



## How Big is One Billion?

- A Rich Uncle leaves you One Billion Dollars
- He puts it in a trust that will pay you \$10,000 per day.
- How long will the money last?

**IT WOULD LAST  
278 YEARS AND 288  
DAYS!**

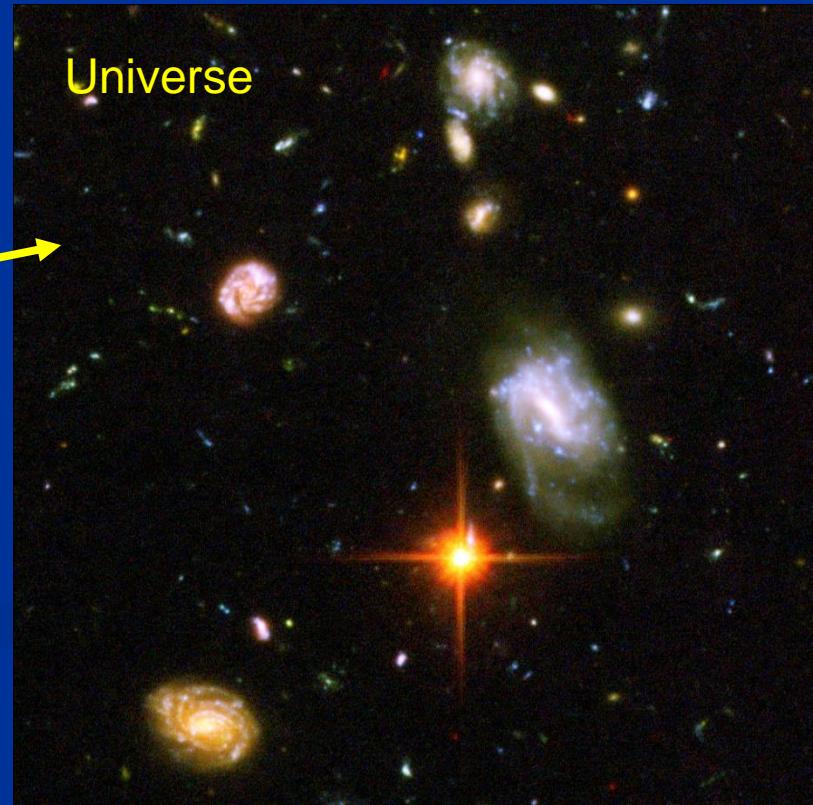
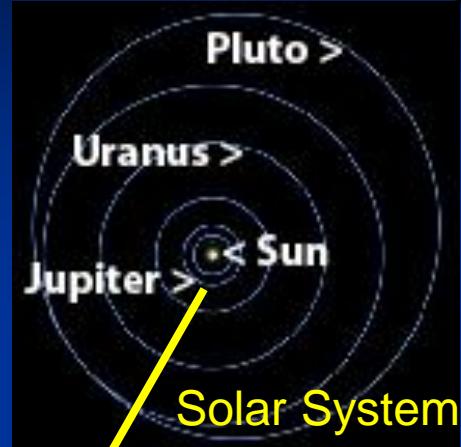


# What is a light year?

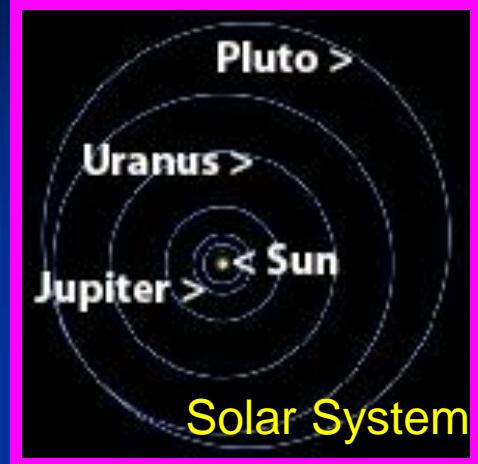
- A light year is the distance light travels in one year.
- It is a distance measure, not a time measure.
- Light travel at 186,000 Miles Per Second.
- Light can go around the world more than 7 times in one second.

A LIGHT YEAR IS  
**5,878,499,810,000**  
**MILES**

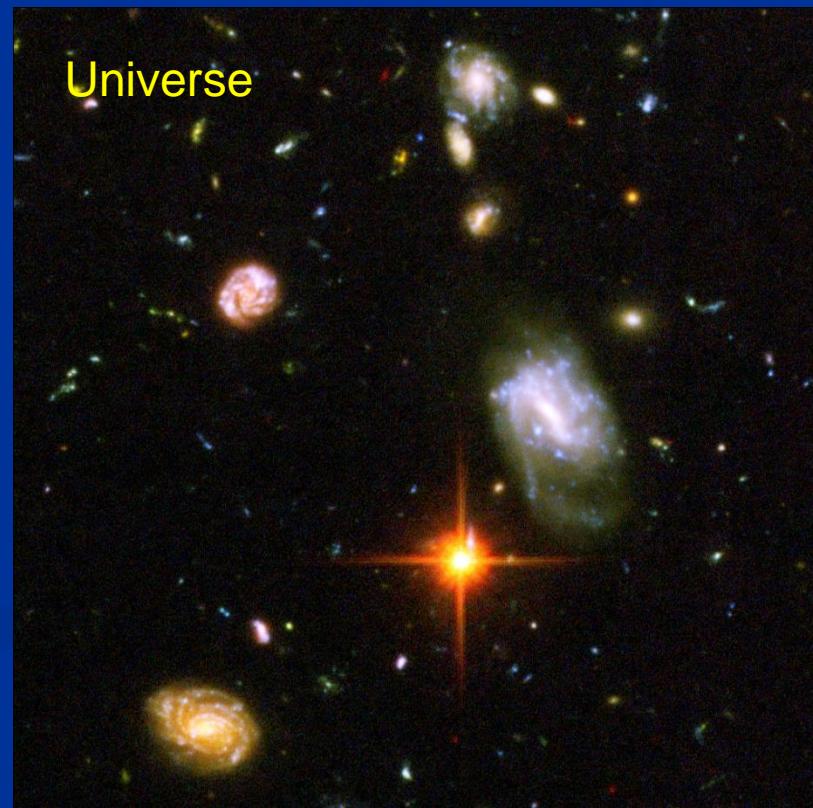
# What's the Difference?



