

What Can We See in the Sky?

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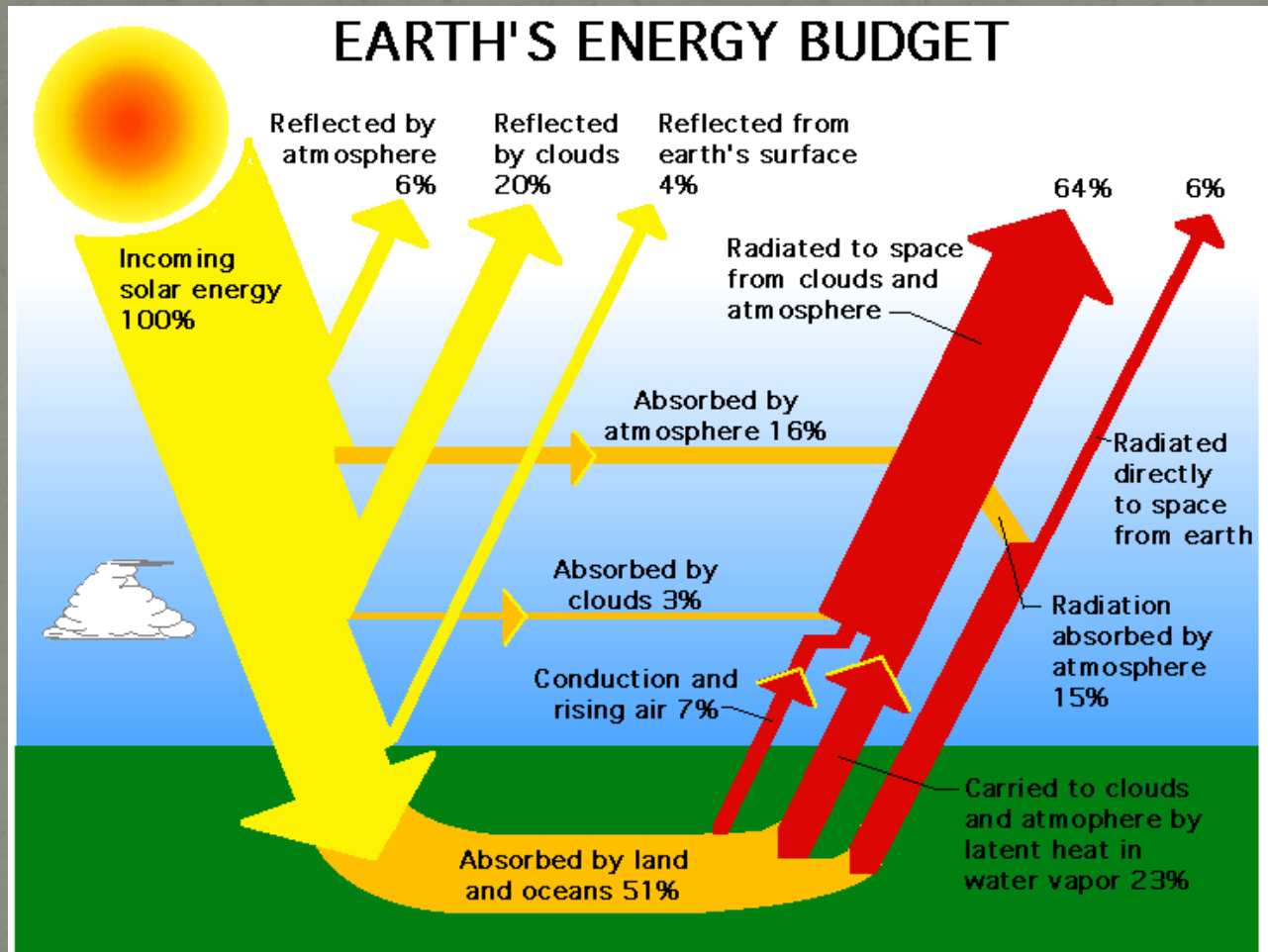
star: a huge ball of superheated gases.



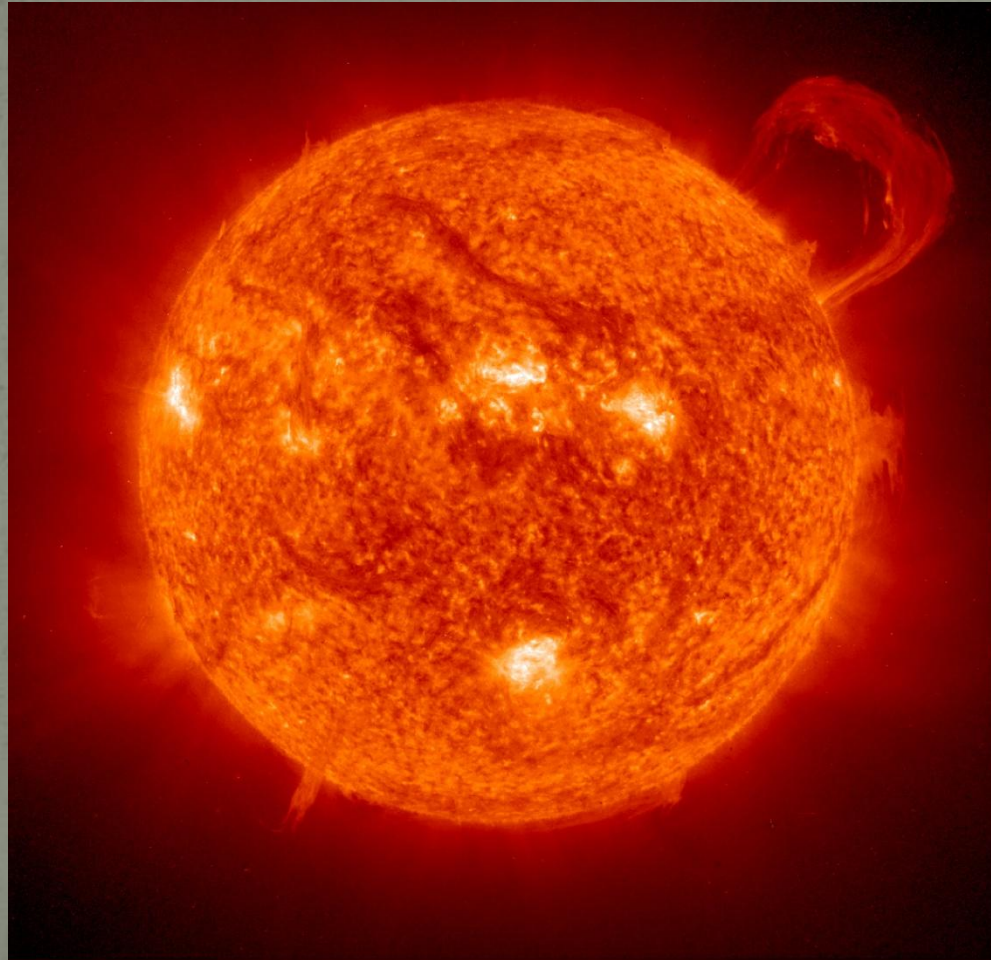
The sun is a star at the center of our solar system.



