

Dating the Mahabharata War to 3105 BC: Astronomical references in the Ancient Texts of India

The Mahabharata eclipses is about a very rare astronomical occurrence of 13 days between eclipses that is registered in the ancient Mahabharata epic of India. Thanks to the information recorded in antiquity by astronomer priests in the Mahabharata epic, we can today recompose the dates in which the historical clash between the Kurus and Pandavas took place.

Dr. S Balakrishna¹ estimated that the rare occurrence of 13 days between eclipses related in the refers to an actual astronomical event witnessed initially on **Aug. 11, 3129 BC** from the location of **Kurukshetra, India, (30 N, 77 E)**.



The method used by Dr. Balakrishna in order to determine the historical date of the Mahabharata War of ancient India is very ingenious and shows how important astronomical information can be from an archeological point of view in recomposing our human history.

The ancient scriptures of the Mahabharata speak of a rare astronomical phenomenon which is the sighting of two successive eclipses with only a 13 day interval between them. Since the moon needs to revolve at least half way around the Earth before another eclipse may occur, it is generally between 14 and 15 days before the Sun, Earth, and Moon are configured to produce subsequent eclipses, but the text of the Mahabharata epic speaks of the rare occurrence of only 13 days of interval between eclipses. The phenomenon is noted in the text to be rare, and it is clearly not a mistake or a slip in the relation.

What Dr. S. Balakrishna has done is pinpoint several moments when this phenomenon can in fact occur according to the modulations and variations of the Moon's orbital parameters. His analysis, Dr. Balakrishna shows that although there are many candidates for the

occurrence in our history, one needs to be reminded that the actual observation was made in India, and in a specific geographic location, and this diminishes the candidates quite considerably. Since many of the 13-day anomaly possibilities could not be observed from Kurukshetra, Dr. Balakrishna singled out the solar eclipse of **Aug. 11, 3129 BC and the following Lunar Eclipse of Aug 25 which occurs before the 14th sunrise.**²

Now, in studying Dr. Balakrishna's work carefully, we will appreciate that this dating of 3129 BC for the Mahabharata eclipses has two important problems. First, the lunar eclipse of Aug 25, 3129 BC is

¹ <http://www.vedicastronomy.net/mahabharatha.htm>

² The idea of 13 days means 13 sunrises, so the Lunar eclipse occurs before the 14th sunrise.

not visible from Kurukshetra as it occurs below the horizon, and second, the Mahabharata text offers a number of further astronomical details which do not fit the dates proposed by Dr. Balakrishna.

For example, **the astronomical references given by the Mahabharata text³ explicitly state that Jupiter and Saturn are in conjunction under the same constellation, and this was the first sign of trouble in Balakrishna's correlation.** In the year 3129 BC—where Dr. Balakrishna sets the 13 day eclipse anomaly- there was no Jupiter-Saturn conjunction, and we also see that the mention of Mars near the star Regulus in the Mahabharata script is also missing in this correlation, In fact practically all the astronomical references are ignored and different from the texts in the 3129 BC correlation.

There are a number of details referring to planetary positions given by the texts and none of them match the date provided by Dr. Balakrishna. Hence we decided to continue on Dr. Balakrishna's work, and we paid special attention to the description of Jupiter and Saturn in conjunction since it was used by the Gupta period astronomer Aryabhata to determine the approximate date of 3102 BC for the Mahabharata War. However, we observed that the most important Jupiter-Saturn conjunction in the constellation of Capricorn according to the texts falls on a date of December 7, **3105 BC**. This information about the position of Jupiter and Saturn is crucial in determining dates in long-term periods like the *yugas* of India because they allow us to pinpoint the precise year in which the astronomical event was observed.

Next we describe a synthesis of the astronomical information provided in the Mahabharata texts, but translated to western astronomical terms:

1. *Ascending Lunar Node approaches the Sun.*
2. *Descending Lunar Node beyond Spica (α Virgo).*
3. *A Fierce Comet rises in Cancer.*
4. *Mars around Regulus (α Leo).*
5. *Jupiter in Capricorn.*
6. *Saturn in Capricorn.*
7. *Venus near α Andromeda.*
8. *Venus and Mars in conjunction under Pegasus (Pisces in the Zodiac).*
9. *Descending Lunar Node in Scorpio.*
10. *Pole Star is blazing fiercely (α Draconis at the time)*
11. *Moon and Sun near α Taurus.*
12. *Mars in Cancer and in opposition to Jupiter Capricorn.*
13. *Jupiter and Saturn stationary in Libra.*
14. *13 Days between Eclipses.⁴*

As we can see, the 13 day eclipse is only one among many astronomical references that allow us to know what time it was when the Mahabharata war took place about 5000 years ago. The analysis of the text clearly shows that **the scripture dates several astronomical events, not one single event, and herein is the true genius of the description of the ancient texts.**

If the texts were to determine one single planetary configuration, then looking for this event would be practically impossible, but since the Mahabharata texts give *several* planetary configurations for the same planets, we are helped in pinpointing a more certain location in time where we must look.