# The Solar System

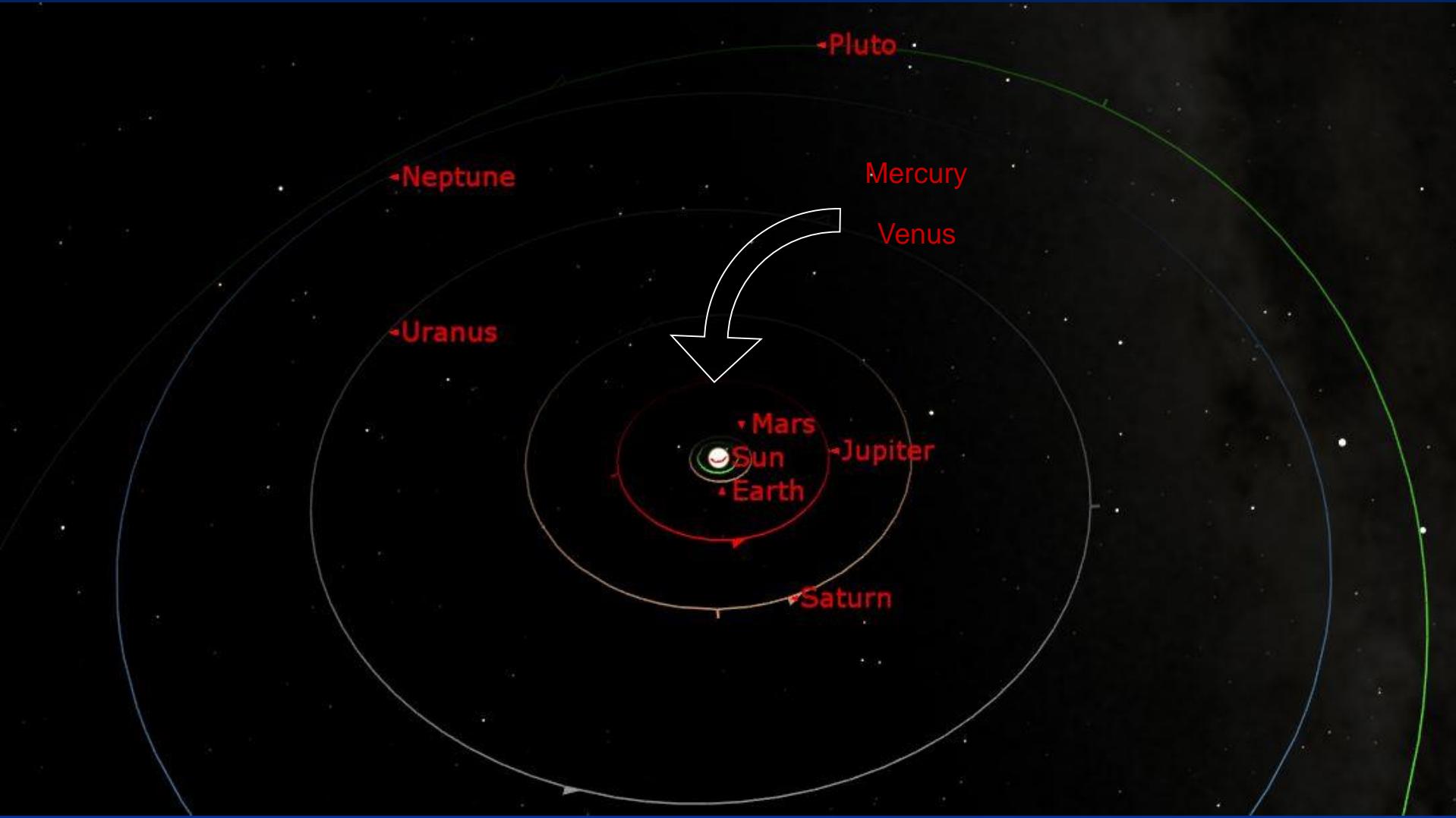


Galaxy

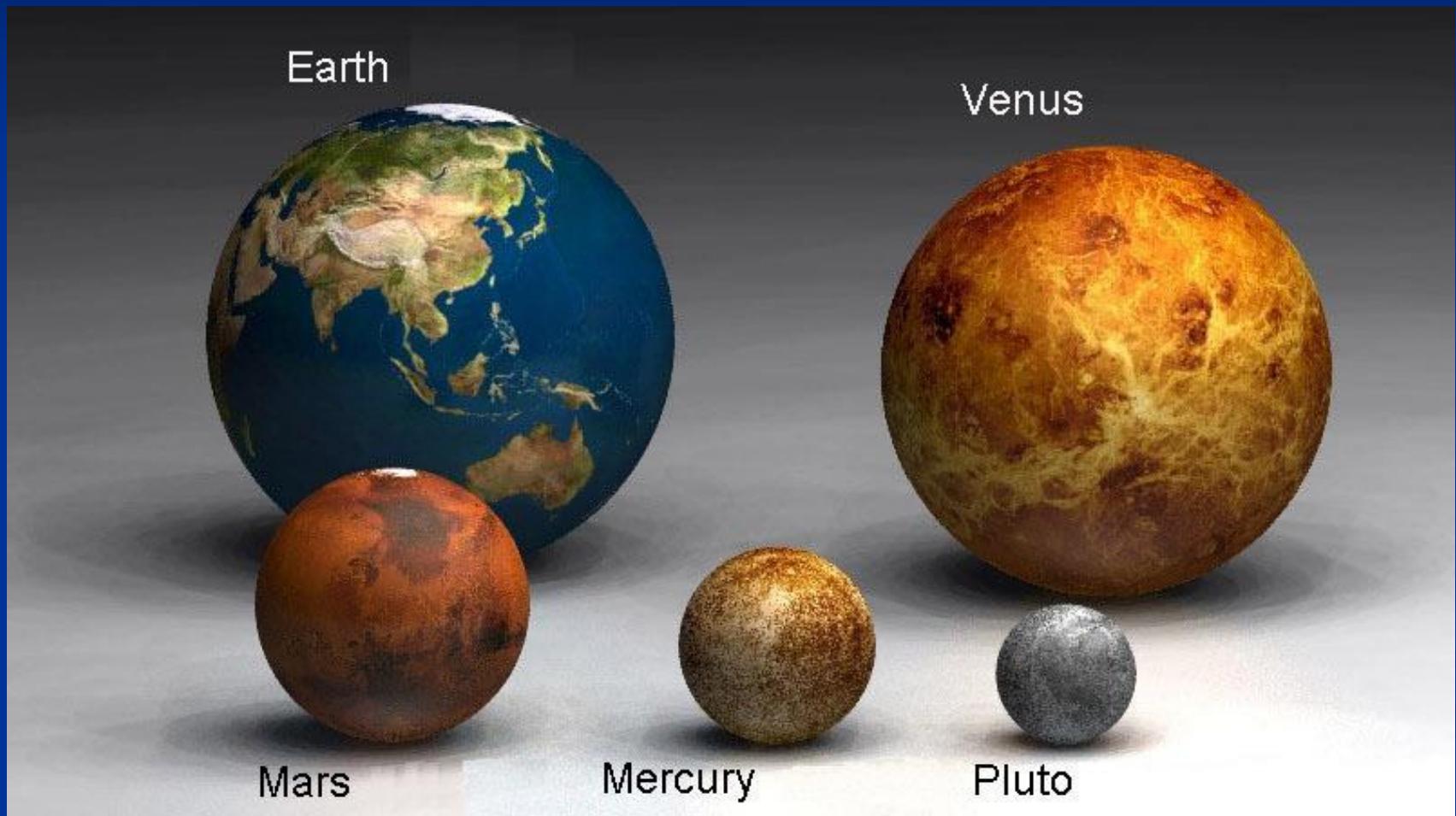


Universe

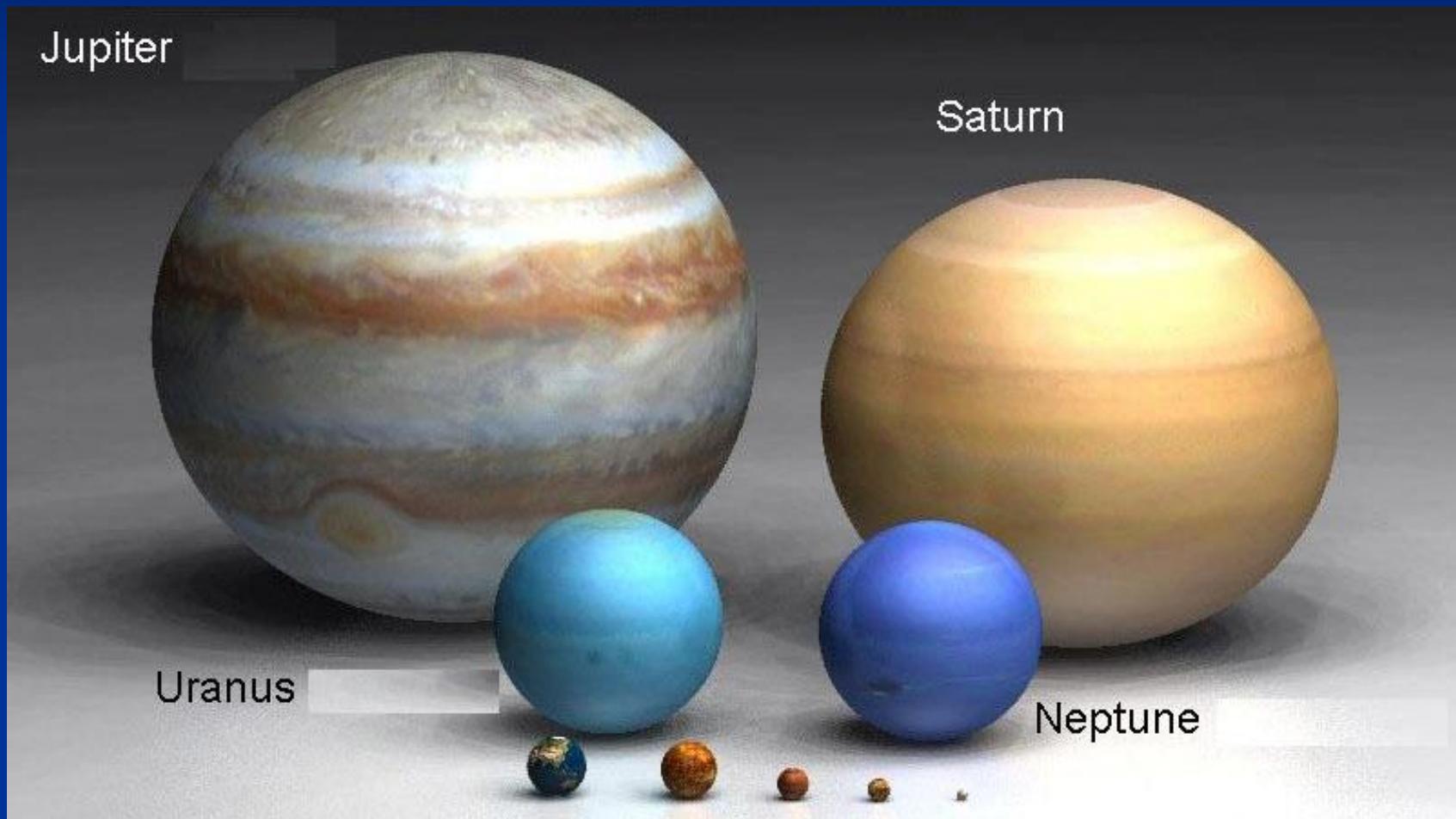
# Solar System



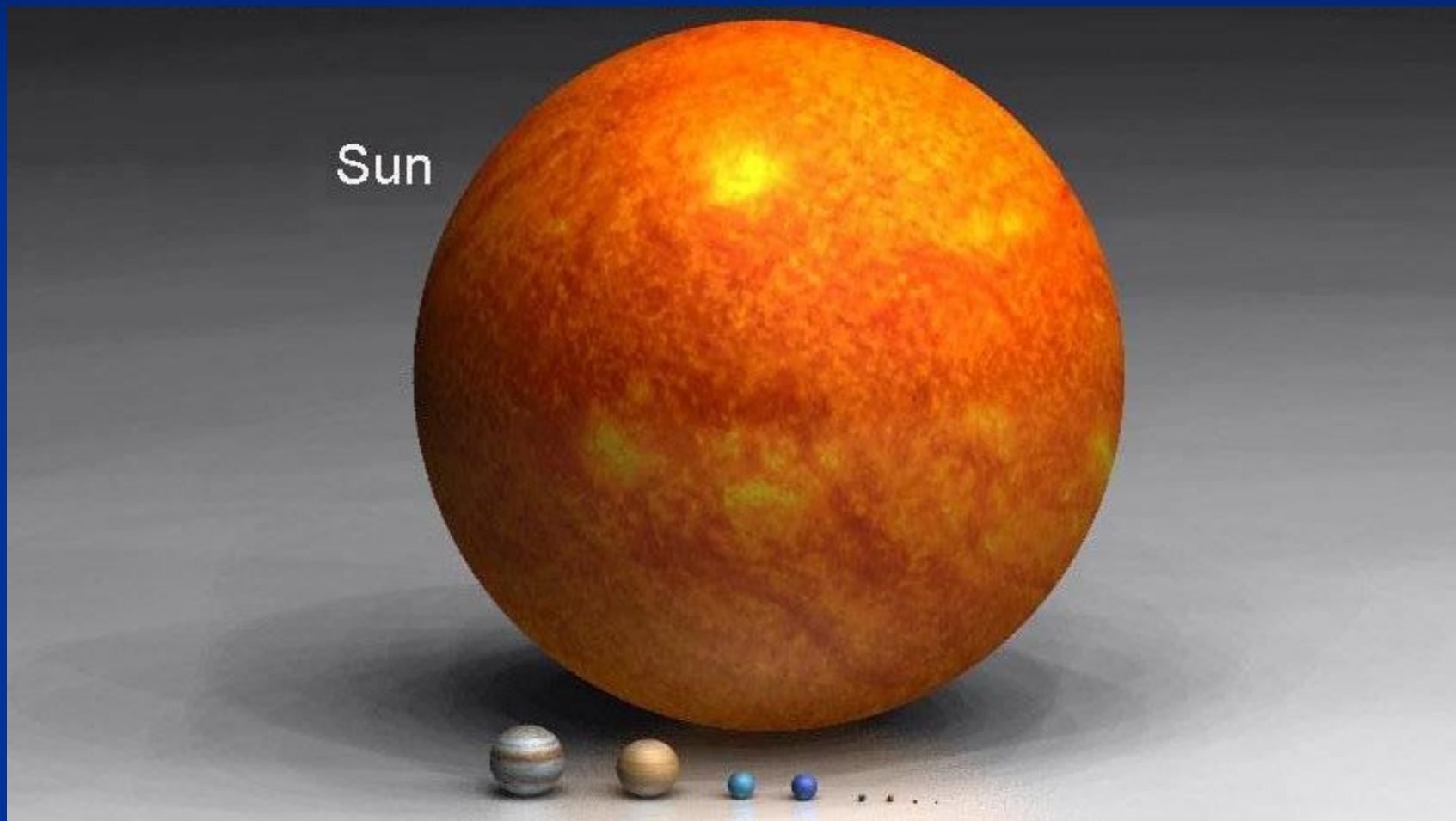
# *The Size of the Planets*



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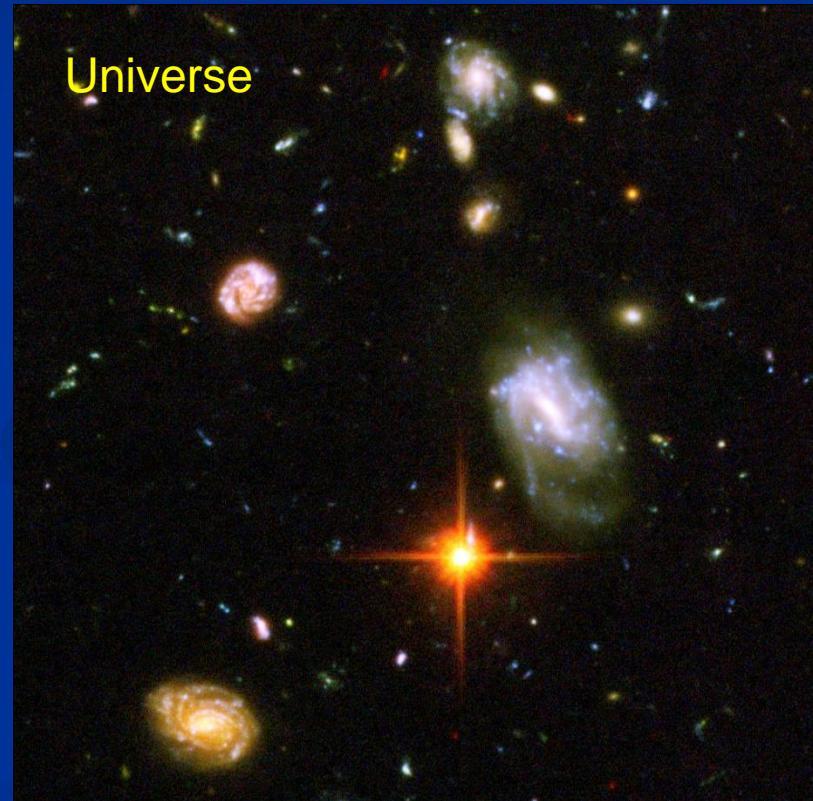
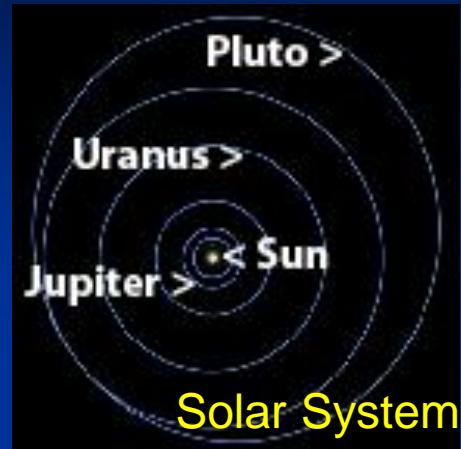


