

On the Cosmos

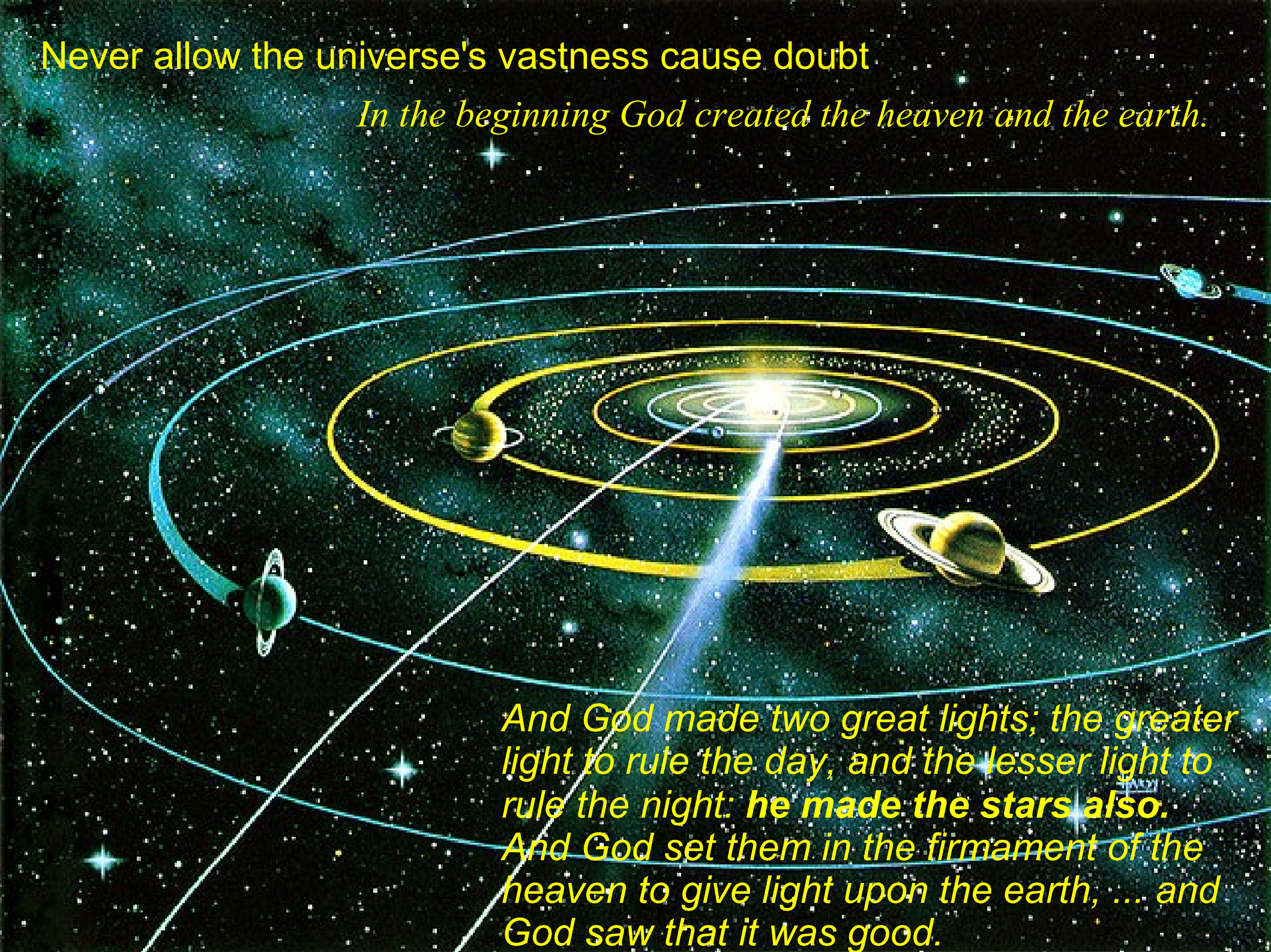
Essays in Science, A Christian Perspective of the Universe



“The heavens declare the glory of God; and the firmament sheweth his handywork. Day unto day uttereth speech, and night unto night sheweth knowledge. There is no speech nor language, where their voice is not heard.”

Never allow the universe's vastness cause doubt

In the beginning God created the heaven and the earth.



*And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: **he made the stars also.***

And God set them in the firmament of the heaven to give light upon the earth, ... and God saw that it was good.

The Uni - Verse is indeed VAST
A Galaxy is made up of a LARGE number of stars

Up to 100 Billion!

Andromeda, pictured, is like our
Milky Way, 100,000 ly in diameter

There are 100 billion similar
galaxies out there!

