

# SCALES IN THE UNIVERSE = from 1m to the size of the Universe.

1 m is about 1 yard and 1km is 1,000 m, 1 light year is  $10^{13}$ km



100m x 100m=San Marco



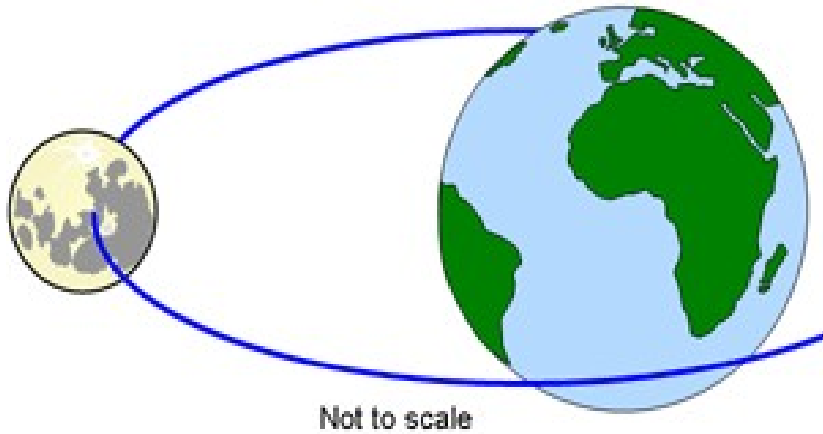
1000m x 1000m = Venice (1km x 1km)  
10km x 10km the whole area



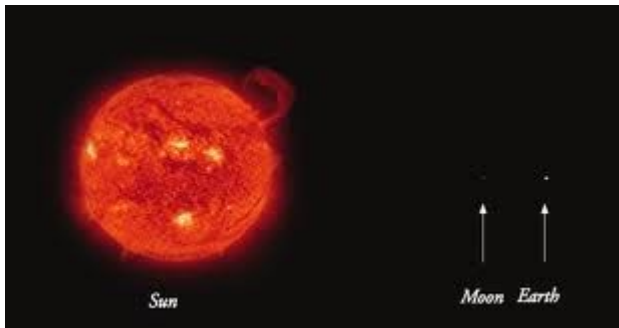
1000kmx 1000km  
(distance Chicago-NY)



10,000kmx 10,000km  
The Earth (R=6000km)



