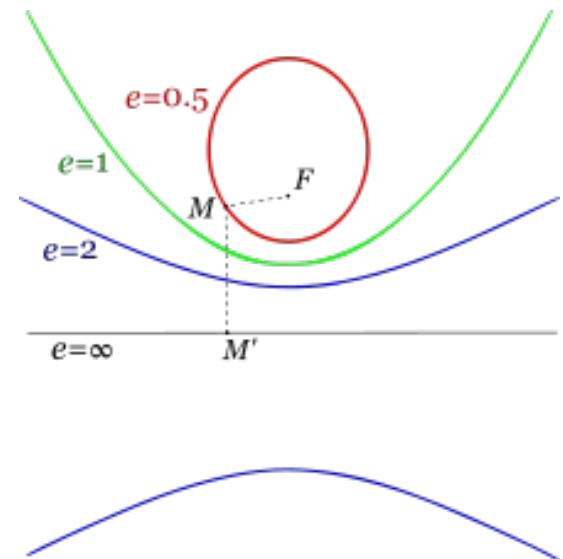
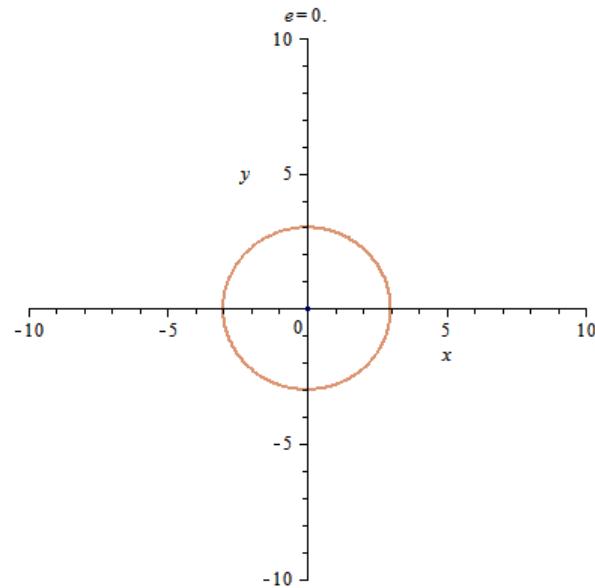
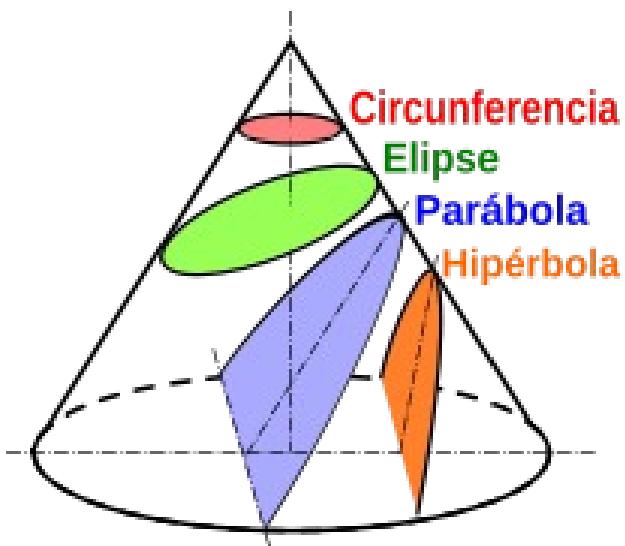
Cronograma:

- 29/01 - Galaxias 1.
- Martes 02/02 - Planetario. (3h) - 5a8
- Jueves 12/02 - Galaxias 2 + Cosmología. (3h) - 5a8

# En el episodio anterior...



# Excentricidad

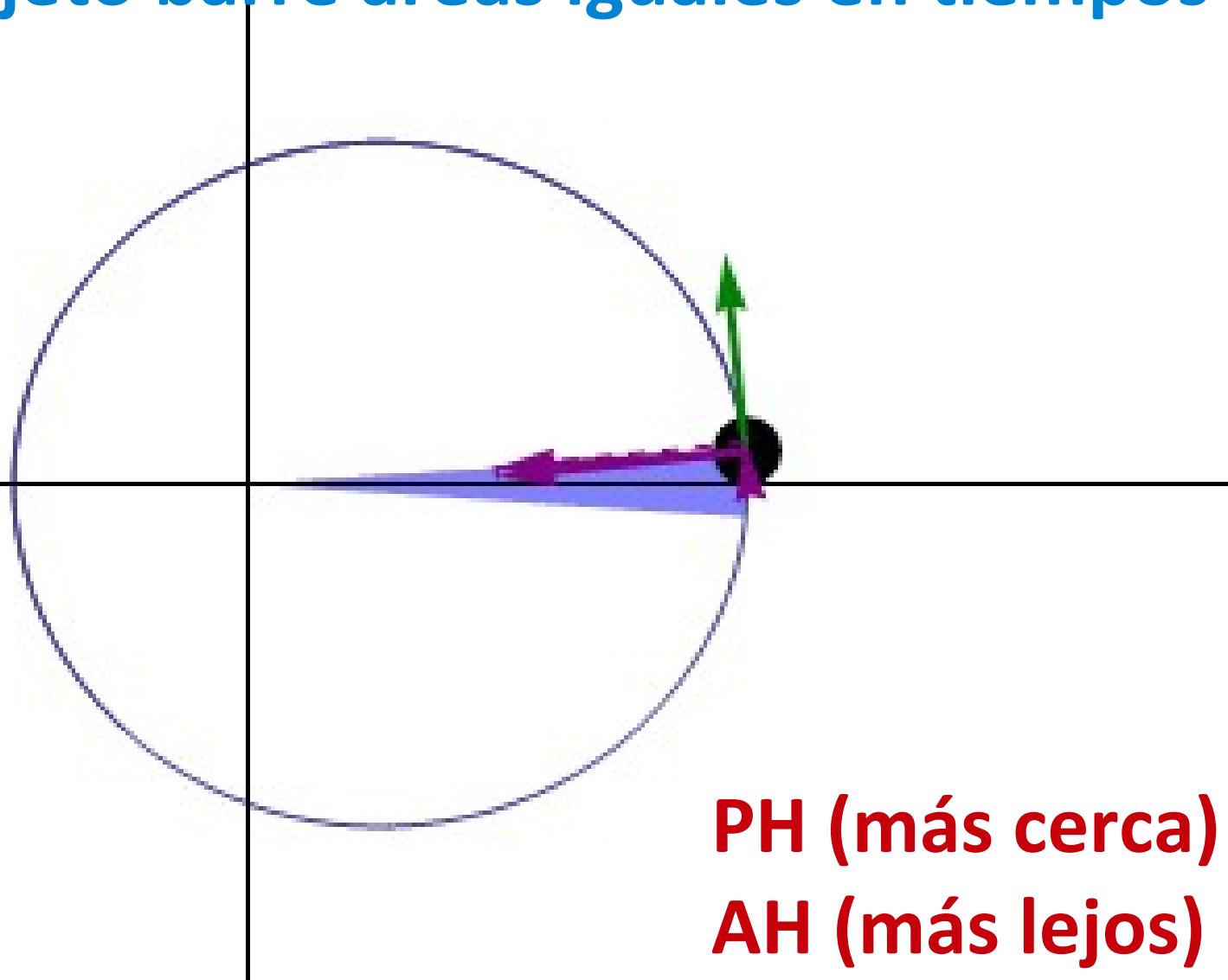


- Lovejoy C/2014 Q2: 0.998
- PanSTARRS C/2011 L4: 1.00009
- Tierra: 0.0167
- Júpiter: 0.043
- Mercurio: 0.2056
- Eris: 0.4418

- Círculo  $\epsilon=0$
- Elipse  $0<\epsilon<1$
- Parábola  $\epsilon=1$
- Hipérbola  $\epsilon>1$

# Velocidad planetaria

El objeto barre áreas iguales en tiempos iguales

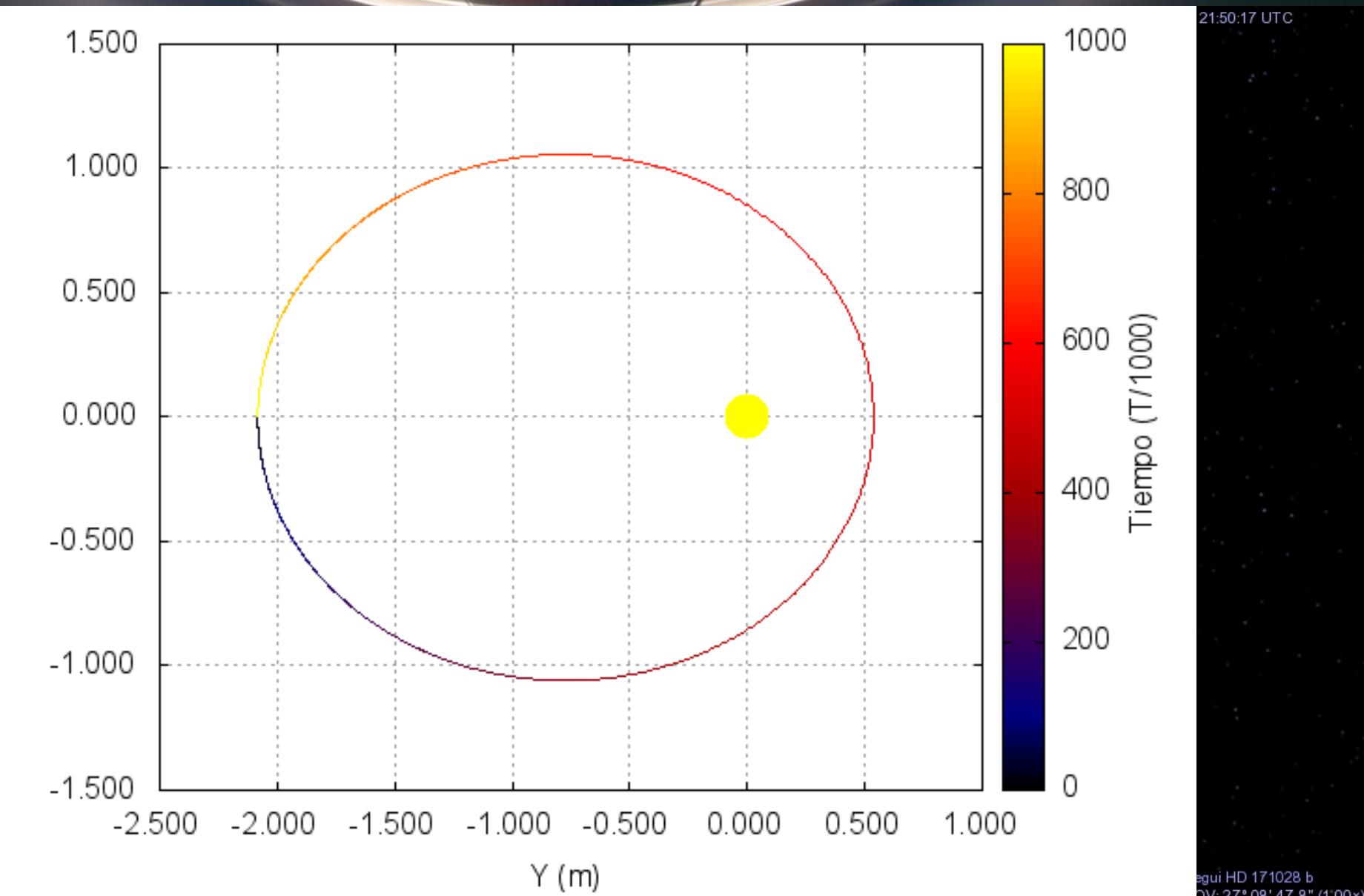


PH (más cerca) → rápido  
AH (más lejos) → lento

# Órbita de # HD\_171028\_b

**HD 171028 b**  
Distanza: 380.670 km  
Raggio: 74.020 km  
Diametro apparente: 18° 44' 17"  
Durata del giorno: 12,560 ore  
Temperatura: 306 K

<http://arx>  
 $M=0.99 M_{\odot}$   
 $m=1.962 M_{\oplus}$   
 $a=1.31019$   
 $E=0.59$   
Velocità: 0,00000 m/s