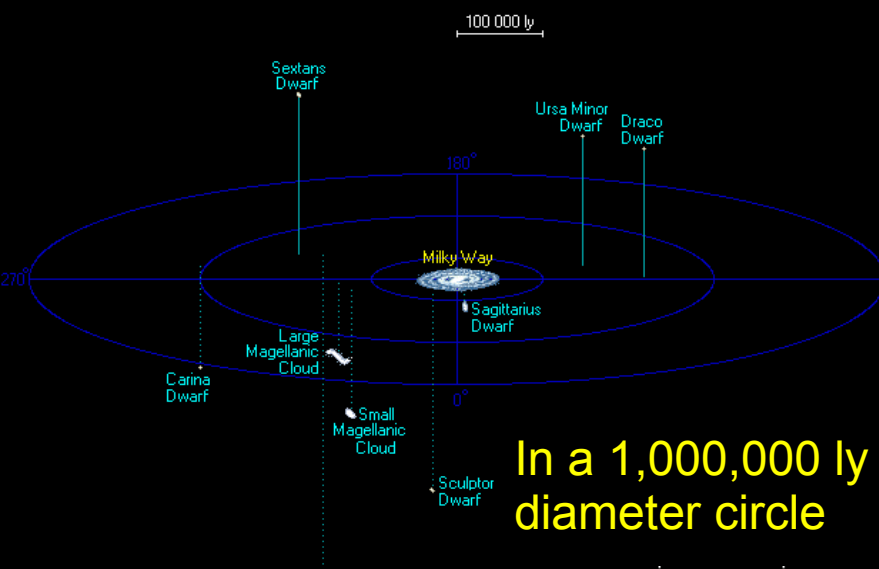
These dots are near stars, The
glowing circles in the back are
likely 100,000 billion more stars
in the Andromeda galaxy

God said "*I made the stars
also*" and they are "*as the
sand of the sea shore.*"

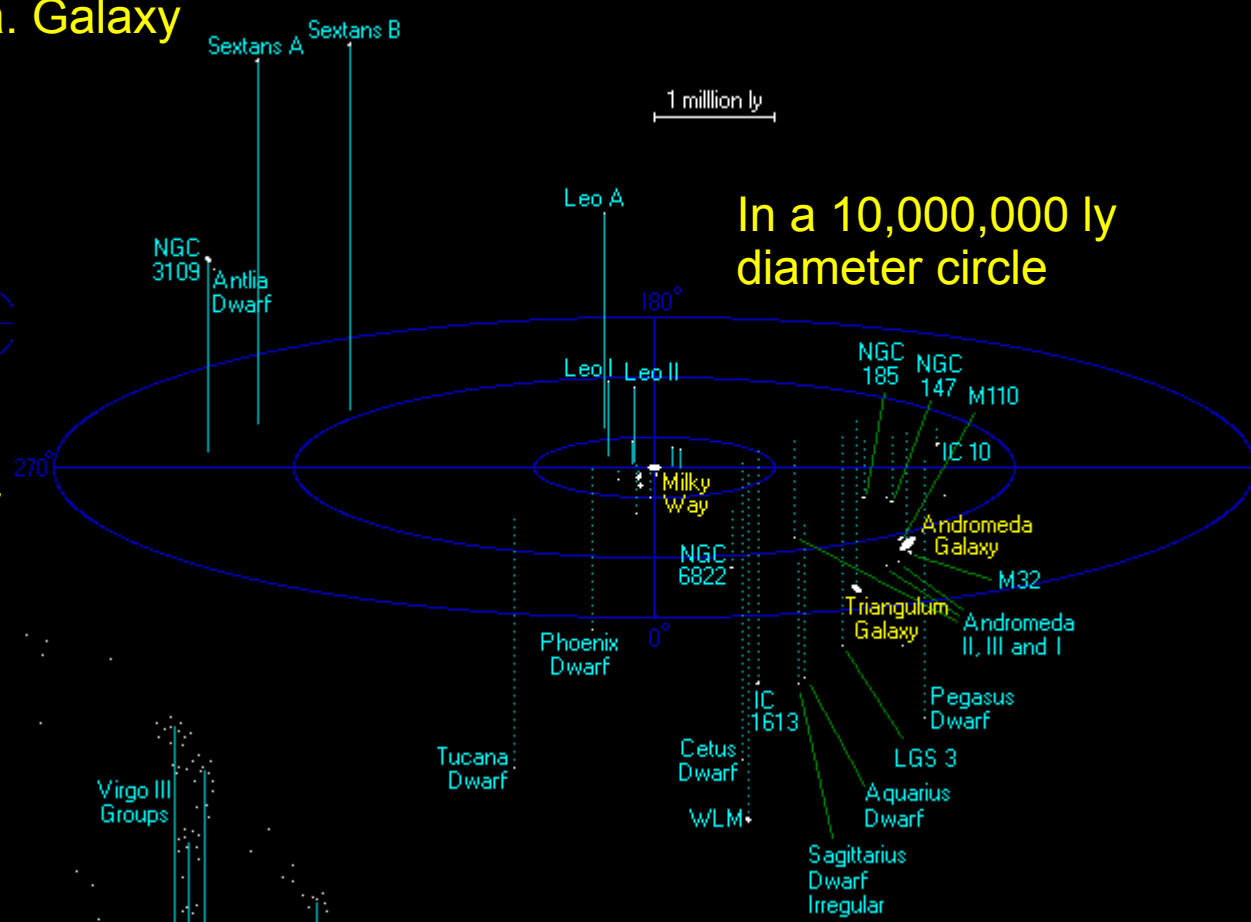
M31: The Andromeda Galaxy Credit & Copyright: Robert Gendler