Without the sun's energy life could not exist.



Like other stars, it is made up of gases,  
mostly hydrogen and helium.



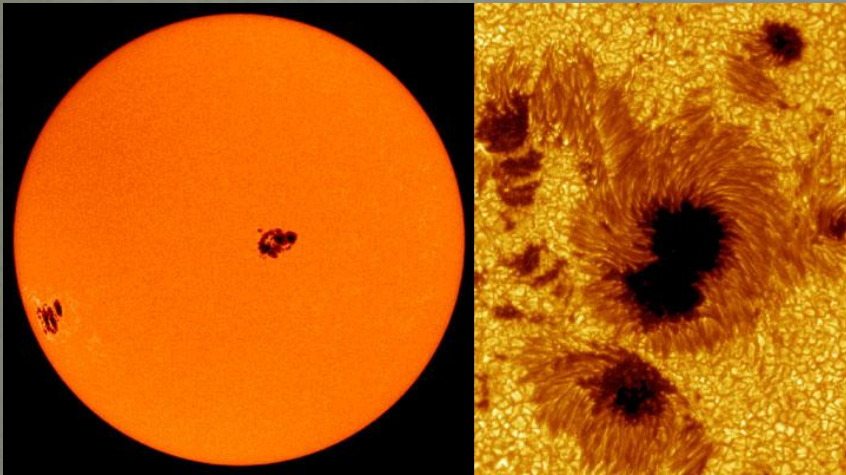
# Sunspots and Solar Flares

Do not give off as much  
light or heat

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Gases that shoot out  
from the sun

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# Blue stars are the hottest and red stars are the coolest.

**REFERENCE GUIDE 001  
STAR SPECTRAL CLASSES**



**SPECTRAL CLASS O**  
Dark Blue  
28,000 - 50,000 K  
Ionized Atoms, especially helium  
Example: Mintaka (O1-3III)



**SPECTRAL CLASS B**  
Blue  
10,000 - 28,000 K  
Neutral helium, some hydrogen  
Alpha Eridani A (B3V-IV)



**SPECTRAL CLASS A**  
Light Blue  
7,500 - 10,000 K  
Strong hydrogen, some ionized metals  
Sirius A (A0-IV)



**SPECTRAL CLASS F**  
White  
6,000 - 7,500 K  
Hydrogen and ionized metals,  
calcium and iron  
Procyon A (F5V-IV)

Yellow  
5,000 - 6,000 K  
Ionized calcium, both neutral and  
ionized metals  
Example: Sol (G2V)

**SPECTRAL CLASS G**



Orange  
3,500 - 5,000 K  
Neutral Metals  
Alpha Centauri B (K0-3V)

**SPECTRAL CLASS K**



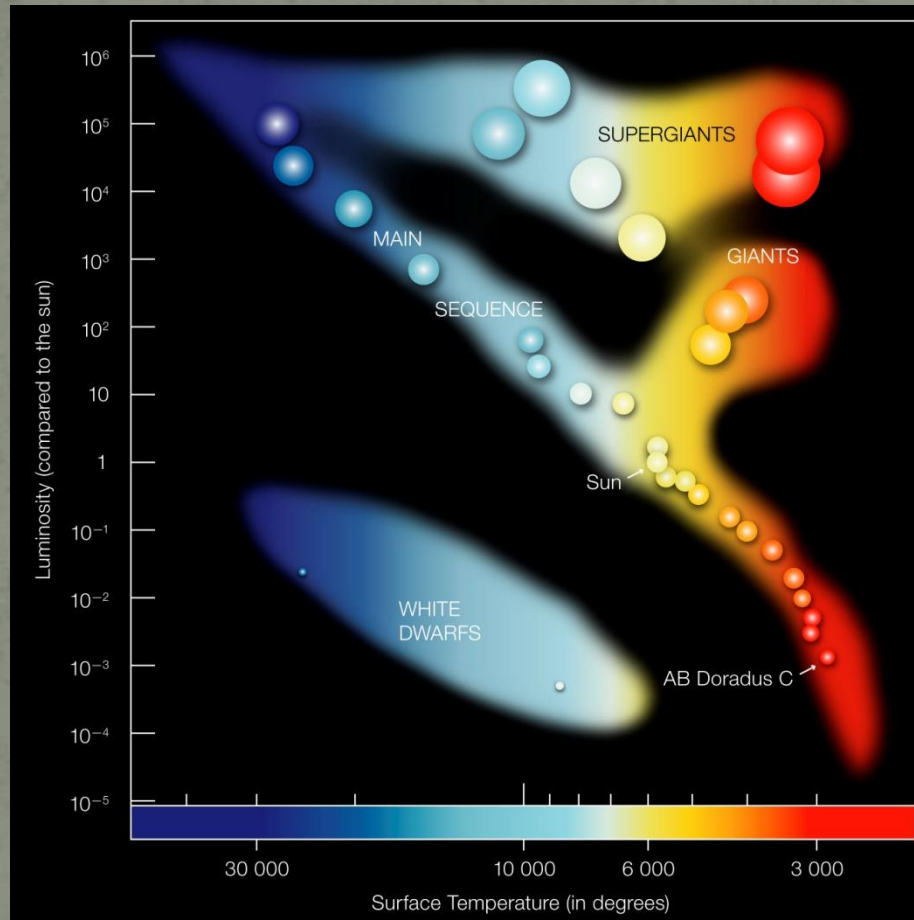
Red  
2,500 - 3,500 K  
Ionized atoms, especially helium  
Wolf 359 (M5-8V)