# A Boeing 747 Cruising at 550 MPH.

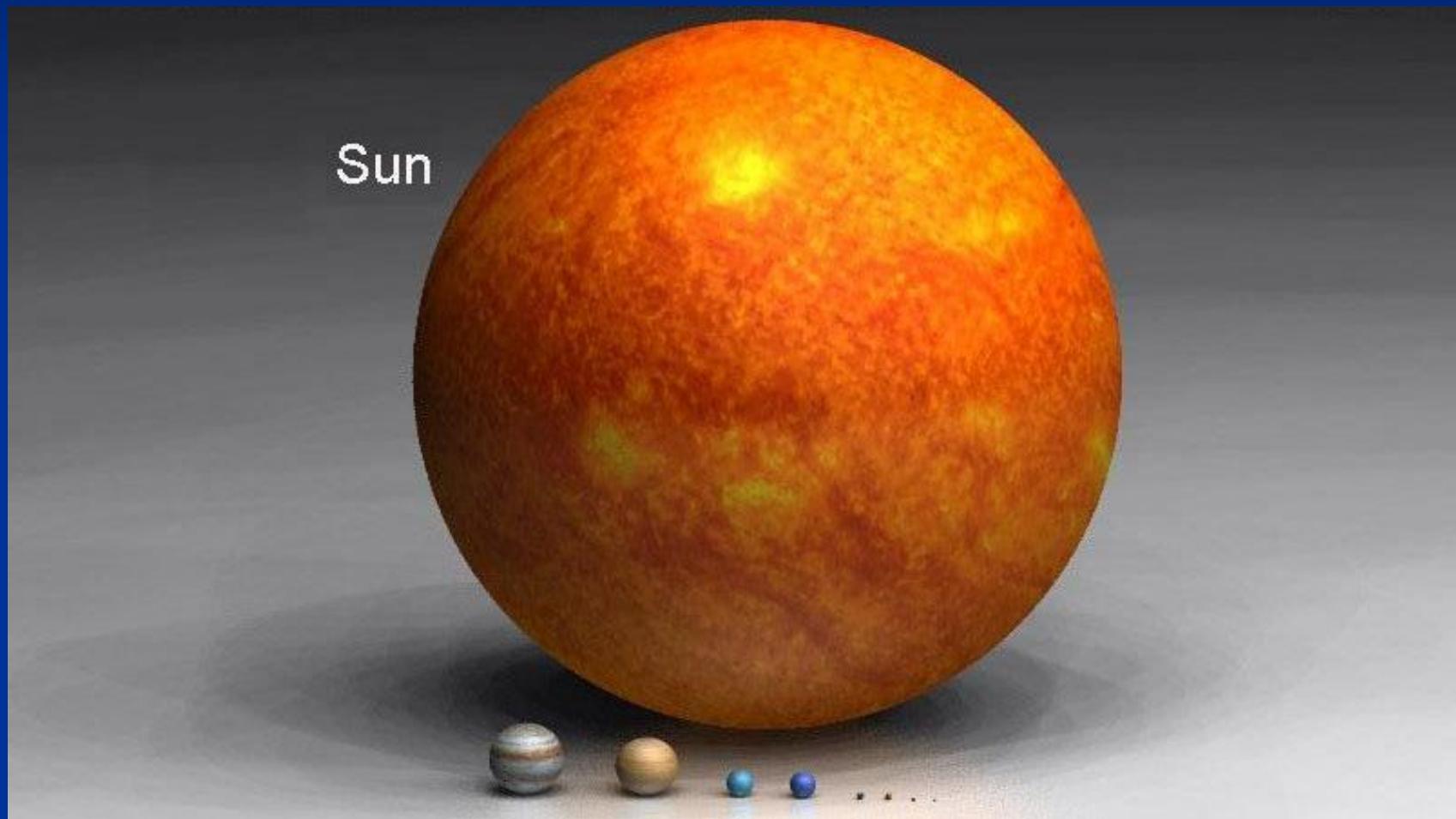
- To travel from San Francisco to New York takes about 6 Hours.
- To travel all of the way around the Earth takes less than 2 days.
- To get from Earth to the Sun would take 18 Years!
- To get from the Sun to Pluto would take 700 Years!
- To get to the nearest star would take 4,718,913 years