Explanation: Andromeda is the nearest major galaxy to our own Milky Way Galaxy. Our Galaxy is thought to look much like Andromeda. Together these two galaxies dominate the Local Group of galaxies. The diffuse light from Andromeda is caused by the hundreds of billions of stars that compose it. The several distinct stars that surround Andromeda's image are actually stars in our Galaxy that are well in front of the background object. Andromeda is frequently referred to as M31 since it is the 31st object on Messier's list of diffuse sky objects. M31 is so distant it takes about two million years for light to reach us from there. Although visible without aid, the above image of M31 is a digital mosaic of 20 frames taken with a small telescope. Much about M31 remains unknown, including how the center acquired two nuclei. From <http://apod.nasa.gov/apod/ap021021.html> Accessed Nov 2008

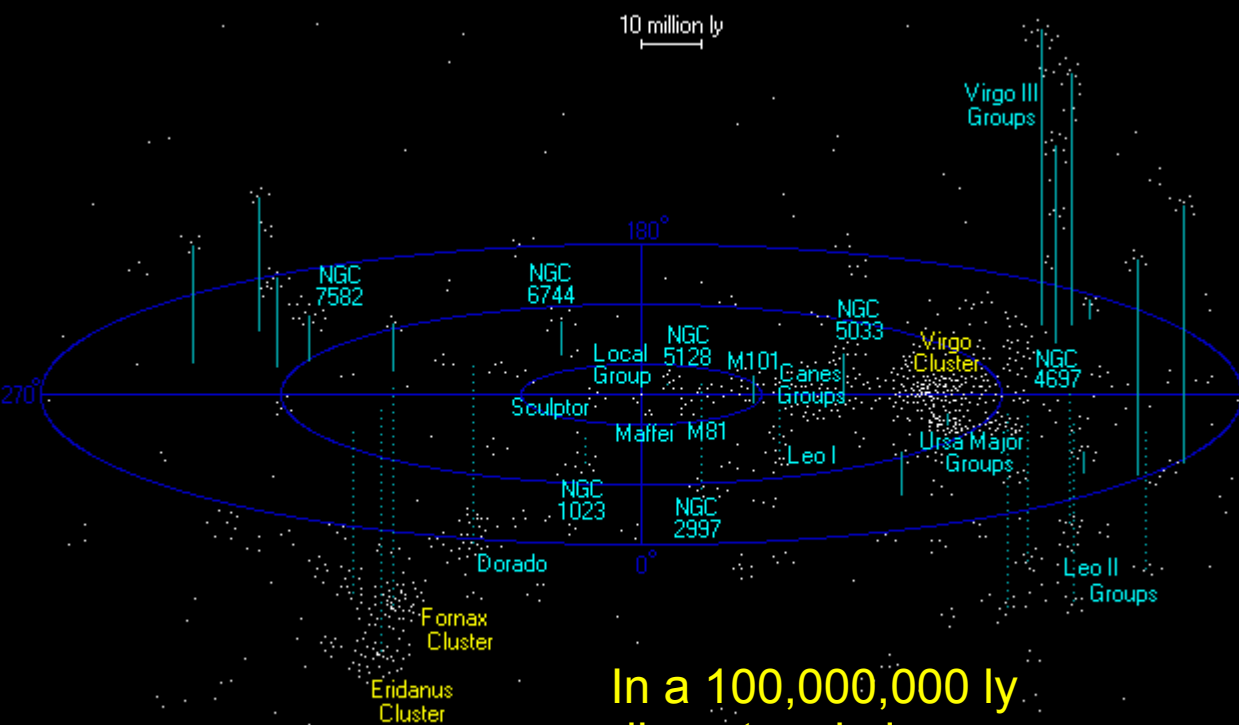
Our Milky Way is a 100,000 light year dia. Galaxy