**SPECTRAL CLASS M**



**Non-Main Sequence Types**  
Class W: Wolf-Rayet Star  
Up to 70,000 K  
Carbon, nitrogen, or oxygen  
Gamma Velorum A (WC)  
Class L: Dwarf Star  
1,300 - 2,000 K  
Metal hydrides and alkali metals  
VW Hyi  
Class T: Methane Dwarf  
700 - 1,000 K  
Methane  
Epsilon Indi Ba  
Class Y: Ammonia Dwarf  
<700 K  
Ammonia  
Not yet observed  
Class C: Carbon  
Class S: Zirconium Oxide  
Classes MS and SC  
Class D: Dwarf

Scientists also classify stars by their brightness or luminosity.



The Hertzsprung-Russell Diagram

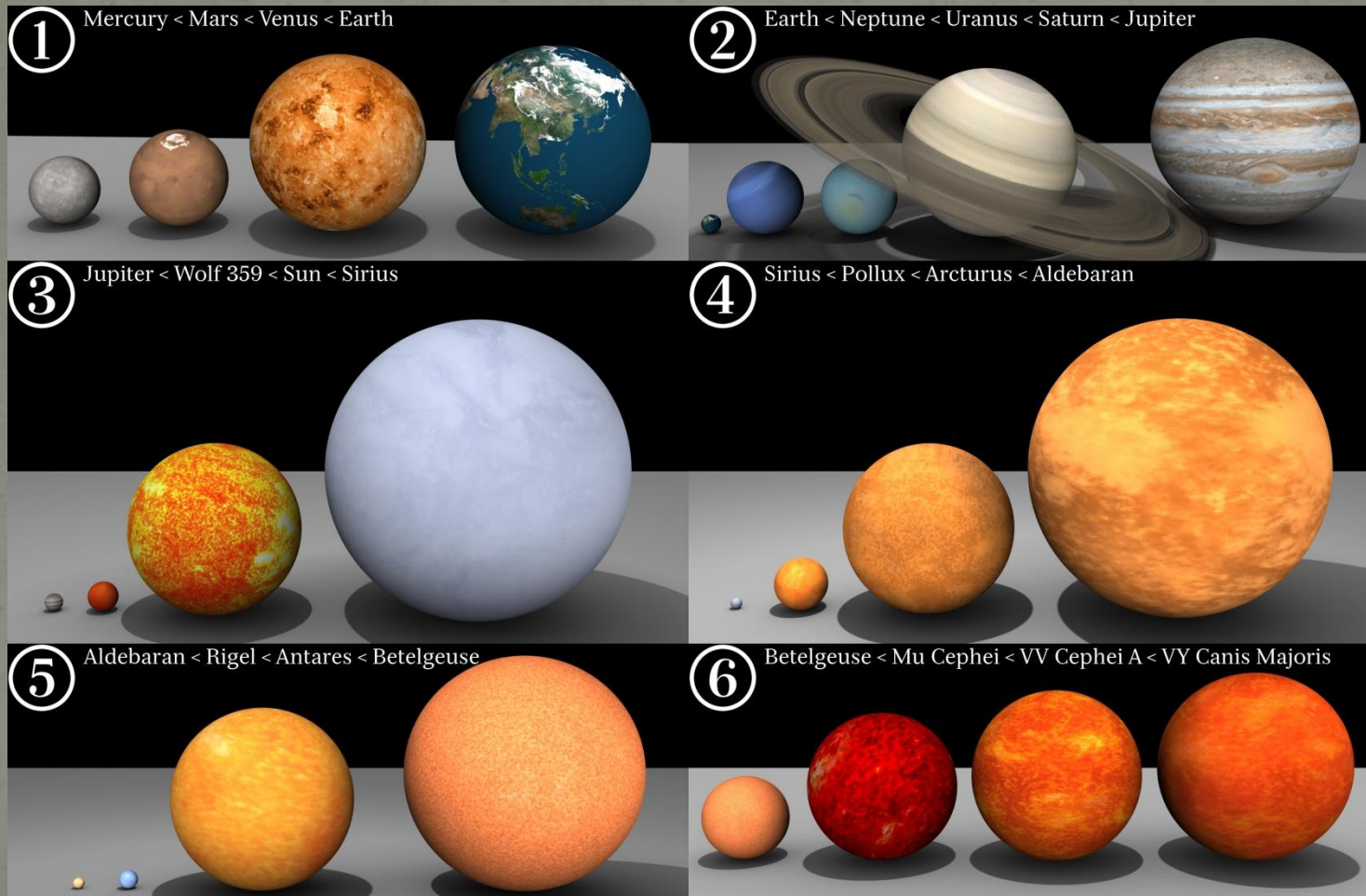
ESO Press Photo 28c/07 (19 June 2007)