# Tercera Ley

- Para un planeta con semieje mayor  $a$ , el período orbital  $T$  vale:

$$T = \sqrt{k a^3}$$

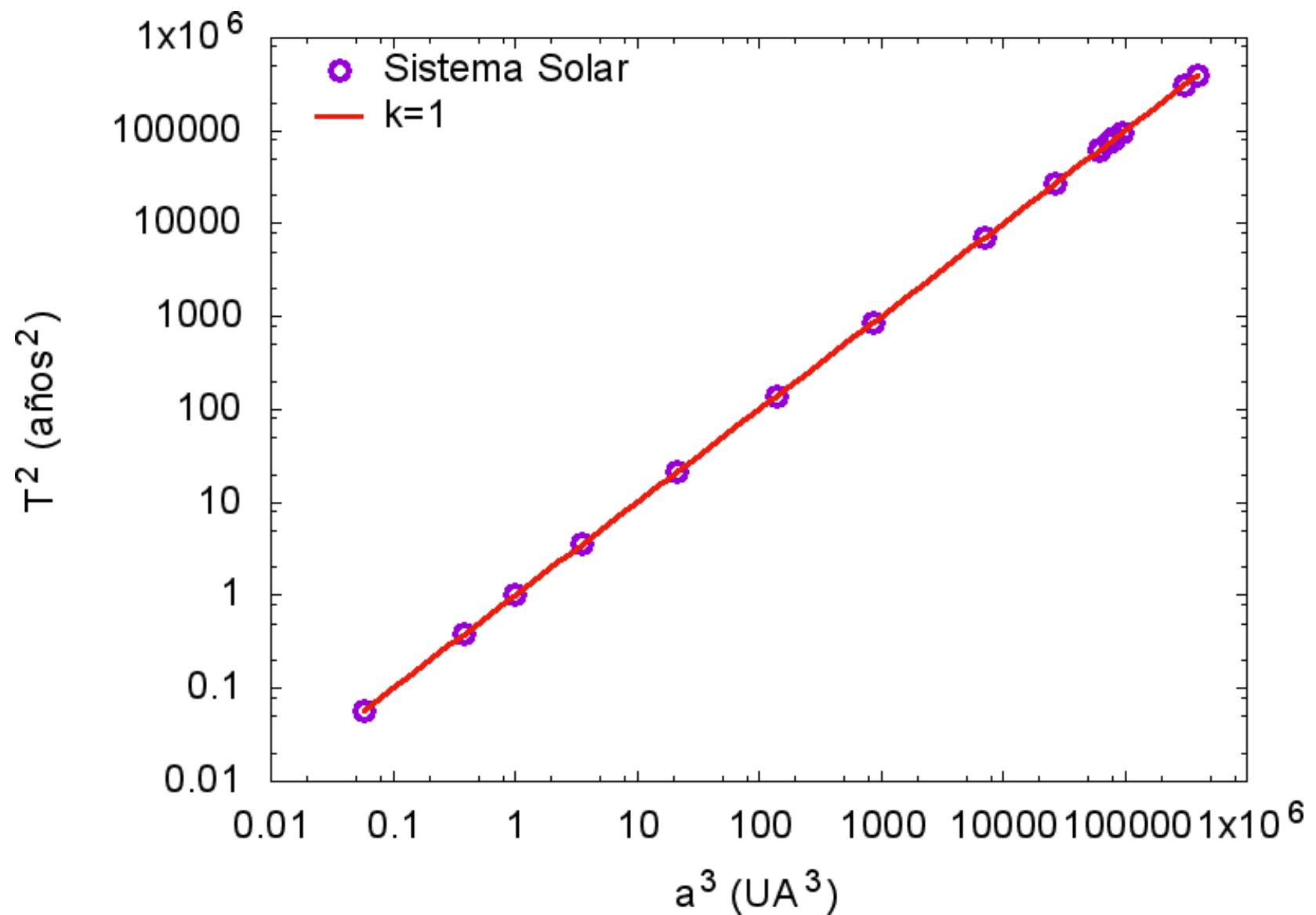
- O bien,

$$T^2 = k a^3$$

- Y la constante  $k$  depende de la masa del cuerpo central

$$k = \frac{4 \pi^2}{G M_{\text{Sol}}}$$

# ¿Será verdad? → Datos!



# Temas de monografía para trabajo final

- Cosmogonía de los pueblos precolombinos (elegir alguno)
- Cosmogonía y Constelaciones
- Evolución estelar (vida y obra de las estrellas)
- Objetos compactos (enanas blancas, estrellas de neutrones, agujeros negros)
- Ensayo sobre posibilidades de vida en Europa (luna de Júpiter)
- Vida basada en Amoníaco como disolvente
- El GalaxyZoo: principales resultados
- Otras Tierras: exoplanetas similares a la Tierra
- El impacto de Galileo Galilei en la concepción moderna de la Astronomía
- Spirit, Opportunity y Curiosity: explorando la superficie de Marte
- La sonda Cassini-Huygens: Saturno y Titán

# Entrega monografía

- Entrega en formato pdf con entre 7 a 10 páginas.
- Las referencias bibliográficas no se cuentan para la extensión del trabajo.
- Letra Arial 11 puntos interlineado simple y 2 cm de margen a cada lado.
- Descargar plantillas Word y LaTeX del blog.
- **Está prohibido copiar textualmente sin citar las fuentes  
(recuerde que somos capaces de identificar señales provenientes de supernovas de otras galaxias ¿realmente cree que no vamos a detectar su copia?)**
- Entrega el PDF por email a [hasorey@uis.edu.co](mailto:hasorey@uis.edu.co)
- **Asunto del email:** trabajo final astronomía
- Incluir el nombre, apellido y código de los integrantes en el cuerpo del correo.
- **Plazo máximo de entrega:**

**Martes 17/02/2015 05:55:55 am**

**No serán recibidos aquellos trabajos que lleguen vencido el plazo.**

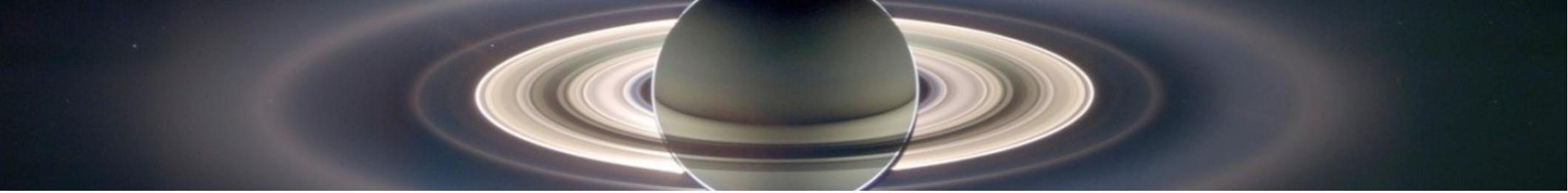
# Exposición

- Cada grupo prepara una charla de 15 minutos (no más de 10 diapositivas incluyendo el título)
- Exposición de los trabajos (todos):