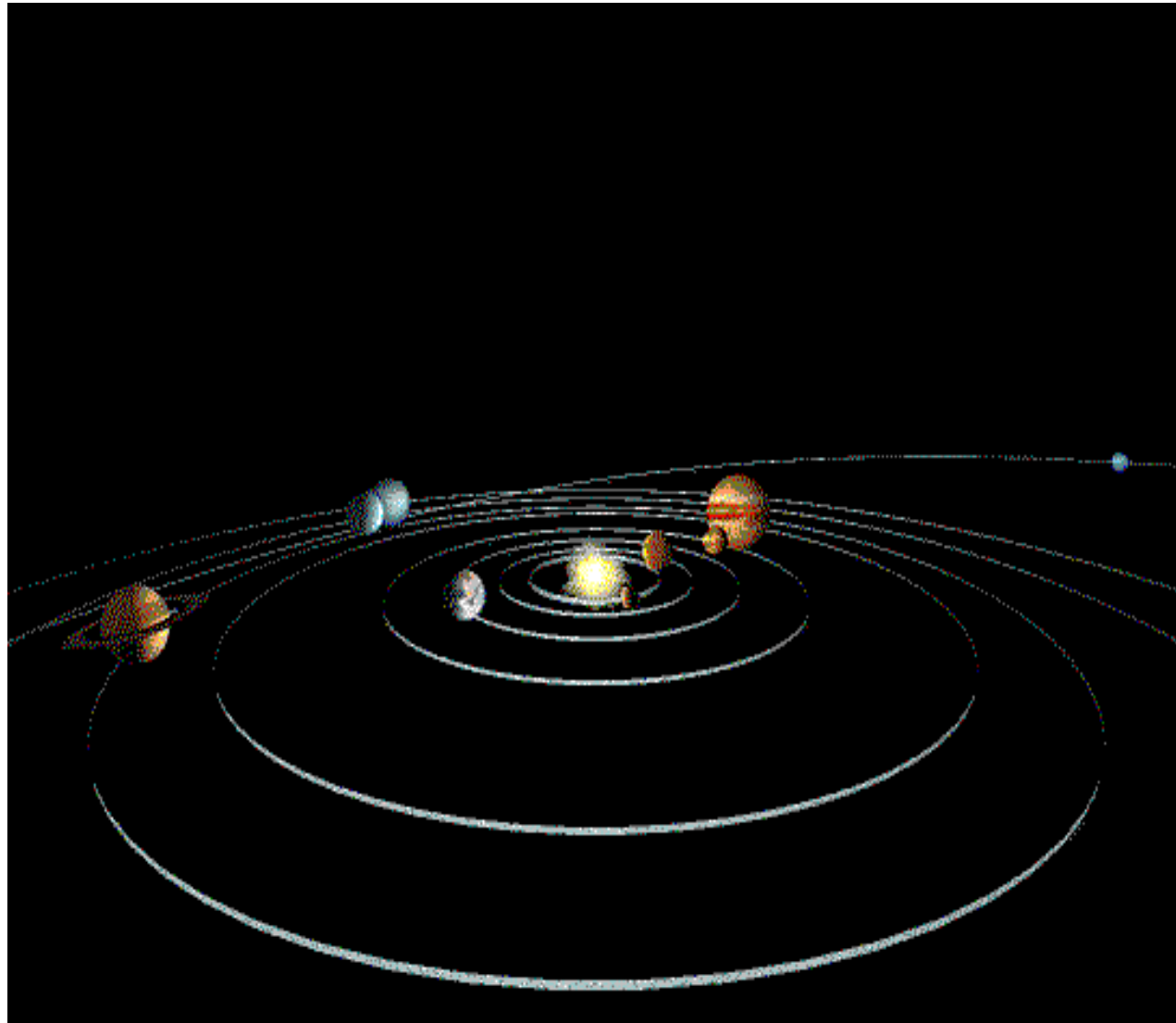
500,000 km x 500,000 km to cover the Moon orbit. (384, 403 km)