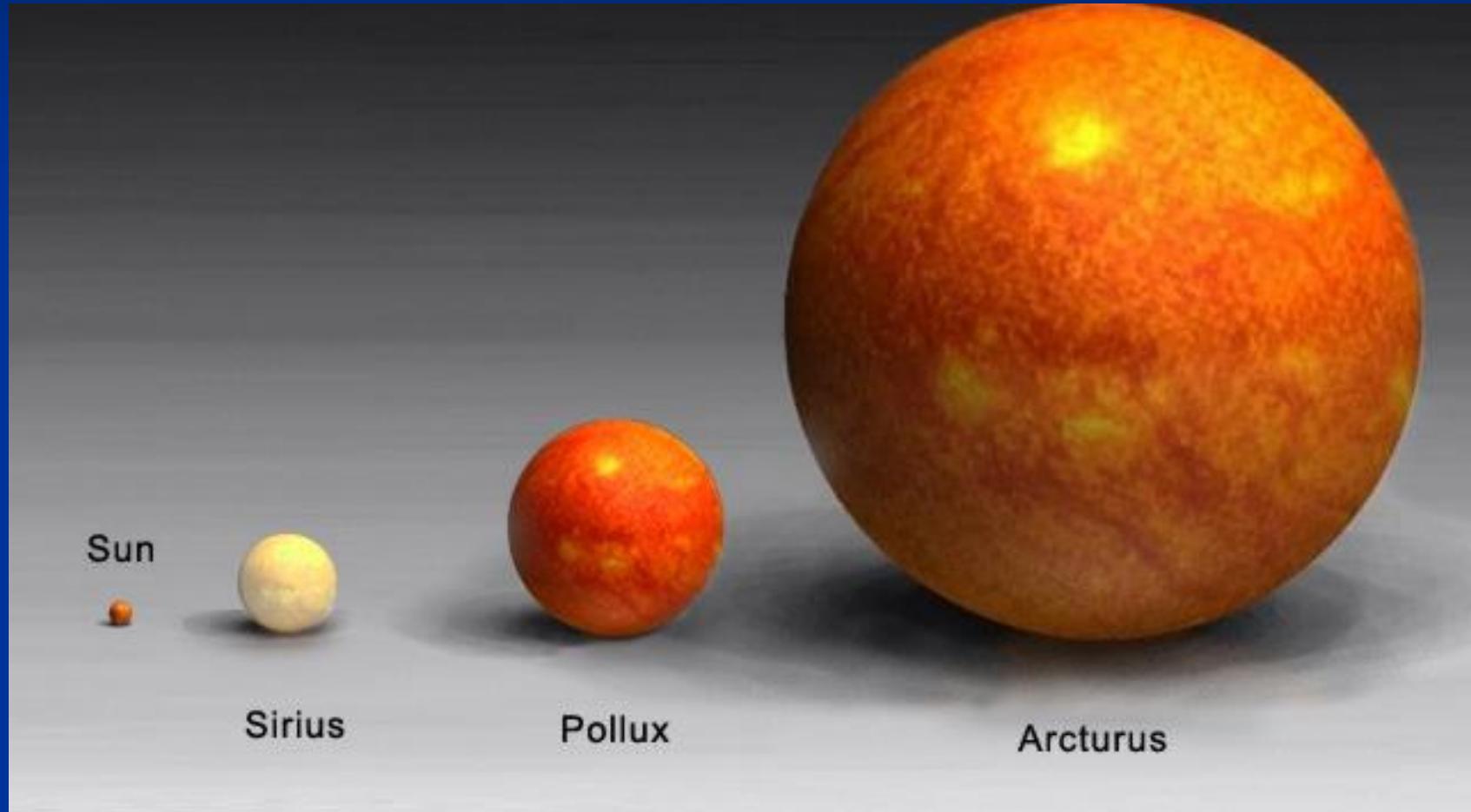
# The Galaxy



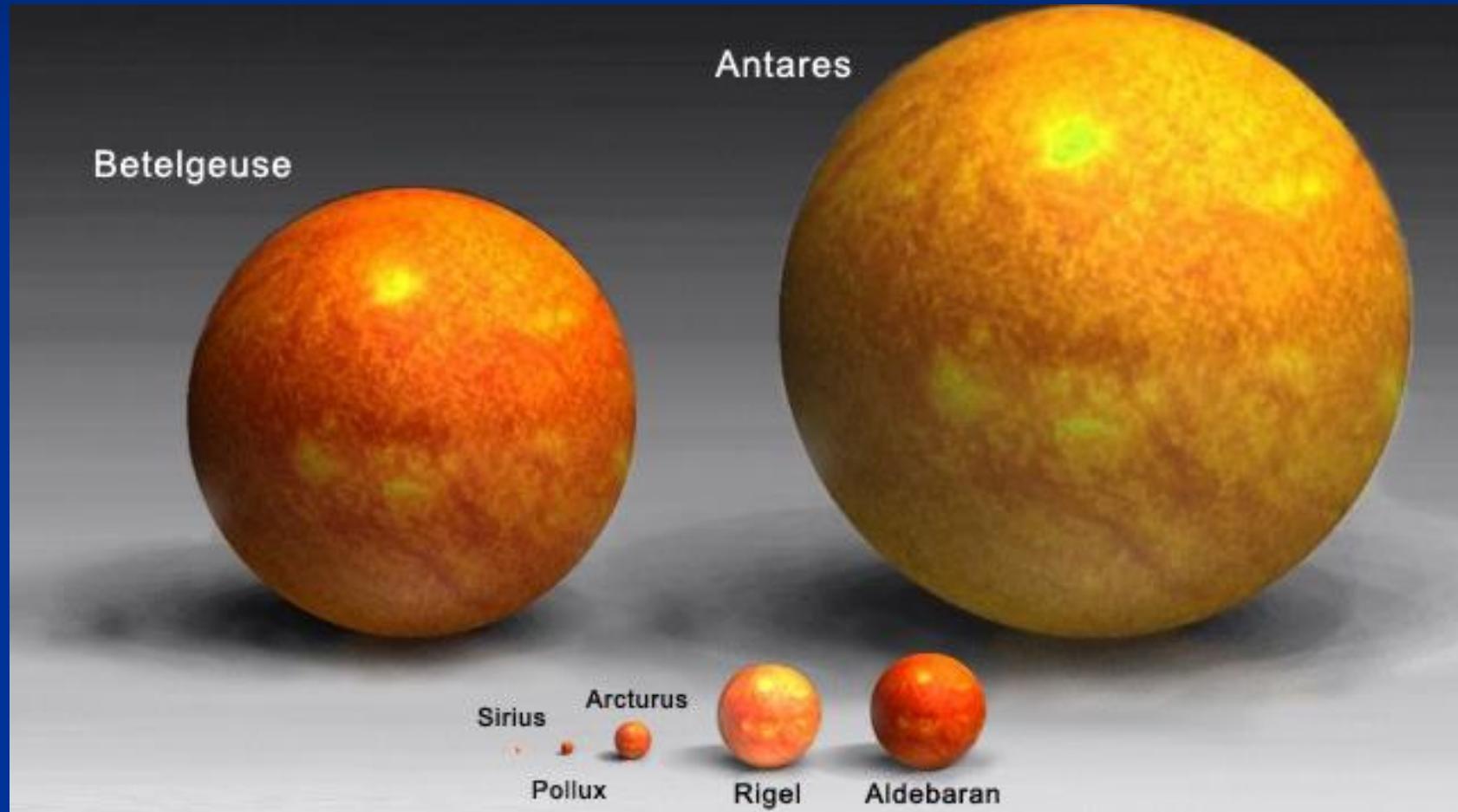
# *The Size of the Sun*



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# The Size of the Sun

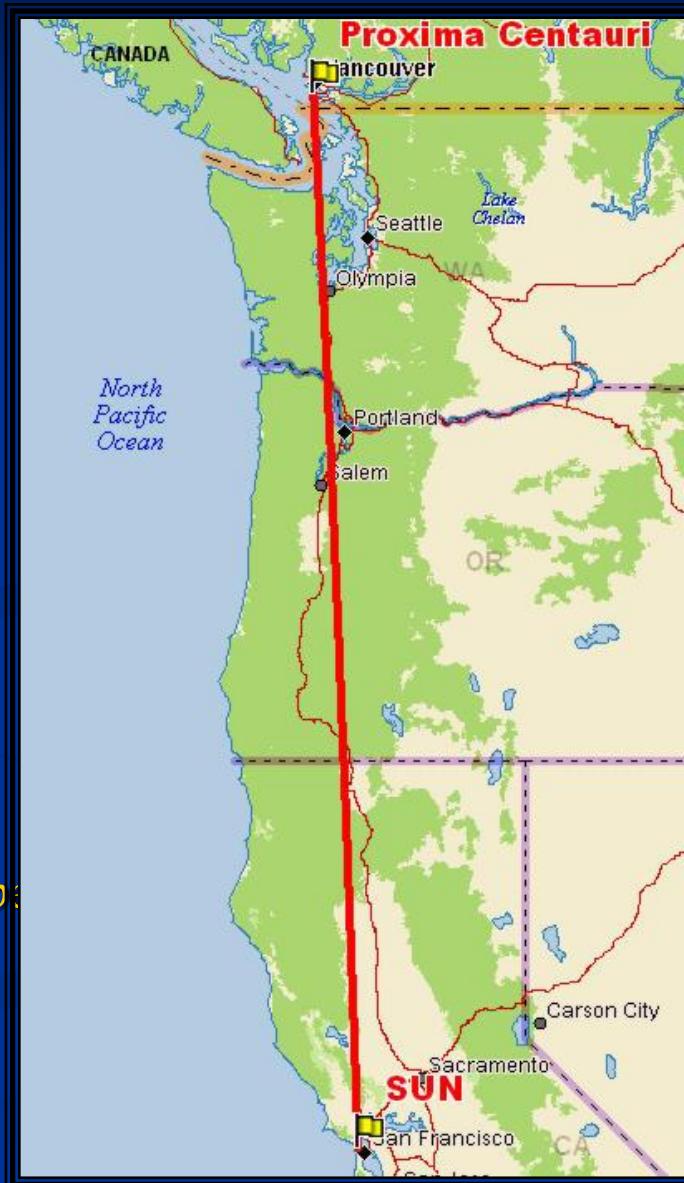


# The Distance Between Suns

Shrinking the sun to the size of a golf ball.



The distance to the nearest star (Proxima Centauri) would be  
770 miles.



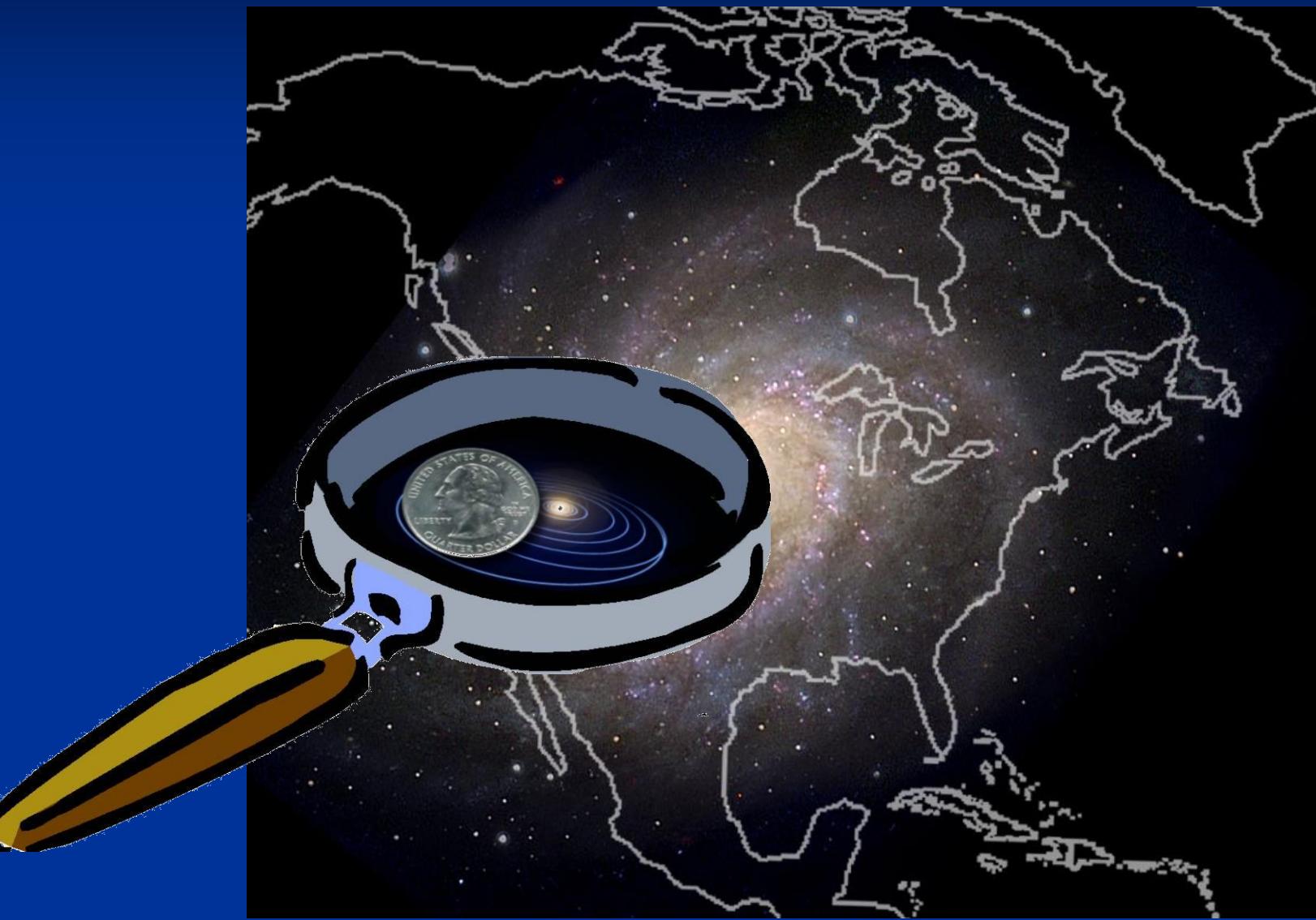
# The Size of the Galaxy

Imagine the Solar System so small that that distance from the sun to Pluto is the diameter of a quarter.