**Martes 17/02/2015 10:00:00 Aula LL402**

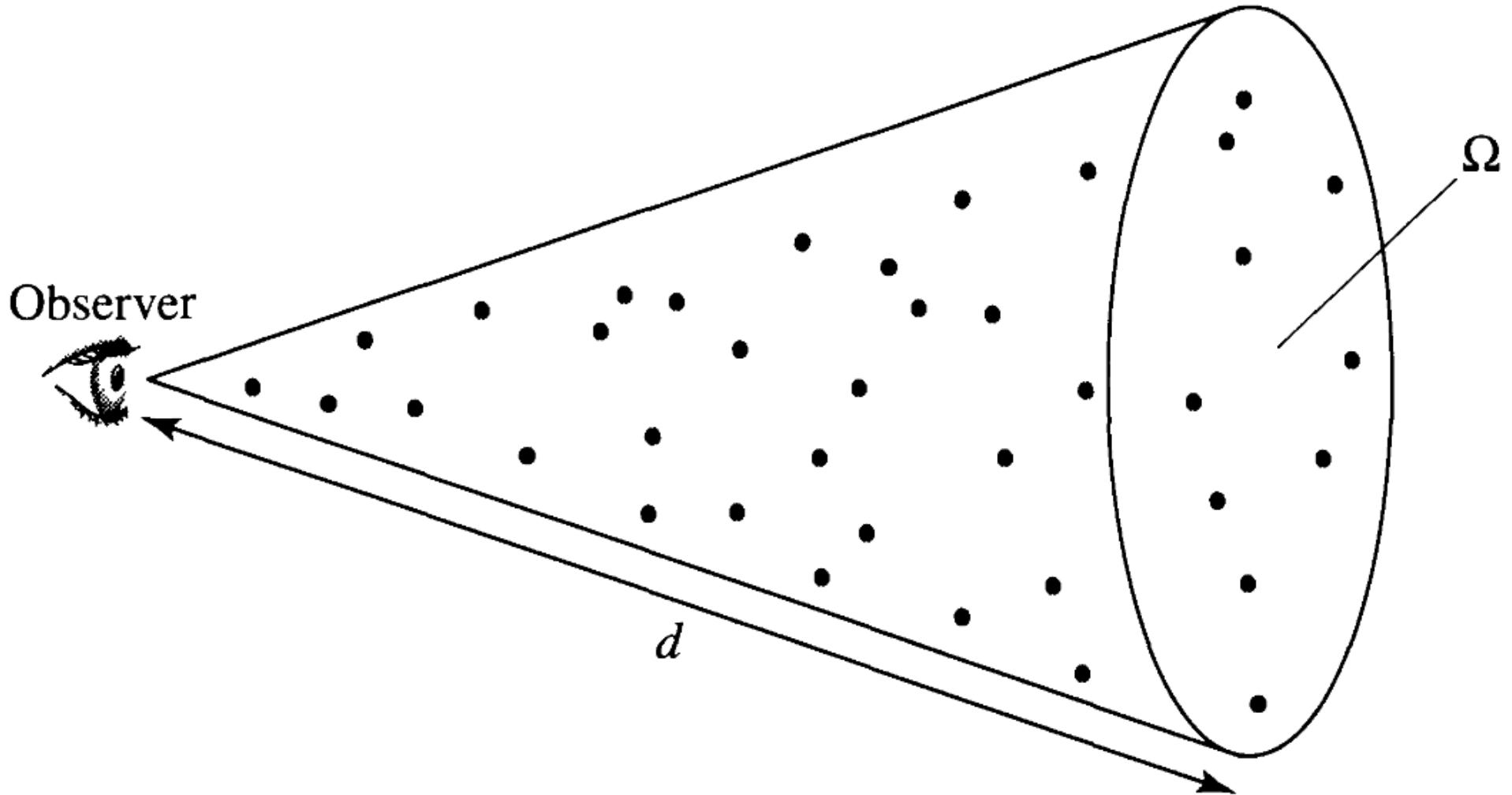
**16:00**

**4 pm**

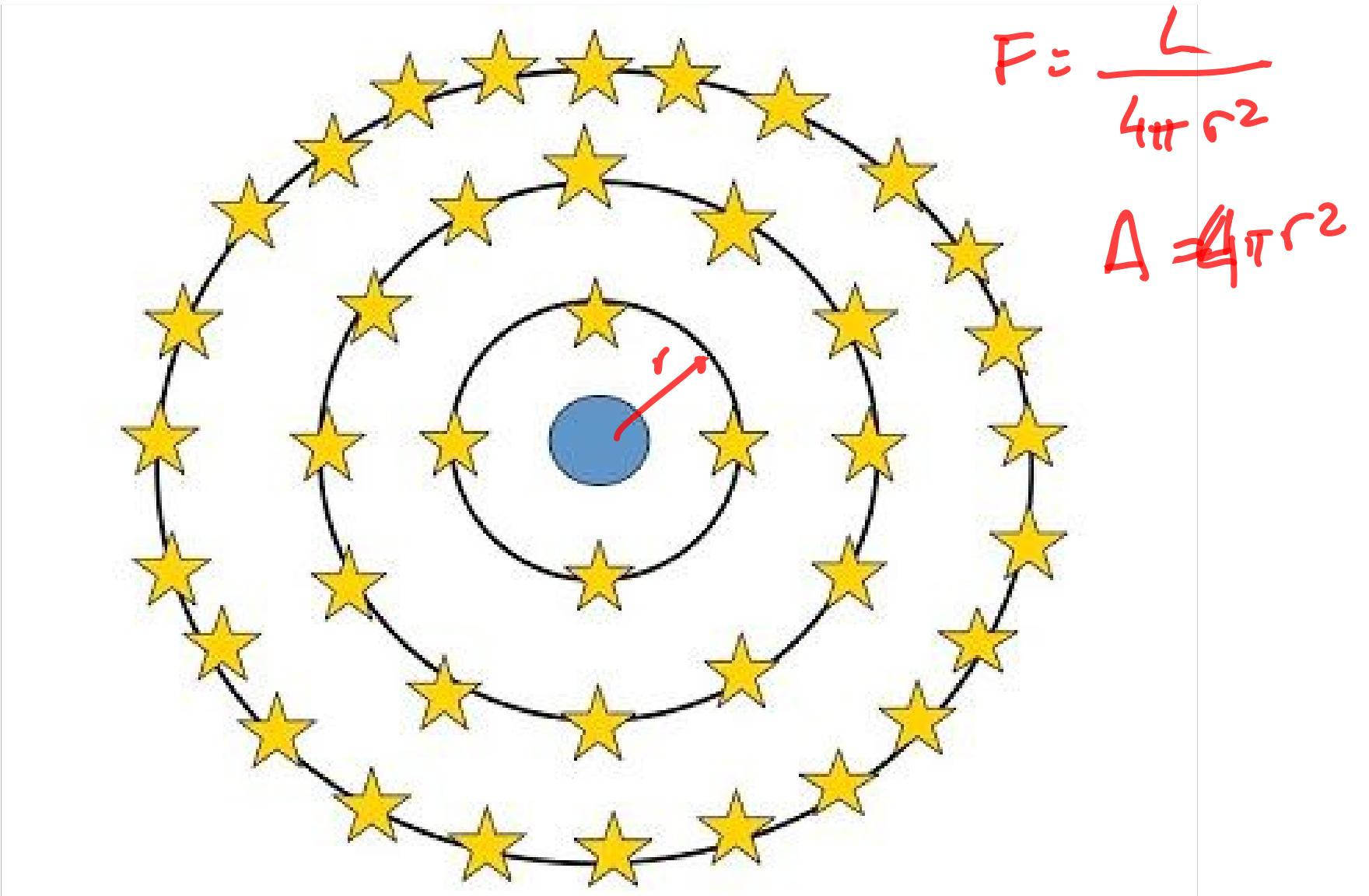


# La Vía Láctea

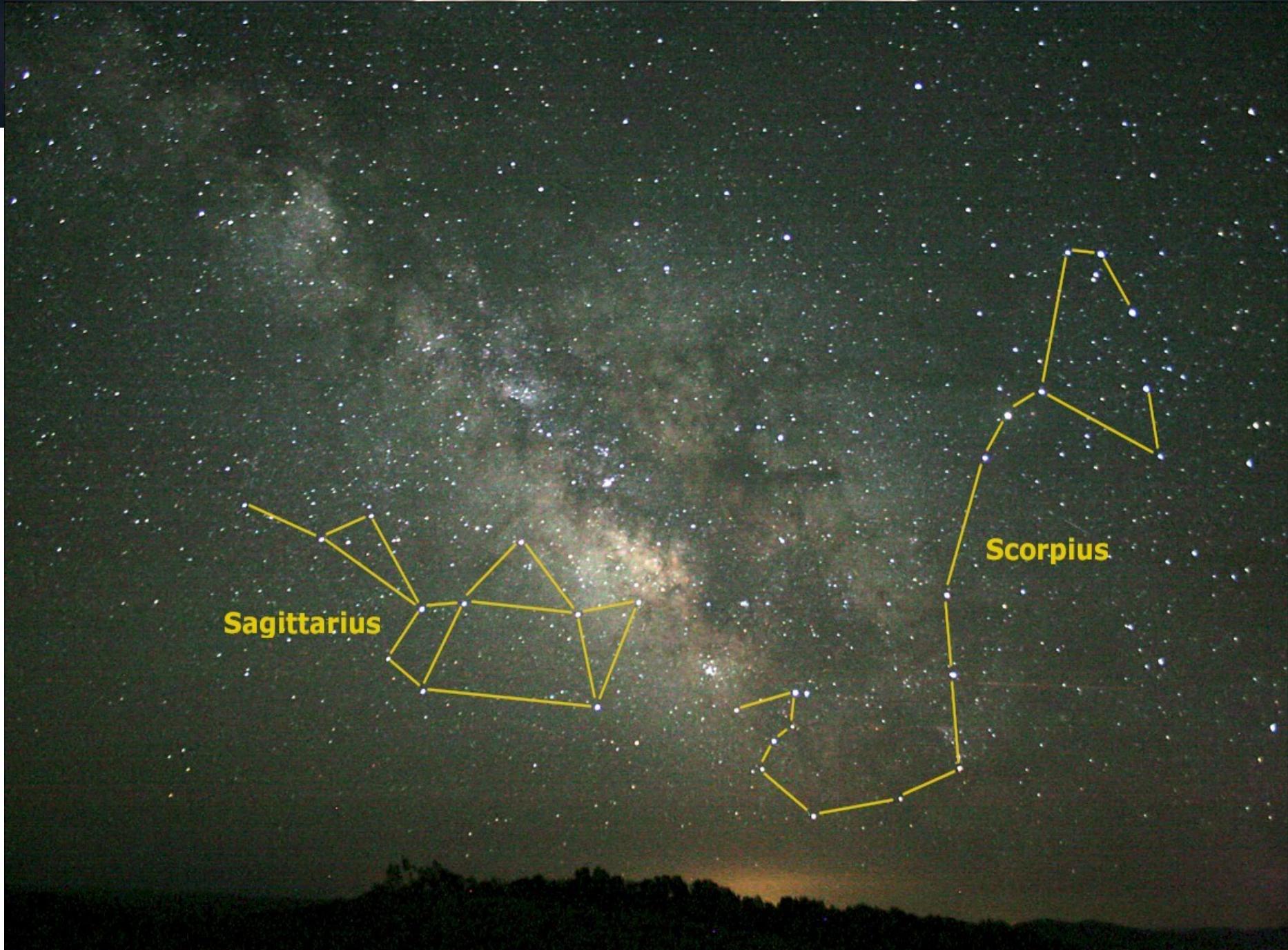
# La paradoja de Olbers

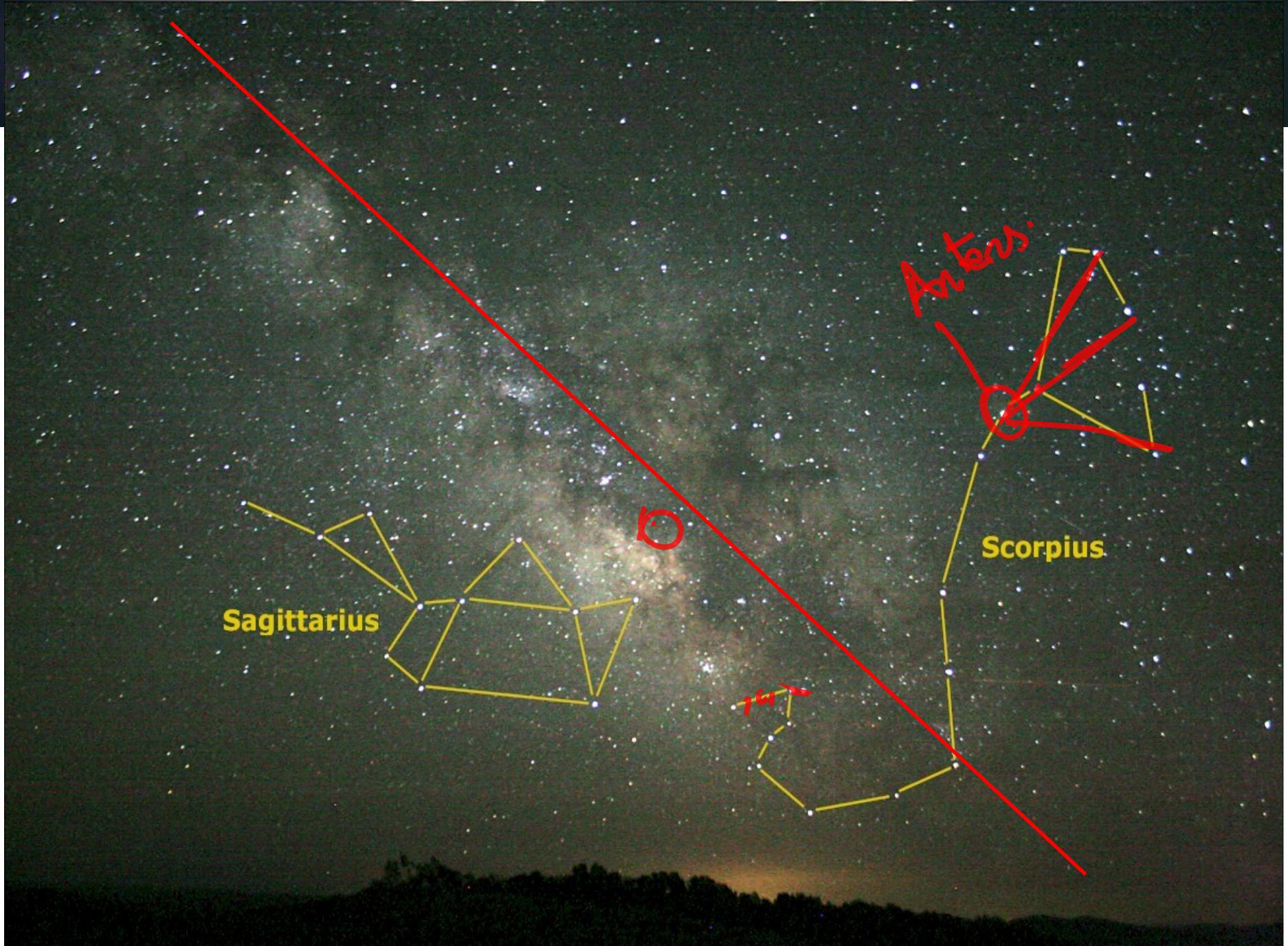


# La paradoja de Olbers

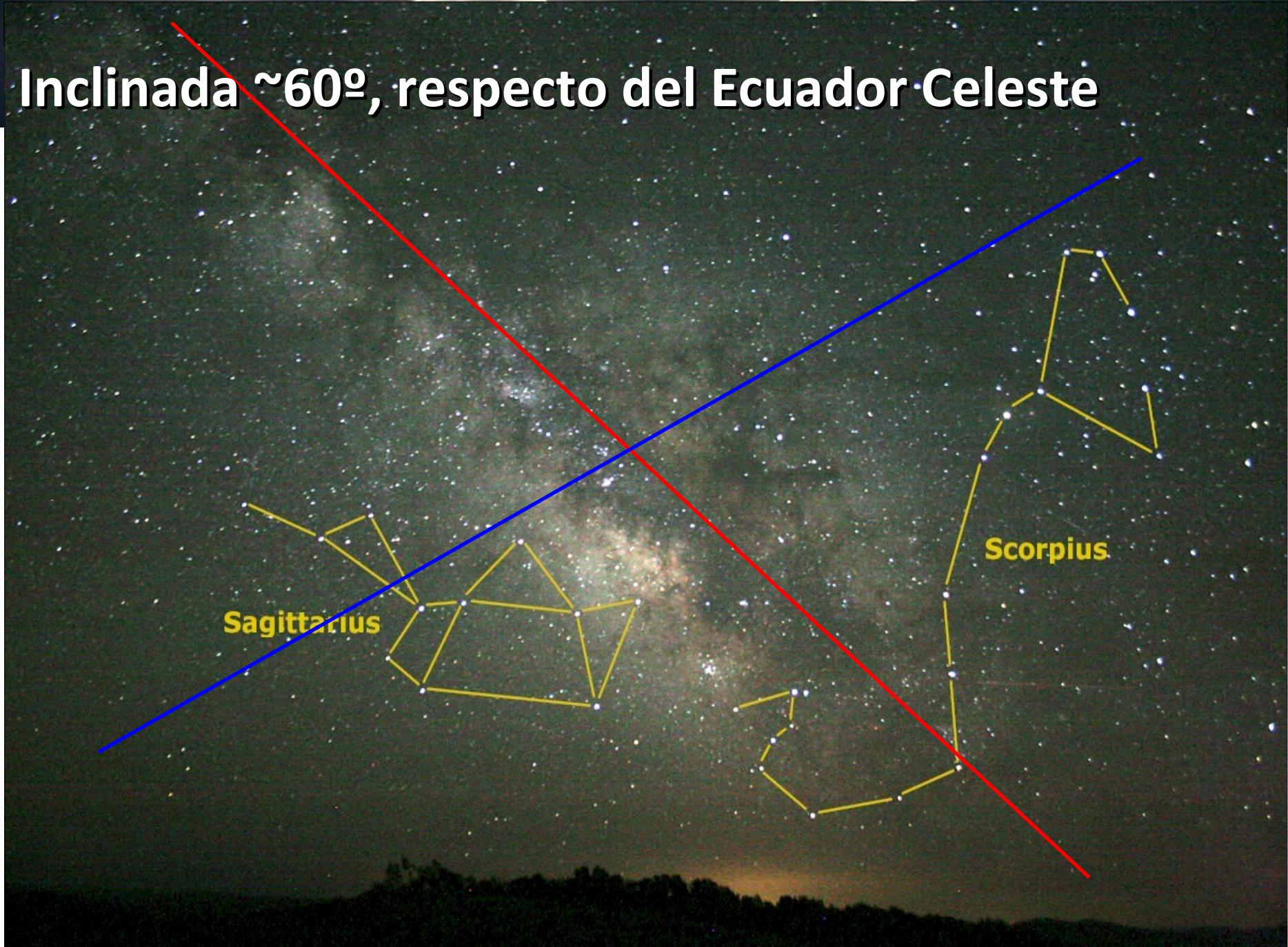


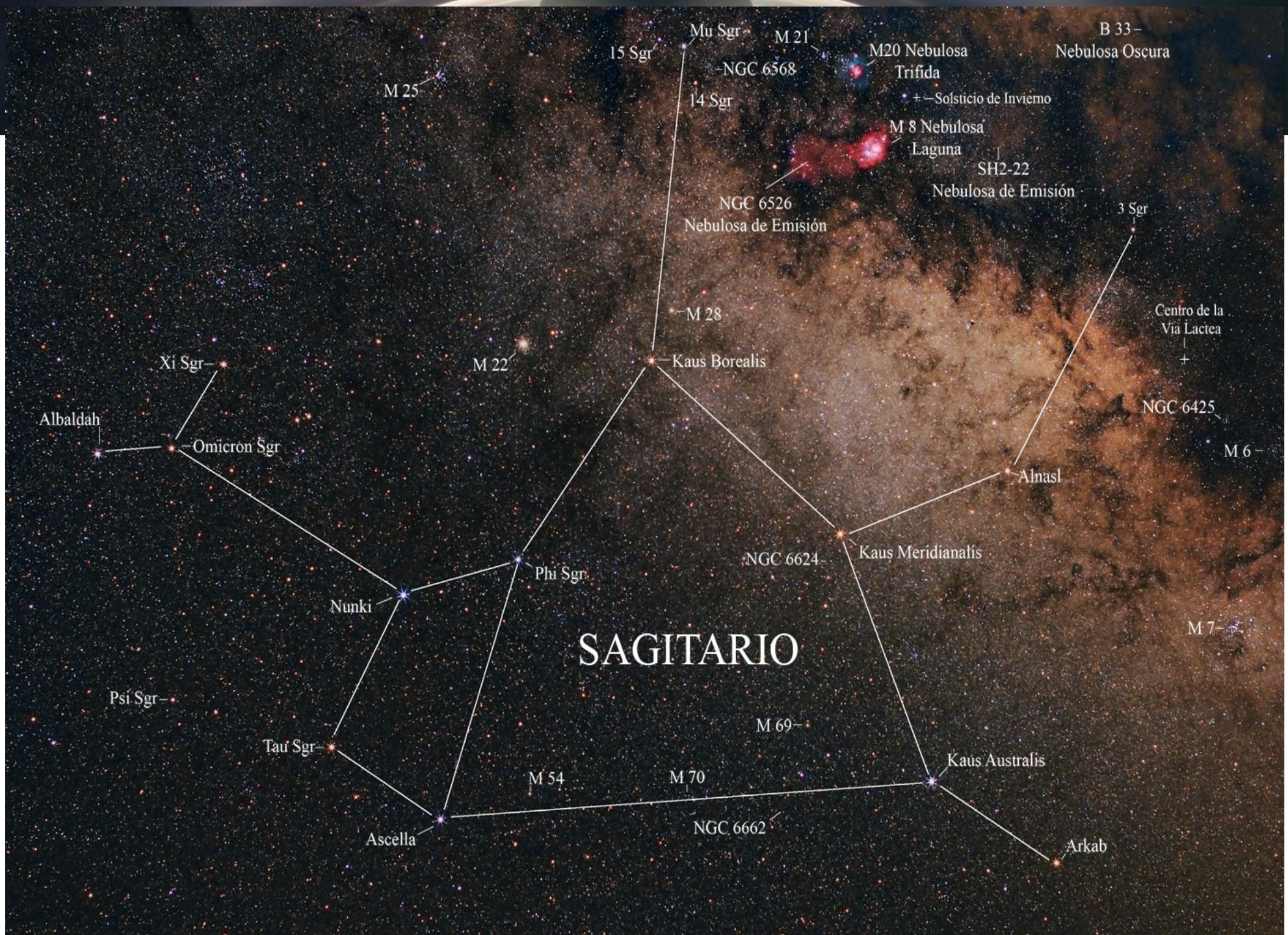


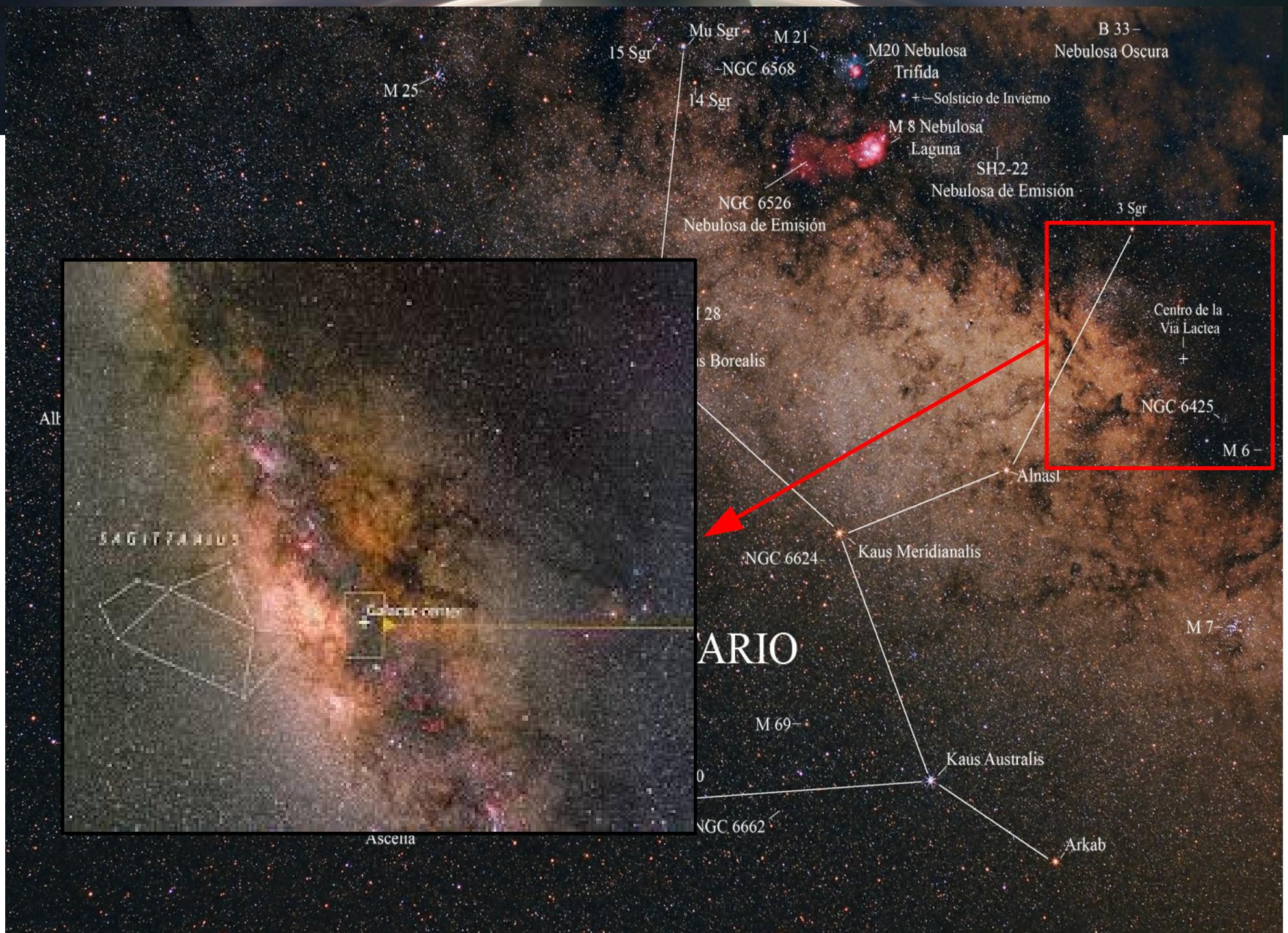


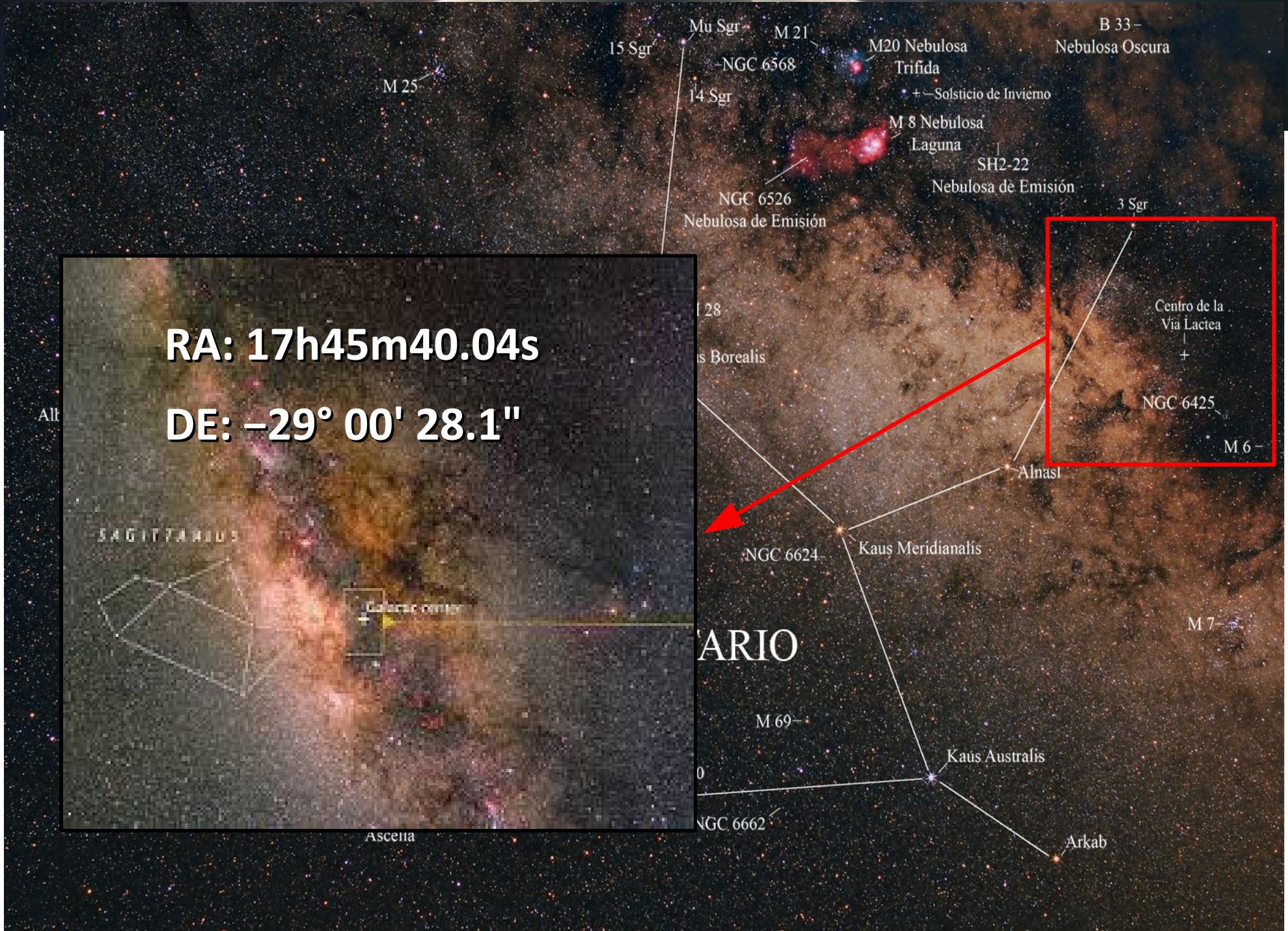


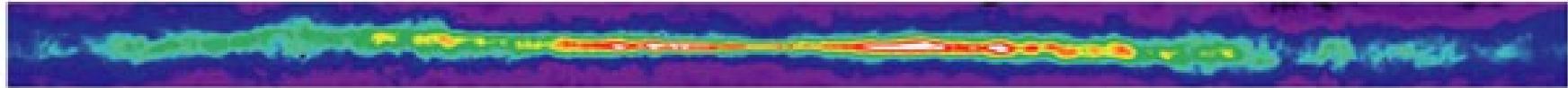
Inclinada  $\sim 60^\circ$ , respecto del Ecuador Celeste











a 21-cm radio emission from atomic hydrogen gas.



b Radio emission from carbon monoxide reveals molecular clouds.



c Infrared (60–100  $\mu\text{m}$ ) emission from interstellar dust.



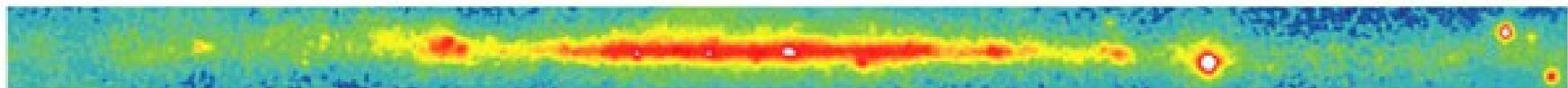
d Infrared (1–4  $\mu\text{m}$ ) emission from stars that penetrates most interstellar material.



