# Companion Star Possibilities

The best way to explain our sun's yearly retrograde movement across the sky is to understand that our sun might actually be moving in a binary or multi-star system.

While most believe that the sun's motion of 50.4 arc seconds per year is simply an "apparent motion" caused by an earth axis that wobbles this same amount (thereby constraining the sun's motion to zero), this paper looks at the possibility our sun does indeed move up to 50 arc seconds per year, and axial wobble itself is constrained to no more than about two arc seconds per year. Assuming the solar motion we see is real it raises the question: Why is the sun curving through space? Physics tells us only a very large mass can explain such behavior.

Discounting the possibility of a nearby black hole, we believe there are now at least three possible companion star candidates. Each has their pros and cons. One is Barnard's Star, a local red dwarf, now moving straight towards us, recently deemed the "runaway star" for its exceptional speed, but most believe it is not bound by the sun and will just race by us. Two, Sirius, the brightest star in the sky, displays a number of characteristics that suggest a gravitational relationship with our sun and solar system, but most agree it is simply too far away for any significant gravitational relationship to exist. Third, a relatively unknown star, GSC 3573-129, highlighted in a paper by V. Goretti of the Bologna Observatory, could also be an excellent candidate, but only if it's distance of just one light year is confirmed. Let's start there.

### Goretti's Star

Vittorio B. Goretti, in a 2013 paper focused on red stars in the Hipparcos Catalogue, pointed to GSC 3573-129 as a particularly interesting red dwarf. He noted observational data suggesting this star might be much closer than heretofore believed, and concluded his paper by suggesting it could be a gravitational "companion of our sun". Goretti, with more than 30 asteroid finds to his name, is a solid observational astronomer. He realized that the proportion of red dwarfs to red giants in our local stellar neighborhood does not match the proportions found elsewhere in our galaxy[1]. Reexamining the parallax of some of these stars he determined that several that were believed to be distant red giants are actually much closer red dwarfs, including a few that may be closer than the three star Alpha Centauri system, one of these, GSC 3573-129, Goretti calculated to be only about one light year distant. This would put the theoretical center-of-mass radius required for a binary system at well less than a light year, enabling an orbit in the approximate observed precession period (the assumed orbit periodicity). As a red dwarf, it would be difficult to detect without precise measurements, which might explain why it hasn't featured prominently in binary star discussions or models of the greater solar system to date.

The notion of a companion just one light-year away aligns well with our calculations of a 0.73 light-year center of mass if Barnard's were the companion, suggesting both warrant serious

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[1] Research on Red Stars in the Hipparcos Catalogue: https://www.tychos.info/citation/157D_Red-Stars-Goretti.pdf

follow-up. While very little is known about Goretti's Star at this time, we hope that this paper will encourage others to study the star and either confirm or disprove Goretti's findings.

### Barnard's Characteristics

Barnard's is well known and an interesting candidate because its proper motion is faster than any other star in our stellar neighborhood. Its present location on the celestial equator, which is the same path the sun travels, and its speed are important considerations in the case for this star.

Weighing about 48,000 Earths, Barnard's is just 15% of the sun's mass. While it is currently accepted as the sun's second closest stellar object, it cannot be seen without the aid of a telescope. The closer and more visible three-star Alpha Centauri system is not on plane and probably couldn't drive the sun along the path we now see. But Barnard's won't be second for long. It is moving so fast it is expected to come closer than Alpha Centauri's current position within about 10,000 years, although still not as close as Goretti's if his calculations are correct. This is quite important, as no astronomer believes we could be in a binary star system unless the companion is, or soon will be, very close.

The Indian sage and Vedic astronomer, Sri Yukteswar, made a strong case for a companion star to our sun in his book *The Holy Science*. Published in 1894, well before Barnard's was officially discovered by E.E. Barnard in 1915, Yukteswar wrote that our sun was likely part of a "dual star" system with a roughly 24,000-year orbit period, suggesting it was this dynamic that indirectly caused the "backward motion of the equinoctial point", a.k.a. precession. He calculated the last aphelion at about 500 AD, and determined the next perihelion would be around 12,500 AD. This number is remarkably close to the modern estimate for Barnard's perihelion, which is now calculated to happen in the year 11,800 AD. Indeed, the delta between these estimates is less than 3 percent of the predicted orbit period, the precession period.

