Putting The Distance Between The Earth And Moon In Perspective

In a spaceship, how long does it take to get to the moon?

It depends on how fast the spaceship can travel. When the Apollo .astronauts went to the moon, it took about two days.

How long would it take to fly in a 747 to the moon?

A 747 airplane normally flies at about 400 miles per hour. The moon is about 250,000 miles away. So if we divide 250,000 by 400, we find that the plane would take 625 hours — or 26 days — to fly to the moon! Boy that would be a looong trip! Twenty-six days of eating airline food — yuck!

How Long would it take to drive to the moon? (65 mph)

250,000miles/65mph = 3846 hours or 160 days.

How Long would it take to walk to the moon? (3 mph)

250,000miles/3mph = 83333 hours or 3472 days or 9.5 years

I. Build a Model Solar System (diameters and distance)

Object	Diameter	Distance from Sun
Sun	1 meter	NA
Mercury	4 mm	40 m
Venus	1 cm	70 m
Earth	1 cm	100 m
Moon	3 mm	30 cm (to Earth)
Mars	5 mm	150 m
Jupiter	11 cm	500 m
Saturn	9 cm	1000 m
Uranus	4 cm	2000 m
Neptune	4 cm	3000 m
Pluto	2 mm	4000 m

II. SOLAR SYSTEM (Distances)

1 CM = 1,000,000 KM

OBJECT	MEAN DISTANCE FROM THE SUN (KM)	SCALED DISTANCE FROM THE SUN
Sun	NA	NA
Mercury	58,000,000	58 cm
Venus	108,000,000	108 cm
Earth	150,000,000	150 cm
Moon*	384,400	0.384 cm
Mars	228,000,000	2.3 m
Ceres**	420,000,000	420 cm
Jupiter	780,000,000	7.8 m
Saturn	1,430,000,000	14.3 m
Uranus	2,870,000,000	28.7 m
Neptune	4,500,000,000	45.m
Pluto	5,900,000,000	59.m
Alpha Centauri (the next closest star)		250 MILES

* distance shown for the moon is distance from Earth

** Ceres is just one representative of what belt?

III. At the Speed of Light through the Solar System and Universe

Light from the	**Travel time**
Earth to the moon	1.28 seconds
Sun to Earth	8.5 minutes
Sun to Mercury	3 minutes
Sun to Venus	6 minutes
Sun to Mars	12.5 minutes
Sun to Jupiter	43 minutes
Sun to Saturn	1 hour
Sun to Uranus	2.6 hours
Sun to Neptune	4 hours
Sun to Pluto	5.4 hours
Sun to the nearest star	4.3 years
Sun to the furtherest stars	18 billion years

IV. SOLAR SYSTEM (diameters)

DIAMETERS OF THE OBJECTS
1 CM = 1,000,000 KM

OBJECT	EQUATORIAL DIAMETER (KM)	SCALED EQUATORIAL DIAMETER (CM)
Sun	1,390,000	1.39
Mercury	4,880	0.00488
Venus	12,100	0.0121
Earth	12,800	0.0128
Moon	3,476	0.003476
Mars	6,800	0.0068
Ceres	1,000	0.001
Jupiter*	142,800	0.1428
Saturn	120,000	0.12
Uranus	51,200	0.05 12
Neptune	48,600	0.0486
Pluto	2,300	0.0023

Trivia

- If the sun was hollow it could hold 1,000,000 Earth's!
- The sun accounts for 99.8% of all the solar system.
- Meaning if you place all 9 Planets, 141 moons and satellites of the planets plus all the comets and asteroids on a balance scale, it would only add up to .2% of the solar system.
- *Note Jupiter can hold 1000 Earths
- This Jupiter is # 6 bird shot (which is 2-3 times to large)

V. SOLAR SYSTEM (weight on other planets)

(Note I use a 20 oz pop bottle as reference)