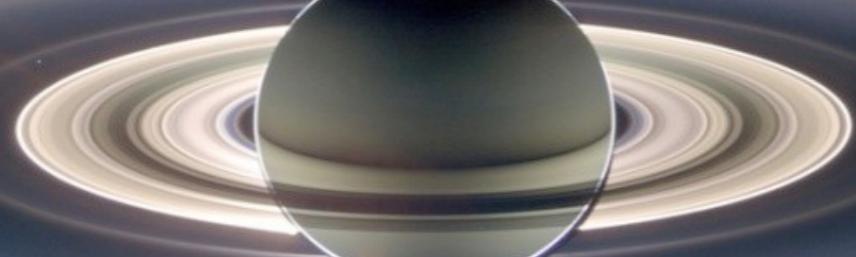
e Visible light emitted by stars is scattered and absorbed by dust.



f X-ray emission from hot gas bubbles (diffuse blobs) and X-ray binaries (pointlike sources).



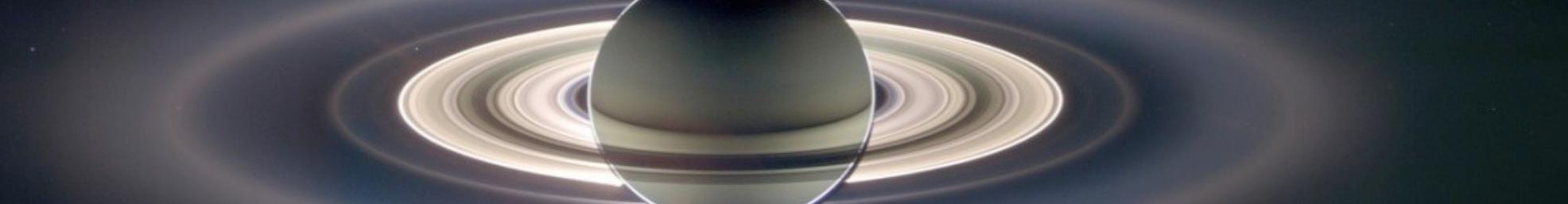
g Gamma-ray emission from collisions of cosmic rays with atomic nuclei in interstellar clouds.



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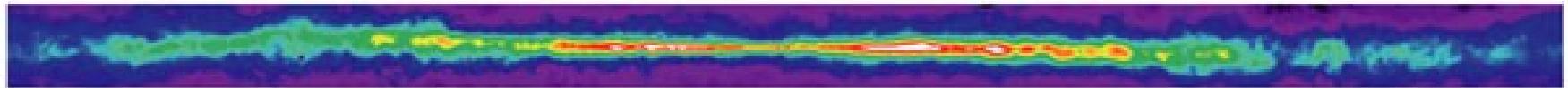
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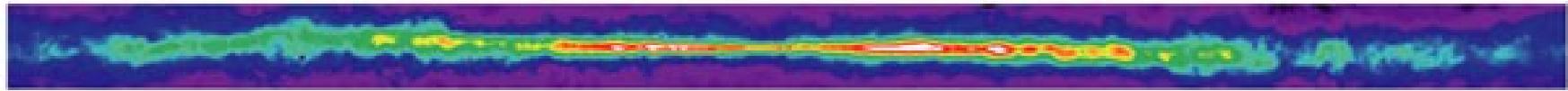
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d Infrared (1–4  $\mu$ m)



e Visible light emit

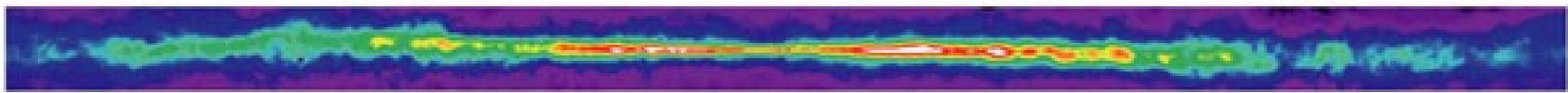
Neutral atomic Hydrogen creates 21 cm radiation



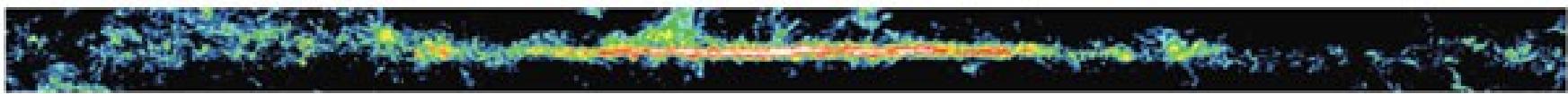
material.



f X-ray emission from hot gas bubbles (diffuse blobs) and X-ray binaries (pointlike sources).