If Barnard's is our companion in a ~24,000-year orbit, and modern science is correct on the timing of its next closest approach, then its last perihelion would have occurred around 11,500 BC. A close approach by an object this size might very well cause solar system perturbations, possibly disturbing the Oort Cloud. While not the purpose of this paper, the date is eerily close to that of the disastrous Younger Dryas period, when a large percent of the megafauna was wiped out. Randell Carlson, Graham Hancock and other historians speculate the Younger Dryas may have been set off by a comet or meteor impacting the Earth, one possibly dislodged by a near encounter with a stellar companion. Robert Schoch of Boston University suggests the Younger Dryas event might have been caused by an unusual solar outburst, which could also be triggered by the close passing of a companion star. Either way the timing is uncanny.

### Sirius

In my book, *Lost Star of Myth and Time*, I looked at the possibility that our sun might have a companion star, from both an astronomical and historical or mythical perspective. This is because some ancient cultures spoke of a vast cycle of time driven by a stellar companion. As part of that quest we find the star Sirius figures prominently in the myth and folklore of ancient cultures.

To the layman, Sirius, the brightest star in the sky should also be one of the closest. It is, but not close enough for modern astronomy to consider it a companion contender. Using traditional measurement systems, it's distance of about 8.6 light years, should rule out any possibility that it might be our sun's dual. At two times the mass of our sun, the center of mass between Sirius and Sol would be many times farther away than the barycenter between our sun and Barnard's star or Goretti's star. So it is hard to see why there would be any detectable gravitational relationship between our sun and Sirius, but they do exist.

For example, the inclination of Pluto's orbit aligns almost perfectly with Sirius, and its orbit period also appears to be in an exact 5.0 resonance with the period of time that it takes Sirius B to orbit around Sirius A. Resonance is a strong indicator of a gravitational relationship. This effect might be because Sirius B is an extremely dense white dwarf, whose exceptional mass could be creating some sort of gravity waves affecting our solar system, especially the distant dwarf planets. Or maybe this is because the Sirius system is closer than now estimated.

Several studies, in addition to Goretti's Research on Red Stars in the Hipparcos Catalogue question the way we measure the distance to the stars, some implying more than a few stars are in fact quite a bit closer than traditionally believed. One paper entitled, *Could Planet Nine be a Dwarf Star*[2], points out issues with (negative) parallax measurements and suggests that spectrographic methods may be a better indicator of stellar distances, at least in some cases.

Another odd thing about Sirius is it does not seem to precess like other stars. Jed Buchwald, an astronomer, and professor of the History of Science at Caltech, mentioned this long observed phenomenon in an article entitled, *Egyptian Skies Under Paris Nights*[3]. To quote, "The rising of Sirius, the brightest star in the heavens… was assumed by the French physicists to move with relation to the sun as do the constellations of the zodiac. It does not, however, as we see here. The curved line dividing the lit from the dark regions represents the horizon near Dendera. The blue lines show the locations of the ecliptic with respect to the horizon at five helical risings separated by hundreds of years. The vernal points mark the equinoxes at these times, and the circled numbers on the lower right indicate the corresponding positions of Sirius. **Sirius remains about the same distance from the equinoxes—and so from the solstices— throughout these many centuries, despite precession**."