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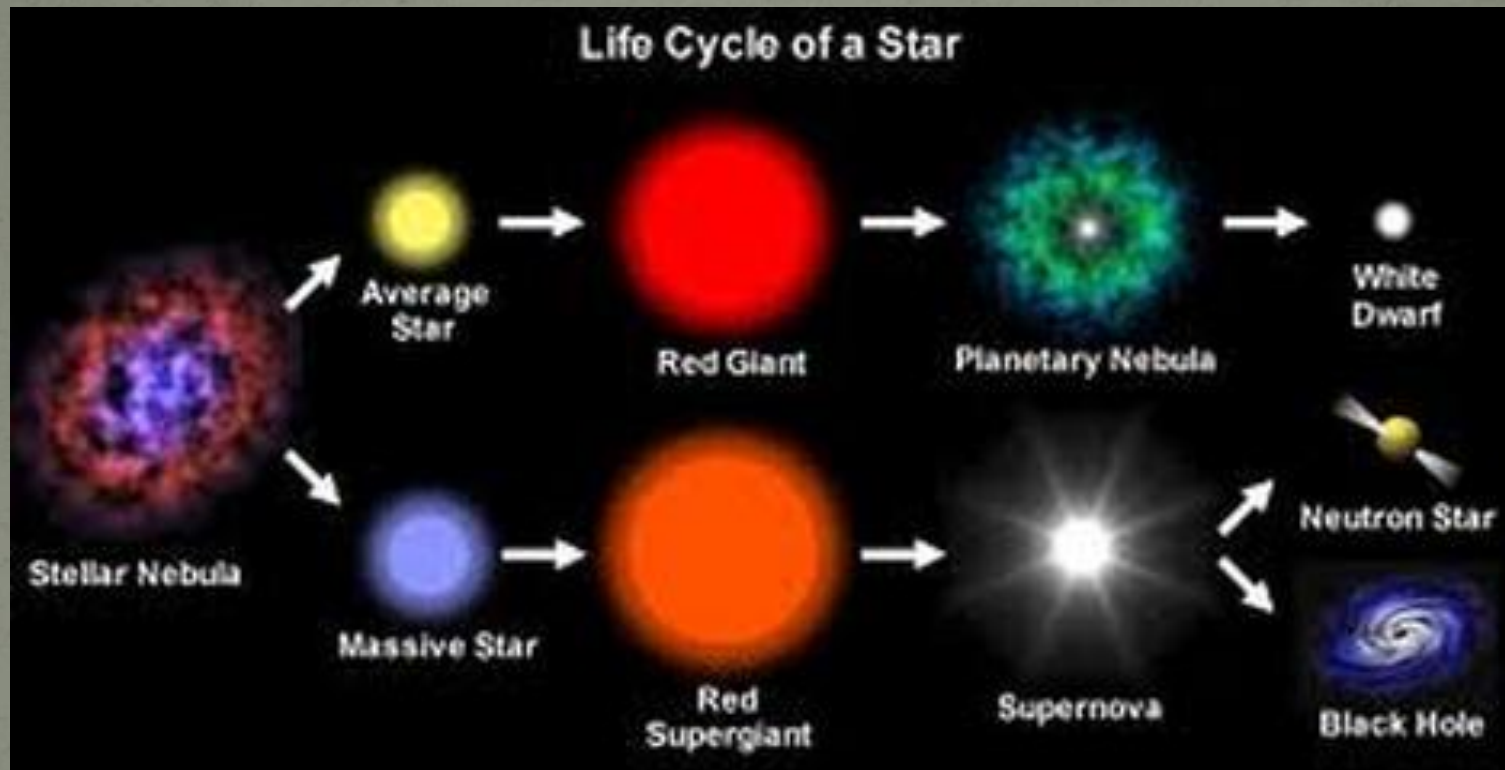




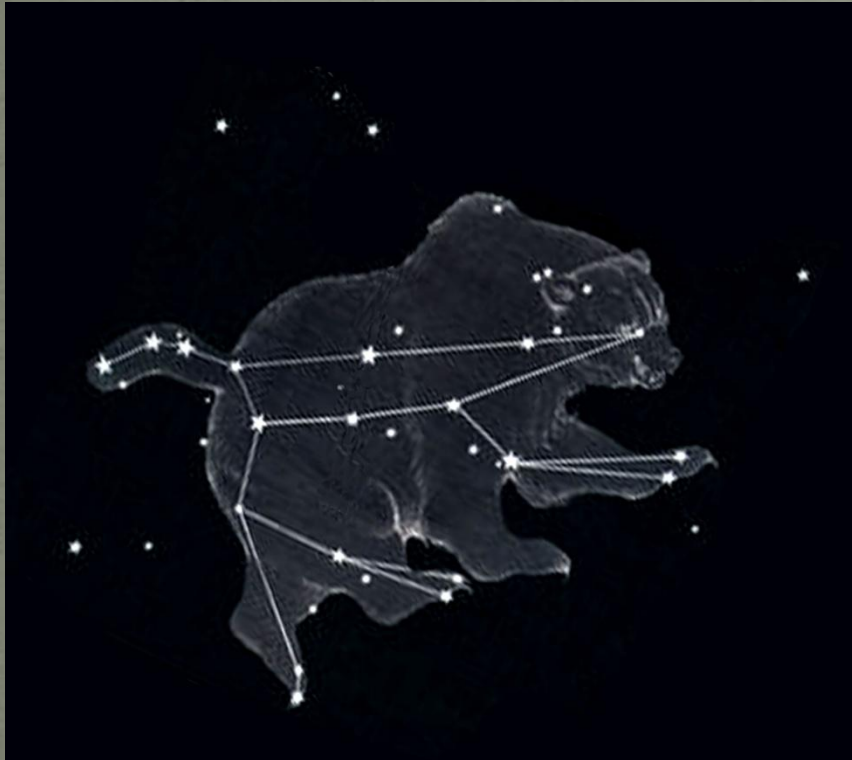
Brightness takes into account the temperature and size of the star as well as how far the star is from Earth.