**a** 21-cm radio emission from atomic hydrogen gas.



**b** Radio emission from carbon monoxide reveals molecular clouds.



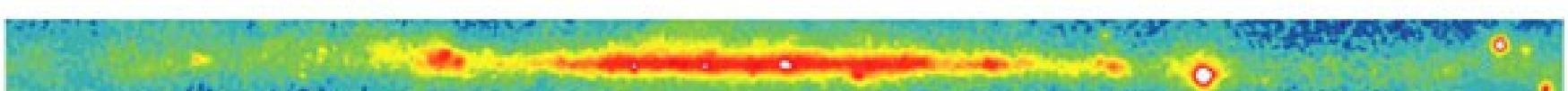
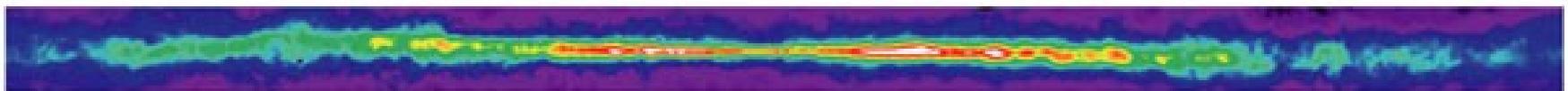
**d** Infrared (1–4  $\mu\text{m}$ ) emission from stars that penetrates most interstellar material.

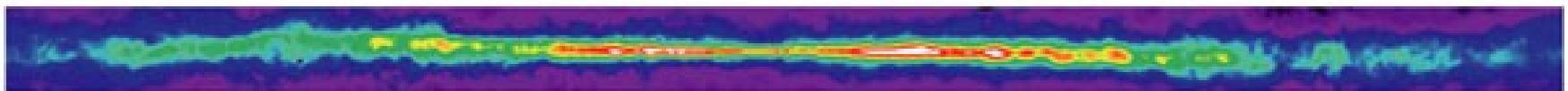


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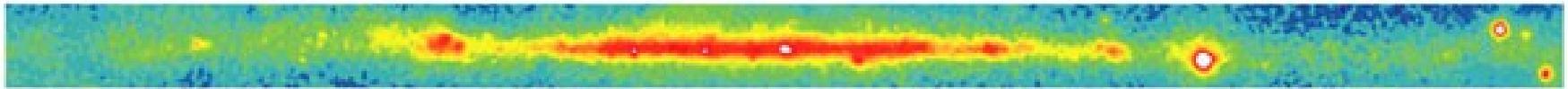
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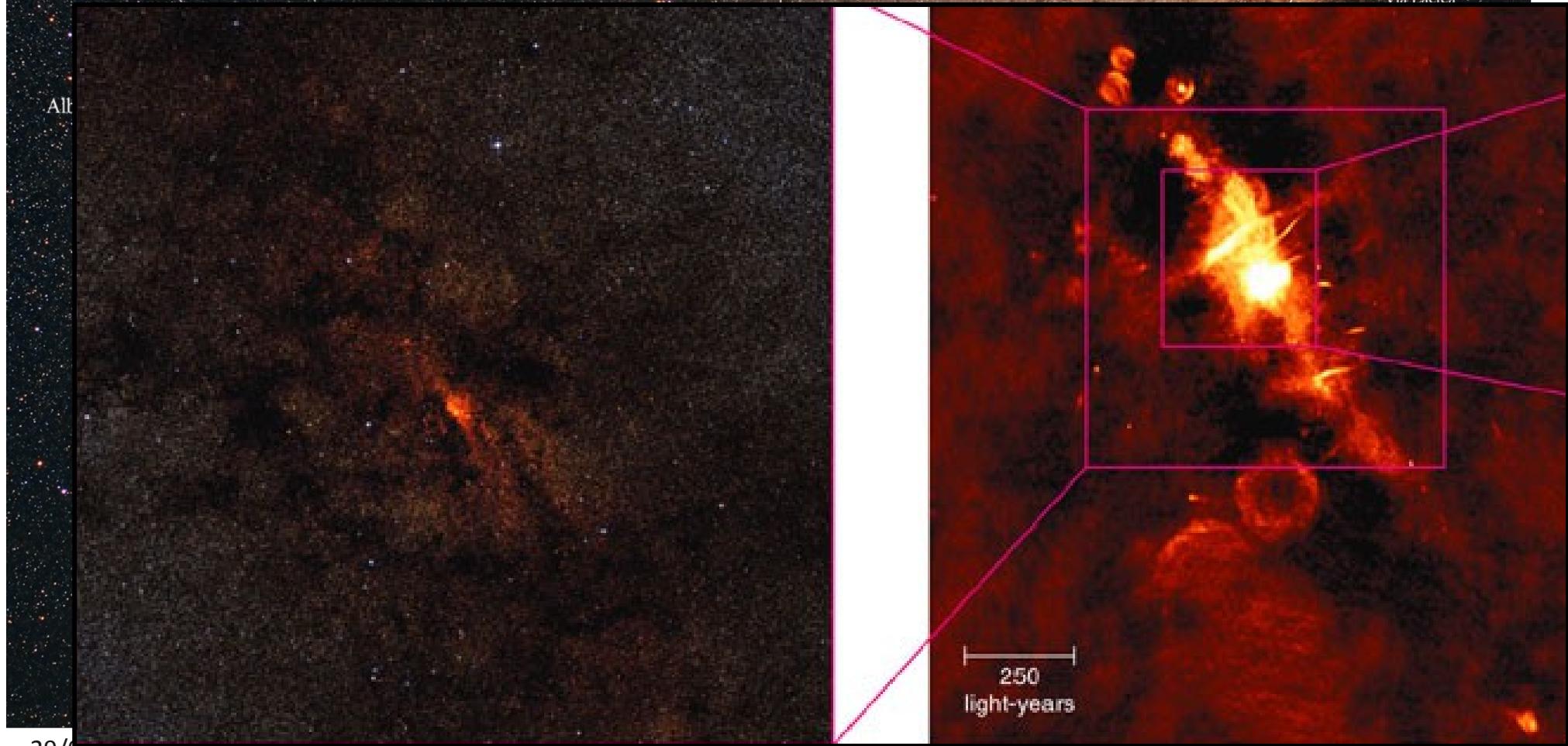
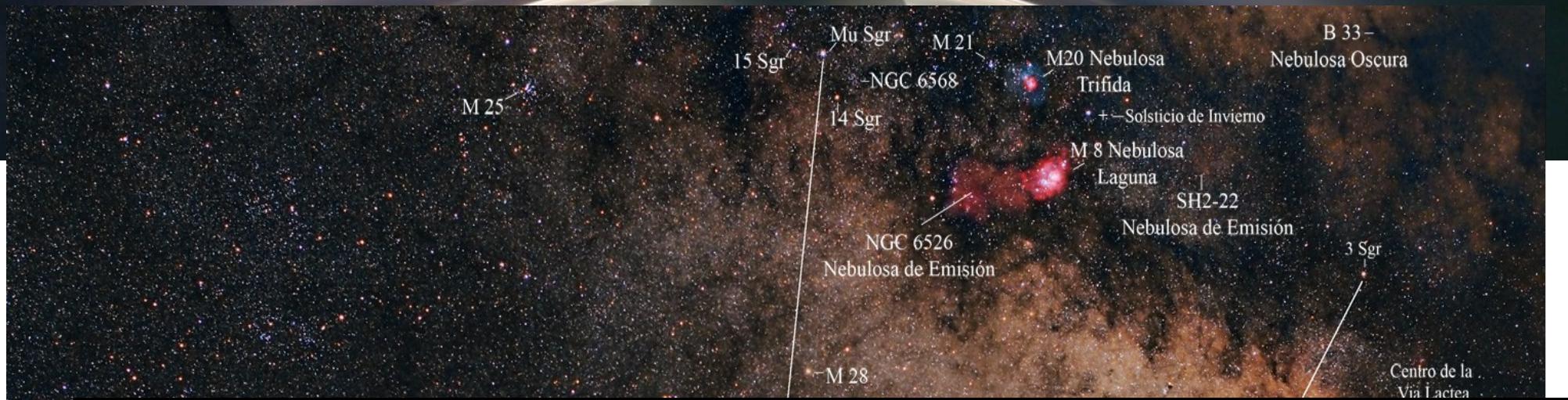


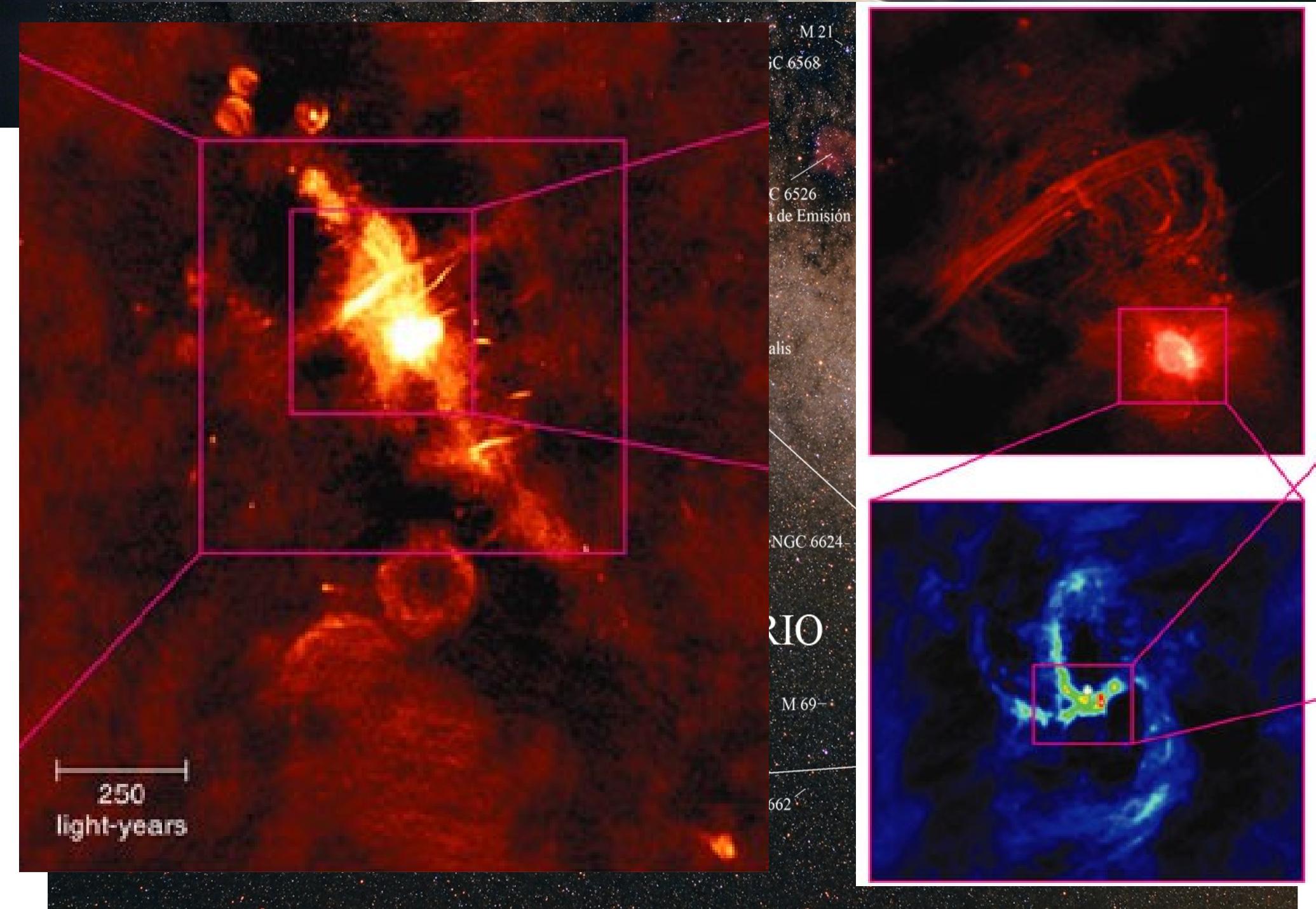
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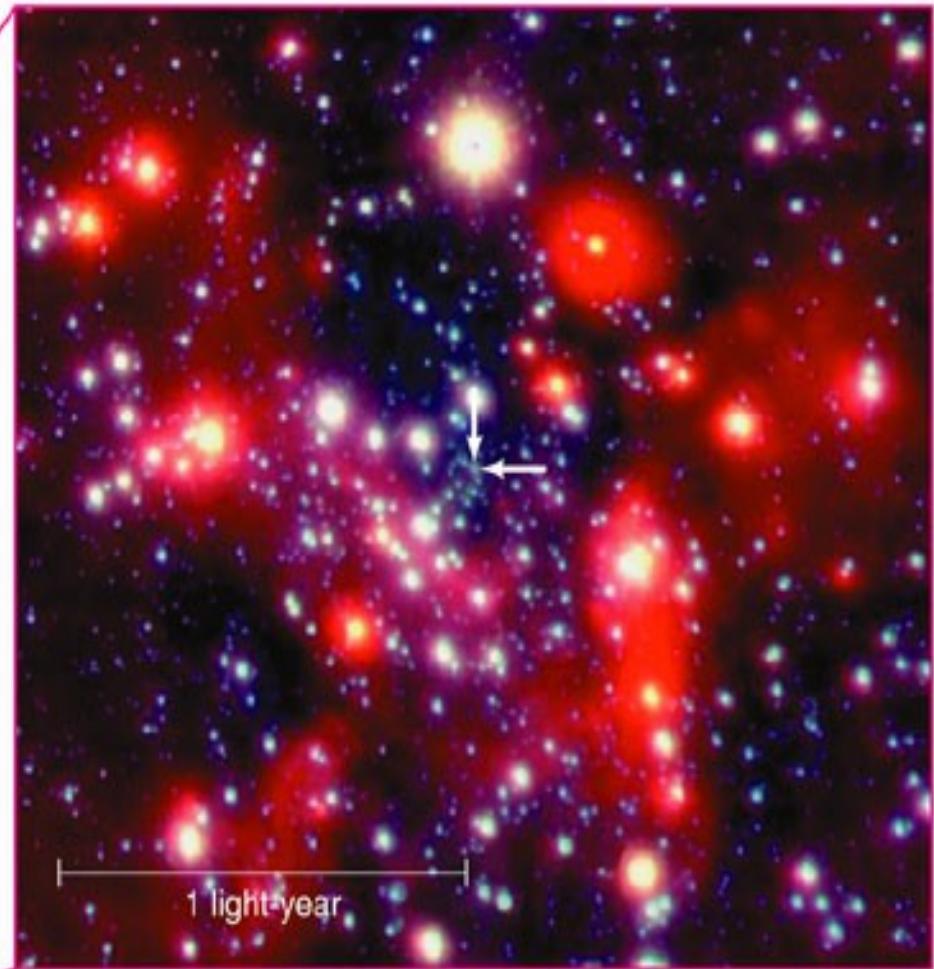
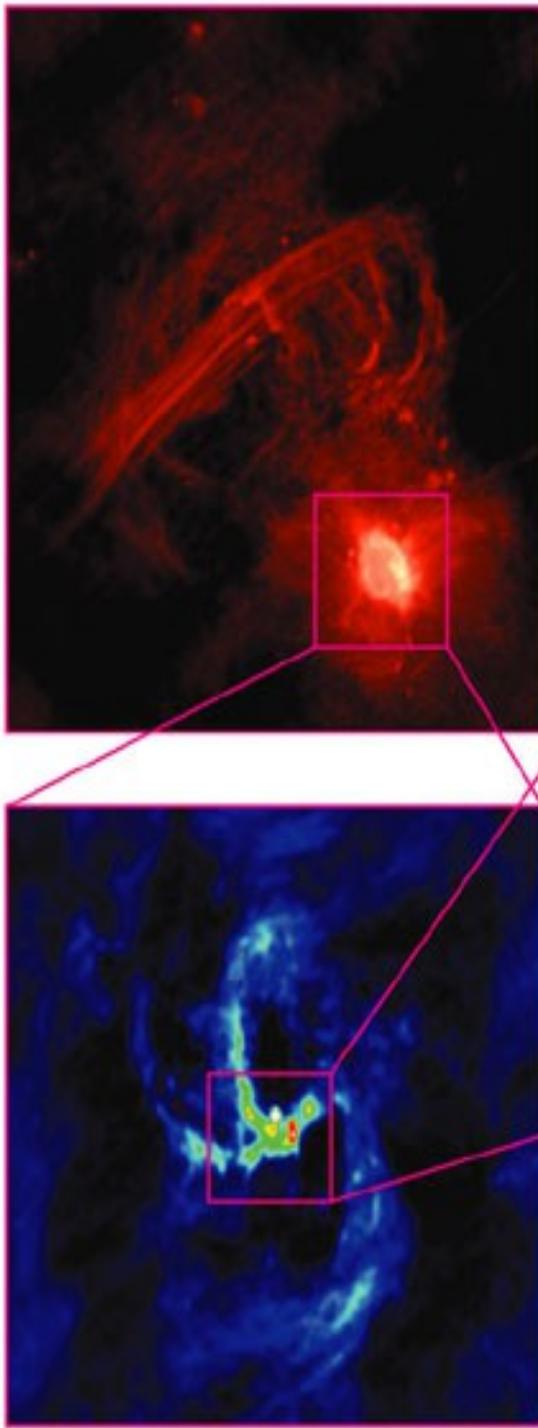