When I asked Jed about "why" Sirius doesn't precess like other stars he guessed it might have something to do with the location in Egypt and or topography when observed from Egypt. However, I subsequently came across an independent research group out of Canada that took transit readings of Sirius from a fixed telescope for over twenty years. They found the same

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[2] Could Planet Nine be a Dwarf Star, by Jerrold Thacker https://vixra.org/pdf/1701.0416v1.pdf

[3] Egyptian Skies Under Paris Nights http://jzbuchwald.caltech.edu/downloads/5Egyptian Stars Under Paris Skies.pdf

phenomenon from a very very different location. In 2005 I personally visited their site near Edmonton, examined the equipment they used, observed an actual transit through the crosshairs of their scope, and was quite impressed with their field notes and system of measurement (including marking transit times via radio signals from an atomic clock). Topography plays no role. I could only conclude, just as the ancient Egyptians did, that there seems to be some special connection between our sun and the star Sirius, in spite of its distance. But that doesn't mean it has to be our sun's companion.

## Precession Background

It has long been thought that the sun's year-to-year motion is only "apparent" and that it hardly moves at all. This belief arose because the axial wobble theory of precession or "libration", espoused by Copernicus, effectively constrained the sun's motion to zero. Copernicus had to do this—fix the sun at the "center of the Universe"—in order for his heliocentric system to work. In his mind, the earth needed an immoveable point to revolve around in a circular orbit. This was before Kepler and the realization that all orbits are elliptical. Having explained the daily and yearly celestial cycles through simple motions of the earth (rotation and revolution), Copernicus needed a third movement to explain the sun's yearly retrograde motion observed equinox to equinox, known as the "precession of the equinox". As he did with the first two, he wanted to explain the sun's third motion *without* it actually moving. Therefore, he reasoned that the earth must also "librate" or wobble, making the sun only "appear" to move, because the wobbling axis would change the position of the equinox, causing the observed 50 arc second per year shift in the position of the stars. Thus, in one stroke he cancelled all motion of the sun along the celestial equator, stating it was nothing more than an *illusion* caused by an unstable axis. It was an elegant solution but time has proved it too simplistic. We now know the sun, like all other stars, does move and hence the amount of precession due to axial wobble appears to be overestimated.

A century after Copernicus, Newton sought to explain "why" the axis might wobble. He knew the moon and sun caused the tides and assumed these same lunisolar forces, tugging on an oblate earth, must cause the axis to wobble and produce ALL of the 50 arc seconds of sun motion we see. Thus he too unwittingly constrained the sun to zero motion. But over time his equations were found to be seriously flawed, they didn't account for nutation, and didn't predict the acceleration in the precession rate (the sun moving faster and faster across the sky each year).

The idea of constraining the sun's motion to zero was unknowingly perpetuated by all those that tried to fix Newton's equations without questioning the basic underlying theory. Great scientists from Jean la Rond d'Alembert, Urbain Le Verrier and Simon Newcombe worked on the problem but all started with the idea the *solar system cannot move*. These attempts continue to this day with a recent paper proposing that the solar system must act like a "rotating disk", to solve the problem[4]. The old scientists added plenty of variables (now numbering in the thousands), while ignoring the question: Could the sun itself actually move?

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[4] Axial Precession in the General Theory of Relativity Solution http://article.sapub.org/10.5923.j.astronomy.20211001.01.html

Today astronomers recognize the sun has some motion, at the very least around the galactic center. But that particular geometric effect is thought to be small, less than .005 arc seconds per year. The actual solar motion we see (50+"per year) is ten thousand times bigger! But again, it is assumed to be nil because precession theory doesn't allow it.

One can only wonder, if we are failing to account for any solar system motion, then what other reference frames might we be ignoring? If the sun is in a binary star system, might this system itself also be in motion around something larger still? Yukteswar and Oriental astronomy suggests this is the case. They say that just as moons revolve and rotate about a host planet, and planets with their moons rotate and revolve around a host star, so do stars literally gravitate towards other stars and they too revolve around their common center of mass. Thus, there may be several moving reference frames between us and intergalactic space. But since axial wobble theory constrains the sun's motion to zero - this question goes unasked - and unanswered.

It should be noted that modern astronomers do recognize these same dynamics (rotation, and revolution of moons, planets and stars that are also gravitationally bound) but they do not connect it with or relate it to any motion of the equinoctial point. The changing equinox is thought to be due entirely to a wobbling axis and have nothing to do with any change in the position of the solar system relative to inertial space. In other words, the base assumption is the solar system does not move.

