A Fresh Calculation of the Center of Gravity of Our Solar System

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Abstract

Sir Isaac Newton calculated the center of gravity of our solar system using his Universal Law of Gravitation and his three Laws of Motion. Since only six planets up to Saturn had been discovered during his life-time, Newton was working with insufficient data. It is necessary to make a fresh calculation of the center of gravity of our solar system using the latest available data. My calculations show that the center of gravity of our solar system is clearly outside the body of the Sun, and more likely at the center of our Earth. This hypothesis resolves many of the unsolved mysteries and paradoxes that the sun-centered universe of the Copernican heliocentric model has spawned since it was first adopted by Galileo and Kepler in the early seventeenth century.

A Fresh Calculation of the Center of Gravity of Our Solar System

Sir Isaac Newton calculated the center of gravity of our solar system using his Universal Law of Gravitation and his three Laws of Motion. Since only six planets up to Saturn had been discovered during his life-time, Newton was working with insufficient data. It is necessary to make a fresh calculation of the center of gravity of our solar system using the latest available data. My calculations show that the center of gravity of our solar system is clearly outside the body of the Sun, and more likely at the center of our Earth. This hypothesis resolves many of the unsolved mysteries and paradoxes that the sun-centered universe of the Copernican heliocentric model has spawned since it was first adopted by Galileo and Kepler in the early seventeenth century.

Sun is said to have a mass of 2 x 10^{30} kilograms, and Mercury, its closest planet, has a mass of 3 x 10^{23} kilograms. Mercury orbits Sun at a mean distance of 57 million kilometers. Multiplying the ratio of their masses (Mercury/Sun) by the distance between the bodies, $\frac{3\ x\ 10^{23}}{2\ x\ 10^{30}}$ x 57000000, yields a value of 8.55 kilometers, which we will round to 9 kilometers. If the solar system consisted of only Sun and Mercury, its center of gravity would thereby be 9 kilometers from the center of Sun.

By applying this logic to the remaining bodies within our solar system, we can estimate its true center of gravity as follows…

Venus, with a mass of 5 x 10^{24} kilograms and a mean distance of 108 million kilometers from Sun, yields a value of 270 kilometers, $\frac{5\ x\ 10^{24}}{2\ x\ 10^{30}}$ x 108000000. If the solar system consisted only of Sun and Venus, its center of gravity would be 270 kilometers from the center of Sun. It then follows that if the solar system consisted of Sun, Mercury and Venus, its center of gravity would be 9 + 270 = 279 kilometers from the center of Sun.

Earth, with a mass of 6 x 10^{24} kilograms and a mean distance of 150 million kilometers from Sun, extends this center by 450 kilometers, bringing the total to 729 kilometers.

Mars, with a mass of 6 x 10^{23} kilograms and a mean distance of 228 million kilometers from Sun, extends this center by 684 kilometers, bringing the total to 1413 kilometers.

Jupiter, with a mass of 2 x 10^{27} kilograms and a mean distance of 779 million kilometers from Sun, extends this center by 779,000 kilometers, for a total of 780,413 kilometers.

Saturn, with a mass of 6 x 10^{26} kilograms and mean distance of 1.43 billion kilometers from Sun, extends this center by 429,000 kilometers, for a total of 1,209,413 kilometers.

Uranus was discovered in 1781; fifty-four years after Isaac Newton died. Uranus is estimated to have a mass of 9 x 10^{25} kilograms and a mean distance of 2.88 billion kilometers from Sun. This pushes outward the center of gravity by 129,600 kilometers, making the total distance 1,339,013 kilometers from the center of Sun.

Neptune was discovered in 1846, sixty-five years after the discovery of Uranus. With an estimated mass of 10 x 10^{25} kilograms and an orbit of 4.5 billion kilometers from Sun, 225,000 kilometers are added to the cumulative distance, bringing its total to 1,564,013 kilometers.

Discovery of the Asteroid Belt began with Ceres in 1801 when astronomers, searching for one large planet between Mars and Jupiter, found a large number of small objects instead. Their combined mass is estimated to be the equivalent of four Earth masses. To add it in our computation, we use a mass of 4 x 6 x 10^{24} kilograms, and an orbit at the midpoint between Mars and Jupiter; 503,500,000 kilometers from the center of Sun. This yields 6042 kilometers $\frac{24\ x\ 10^{24}}{2\ x\ 10^{30}}$ x 503500000, bringing the total to 1,570,055 kilometers from center of Sun.