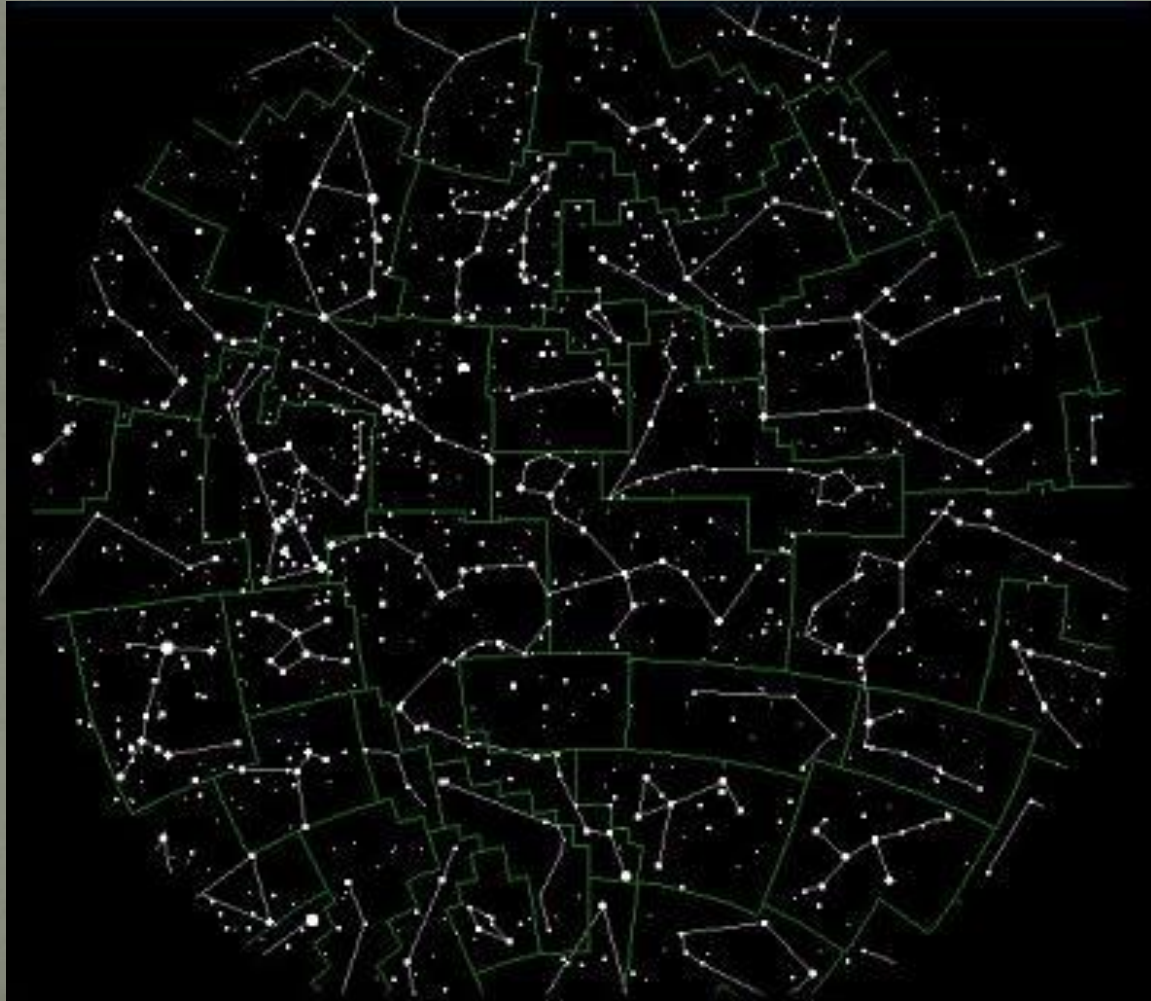
Stars go through stages.



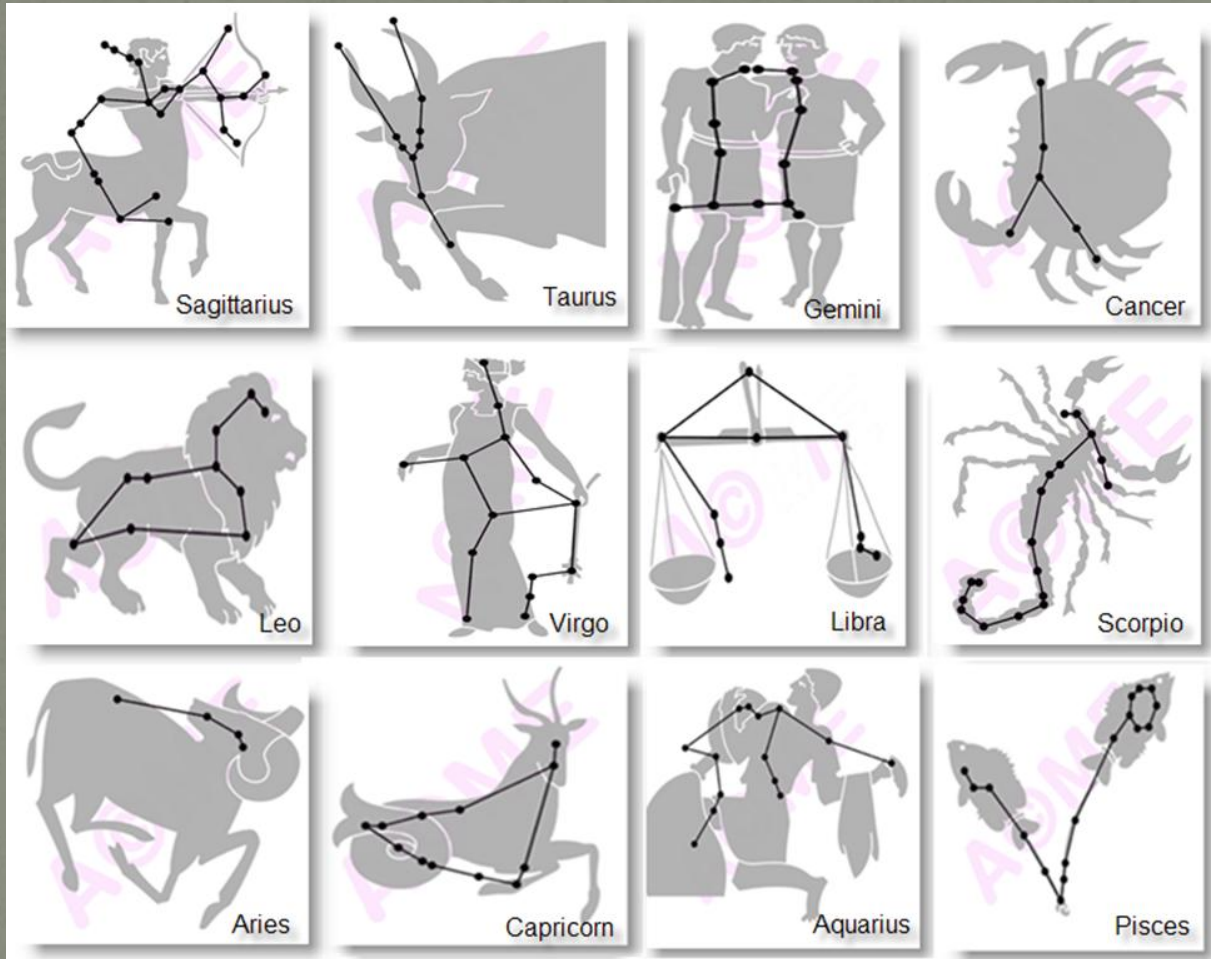
The Big Dipper is part of the constellation Ursa Major.