What seems to have been forgotten is that the theory of lunisolar precession requires the earth to revolve around the sun 50 arc seconds short of a complete orbit in an equinoctial year. That is how the Copernican model works: the axis is presumed to wobble 50" and therefore the equinox occurs, along the earth's orbit path, at a point 50" short of where the equinox occurred in the prior year (relative to the fixed stars). That is the explanation for the shift in the background stars seen equinox to equinox. But recent studies of the motions of the moon[5], show the earth does indeed travel 360 degrees along its orbit path each year (relative to the sun), give or take a few arc seconds. And this happens in the period of time equivalent to an equinoctial year. This is proven by calculating the number of lunar orbits in an equinoctial year (13.3682) versus the number of full moons observed in that same period (12.3682), and finding that the two measurements show a delta of exactly "one" only in the time period known as a solar year (equinox to equinox). Hence, most of the 50 arc seconds that the sun moves (relative to the background stars) is due to actual solar system motion, NOT earth motion, leaving only a few seconds of arc for axial wobble. The moon is the earth's witness. Solar and lunar eclipses (dependent on exact relationships between the earth, sun and moon) are precisely predicted to within a second or two. They don't care if the earth wobbles or not. They tell us the sun really moves!

In fact, the sun is on quite the gallop around our local stellar neighborhood, completing a circuit in about 25,770 years at the currently observed rate. This is slower than the Yukteswar predicted

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[5] On the Precession of the Equinox, Robert Augusto Riva, University of Chicago, and https://binaryresearchinstitute.org/bri/evidence/the-lunar-cycle/

24,000 year orbit period, but close to what one would expect at this point in his hypothesized orbit. Specifically in 2025, 1524 years from apoapsis (>13% of the semi major axis), given Kepler's laws. Stated simply: when two stars are still far apart they move slower than when they are close together.

The fact is, the precession rate (sun's rate of motion across the sky) is speeding up year after year, with no good explanation offered by the precession dynamists. Indeed, the moon is slowly drifting away from the earth, and the earth is slowly drifting away from the sun, meaning that if anything we should see the precession rate "decelerating" not "accelerating". This otherwise unexplainable acceleration is why the IAU in 2006 suggested "the need for a precession theory consistent with dynamical theory"[6]. It has always been the case and is but another sign that what we call "axial precession" is overstated. This problem does not exist if the precession observable is actually a solar system in motion. In a binary system, half the time, such acceleration is expected. It is simply an indication that the sun, and its (still unidentified) companion, are now moving closer to each other: towards periapsis.

### Distance, Speed, Orbit Period Calculations for Barnard's

Barnard's Star is currently about 5.95 light years from the Sun, but moving closer. Independent sources now expect it to come within 3.75 light years over the next 10,000 years. So let's use 4.07 as its average distance, during a presumed binary orbit period.

To find the hypothetical *common center of mass* between the two stars (the point that both stars must orbit) and using Barnard's mass estimated at .144 solar masses (rounded to .15), we can determine the average center of mass between the two stars would be .7311 light years from our sun (the larger mass). While we don't know the exact eccentricity of the sun's orbit, we know it is minor (because the companion mass is much smaller), and therefore we can determine the approximate distance our sun would need to travel, and from this, determine the required speed.

The estimated distance calculation is straightforward: 2*Pi*.7311 light years or (2x3.141594x.7311) = 4.5904 light years. Rounding the orbital circumference to 4.5LY and using an orbit time of 24,000 years (meaning the sun moves an average of 54"py), we can then determine a speed by dividing 4.5 LY by 24,000. The result is the sun must travel at an average speed of .0001875 LY per year, or about 125,805 mph. Again, according to Kepler's Laws, the present speed would be a bit lower as the two stars are much closer to apoapsis than periapsis, and thus the sun is now only traversing about 50.4 seconds of arc per year, which is what we now observe.