Pluto was discovered in 1930 in a deliberate hunt for a "Planet X" that was thought to affect the orbits of Uranus and Neptune. Pluto was classified as a planet until its "demotion" to "dwarf planet" in 2006. It is acknowledged as the first Kuiper Belt Object to be discovered.

The Kuiper Belt is a broad ring of objects that begins near the orbit of Neptune and extends to roughly 15 billion kilometers from Sun. The Kuiper Belt can be split into an inner zone called the Classical Kuiper Belt, and an outer zone called the Scattered Disk.

Surrounding the solar system beyond the Kuiper Belt lies an enormous cloud of long period comets known as the Oort Cloud. Its outer reaches extend to almost a light-year from Sun, and it is believed to contain trillions of objects with a total mass of roughly five Earths (pages 208-211, ***Universe***). Five Earth masses at a mean distance of one half of a light-year (4.73 trillion kilometers) yields a value of 70,950,000 kilometers = $\frac{30\ x\ 10^{24}}{2\ x\ 10^{30}}$ x 4.73 x10^{12}. Adding this to the data for Mercury through Neptune brings the distance from Sun's center to solar system's center of gravity to 72,520,055 kilometers (72.5 million kilometers)… somewhere between Mercury and Venus.

It is reasonable to hypothesize that our solar system's center of gravity of is **not** within Sun, but at least 72.5 million kilometers from the center of Sun, i.e., nearly half way to Earth. This calculation extends the calculations and conclusions Isaac Newton made when he was working with insufficient data. Observations from time immemorial have shown Sun orbiting Earth as a physical reality, while the Copernican heliocentric solar system is still a mathematical construct. Therefore, we may reasonably conclude that either one or both of the following two hypotheses account for the apparent motion of our Sun around a stationary Earth.

Hypothesis 1

There is more undiscovered matter in our solar system that extends its center of gravity to the center of Earth. This material could be in the form of a planet (Planet IX, as proposed by two Caltech astronomers in 2016), a small Black hole, or even a small Neutron star.

Hypothesis 2

Negative Weight Theory: Sun is made up of the lightest elements, hydrogen and helium, at high temperatures. Therefore, relative to other objects in the solar system, Sun's effective weight is less than its mass by some proportion that can be calculated.

Discussion

Copernicus proposed his heliocentric theory of our solar system because he believed it was easier for Earth to rotate on its axis than for all the stars and planets revolve around Earth. He also felt that with Sun being much more massive than Earth, it should be at the center. Copernicus did not have empirical evidence to support his theory. Consequently, his theory is mathematically true, but devoid of empirical support.

Tycho Brahe offered an enhancement to the Ptolemaic geocentric system later in the sixteenth century, proposing that our Moon and Sun orbit Earth, while the other planets revolve around Sun. Galileo and Kepler (a student of Brahe) both favored the Copernican model in the early seventeenth century because it fit well mathematically for a small six-planet solar system.

Newton was neutral, as stated in ***Book III of The Principia****, PHAENOMENON IV, (1687), "*That the fixed stars being at rest, the periodic times of the five primary planets, and (whether of the sun about the earth, or) of the earth about the sun, are in the sesquiplicate proportion of their mean distances from the sun" *(page 324, **The Principia,** Isaac Newton; translated by Andrew Motte).* Based on his laws of motion and gravitation, Newton found that the total weight of the six known planets was insufficient to drag the center of gravity of our solar system out of Sun's body. Thus he endorsed the Copernican heliocentric model.

Spectroscopic studies have shown that stars are comprised mainly of hydrogen and helium, and Sun exhibits a surface temperature of 5500 degrees Celsius. As such, Sun is like a hot hydrogen-helium balloon holding up its satellites exactly as a hot air balloon above Earth

bears its load. I call this postulate “Negative Weight Theory” because hydrogen and helium exhibit “negative weights” on Earth, even at room temperatures.

Conclusive Proof

The celebrated Michelson-Morley Experiments of 1887 proved that Earth has no motion. The objective of their experiment was to detect “aether drag” under the principle that Earth revolves around Sun at a rate of about 30 kilometers per second. Michelson and Morley split a beam of light in two, sent them perpendicular to each other, and measured their return. Returned beams were supposed to show a pattern of interference because the beam sent parallel to the motion of Earth should have taken a little longer to return than the beam sent perpendicular to the motion. The experiment did not identify differences. The rational and scientific inference being that *whether or not aether exists, Earth does not move*.