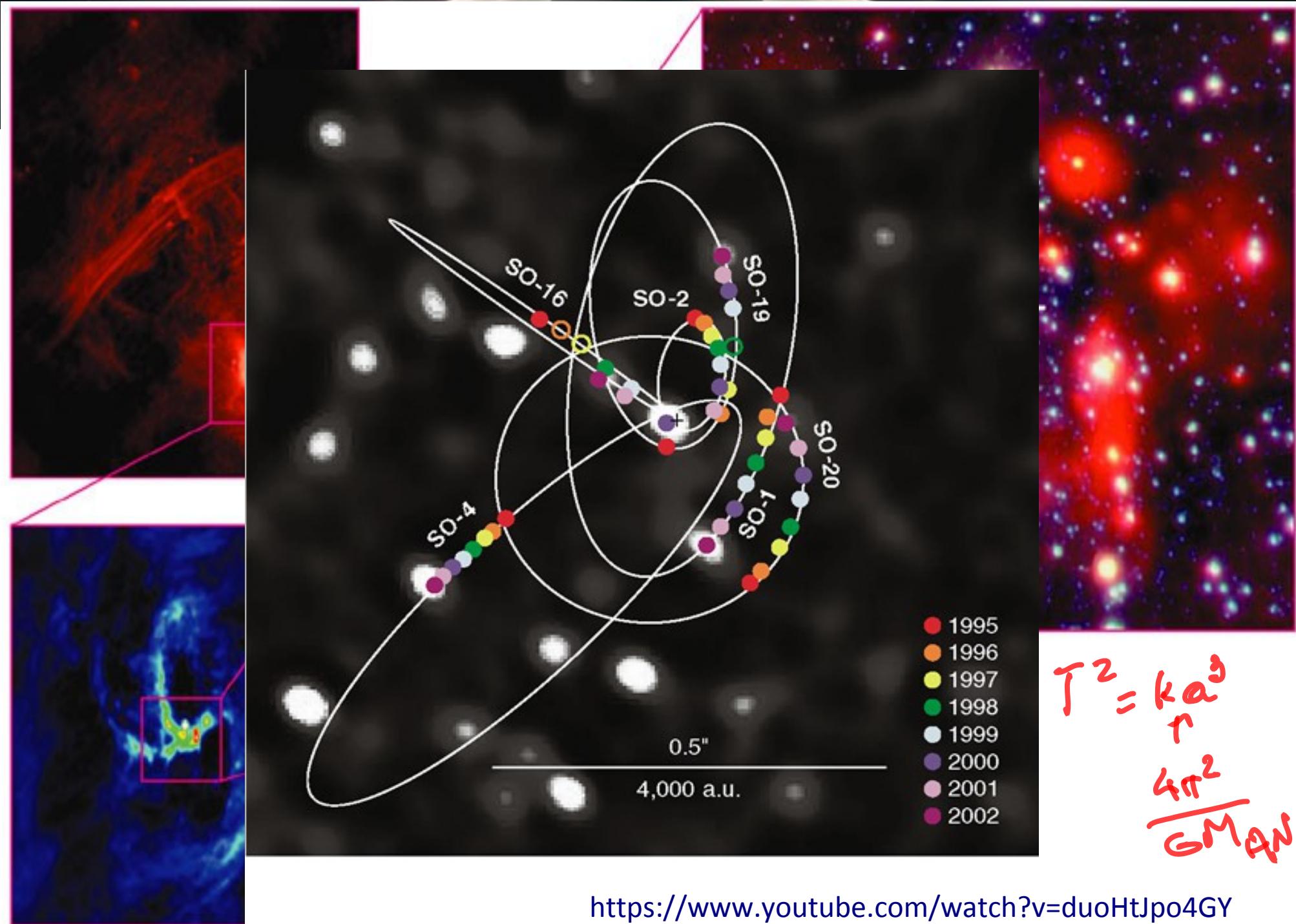
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[http://en.wikipedia.org/wiki/File:Infrared-visible\\_light\\_comparison\\_of\\_VISTA's\\_gigapixel\\_view\\_of\\_the\\_Sagittarius\\_star\\_forming\\_association](http://en.wikipedia.org/wiki/File:Infrared-visible_light_comparison_of_VISTA's_gigapixel_view_of_the_Sagittarius_star_forming_association)



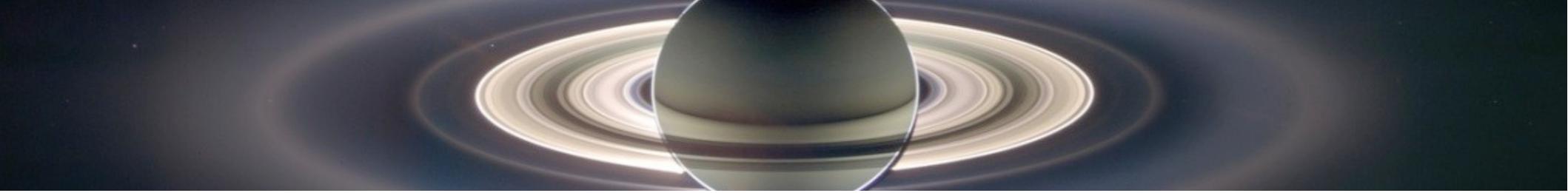






# El agujero negro central

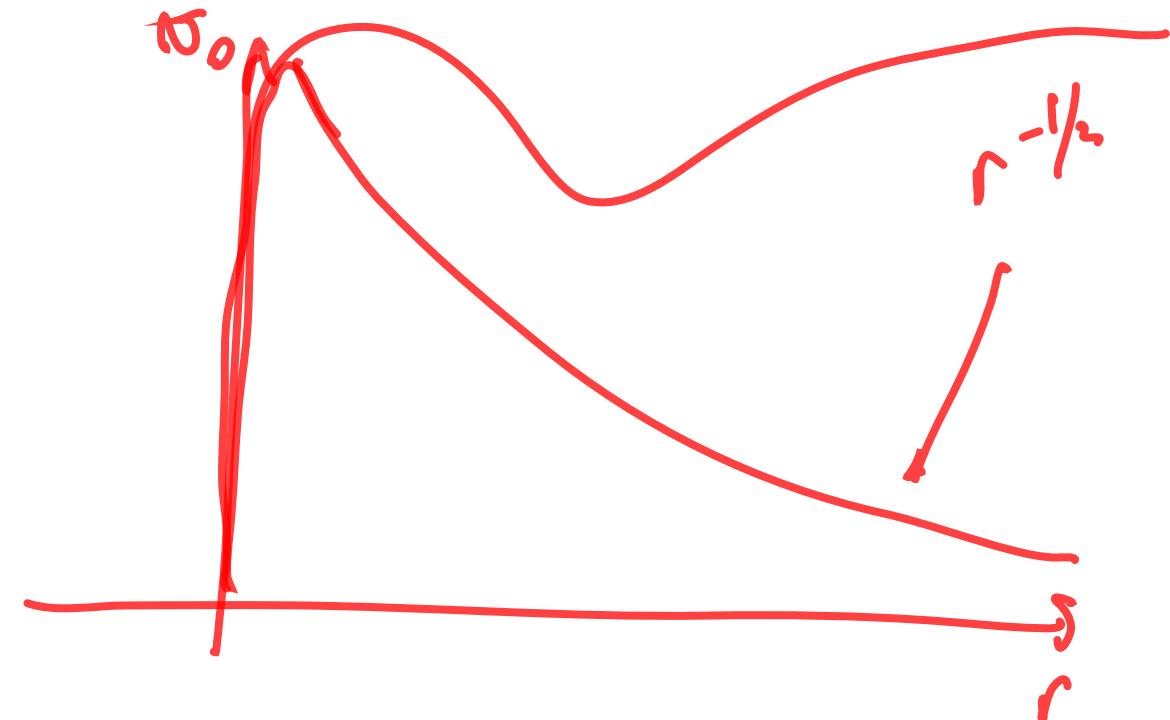




# ¿Y qué forma tiene nuestra galaxia?

Mete licidad.