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[6] IAU 2006 Resolution B1

In 2009 we built a model based on this data (presented at the AGU in San Francisco)[7] and found that had scientists used this simple method to predict the changing rate of precession over the last 200 years, their calculations would have been 43 times more accurate than the traditional lunisolar model!

Sailors transversing long stretches of open ocean would have liked this model back in the 18th and 19th before radar, computers, radio and satellites. Navigating by the sun and stars they needed to know exactly how much the sun moved for fear of missing an island or safe port over a long journey. Precession calculations back then had a real purpose. But modern equipment has obviated the need for anyone to do such calculations or worry about the accuracy of lunisolar precession equations. Nobody really cares about precession anymore. Normally, the more predictive model would be favored over a less predictive model. But since few study precession we doubt that even if astronomers were aware that a more accurate model might exists, none would use it. This is because until an actual companion has been identified, there is no incentive to challenge current precession theory. The purpose of this paper is to look at Barnard's, Sirius and Goretti's, as potential candidates, and increase the incentive to finally explain precession.

To put our estimate of speed in perspective, the earth currently moves at about 66,600 mph in its orbit around the Sun, while Barnard's Star speed is estimated at about 215,000 mph in its current trajectory towards our Sun (stellar speeds are harder to determine). So an average speed of 125,000 mph for our Sun (less at apoapsis and more at periapsis) seems well within the window of reason. We do this calculation just to dispel the notion that most astronomers still believe it near impossible our sun might be in orbit around a nearby star. The required speeds are not the problem. The problem is most assume this speed is actually too fast, and will result in a scenario where Barnard's simply sails past our sun with hardly any gravitational interaction.

## Perspective

Astrophysicists Mike Brown and Constantine Batygin at Caltech, in their search for a hypothetical Planet Nine, have raised awareness that certain solar system anomalies, like the unusual patterns of the dwarf planets, their orbit inclinations and bunched perihelions, require an explanation. That is why they, and many other scientists, have been looking for a hefty Ninth Planet[8], something on the order of five to ten earth masses being the latest estimate. But after many years, utilizing the best minds and best equipment in the world, the hypothesized planet remains illusive. My belief is they have been unknowingly handicapped by an archaic theory of precession that does not allow the sun to move. This means they have very little wiggle room in looking for an object responsible for producing the noted effects. Their candidate has to be

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[7] Predicting Changes in Earth Orientation Paper, AGU: https://binaryresearchinstitute.org/bri/5.9/wp-content/uploads/2022/05/Earth-Orientation-24pg-web.pdf

[8] Mike Brown, Constantine Batygin, Caltech: https://www.science.org/content/article/astronomers-searching-planet-nine-find-possible-hints-different-planet

*within* the outer reaches of the solar system. If they understood that axial precession has been greatly overstated, and the sun and entire solar system is curving through space at about 50 arc seconds per year, they and others would likely begin to look well *outside* our immediate solar system for possible solutions. This is because only a very significant mass could cause our sun to curve through space at the observed rate. This object would need to be orders of magnitude larger than the currently presumed Planet Nine. In other words, not five earth masses, but something closer to 50,000 earth masses!

If our sun does have a companion, then the gravitational force exerted by this star would also be responsible for many other solar system characteristics that we now call "anomalies". Two of the oldest include, the tilt of the planetary plane, and the sun's apparent lack of angular momentum relative to the planets, both of which have puzzled scientists for years.[9] In a binary model, another star could be tugging on the whole planetary plane, and the sun't lack of angular momentum problem would be instantly solved because the sun's angular momentum would mostly be in its larger binary motion. While not the purpose of this paper, we recommend that all known solar system anomalies be reviewed to determine if they might be solved by our sun's motion around a nearby stellar mass.