In a 1,000,000 ly diameter circle



In a 10,000,000 ly diameter circle

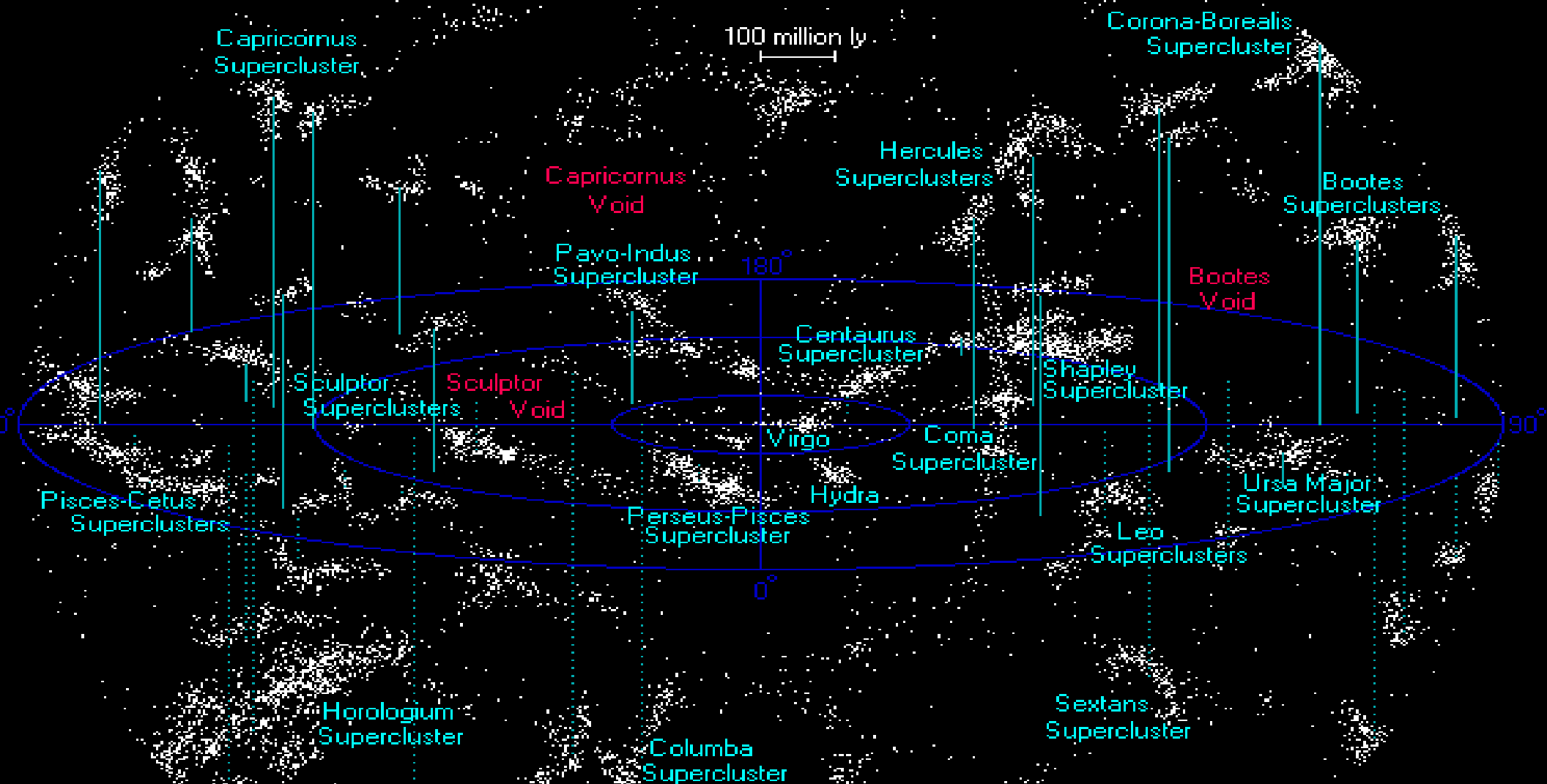


In a 100,000,000 ly diameter circle



Andromeda is similar to MW

Our Milky Way (center dot) and our nearest 1 Billion ly Neighbors



Do not let vastness
Cause you to doubt!

*In the beginning God created
the heaven and the earth. ...
He made the stars also.*

The brightest star in this picture is the first supernova to be visible to the unaided eye for almost 400 years. It occurred in a region rich in young, blue stars and it was one of these which destroyed itself. When this picture was taken, about 2 weeks after the supernova was discovered, at the end of February, 1987, the expanding shell of material had already changed from blue to orange-red as it cooled. The location of the supernova in the Large Magellanic Cloud (LMC) means that it can only be seen from the southern hemisphere.