THEN...



*...the Galaxy would be the size of North America*





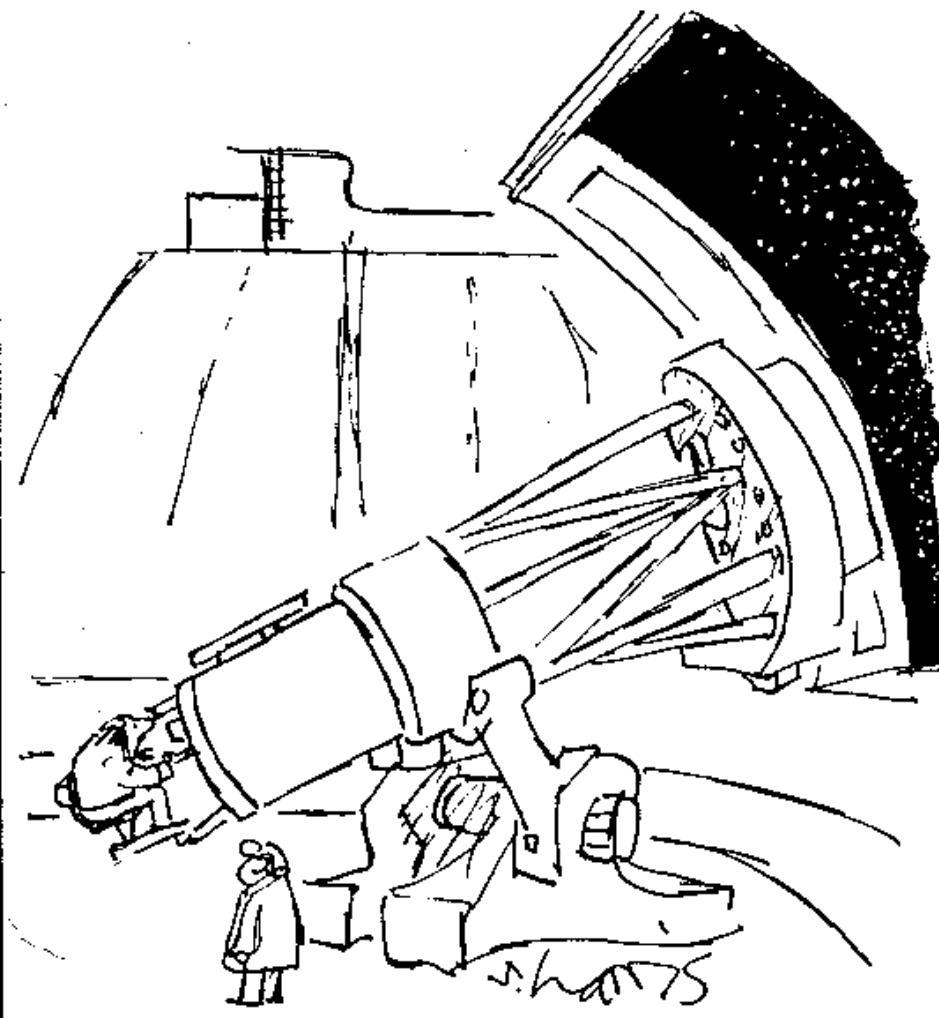
# Milky Way Galaxy





How Many Stars in our Galaxy?

200 BILLION Stars!!!



"Let's see, now ... picking up where we left off ... one billion, sixty-two million, thirty thousand, four hundred and thirteen ... one billion, sixty-two million, thirty thousand, four hundred and fourteen ... "

# How Many Stars in our Galaxy?

- ❖ Take a Football Field out as many seeds on the
- ❖ Build a 4 foot wall tall around galaxy
- ❖ Fill the field with birdseed

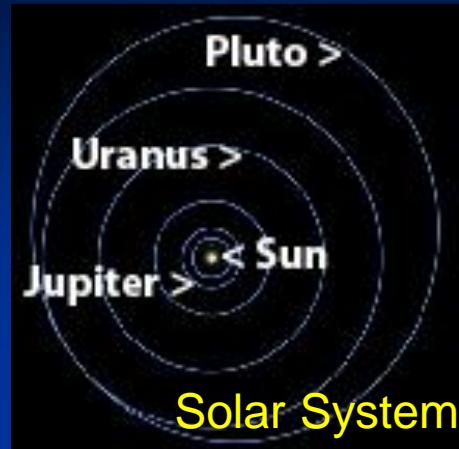


# 200 BILLION Seeds

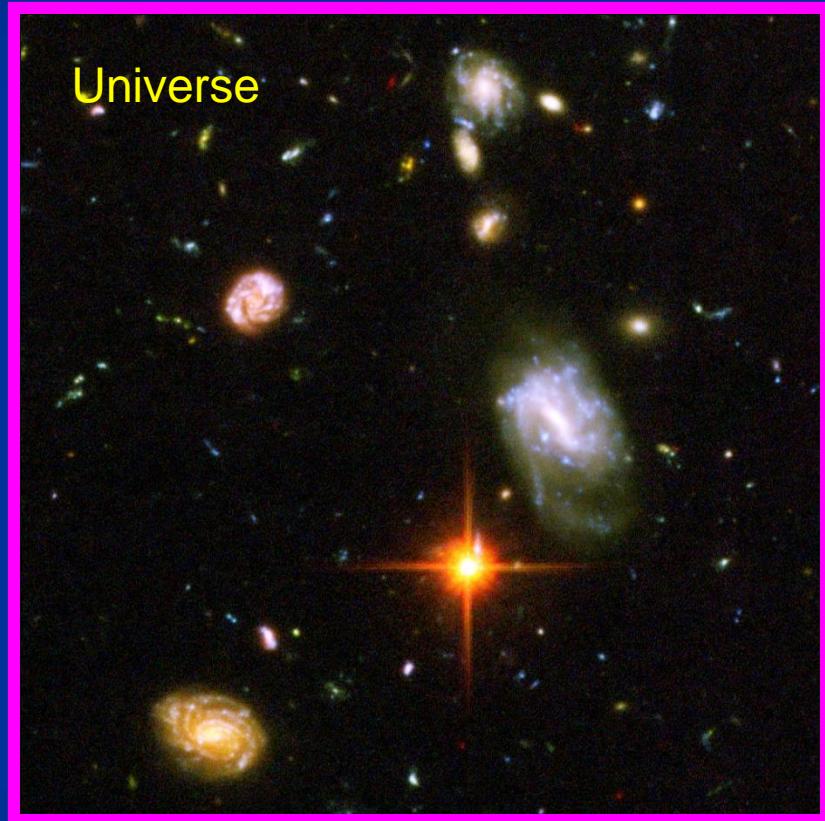


# 200 BILLION Stars

# The Universe



Galaxy







M31 Andromeda Galaxy  
8 Feet

M33 Pinwheel Galaxy  
8 Feet



M33 Whirlpool Galaxy  
50 Yards



M81  
16 Yards



M104 Sombrero Galaxy  
67 Yards

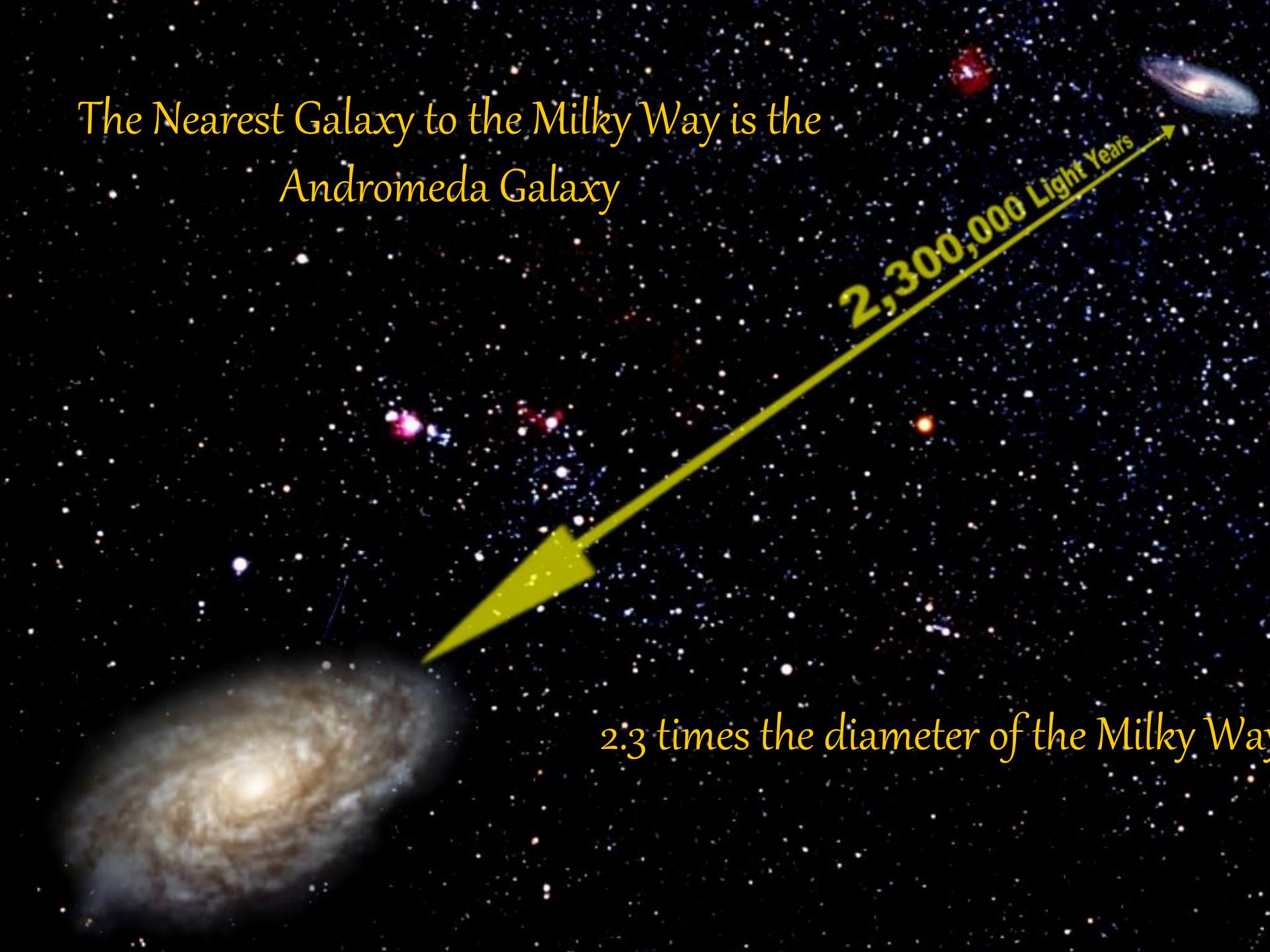


# How Many Galaxies in the Universe?

There are About as many galaxies as there are  
stars in the Milky Way  
or seeds on our football field!!!