I rarely talk to other scientists about the idea that our sun might have a companion star, because they look at me strange and say, "If it did we would know it by now". Indeed, we probably would "know it" if we understood that precession theory masks the sun's motion, because then everyone would be looking for the cause of this motion. It takes something pretty big to move the sun! Other general criteria one would expect from by the astronomical community include: 1. If we were in a binary system our companion star would probably be the fastest moving star in the sky. 2. Our companion would probably be the closest star to the sun, now or very soon. 3. The companion would probably appear to be coming nearly straight towards us. And 4. "If" the orbit period is the approximate precession period, then the center of mass would likely need to be within one light year from our sun. Barnard's seems to fit these criteria, but we may find over time that Goretti's star, if it is as close as he suspected, may also good fit.

## Peculiar Motion

In the literature we find two possible reasons why Barnard's Star moves so fast: 1. Its motion is magnified because it is relatively close, and or 2. It must have come close to another star sometime in the relatively recent past, causing it to accelerate. The first is largely true. Closer objects do appear to move faster, however, the stars of the Alpha Centauri system are now much closer than Barnard's but show only a third of Barnard's motion. So mere proximity cannot be the full answer.

The second reason, is just basic physics. If Barnard's came close to another star in the recent past it would accelerate its motion via a gravitational boost. But Barnard's mystery accelerant has not yet been identified even though it should still be somewhere in the local stellar neighborhood.

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[9] Angular Momentum: https://binaryresearchinstitute.org/bri/evidence/angular-momentum/

Barnard's is presumed to be moving away from that recent close encounter so it should now be slightly decelerating (even if it is still the fastest star in the sky). But that's not what studies show.[10] Barnard's is itself now accelerating! The most logical conclusion then is that Barnard's is actually moving closer to its mystery accelerant star. But the only thing it seems to be moving closer towards right now is our very own sun! We are one of the few stars in the hood, and as Barnard's comes closer to "us" it apparently experiences more and more of our gravitational pull and moves faster! Again, Barnard's, or any other star moving towards its companion, picks up speed as the distance closes and the gravitational effect increases.

All of this is hard to get your head around if you still believe in the circular Copernican model of precession: the sun only appears to move because the axis wobbles - the axis must wobble a whole lot because the sun cannot move. All indications are the Sun really does move. Its motion of about 50 seconds of arc per year is there for everyone to see and measure. And if we look closely we will notice that it doesn't just move, it accelerates, year by year (at least in the last few hundred years when scientists have continually pushed the precession rate up - not down as required by Newton). Of course if the sun is in a companion star relationship, as Yukteswar surmised, in a roughly 24,000 year orbit, we would expect it to accelerate in the years between 500 AD and 12,500 AD as the sun, and its companion move closer together.

But if Barnard's is a real candidate how do we address the escape velocity issue? It seems to be moving too fast to be bound by the sun. While there is no easy answer it is known that many stars do in fact violate this condition. Indeed, many of the outer stars in our galaxy should have escaped its pull long ago because they either move too fast or they are too far away from other stars to be held with "normal gravity". This is why astrophysicists have put forth the theory of "dark matter". They assume that our galaxy (and all galaxies) are filled with massive quantities of undetectable dark matter (far more than visible matter). They believe it is this mysterious matter that holds things together when they would otherwise escape. Even though no one has yet discovered dark matter, it is reasoned that it must exist because without it we would need new laws of physics to explain gravitational relationships, especially at stellar scales. It's a rather inconvenient situation!

As of this writing, dark matter is still undetected, and some are losing confidence in that particular theory. But clearly "something" is causing countless number of stars to be gravitationally bound to other stars in our galaxy, and probably most galaxies. It is likely that there are forces we don't understand. These could be electromagnetic in nature, but there are still no widely accepted theories to replace dark matter. My point is, if such forces do exist at stellar scales then possibly they would also apply to our sun and any potential companion.

## Astronomical Implications

I began this work not to tackle an "astronomical problem" but rather to better understand why ancient cultures around the world tied the motion of the heavens (the phenomenon commonly known as precession) to a grand cycle of time with alternating dark and golden ages. I simply

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[10] https://ui.adsabs.harvard.edu/abs/2009AAS...21340613B/abstract

wanted to know if there might be any scientific basis for this common mythological tale of a vast cycle of time.