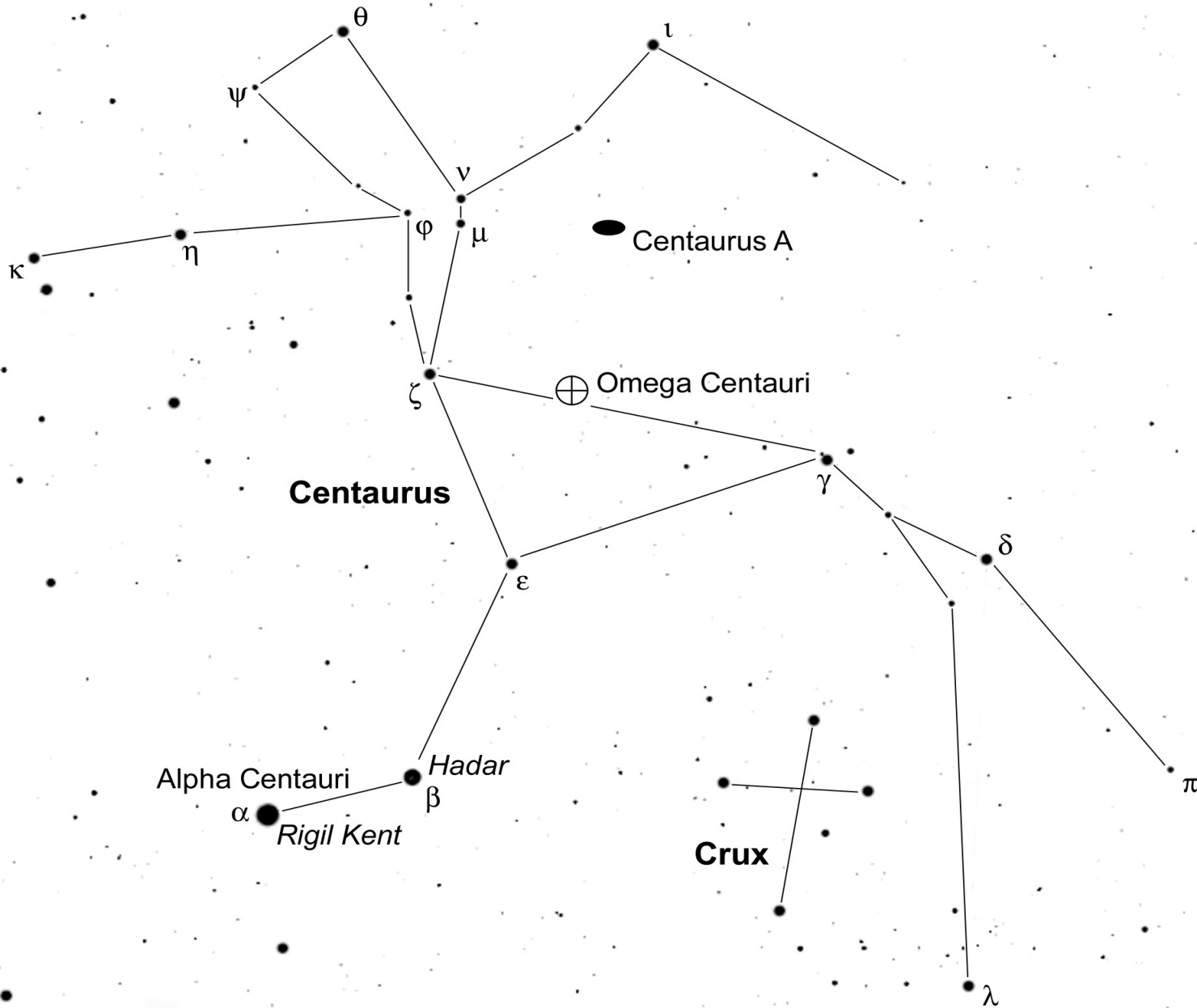
**Distance Earth-Sun =  
150 million km = 1 AU  
(astronomical unit)**

## Sun-Planet Distances

Planet	Copernicus	Modern
Mercury	0.38	0.387
Venus	0.72	0.723
Earth	1.00	1.00
Mars	1.52	1.52
Jupiter	5.22	5.20
Saturn	9.18	9.54