Constellations are groups of stars that divide the sky into sections.



The Zodiac signs are constellations that the sun appears to pass through.



galaxy: a huge system of gases, dust, and stars.



# Our galaxy, the Milky Way as seen from Earth.



There are many galaxy shapes. The Milky Way is a spiral galaxy.

# Types of Galaxies



Barred Spiral



Irregular



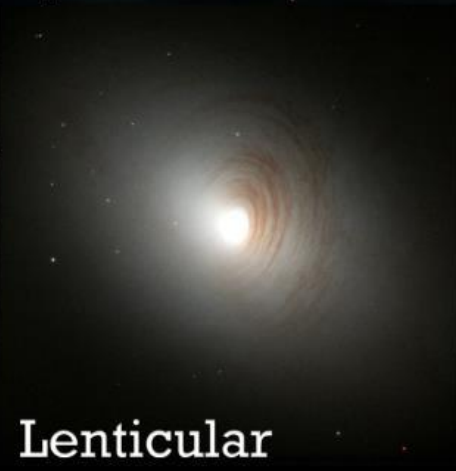
Spiral



Peculiar



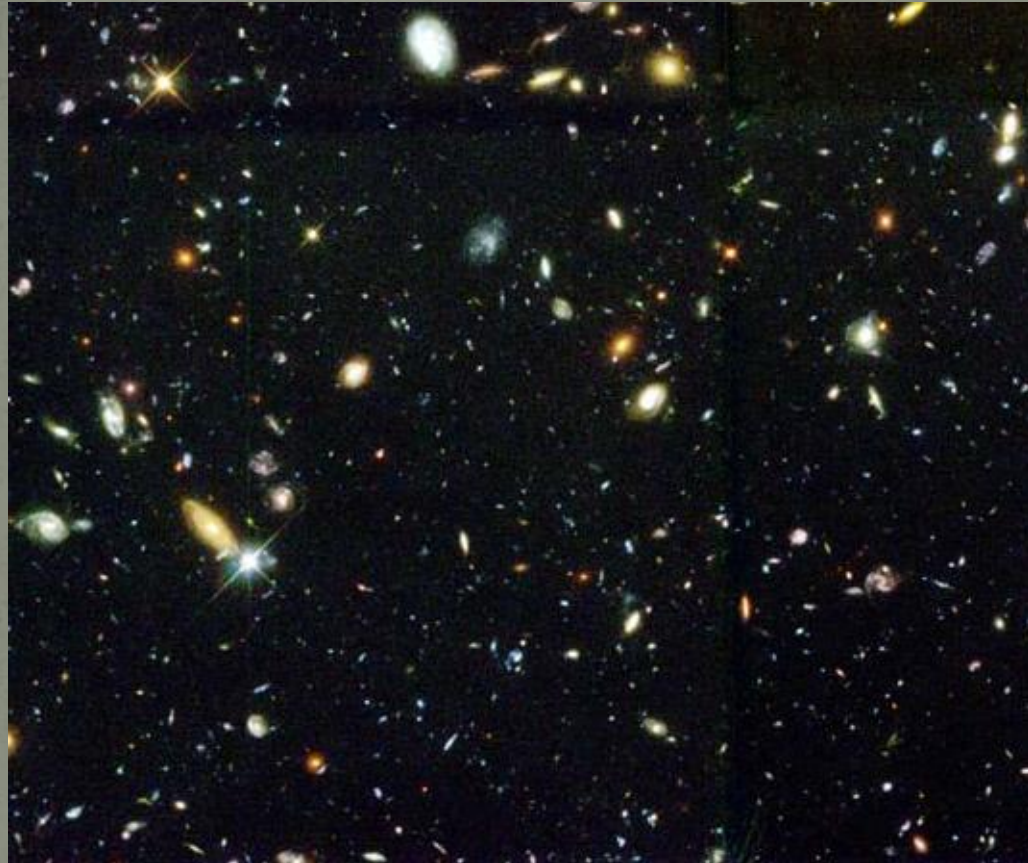
Elliptical



Lenticular

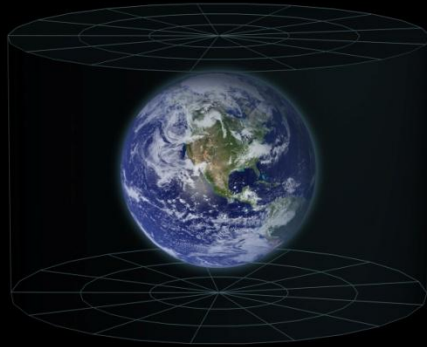


A single picture from the Hubble Space Telescope showing many galaxies.