It is now accepted that the heliocentric system was known by several Greeks, and apparently taught by Aristarchus of Samos in 300-400 BC. But it was then lost for almost 2000 years before being resurrected by Copernicus[11]. It seemed to me that the only way that "lost" inventions like the Babylon battery, the Greek Antikythera geared device, ancient Greek optics, advanced engineering skills shown in structures like the pyramids, and heliocentric systems could have been known before the Dark Ages, then lost for thousands of years, only to be rediscovered post-Renaissance (the French term for "rebirth"), if there was some truth to this tale of a cycle.

The myth and folklore of dozens of ancient cultures tie the motion of the heavens (precession) to such a cycle of time, which indirectly produces different conditions here on earth. Just as the cycle of day and night, and the cycle of the seasons are caused by the first two celestial motions, so did the larger motion of the heavens supposedly cause a "cycle of the ages", according to the Ancients. To the Greeks, this was known as Plato's Great Year, which they broke into the Iron, Bronze, Silver and Golden ages. To the Indians, one precession cycle was one complete "Yuga" with similar phases or ages they called Kali (the darkest age), Dwapara, Treta, and Satya (their Golden Age). They even gave us the same 24,000-year cycle period, described by Manu.

A major work on this topic is *Hamlet's Mill*, by co-authors Giorgio de Santillana, the former professor of the History of Science at MIT, and Hertha von Dechend, former professor of anthropology and the History of Science at Frankfurt University. They were looking for the "origins of science" when they found multiple ancient cultures had a deep knowledge of astronomy, including the precessional "motion of the heavens," long before Hipparchus. The "Mill" in their Hamlet's Mill, is the precession cycle as seen from an ancient perspective, grinding out different ages over time.

If the Ancients were right, that this large binary motion indirectly has effects similar to the earth's first and second motions (which affect consciousness and behavior on a daily and yearly basis across the planet), then it is fair to assume that some of their myth and folklore may have a basis in fact. These are the findings of the researchers that regularly present at the Conference on Precession and Ancient Knowledge, where this topic has been studied for over 20 years.

A final interesting fact is that the Ancients, who gave us the geodetic systems we still use today for both terrestrial and celestial reference frames, apparently embedded a knowledge of the larger cycle in our daily system of time: our clocks and watches contain a microcosm of the 24,000 year cycle. Of course, the sun's motion is measured in years: 12,000 years moving towards its companion (more light), and 12,000 years moving away (less light), whereas our daily system of time is measured in hours, 12 of AM (increasing light), and 12 of PM (decreasing light), within a 24-hour day. I believe the ancient skywatchers may have understood the connection between the large motions of the heavens and life on earth much more than we do today.

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[11] Copernicus Knew of the work of Aristarchus of Samos: https://philosophy.stackexchange.com/questions/7547/is-there-any-evidence-that-copernicus-knew-of-the-heliocentric-hypothesis-elabor

This knowledge seemed to exist as late as the Roman Greco era, when the Mithraic culture spoke of a “sun beyond our sun”. Their god “Mithras” is often depicted as moving the sun through the twelve ancient constellations of the zodiac, the very observable of precession. After that the world goes into a long dark age and doesn’t come out until the renaissance.

While our sun’s motion is difficult to explain, it could be even harder to prove it is gravitationally bound to another star unless we reexamine current theories from first principles. Failure to understand the true cause of precession stands like a Gordian knot. Without unwinding its cords we don’t see our solar system’s motion, and we completely obscure the cause of any Great Year, that may exist. But if we can solve this enigma, and I’m confident we will, it won’t just affect astronomy. It will likely change our view of our place in the local stellar neighborhood, our view of history, anthropology, archaeology, and half a dozen other sciences. Just as Copernicus 500 years ago, helped us understand we live on a moving earth within in a vast solar system, setting off the Copernican revolution,  so would a larger realization that we exist in a moving solar system, heading towards another star, likely trigger a whole new way of looking at the world around us. Understanding our sun is bound to one or more nearby suns will literally bring new light!

Walter Cruttenden, September 2025

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