The Nearest Galaxy to the Milky Way is the  
Andromeda Galaxy



2,300,000 Light Years

2.3 times the diameter of the Milky Way

# Andromeda and Milky Way Galaxies will collide

- Hurtling together at 245,000 MPH
- Will Collide in about 4 Billion Years
- Collision will take billions of years
- Earth will have been burned up by the Sun by then
- Stars will not collide - there is too much distance between them.

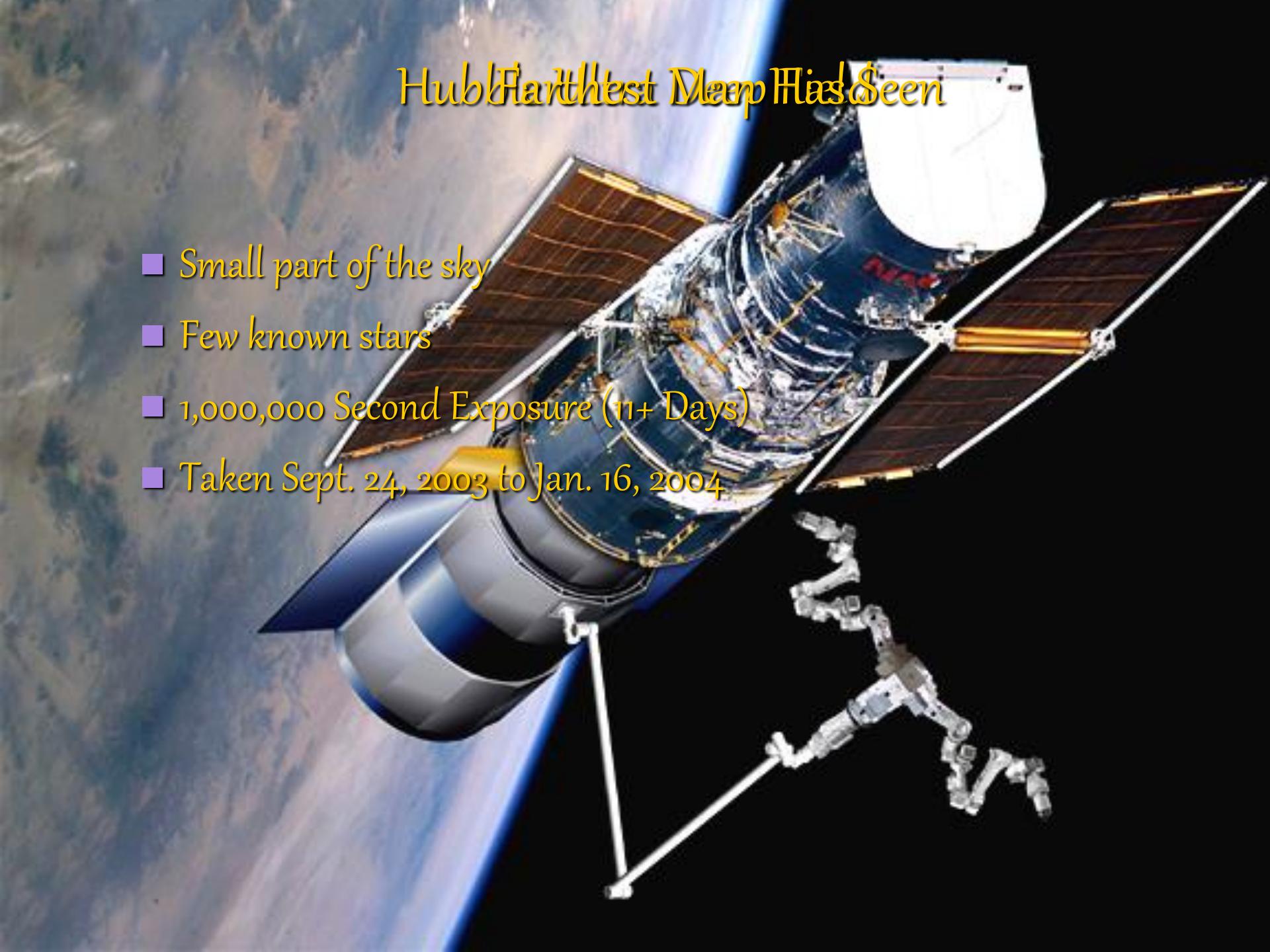


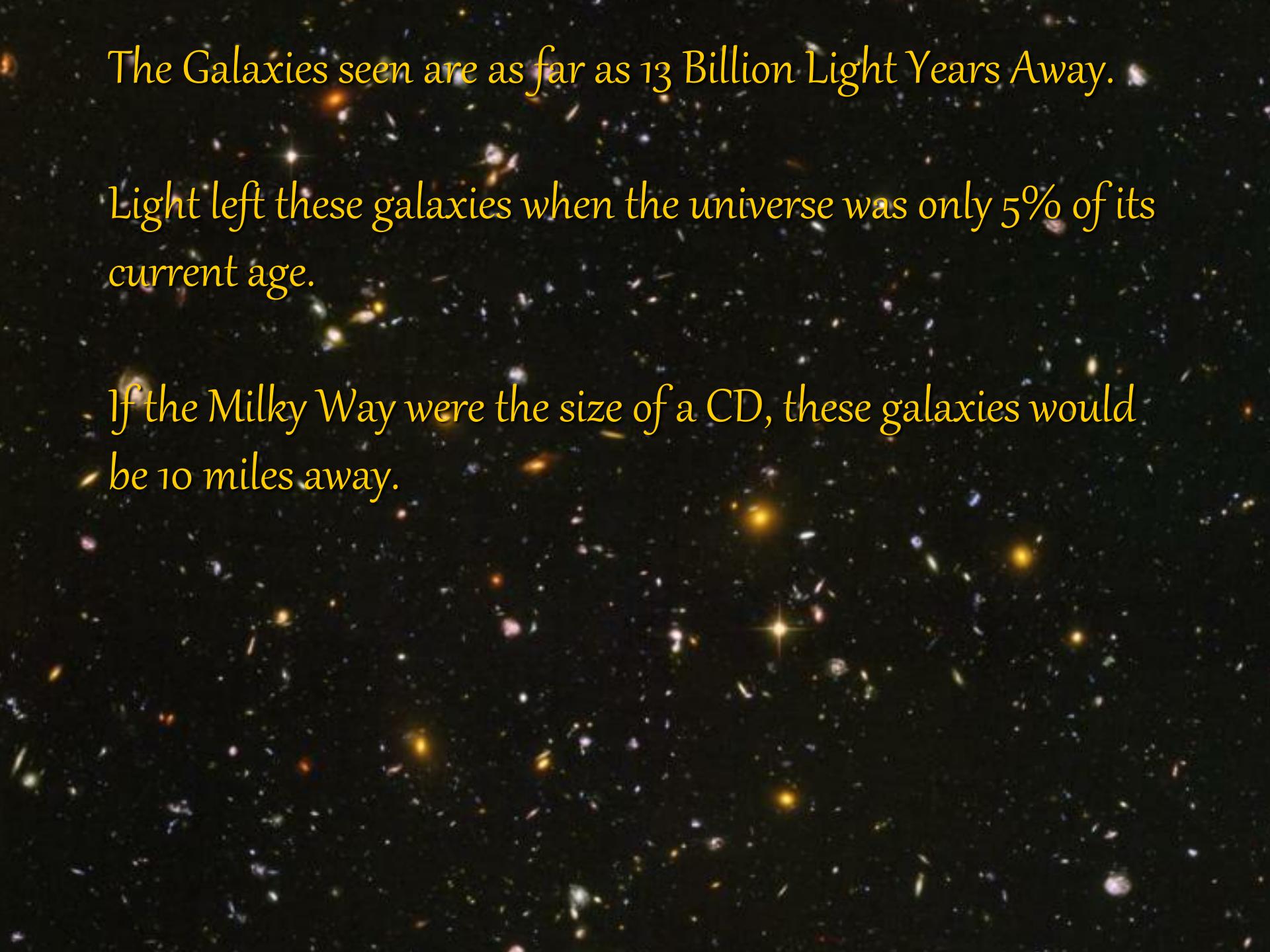
Farthest Man Has Seen



# Hubble's Deepest Map Has Seen

- Small part of the sky
- Few known stars
- 1,000,000 Second Exposure (11+ Days)
- Taken Sept. 24, 2003 to Jan. 16, 2004





The Galaxies seen are as far as 13 Billion Light Years Away.

Light left these galaxies when the universe was only 5% of its current age.

If the Milky Way were the size of a CD, these galaxies would be 10 miles away.