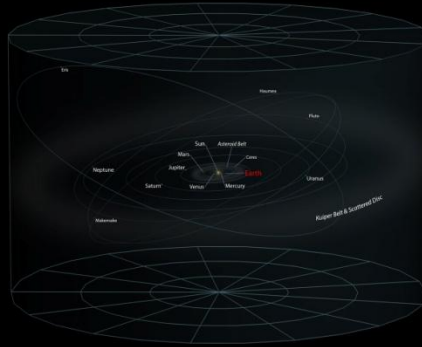


As big as Earth and our solar system are, they are just one small part of the universe.

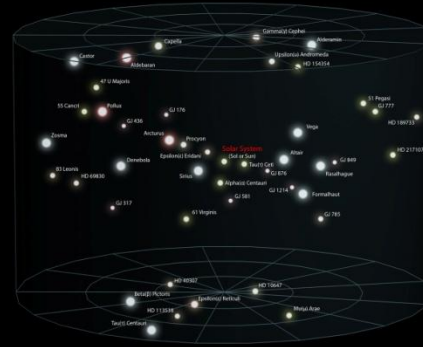
Earth



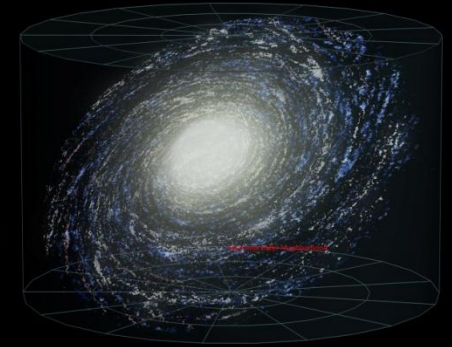
Solar System



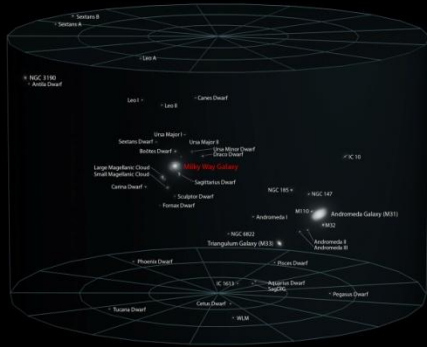
Solar Interstellar Neighborhood



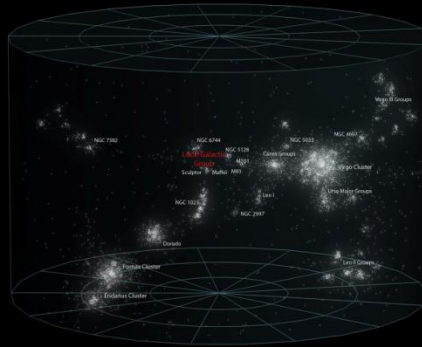
Milky Way Galaxy



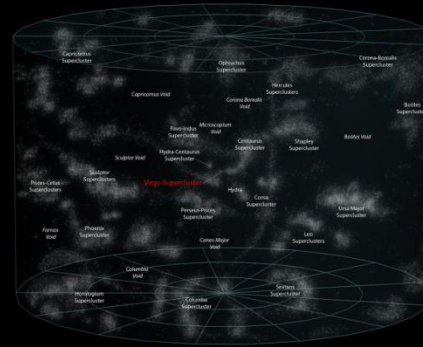
Local Galactic Group



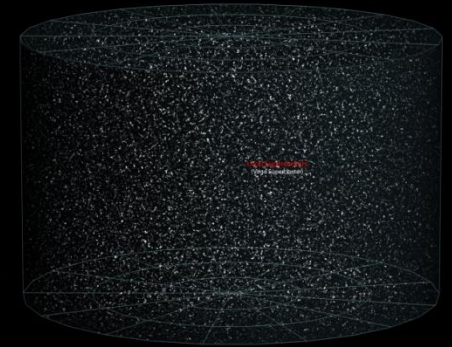
Virgo Supercluster



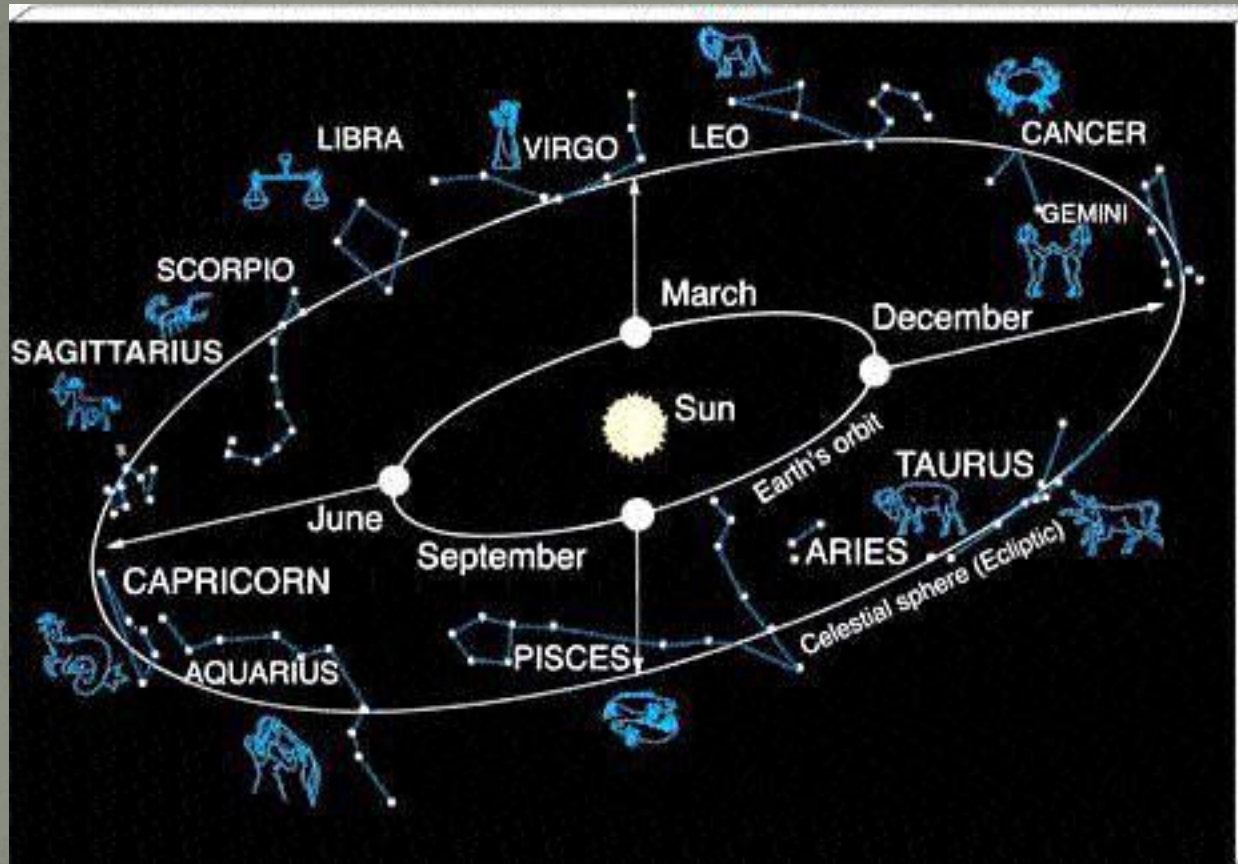
Local Superclusters