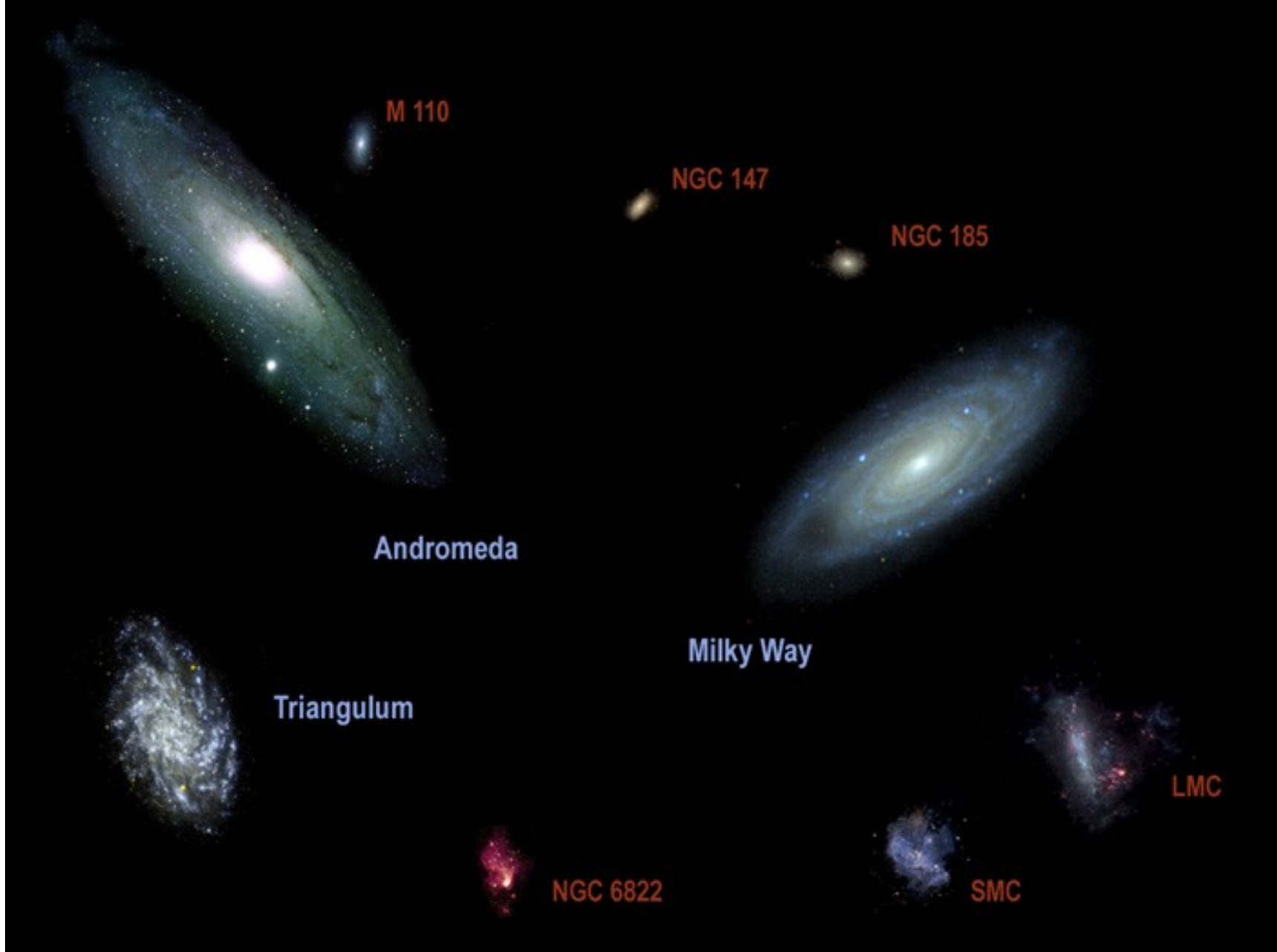
1 billion km x 1 billion km to cover the  
Solar system (including Pluto !!)