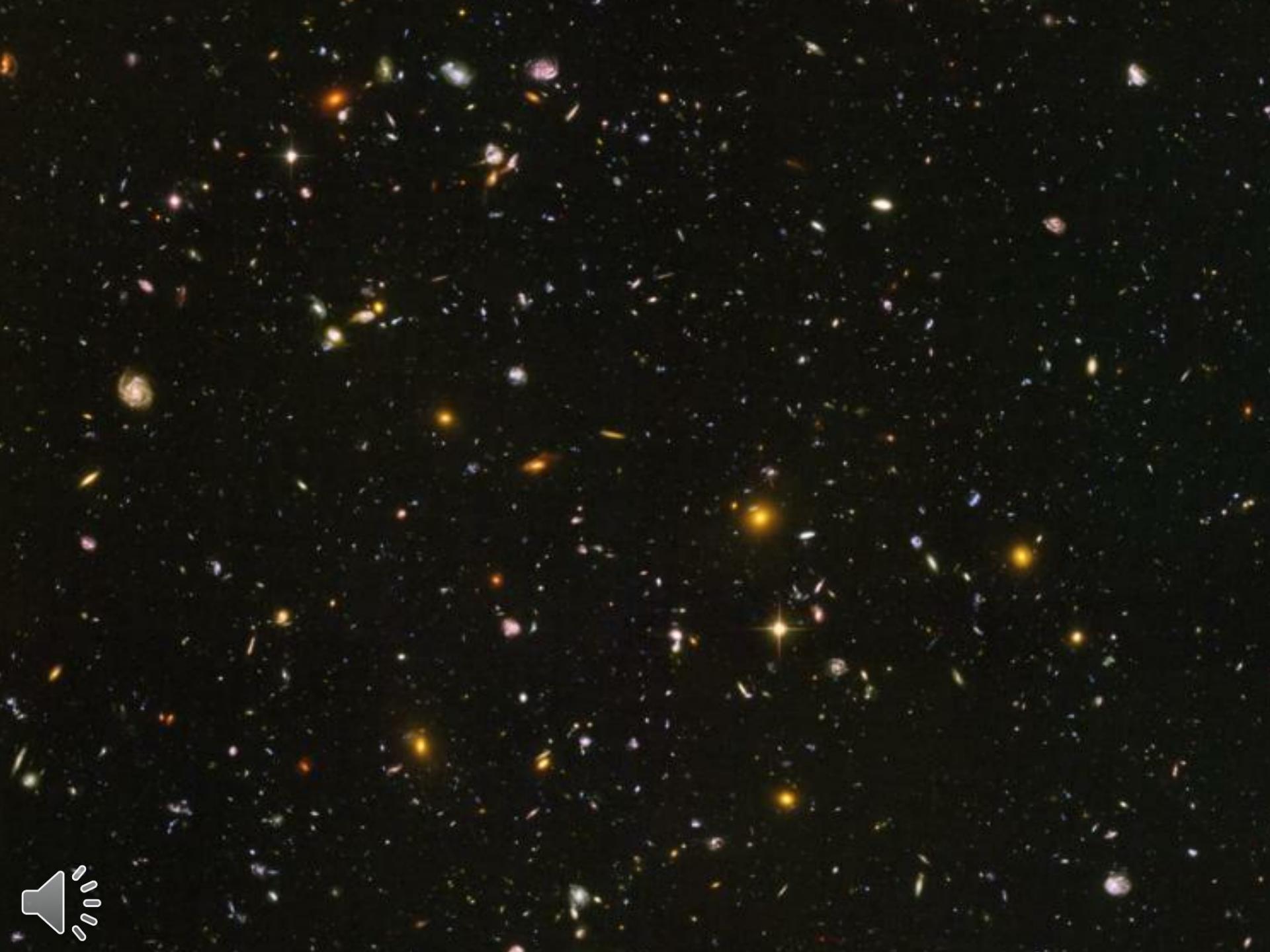
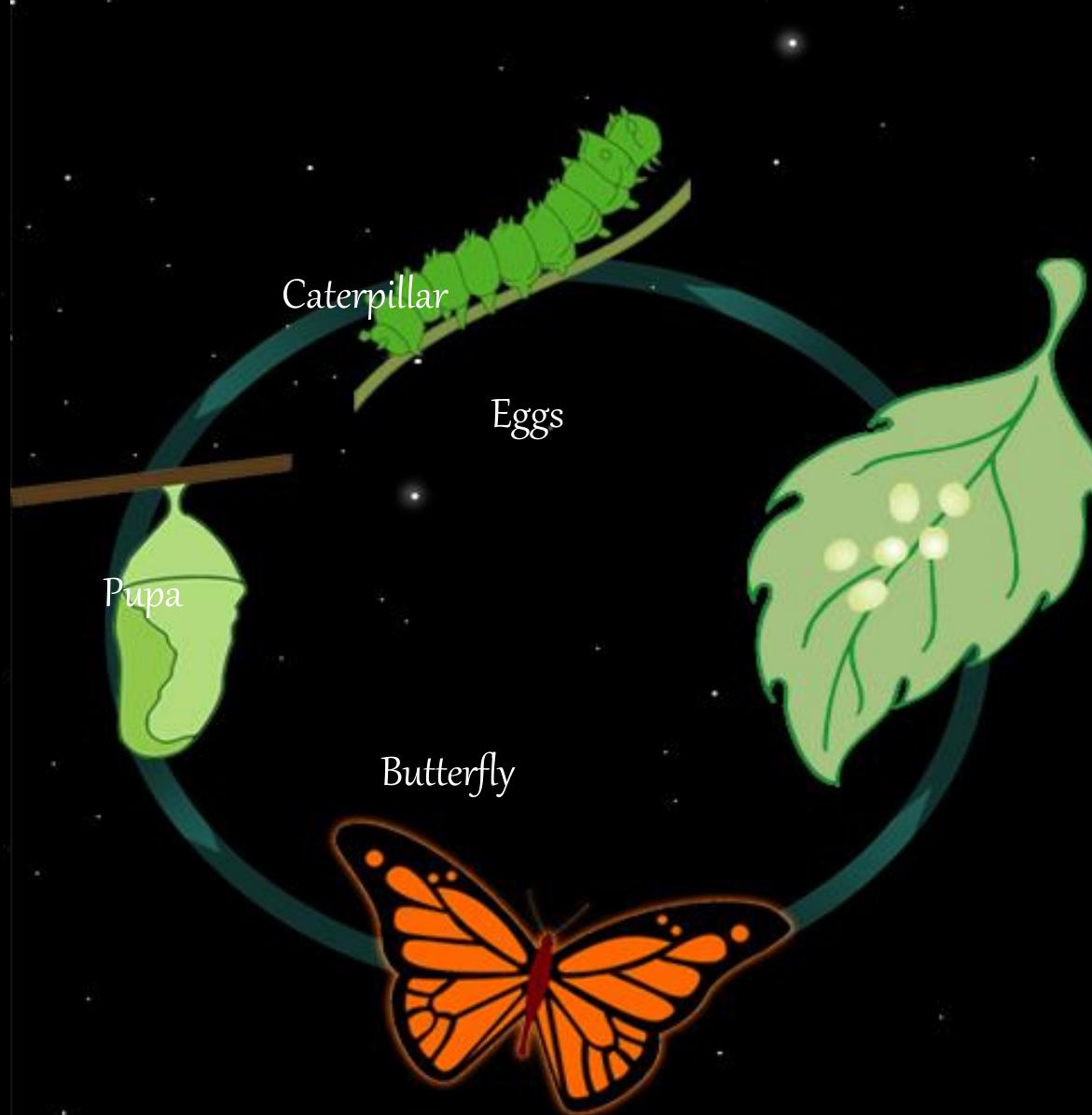




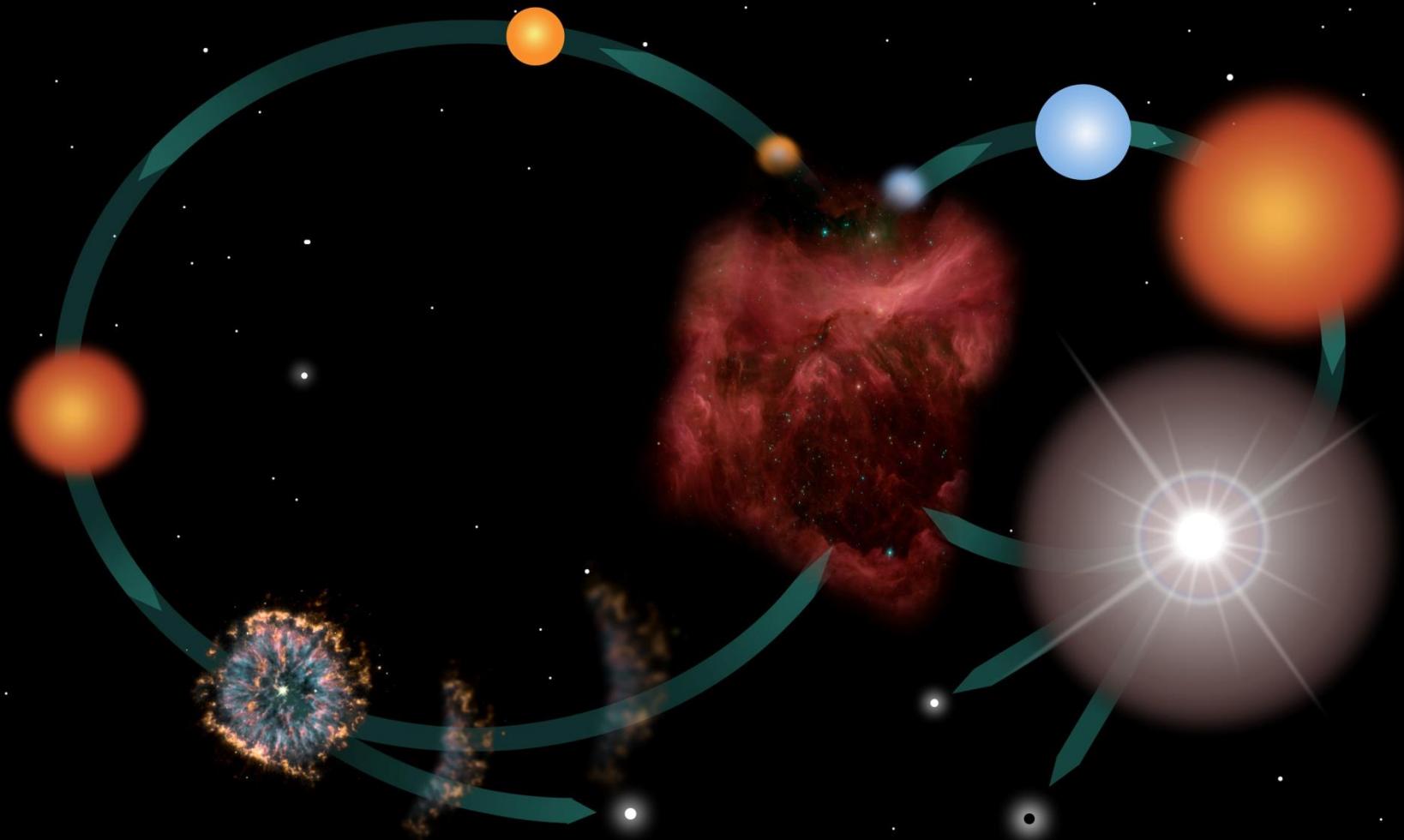
Chart of the matter of the universe. In a way, this chart is an embarrassment for scientists. We are only able to account for 4% of the matter in the universe.