Celestial Object	Gravitational Pull (Compared to Earth)		Period of Revolution (Compared to Earth)
Mercury	0.38	7.6 oz	0.241 Earth years
Venus	0.91	18.2 oz	0.615 Earth years
Earth	**1.0**	**20oz Bottle**	**1.0 Earth year**
Mars	0.38	7.6 oz	1.88 Earth years
Jupiter	2.54	50.8 oz	11.9 Earth years
Saturn	0.93	18.6 oz	29.5 Earth years
Uranus	0.8	16 oz	84.0 Earth years
Neptune	1.2	24 oz	164.8 Earth years
Pluto	???		248.5 Earth years
Sun	27	540 oz or 33.75 lbs	
Neutron Star*			

* The mass of Neutron Star is so great that if it were a teaspoon, it would weigh a billion tons.

How Vast Is Our Universe?

It is so vast that it takes a beam of light (which travels some 700 million miles per hour) over 100,000 years just to cover the distance length of our galaxy called the Milky Way. But our galaxy is only one among many billions in the known universe. To illustrate the size of our universe, consider the following four examples:

A. PAPER STACK MODEL

1. Let us say the thickness of a sheet of paper represents the distance from the earth to the sun (some ninety-three million miles).
2. To represent the distance to the nearest star we would need a seventy-one-foot high stack of paper.
3. To cover the diameter of our Milky Way galaxy would require a 310-mile high stack.
4. To reach the edge of the known universe would demand a pile of paper sheets thirty-one million miles high.

B.ORANGE AND GRAIN OF SAND MODEL

1. Here an orange would represent the sun.
2. A grain of sand is the earth, circling the orange at a distance of thirty feet.
3. Pluto (most remote planet in our solar system) is another grain of sand, circling the orange at ten city blocks away.
4. Alpha Centauri (the nearest star) is 1300 miles away from the orange.