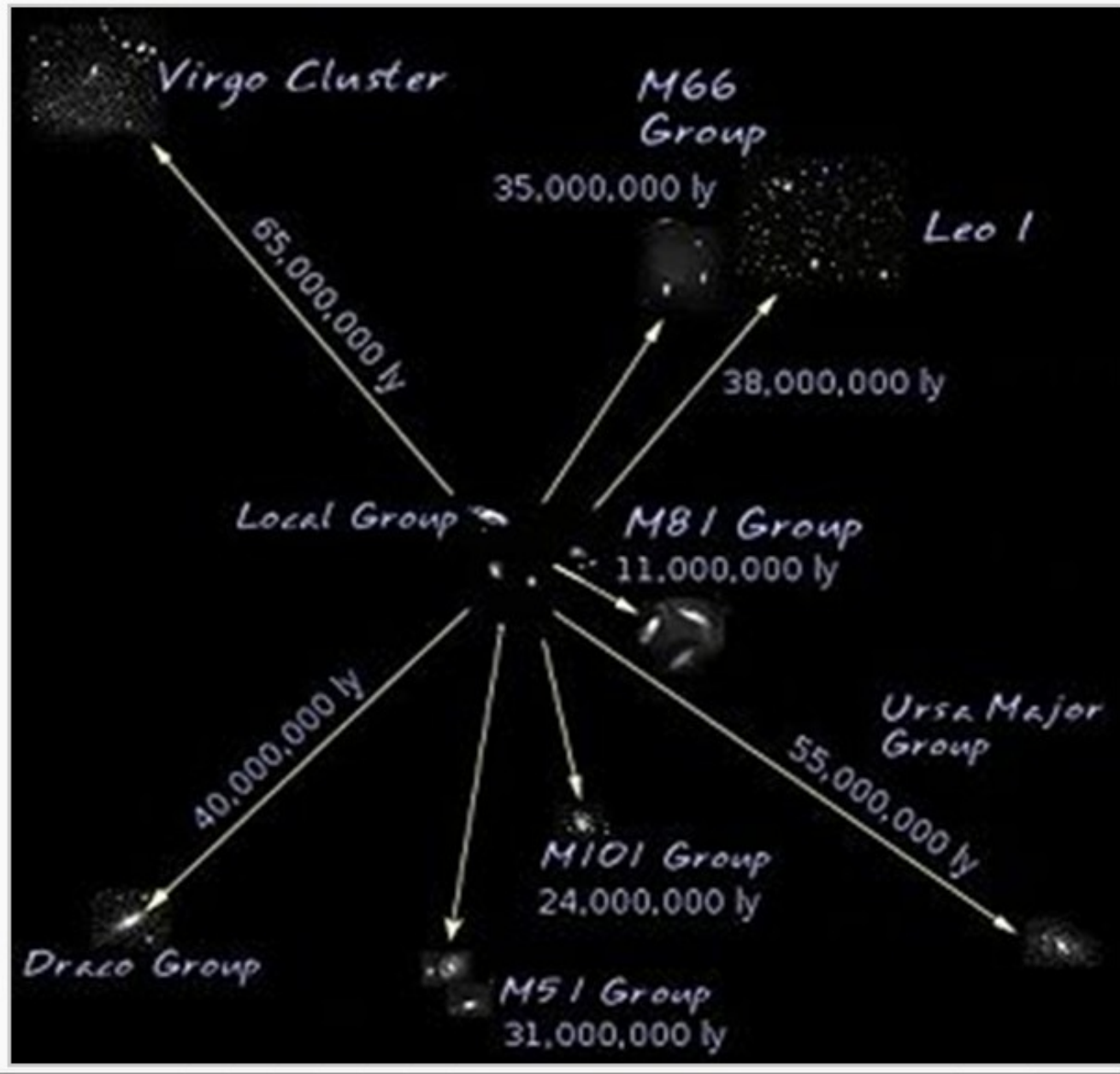
- Closest star is proxima centauri at about **4.3 light years** away. Part of a multiple system Alpha centauri (24AU between 2 binary stars (Uranus) , 15000 AU with proxima)  
[http://en.wikipedia.org/wiki/Alpha\\_Centauri](http://en.wikipedia.org/wiki/Alpha_Centauri)