³ These 18 pieces of data are analyzed in depth at the end of this work and are presented so the reader who is curious might corroborate the information with astronomical software.

⁴ This information is later presented in greater detail and in 18 different pieces of data.

In order to find the date, one needs to search for a matching planetary configuration along with the 13-day eclipse anomaly.

For example, the notion of a fierce comet in Cancer is most probably referring to the most famous of comets: the one we know today as Halley's Comet. This comet is known to make itself recurrently visible in the constellation of Cancer after it returns from its long parabolic orbit around the Sun. Its period is between 75 and 76 years, so the sight of Halley's Comet is literally a once in a lifetime event. As we see in the in depth analysis of the data at the end of this work, this sighting of Halley's Comet 5000+ years ago may be calculated to have happened sometime around 3105 BC with some degree of error which is somewhat considerable and clearly insufficient to settle a date. But since there are clear planetary configurations that need to be met, the uncertainty factor will hopefully be diminished until we can speak of a match of all or at least an abundant majority of the events described.

Mars, for example, has three different positions in the texts: one in Leo (4), another in Cancer (12), and another in conjunction with Venus (8). The latter is said to have occurred in our Zodiac sign of Pisces, and this indeed happened on April 4, 3106 BC. Later, in time, in the year 3105 BC, Mars would circle around the Zodiac passing through Cancer to reach its fundamental location in Leo as is suggested by point (4).

Jupiter and Saturn are mentioned to have two locations, and as we already mentioned, this is essential in knowing the period in question is correct. The description of points 5 and 6 fit the gas giants in Capricorn while the other (13) is in Libra. **Knowing about the triangular configuration of conjunctions between Jupiter and Saturn, it is easy to see that the Great Conjunction of Jupiter and Saturn according to the text of the Mahabharata epic was falling in the Zodiac Signs of Capricorn, Libra, and Taurus. These Great Conjunctions happened in the years 3144 BC (Libra), 3124 BC (Taurus), and 3105 BC (Capricorn).**

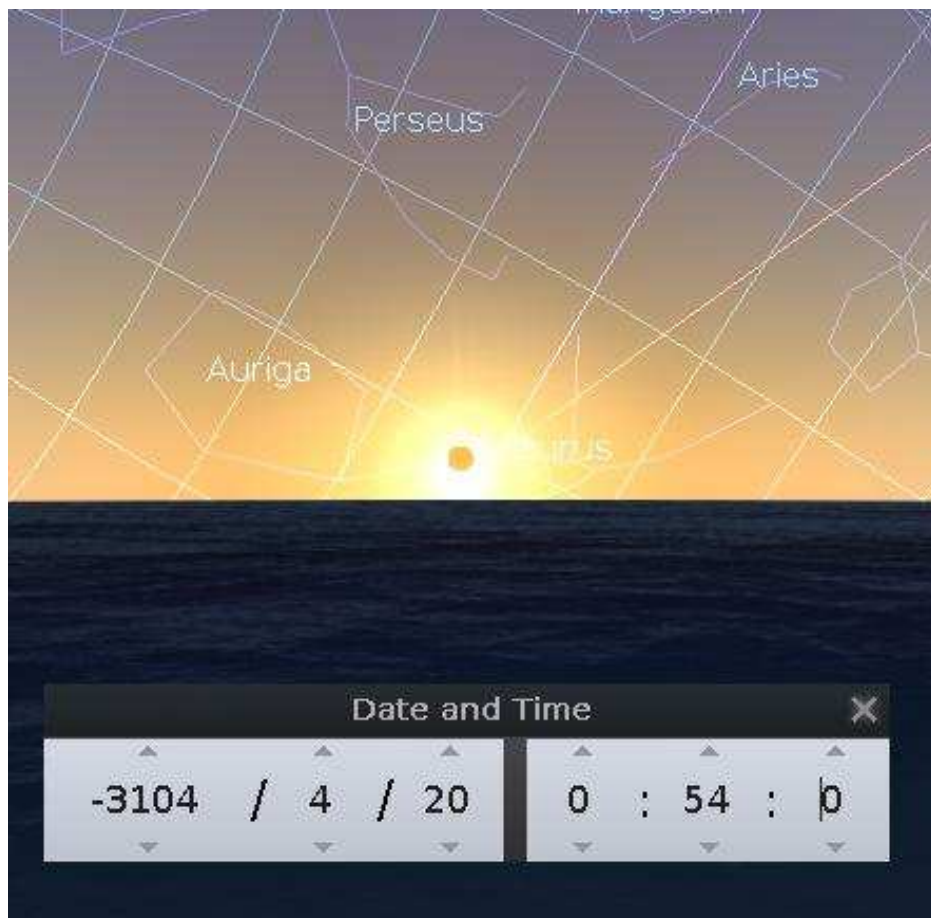
With this information we can attain the date for the switch of the Age in the traditional history of India with an accuracy pinpointing the year, but the last piece of data about the 13 day eclipse phenomenon allows us to find the very month and day of the sighting. As we have seen quite briefly, the position of Mars near the star Regulus (α Leo) in 3105 BC and the Great Conjunction between Jupiter and Saturn in Capricorn which also falls in 3105 BC point to the fact that this is probably the year of the phenomenon. But did the 13-day eclipse anomaly occur in this year? The answer is yes, and in perfect conditions which allow for both the solar and lunar eclipses to be sighted from Kurukshetra, India (30 N, 77 E).