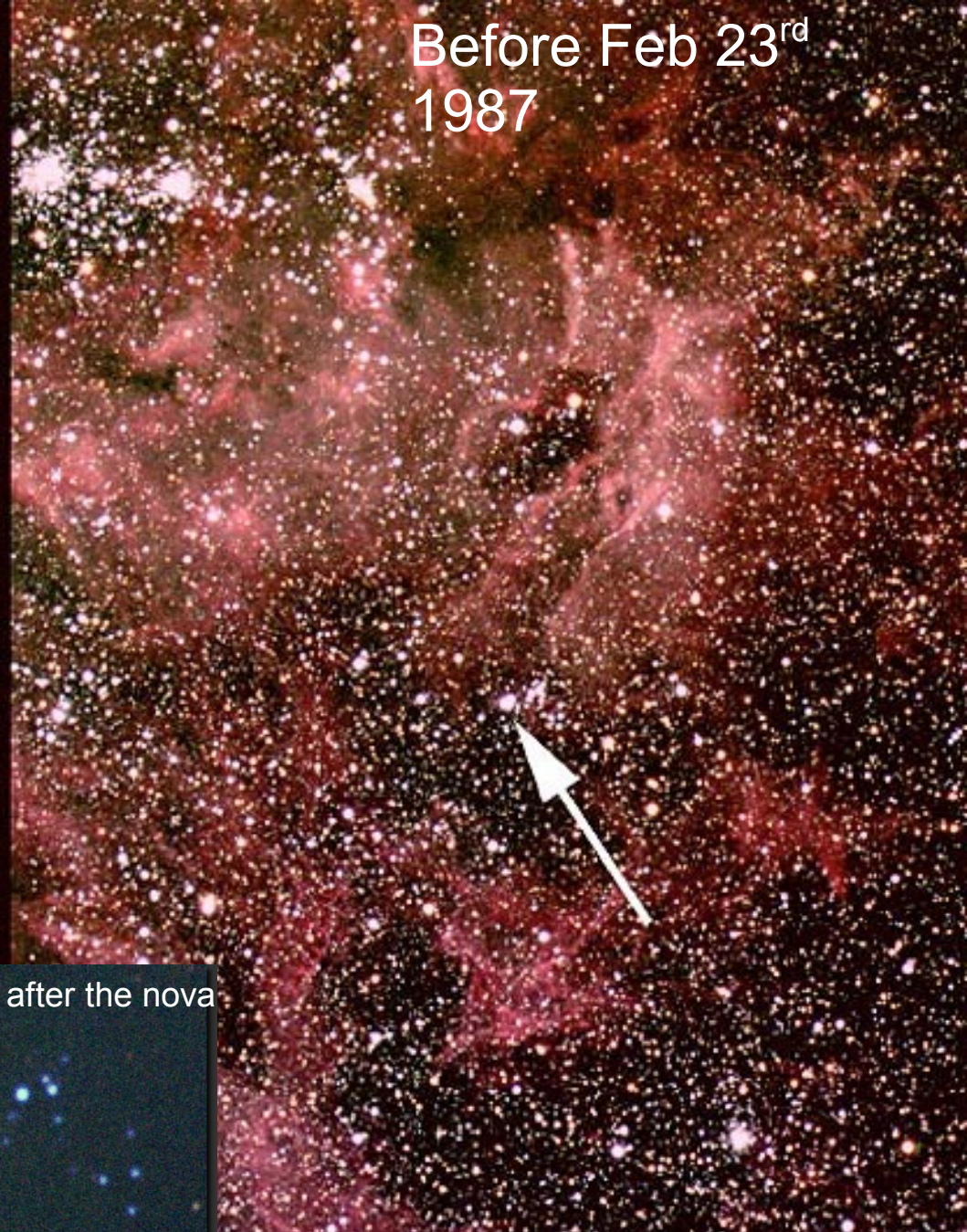
Supernova 1987a in the Large Magellanic Cloud 160,000 ly away but visible in the southern night sky

Did it nova 160,000 years ago?
154,000 years before God spoke the universe into existence?

10 Days After Feb 23rd
1987



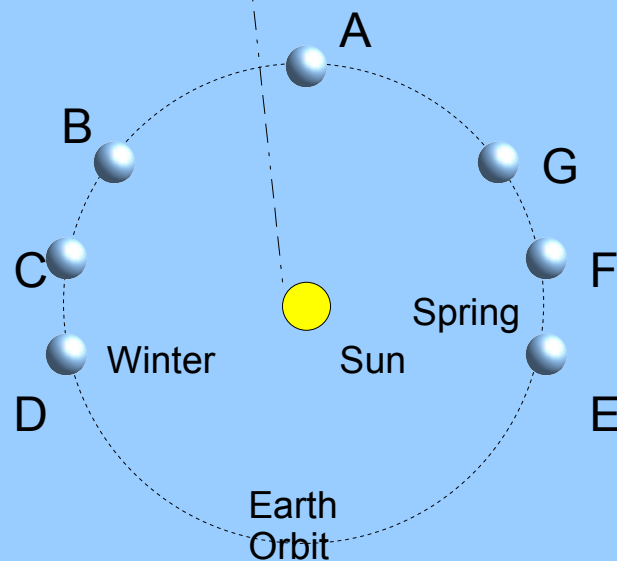
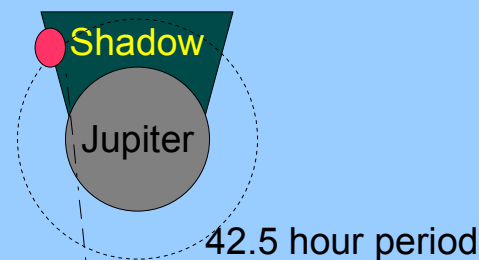
Before Feb 23rd
1987



Red Star 4 yr after the nova

Do not let the speed of light cause you to doubt God. God can approach, attain and surpass the speed of light, Genesis says as much.