**Milky way = 100,000 light years across.**

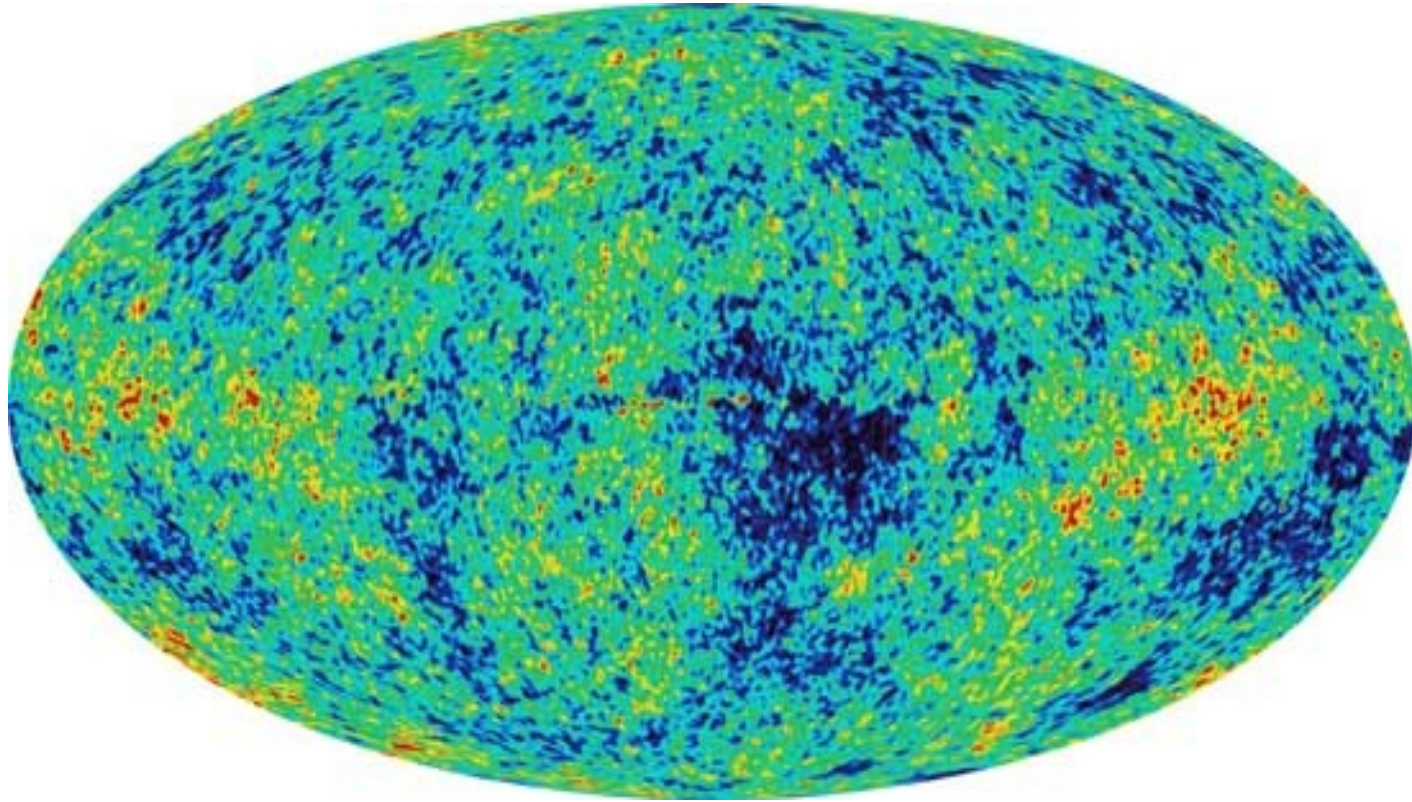


**Andromeda Galaxy = 2.5 million light years away.**



Virgo group = 60 million light years





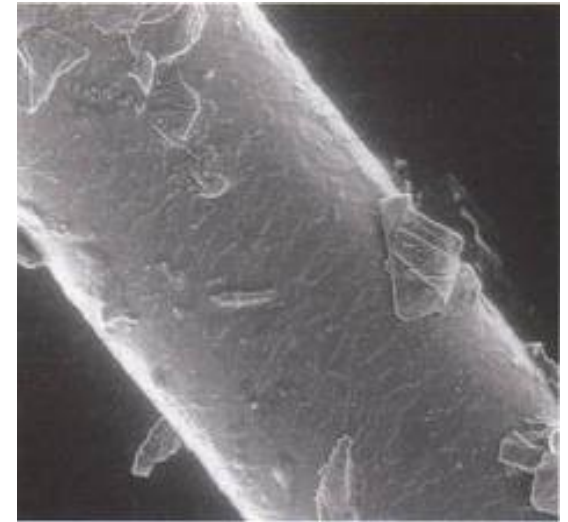
**The whole Universe = 15 billion light year in size or  $10^{26}$ m**