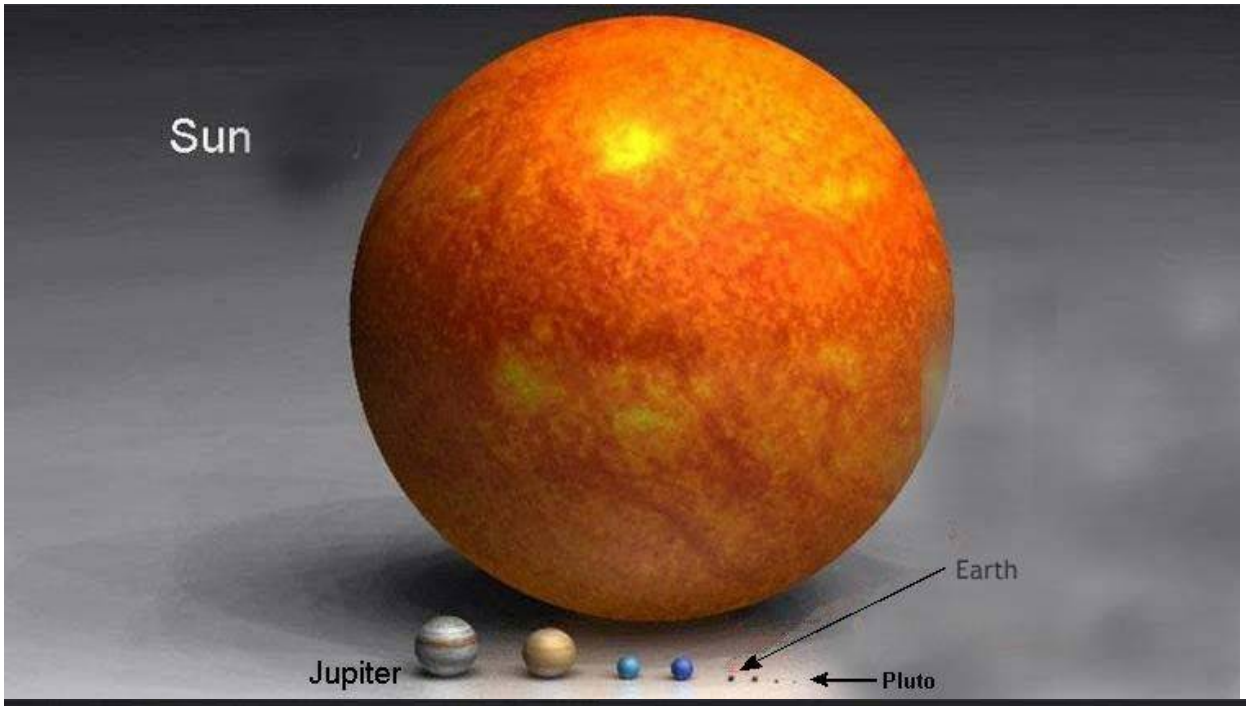
C.HOLLOW SUN ILLUSTRATION

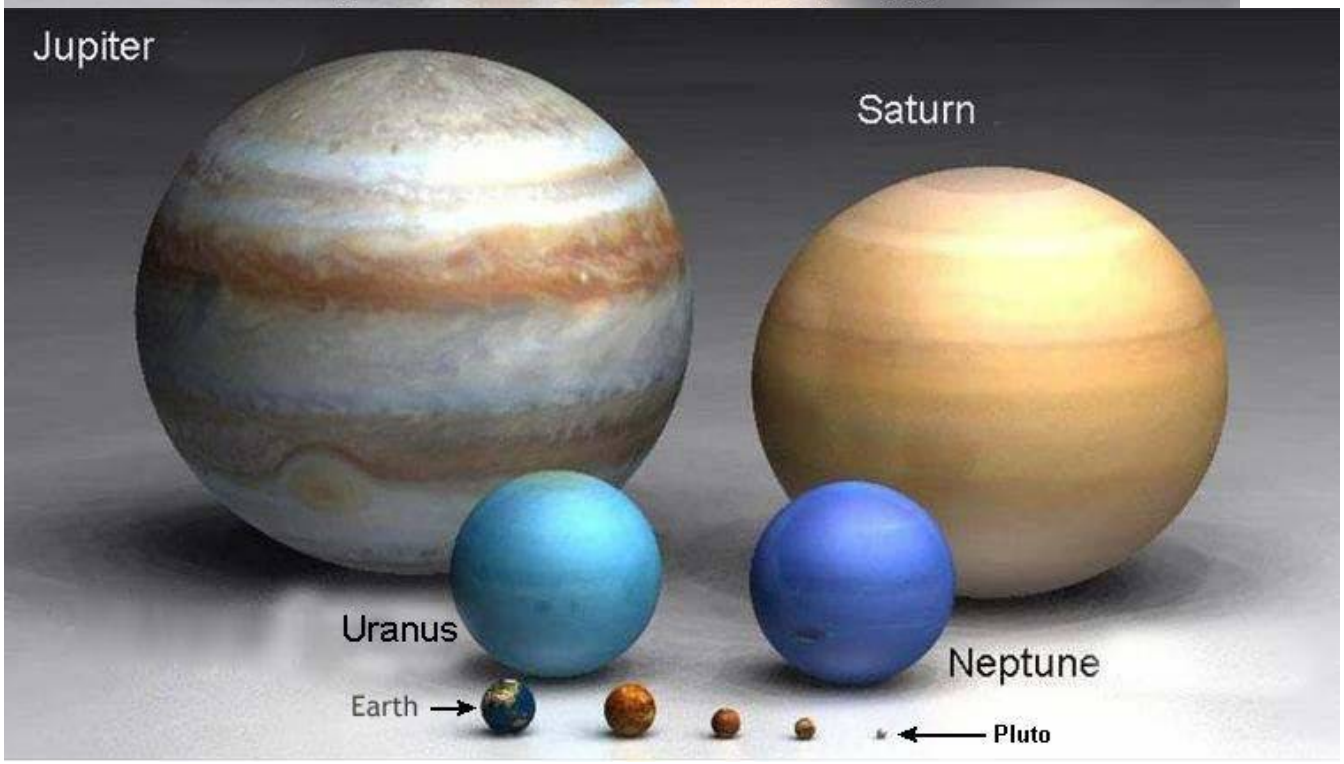
1. If the sun were hollow, one million, three hundred thousand earths could fit inside.
2. A star named Antares (if hollow) could hold sixty-four million of our suns.
3. In the constellation of Hercules there is a star which could contain 100 million of Antares.
4. The largest known star, Epsilon, could easily swallow up several million stars the size of the one in Hercules!