H, He, Metkes



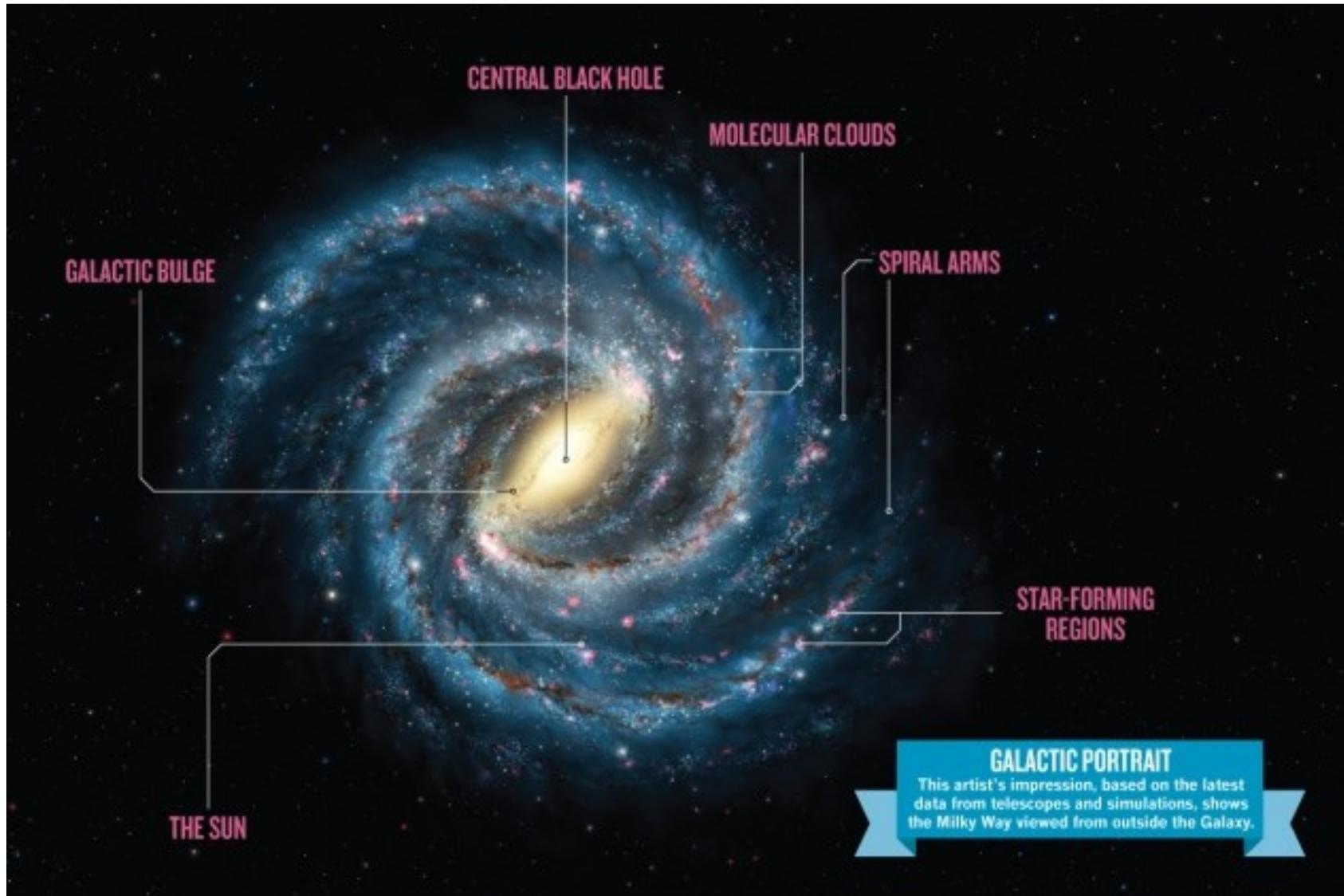


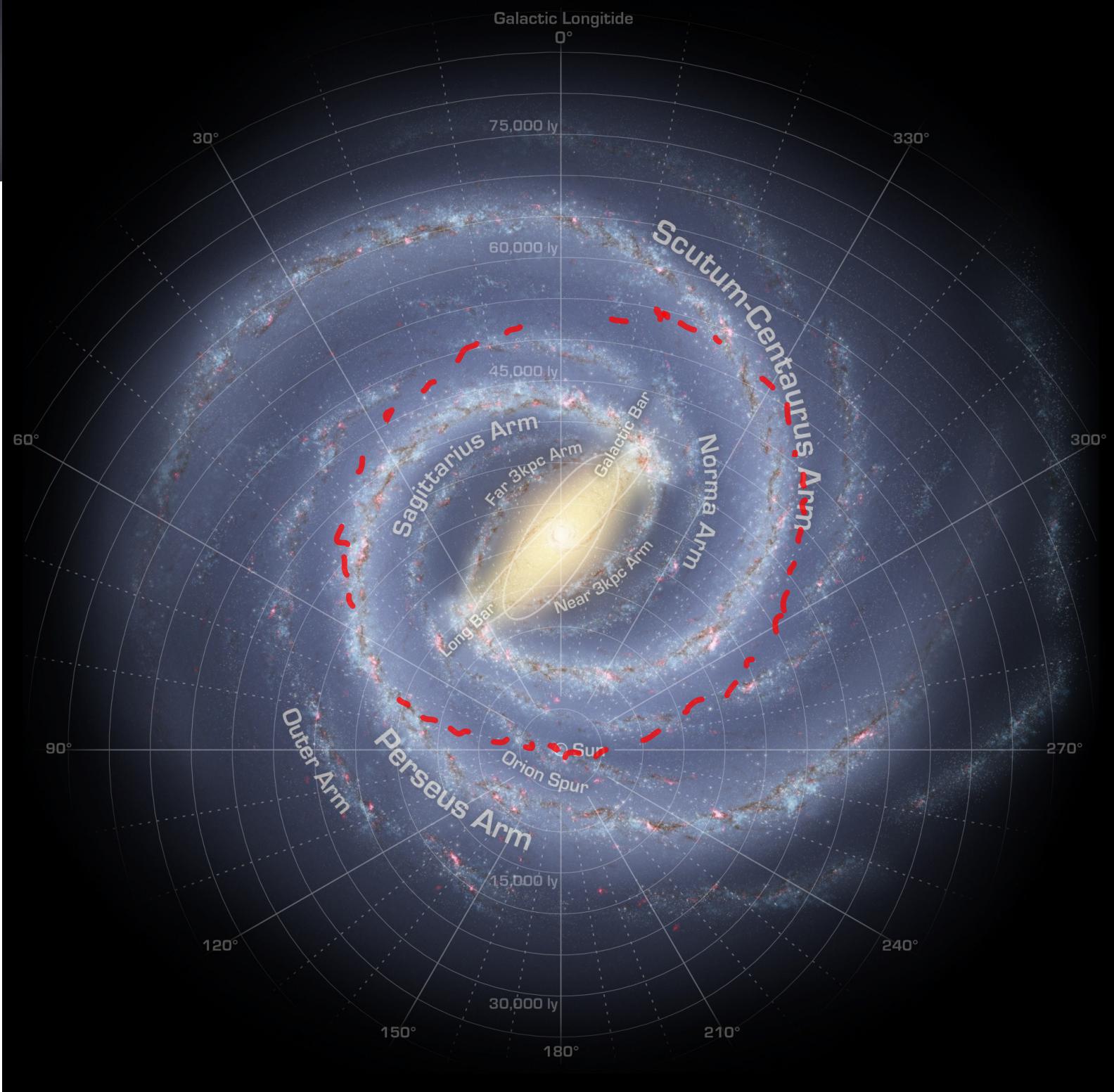
## A Roadmap to the Milky Way

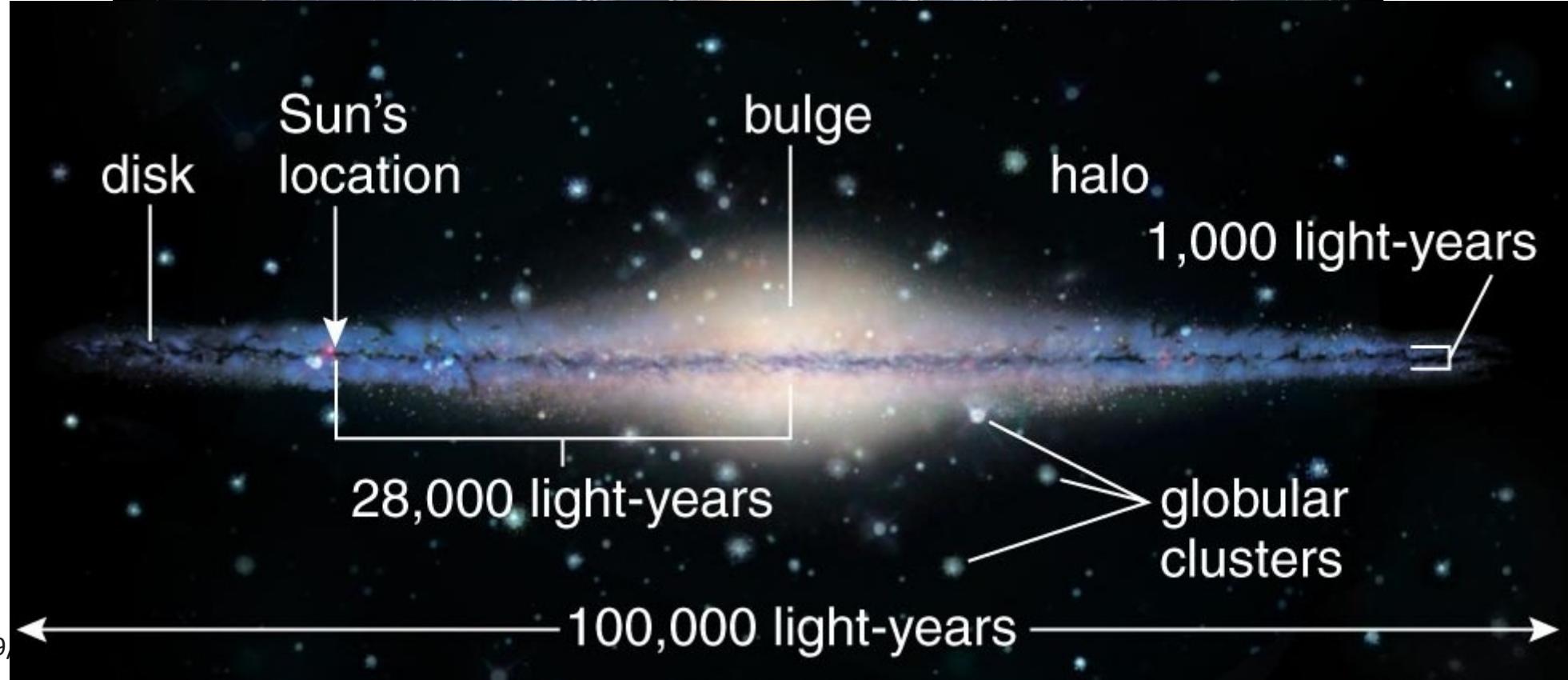
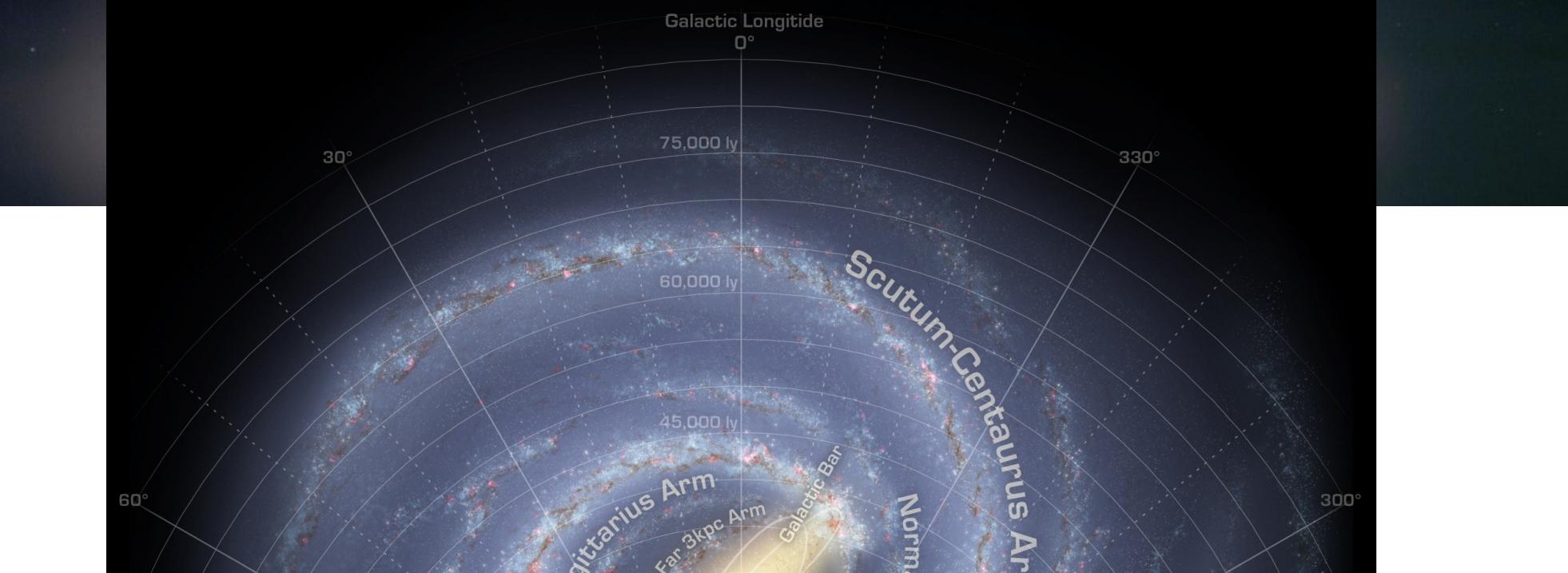
(artist's concept)