Observable Universe



As Earth revolves around the sun, we see different parts of space at different times.



Many ancient cultures have watched the  
changing night sky.

The Mayans (Central America)



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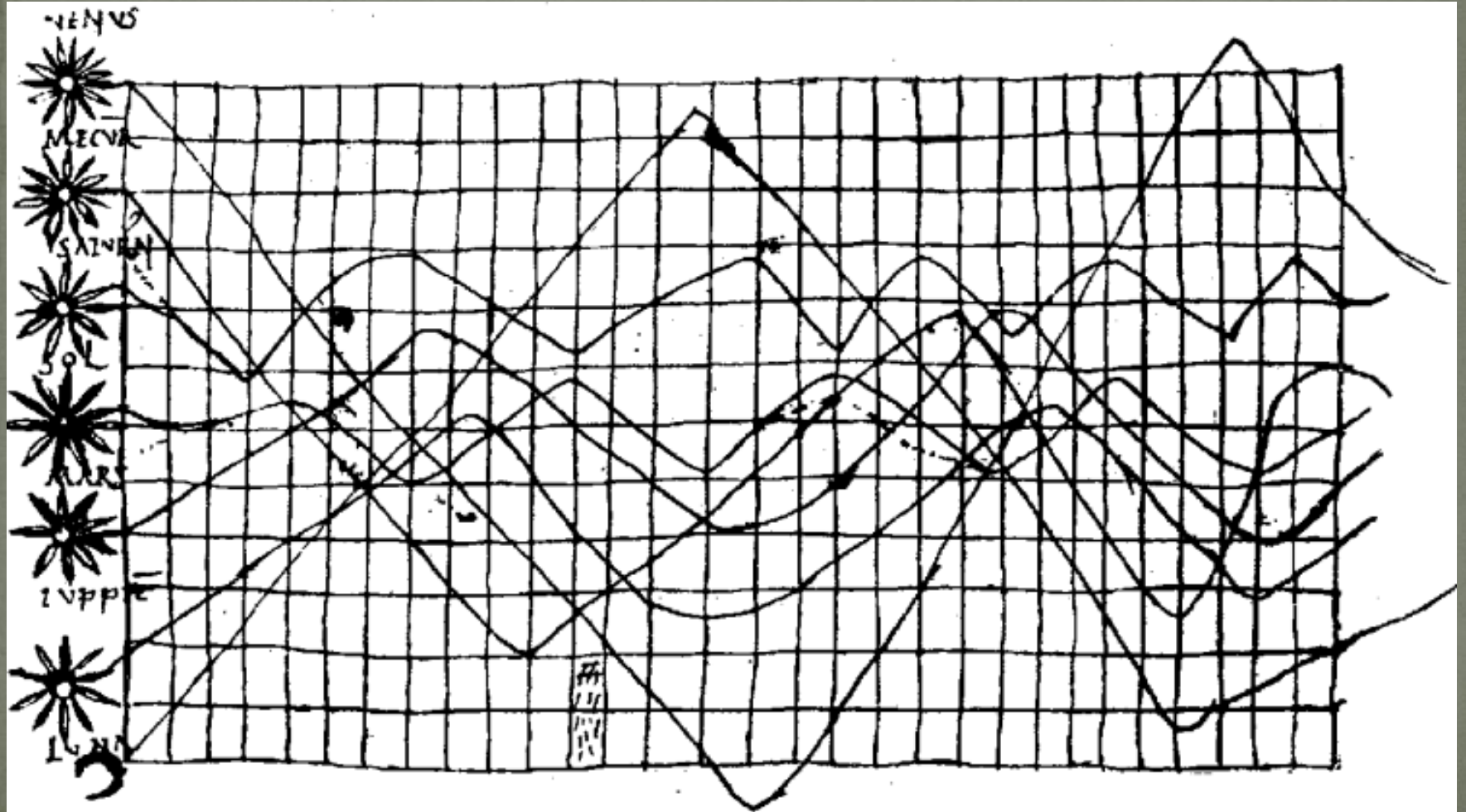


Planetary alignment (Egyptians)



Solar alignment (Druids U.K.)

Both the Greeks and the Romans recognized that the planets appear to move independently of the stars.



The early Greeks called these moving bodies *planetai*, the Greek word for “wanderers.”