Brahe’s geo-heliocentric model of our solar system now warrants serious attention because it fully explains all known motions within it:

1. Earth is stationary at the center of gravity (barycenter) of our solar system with zero rotation and zero revolution – *as observed for millennia.*
2. Sun orbits Earth in about 24 hours, at a radius of about 150 million kilometers, giving Sun an orbital speed of about 10,900 kilometers per second ($2\pi r/86400$), less than 4% of the speed of light – *as observed.*
3. Moon orbits Earth in about 24 hours and 51 minutes, falling about 51 minutes behind Sun each day, and levelling up with Sun again in about 28 days – *as observed.*
4. Distant stars remain fixed, but their light makes a complete revolution around Earth every 24 hours – *giving the illusion that the stars themselves revolve around Earth.*
5. All other planets and comets orbit Sun at varying speeds, depending upon their masses and distances from Sun – *as observed.*

I shall now explain these phenomena in greater detail.

According to Tycho Brahe, Earth is too sluggish to move. It is the densest object in the solar system, roughly four times denser than Sun. This makes it reasonable for Earth to have zero rotation and zero revolution, similar to the nucleus of an atom, and be designated as the barycenter of our solar system. The motion of all objects in the solar system must now be calculated as observed from a stationary Earth. Sun orbits Earth in about 24 hours, at 10,900 kilometers per second, less than 4% of the speed of light. For a massive object like Sun, this is only a wobbling motion.

Every star shows wobbling motions, and binary stars orbit around each other, so Sun's orbit around a stationary Earth is quite natural and sustainable. Along with its daily orbit, Sun has a yearly linear motion of $23\frac{1}{2}$ degrees north and $23\frac{1}{2}$ degrees south of the Ecliptic, for a total of 47 degrees, occurring between the Tropic of Cancer and Tropic of Capricorn. This is similar to a spring or a slinky constructed with 365 loops.

When we consider Earth stationary, we observe our moon, Luna, orbiting in about 24 hours 51 minutes. Like Sun, this is a natural orbital motion, as a slightly larger moon, Io, orbits Jupiter at a slightly longer distance, in about 42 hours. For Luna to stay in orbit without falling into Earth, its orbital period must be less than 42 hours. It cannot be 28 days, as is generally accepted and assumed in the Copernican model. Even Jupiter's farthest Galilean moon, Callisto, 1.88 million kilometers from Jupiter, completes one orbit in 16.7 Earth days.

Comparison of Luna with Io – as Observed from a Stationary Earth

	Distance from Host Planet	**Mass Kilograms**	**Diameter**	**Orbital Speed**	**Orbital Period**	**Density kg/m^3**
Luna	384,400 km	$7.35\ x\ 10^{22}$	3475 km	27 km/s	24h, 51m	3344
Io	422,000 km	$8.93\ x\ 10^{22}$	3643 km	17.5 km/s	42h	3530

The strongest argument supporters of Copernican heliocentric theory could make against this new paradigm is the apparent daily revolution of stars around a tiny point-sized Earth,

as that would be physically impossible and violate all known laws of physics. This paradox is easily explained by appreciating that it is merely the *light* from distant stars that revolve around Earth, not the stars themselves.

Newton firmly believed that light is corpuscular, obeying laws of motion and gravitation. Eddington's observations of the 1919 eclipse showed that Sun bends starlight passing by it. Given that all stars possess this property, we cannot be sure of the actual spatial position of any star beyond our Sun since we do not know how many deflections any light has suffered during its travel from the star of origin to Earth. We can only be certain of the relative position of the stars in two dimensions, as viewed from Earth.

Rays of light bent several times can make a circle. A star directly behind an observer would become visible to this observer if there were a sufficient number of "in-between" stars capable of bending the original light a total of 180 degrees. The night sky is only a map of the visible universe, much like a map of (globular) Earth. An observer in Madrid, Spain, cannot see his antipode (diametrically opposite point) on Earth in Weber, New Zealand, but can see Weber, New Zealand, on a map of the globe. In other words, the night sky is merely a two-dimensional map of the visible universe that shows the relative positions of the stars visible to an observer on Earth.

If we assign no motion to Earth, it becomes the only stationary object in our solar system. It is reasonable to assume that life successfully developed on Earth because it is immobile. Moving bodies are subject to more frequent collisions with other moving bodies than are non-moving bodies. We see many more impact craters on Mercury, Venus, Mars, and our moon than we see on Earth. A stationary Earth is well protected from cosmic collisions, first by a lunar shell, then by a solar shell. This allows us to rationally conclude that life, as we understand it, only develops on stationary planets… such as Earth.

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