In 1676 Danish astronomer Ole Romer calculated the speed of light from the observed change in the moon rise of Io, one of Jupiter's moons. Ole used a ratio of the rate of change of the rise time and the velocity of earth's orbit around the sun.



The sunlight you saw at sunrise this morning, took 8.317 minutes to get here.

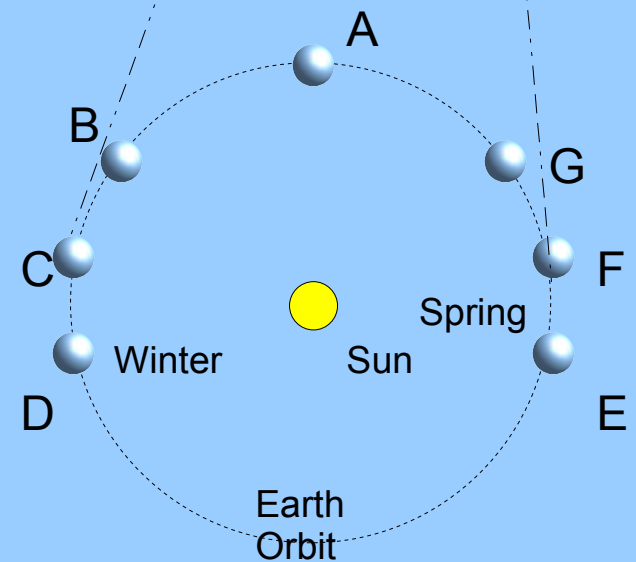
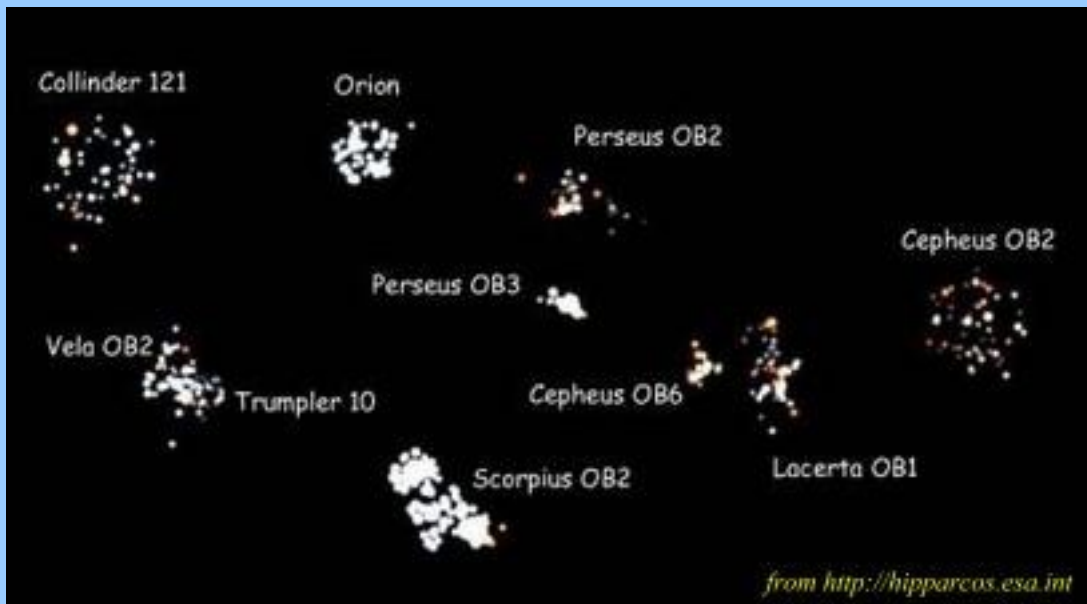
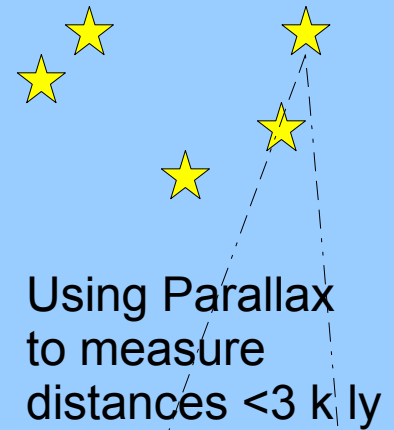


This is an image of jupiter and its four moons, the Galilean satellites photographed by Voyager 1. They are not to scale, but in their correct positions. NASA From www.windows.ucar.edu Nov 2008

God designed our eyes to judge distance by measuring angles of two almost parallel lines of sight one from our left eye, one from our right. Similarly we can measure distances in space using this parallax technique. This works good up to a couple thousand light years of distance.