**END**

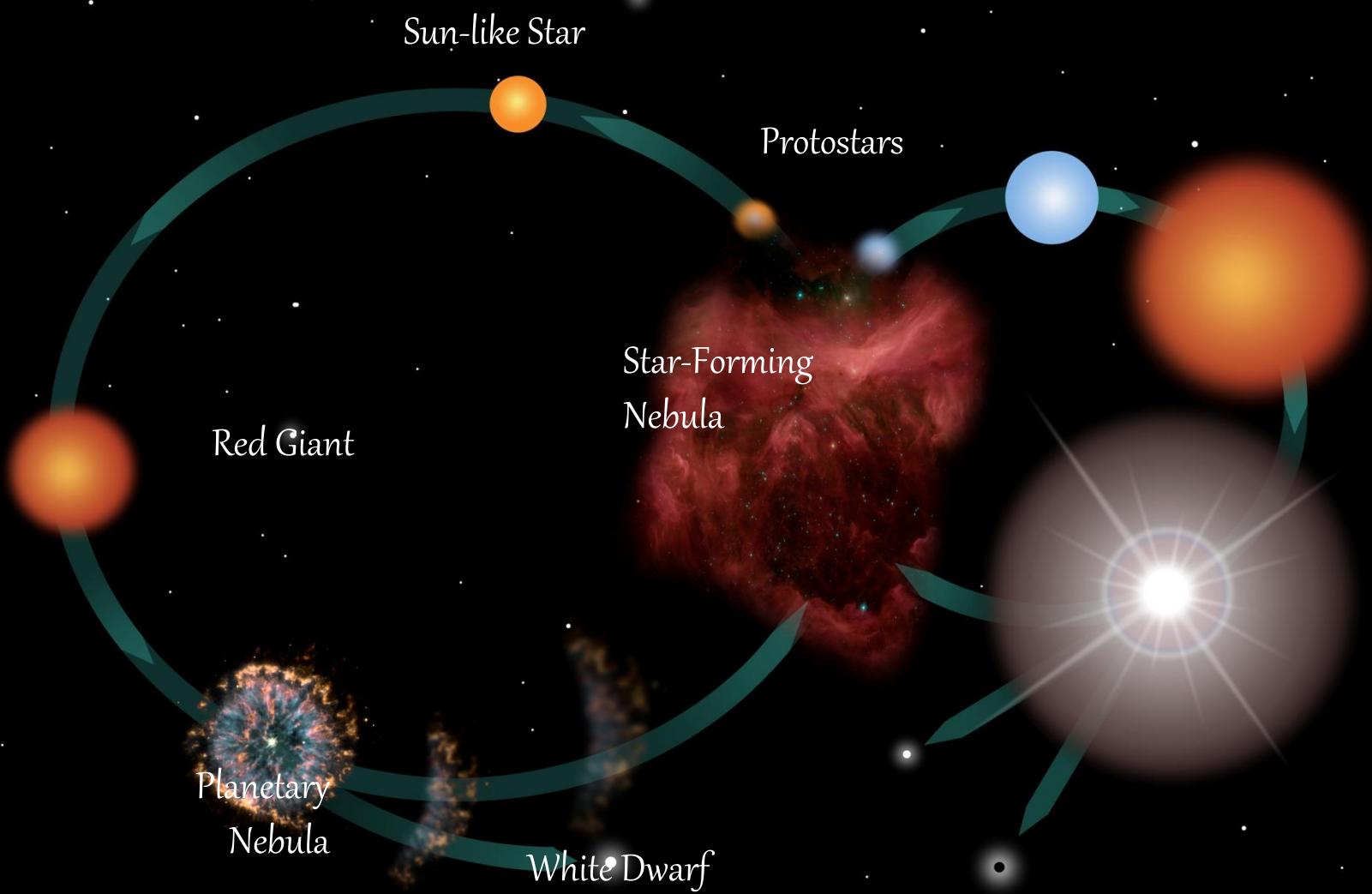
# Life of a Butterfly



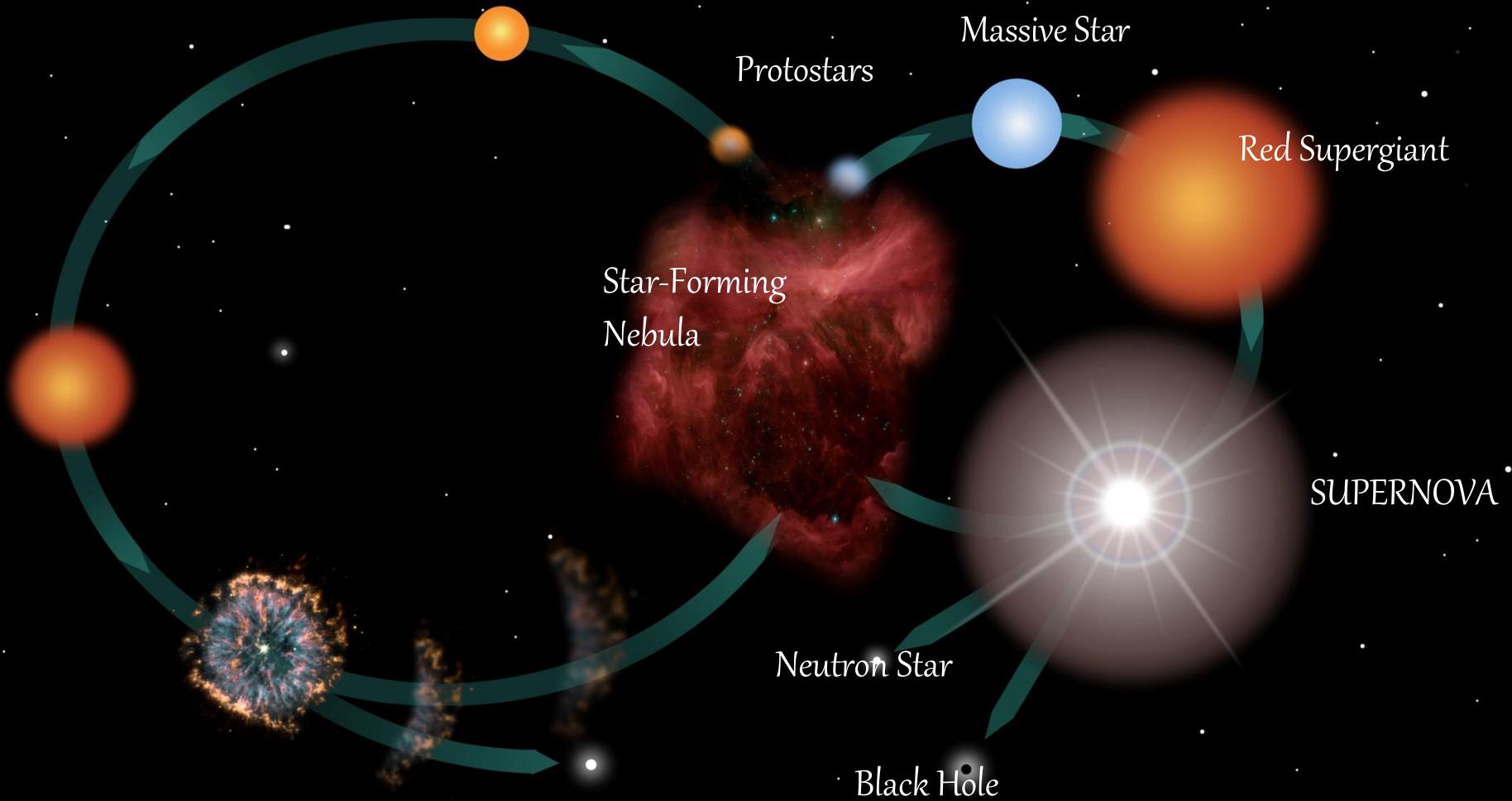
# Life of a Butterfly

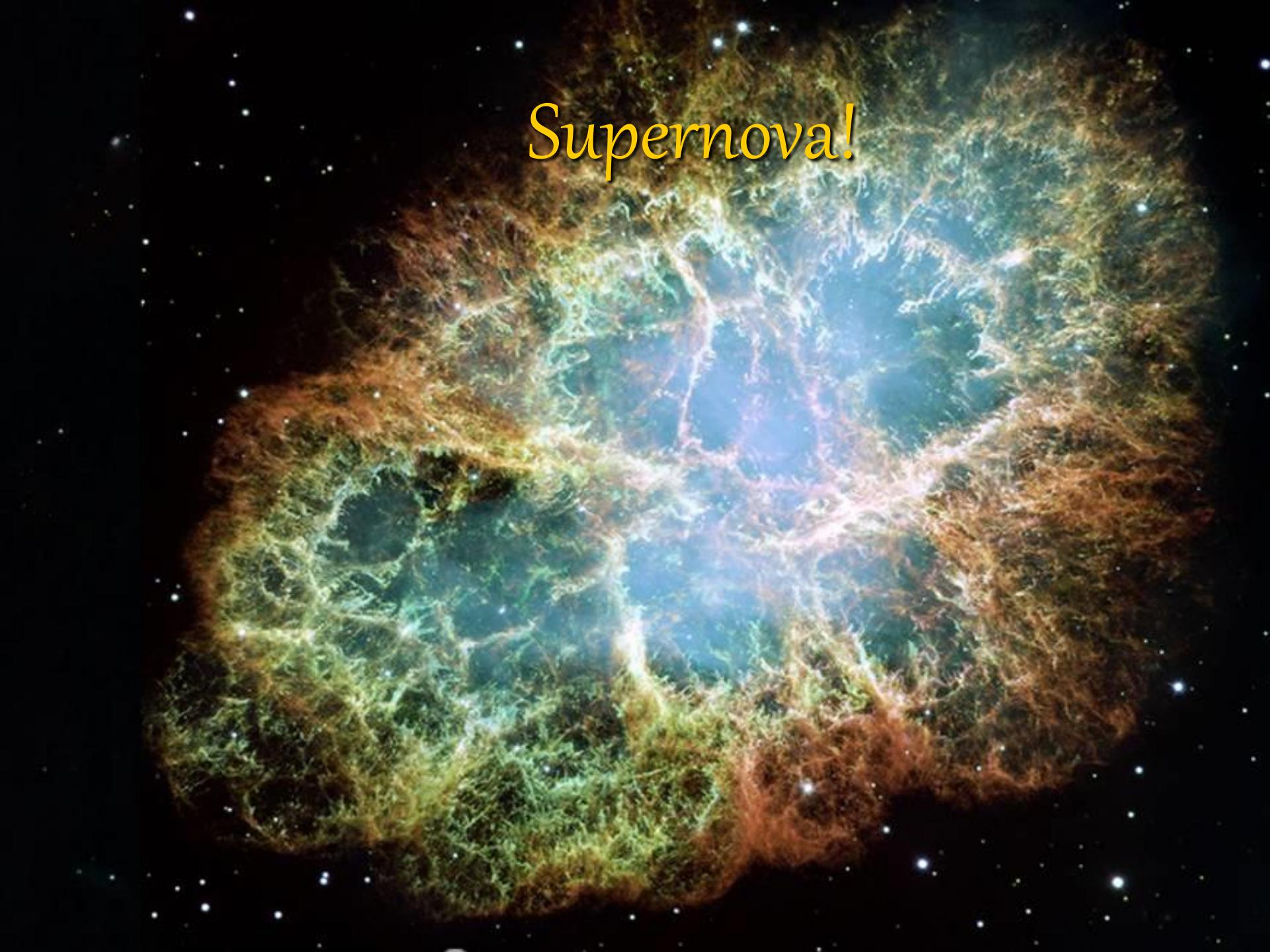


# Life of a Sun-like Star



# Life of a Massive Star



A color composite image of a supernova remnant, likely the Crab Nebula, showing intricate filaments of green, blue, and orange against a dark background of stars.

*Supernova!*



# The Planets

- Ancients watched five planets move against the night sky.
- The planets movements were irregular and mysterious, unlike those of stars.
- The planets were thought to be gods or the result of the actions of the Gods.
- Since the motion of stars were very good at predicting seasons, the motion of planets were thought to be predictors of the future.