10cm in size



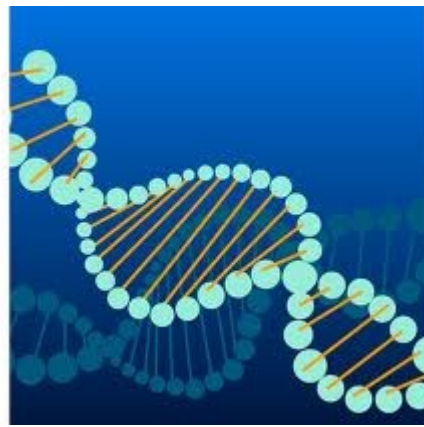
1mm in size



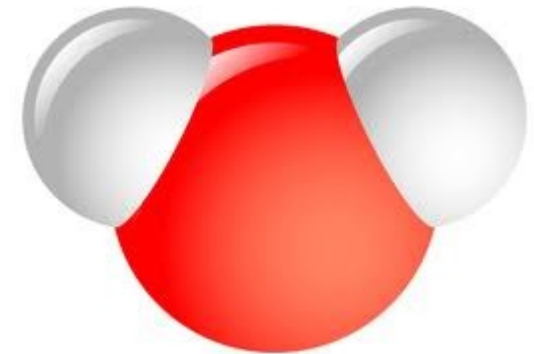
25 micrometer = thin air



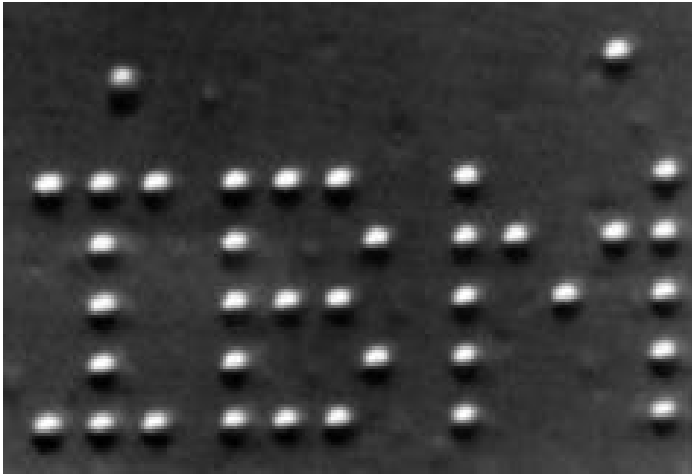
8 micro red cell



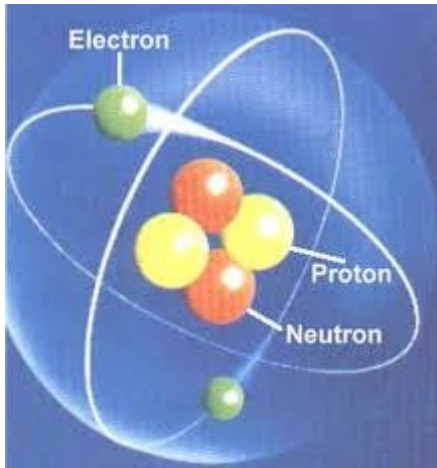
0.01 micro red cell



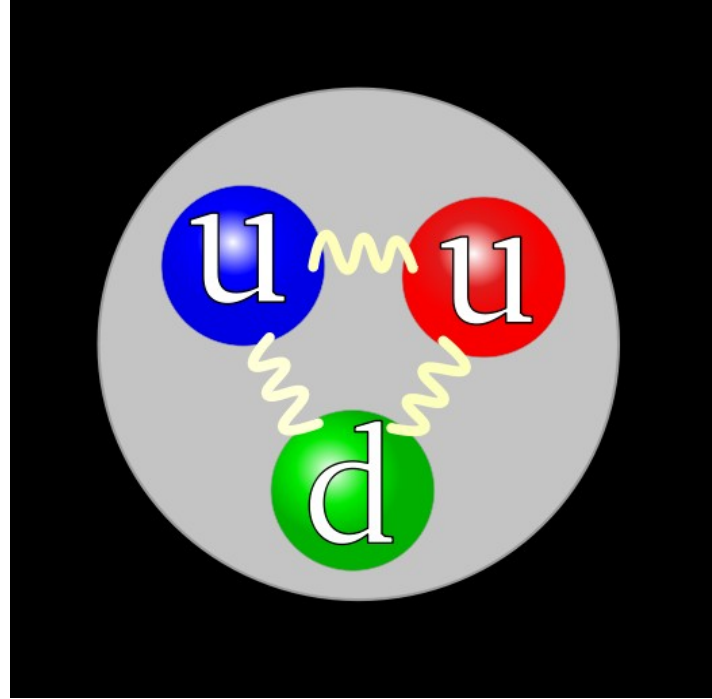
Water molecule = 1 nm =  $10^{-9}$ m



1 atom = 0.1 nm = 1 Å =  $10^{-10}$ m



1 nucleus =  $10^{-14}$ m



1 quark =  $10^{-16}$ m