ESA's Hipparcos (High Precision Parallax Collecting Satellite) space astrometry mission was a pioneering European project which pinpointed the positions of more than one hundred thousand stars with high precision, and more than one million stars with lesser precision.



For deep space one can judge distances by measuring star size, intensity, emissions and pulsations

In this photo of the Christina Galaxy you can judge close and far stars by their size.

Stars clusters also have constant motions and rotations which enable one to judge distances even more accurately.

Galaxy Christina
From www.usm.uni-muenchen.de Nov 2008

Must a galaxy 2 million light years away be 2 million years old?
Or is the speed of light RELATIVE in outer space.

www.usm.uni-muenchen.de

When a day is as a thousand years,
Relativity would put 2 million years
at just 5 ½ years, and 160,000 years
at 5 months and 8 days.



From www.itsa.gov/supernova/supernova-images.html

At 160,000 light years away, when did
the Supernova seen in Feb 1987 really
happen?



From www.astro.caltech.edu/palomar/ Nov 2008

For a Christian the age of the universe is not in question. Believing the revealed Word of God as infallible and inerrant makes the Earth and all the universe 6,000 years old.

For an evolutionary atheist every larger telescope peering deeper into space makes an age of the earth estimate increase in magnitude. They have gone from thousands, to millions, to hundreds of millions and are now entertaining that the Earth is billions of years old.

At odds for a 6,000 year old universe is the speed of light reaching us from distant galaxies

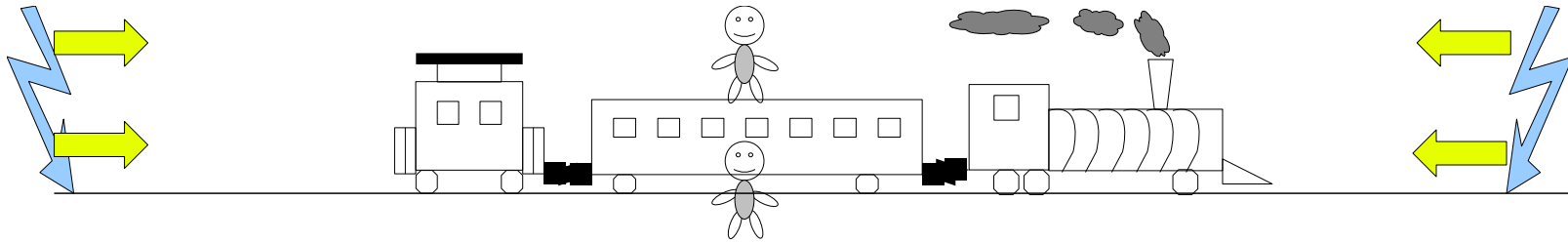


It is far easier and more scientific to account for a billion light years reaching Earth than it is to ignore the evidences for a 'young earth.'

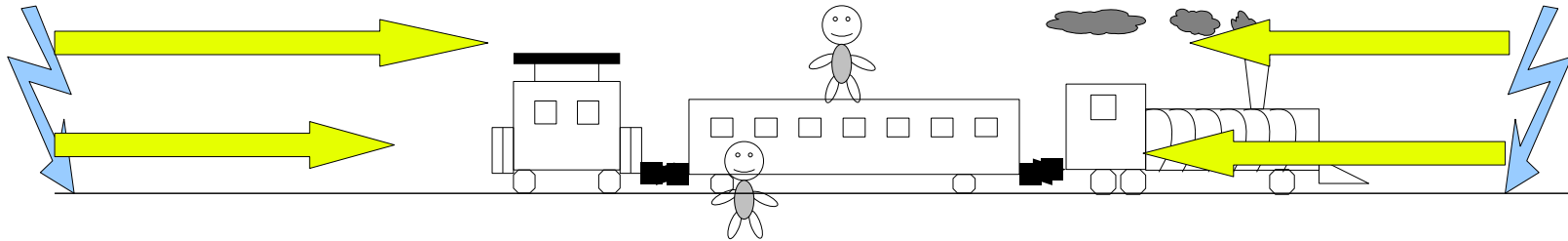
At odds for a 2 billion year old universe is observable evidence on Earth which indicates a 6,000 year old Earth.