D.THE RELATIVE SPEED ILLUSTRATION

1. Our earth is traveling around its own axis at 1000 m.p.h.
2. It moves around the sun at 67,000 m.p.h.
3. It is carried by the sun across our galaxy at a speed of 64,000 m.p.h.
4. It moves in orbit around our galaxy at 481,000 m.p.h.
5. It travels through space at one million, three hundred and fifty thousand m.p.h.
6. Every twenty-four hours we cover 57,360,000 miles.
7. Each year we travel 20,936,400,000 miles across empty space.

All the above is, of course, but a feeble attempt to illustrate the magnitude of space and of a universe which contains as many stars as there are grains of sand on all the seashores of the world.


Sun
Earth
Jupiter
Pluto


Jupiter
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Earth
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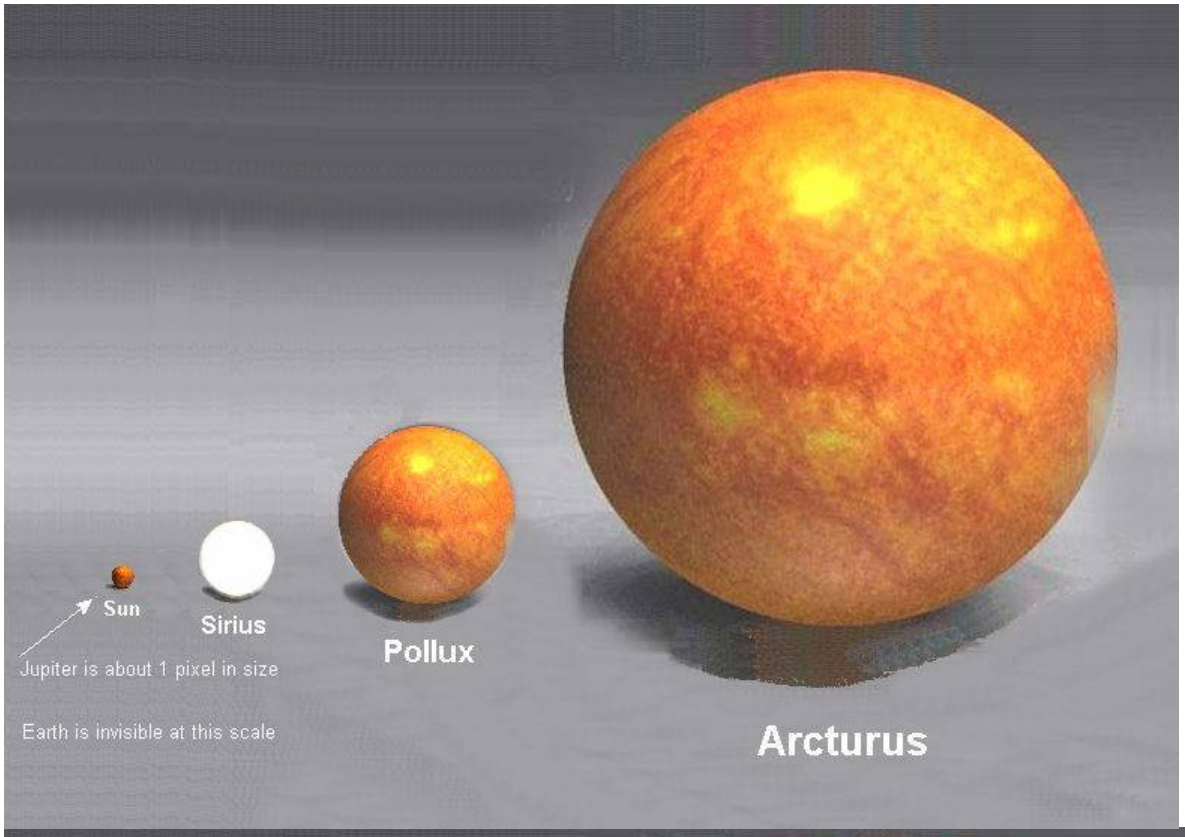
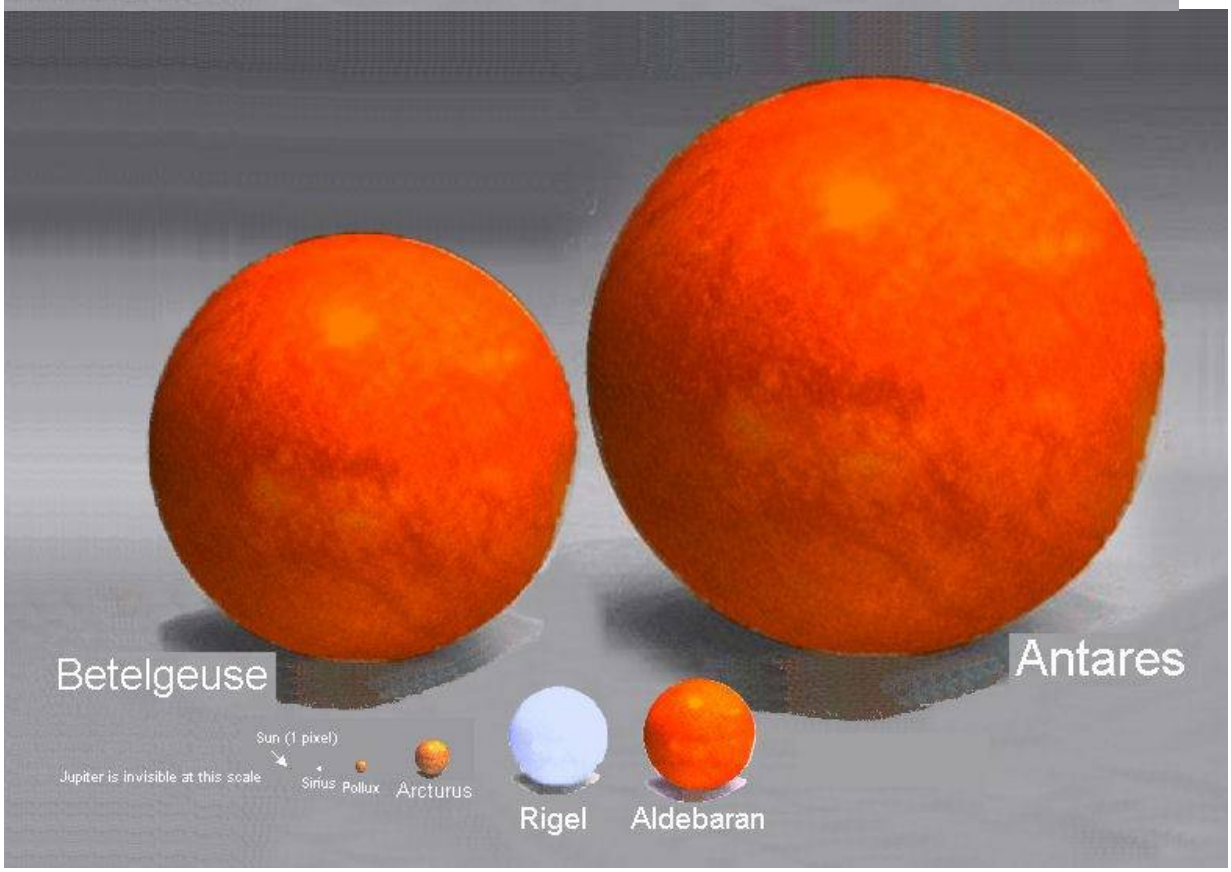
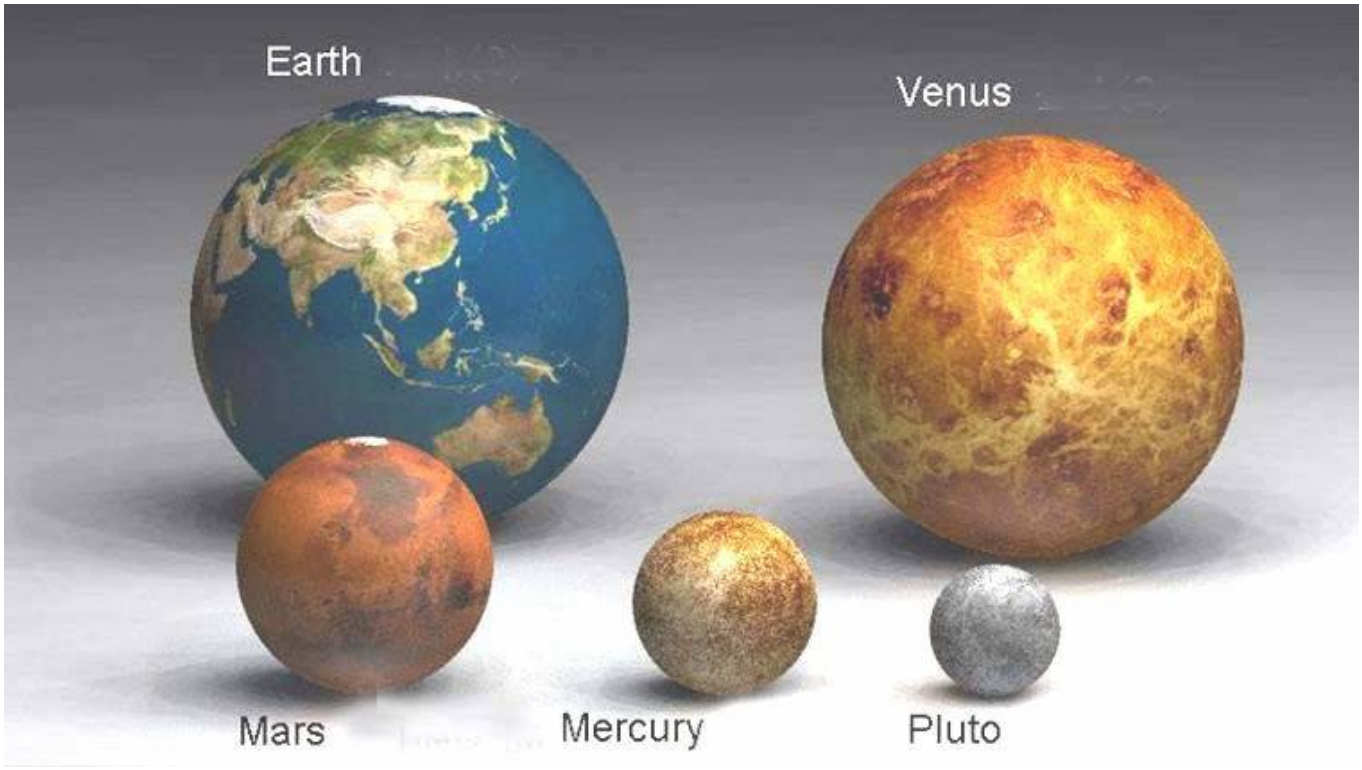

Sun
Sirius
Pollux
Arcturus
Jupiter is about 1 pixel in size
Earth is invisible at this scale


Betelgeuse
Antares
Sun (1 pixel)
Jupiter is invisible at this scale
Sirius
Pollux
Arcturus
Rigel
Aldebaran


Earth
Venus
Mars
Mercury
Pluto