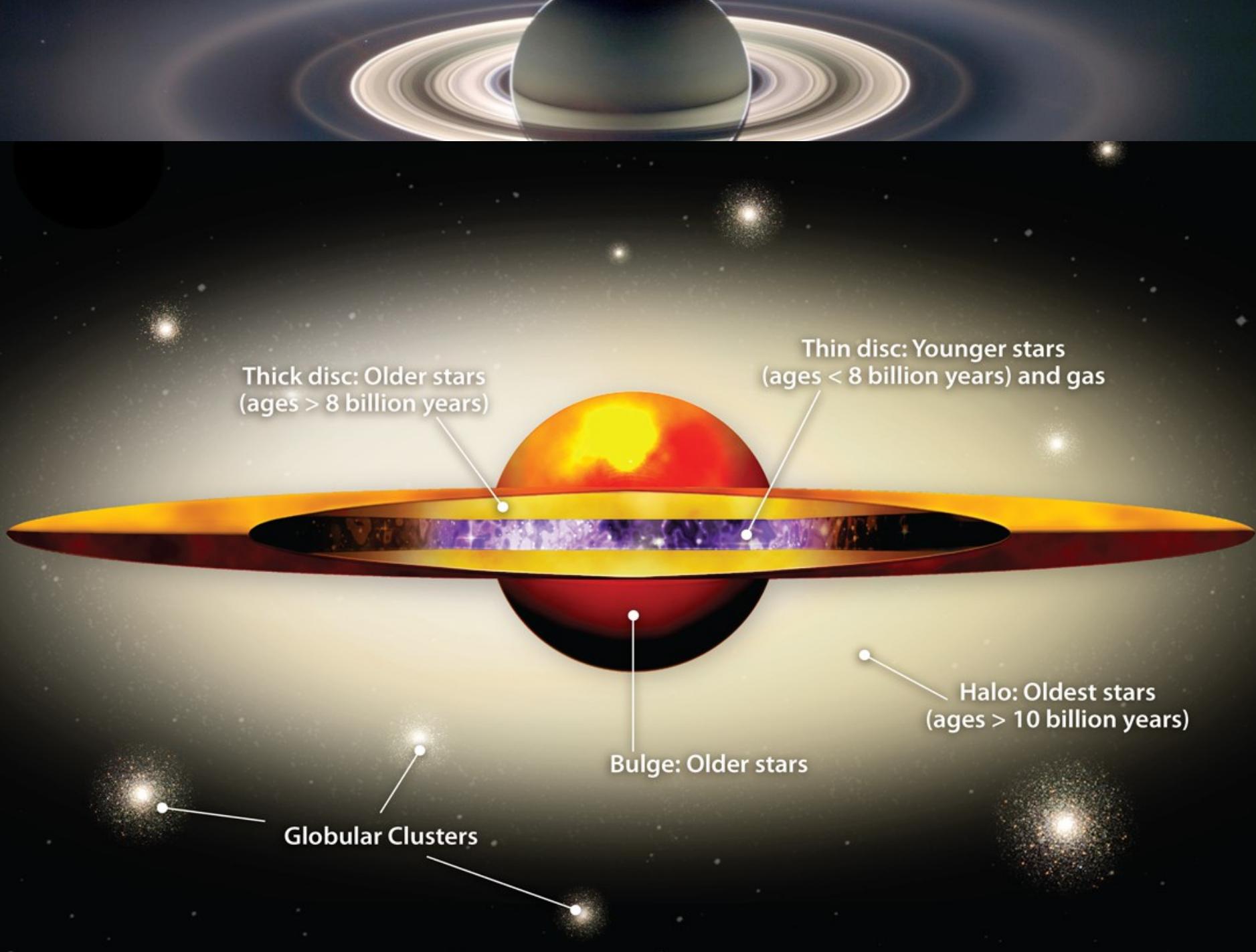
NASA / JPL-Caltech / R. Hurt (SSC-Caltech)

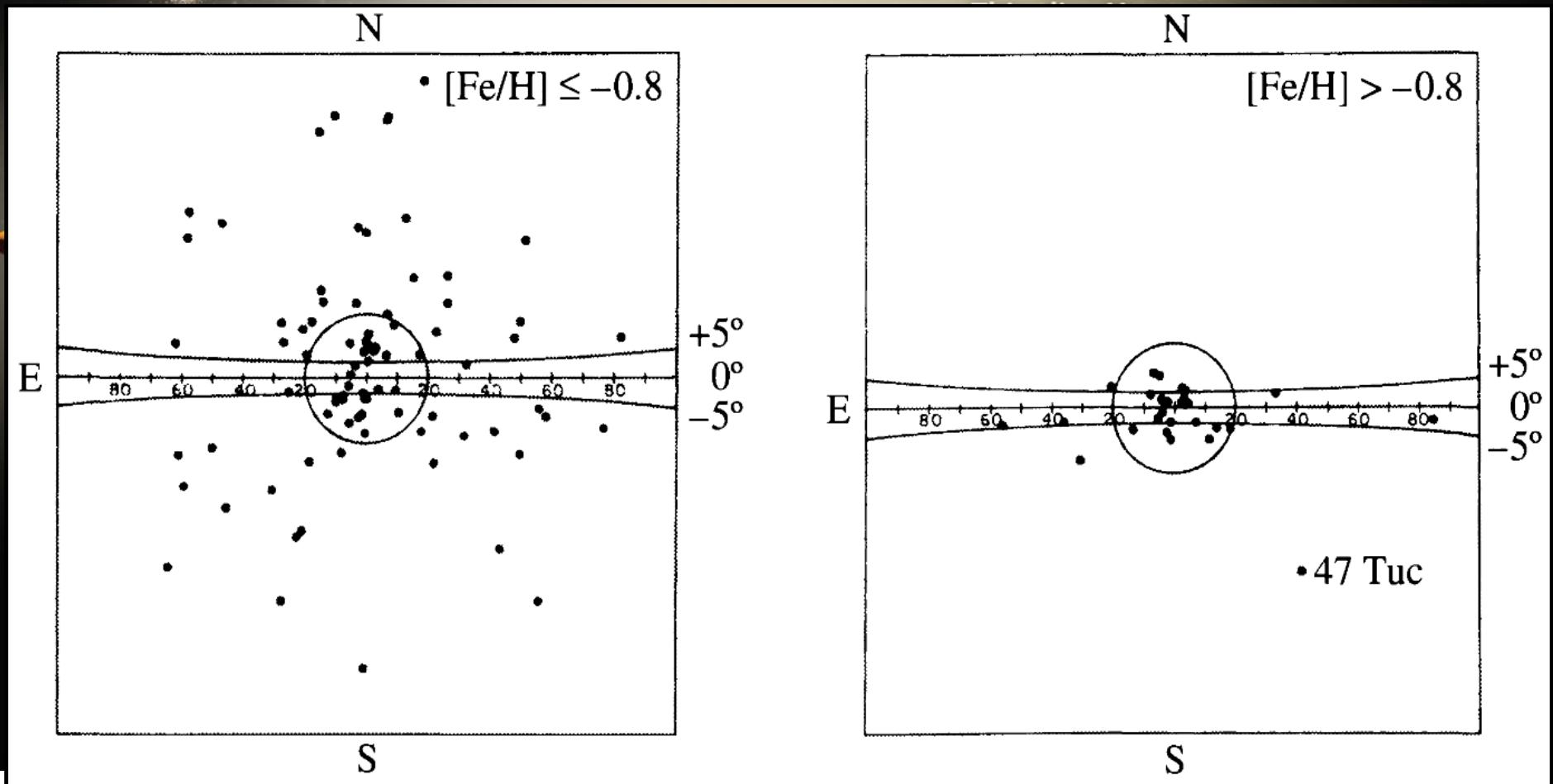
ssc2008-10a





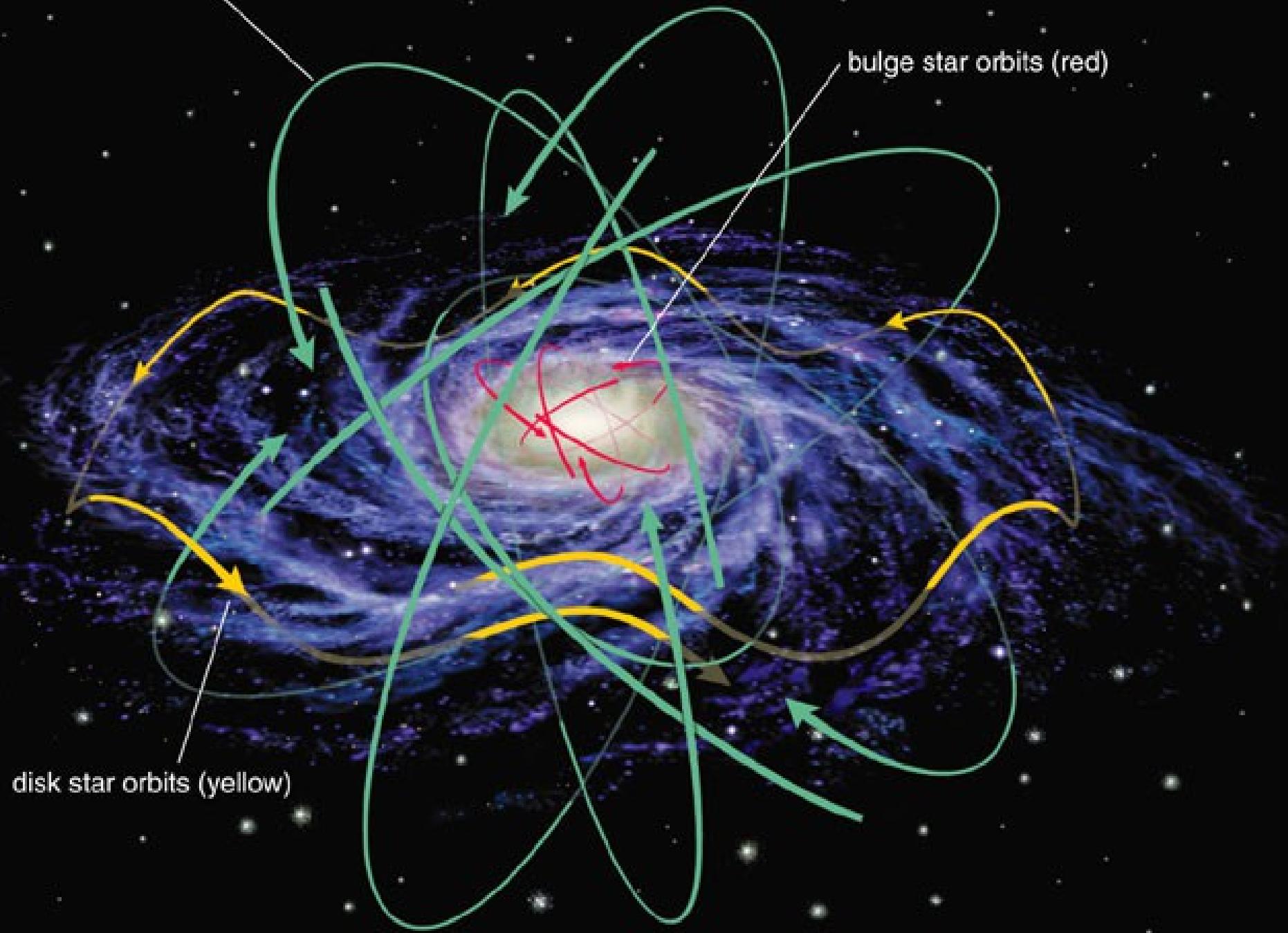






halo star orbits (green)

bulge star orbits (red)

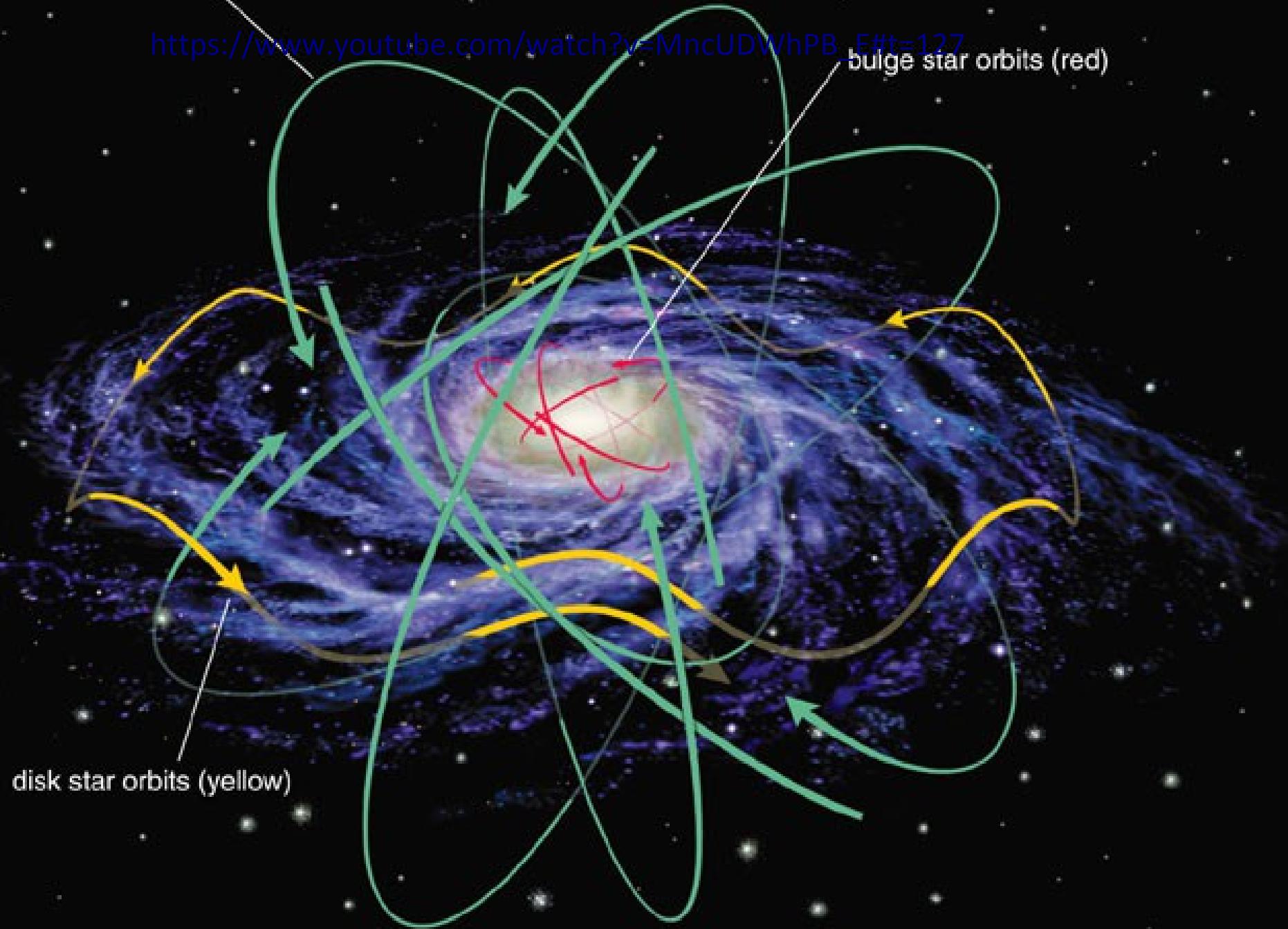


disk star orbits (yellow)

halo star orbits (green)

[https://www.youtube.com/watch?v=MncUDWhPB\\_E&t=127](https://www.youtube.com/watch?v=MncUDWhPB_E&t=127)

bulge star orbits (red)



disk star orbits (yellow)