- Falls erode up stream and Niagara Falls is in Niagara, not Cleveland
- Coral reefs grow, and the largest in Australia is only 4000 years old.
- Deserts grow, and the Sierra Desert is only 4,000 years old.
- Silt fills gulfs, and the Gulf of Mexico has less than 6,000 years of silt built up.
- Upright fossils span several 'geological stratum', The Grand Canyon was not formed over even hundreds of years!
- Space dust builds up; on our moon it is only deep enough for 6,000 years
- Moons cool in time, and Jupiter's moons have cooled for only 6,000 years.
- The 2nd Law of Thermodynamics forbids the "Hadean Era" of an uninhabitable Earth 4.6 BILLION years ago

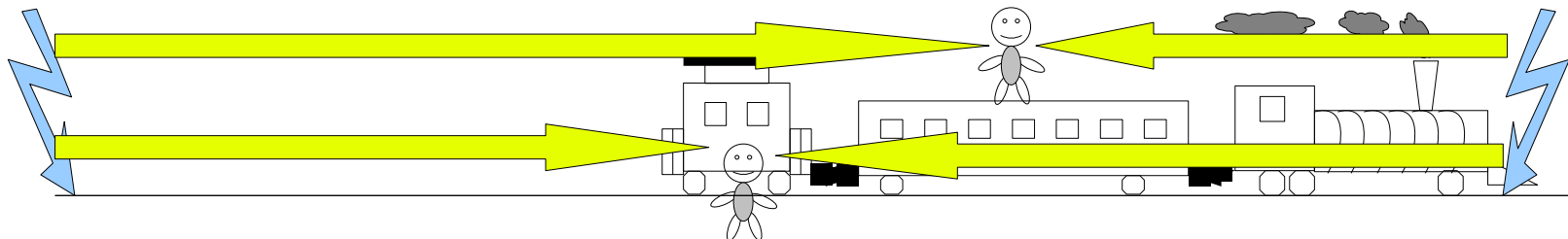
Albert Einstein's Special Theory of Relativity demonstrates a slowing of time and a decrease in dimension when a moving coordinate system approaches light speed.



When lightning simultaneously strikes the engine and caboose of a VERY long VERY fast train,



Does the stationary observer at the midpoint, and the middle of the train passenger see the flash at the same instant?



YES, If the speed of light is constant and not relative to our relative velocities, they must. This is impossible for our Euclidean Cartesian coordinate systems and our Newtonian physics. It is not readily observable or logically conceivable. When approaching light speeds things do not follow our relative laws and things are not as they appear.

Quasars are whole galaxies being compressed and sucked into "Black Holes"



Above is a gallery of portraits of six quasars taken by the Hubble Space Telescope. The quasars in the two columns on the right show associated galaxies breaking up because they are merging with the quasars. The galaxies should provide plenty of debris to feed the hungry black hole in the center of the quasar. From <http://www.definity-systems.net/~apw/astro/galaxies.html> accessed Nov 2008

Quasars are whole galaxies being compressed and sucked into “Black Holes”

The first quasar discovered by radio astronomers in 1963 was 3C 273, a radio source that appeared to be a star-like object. ... Working out the red shift of the hydrogen lines in 3C 273, astronomers were able to discover how fast it was going away from us, and therefore how distant it must be. Quasar 3C 273 was found to be an astonishing 2 billion light years away, making it the most distant object known in universe at that time! At this great distance it was too amazingly bright to be a star. In fact it was giving out 100 times more light than the most brilliant galaxies. From <http://www.definity-systems.net/~apw/astro/galaxies.html> accessed Nov 2008

Astronomers now believe that quasars are a special sort of galaxies. Since they are billions of light years away, astronomers had to come up with an explanation for their incredible brightness. The best theory so far says that a quasar's energy is generated by a giant black hole at its center, up to a billion times more massive than the Sun. This black hole is voraciously sucking matter from a nearby galaxy. Even though nothing including light can escape from the black hole itself, the region around it has become very hot as gravity pulls and compresses matter into the black hole. The super-heated matter surrounding the black hole is actually what gives the quasar its brilliant light. Some quasars can change the amount of light they give out over the course of days, meaning the region producing all the energy must be as small as a few light-days in diameter! No large object can change its light output faster than the time it takes light to pass the change through the object. From <http://www.definity-systems.net/~apw/astro/galaxies.html> accessed Nov 2008

Incidentally, pulsars, like quasars, are radio sources but the similarity ends there. First of all, pulsars are located right here in the Milky Way Galaxy. They are a very special type of dead star, spinning rapidly and sending out flashes of radiation including radio waves in tight beams. Many, if not all dead neutron stars are pulsars, but we can only see the pulsing effect if the beam of radiation travels toward the Earth. A neutron star is the aftermath of a giant stellar explosion called a supernova; it is the core of the original star collapsed and compressed to a sphere only a few kilometers across. During this collapse the the core begins to spin more and more rapidly, generating pulses of either radio waves or X-rays. When they were first discovered, pulsars were thought to be beacons from an extraterrestrial intelligence. The original pulsar was even nicknamed LGM-1 (LGM standing for Little Green Men), but its proper name is PSR 1919+21. More than 500 pulsars have been since discovered, some in regions that are very obviously the remains of supernovas. From <http://www.definity-systems.net/~apw/astro/galaxies.html> accessed Nov 2008