The texts says (11) that the Sun and Moon are to be located in Taurus, or more precisely, next to the star Aldebaran (α Taurus) which is the eye of the Zodiacal Bull. This Soli-Lunar reference gives us a notion of where the Solar Eclipse took place in the Zodiac, and it moreover shows us the place of the year which is during the first Full Moon after the Vernal Equinox.⁵

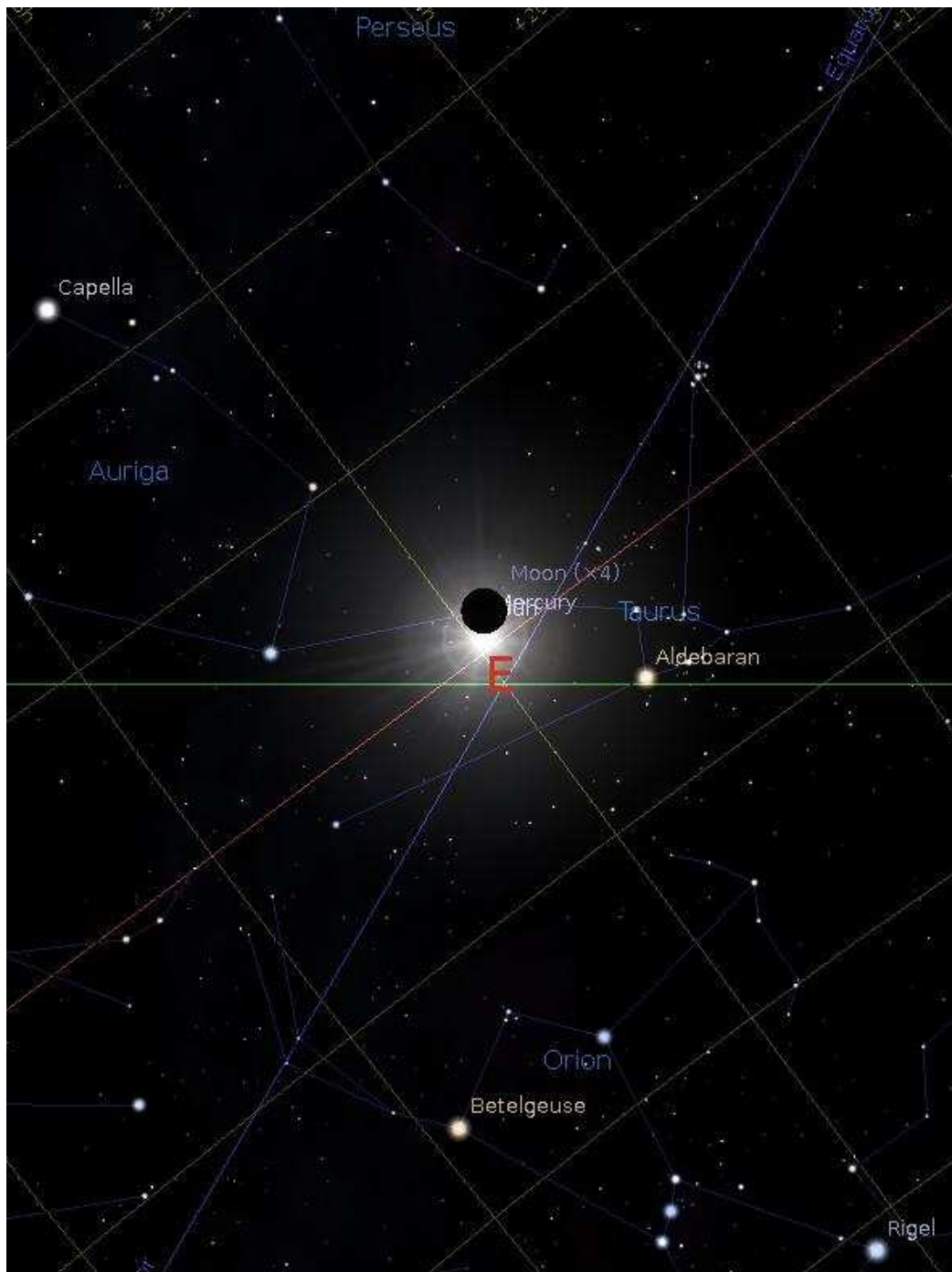
One more piece of evidence in the texts hinted that the 13 day eclipse occurred "from the first lunation", that is, on the first New Moon after the Vernal Equinox, and with all this information at hand, it was not all that difficult to locate the precise date given in the Mahabharata texts.

⁵ The Vernal Equinox was placed in Taurus 5000 years ago which confirms that the date in question is neither more recent nor older than 5000 years before our time.

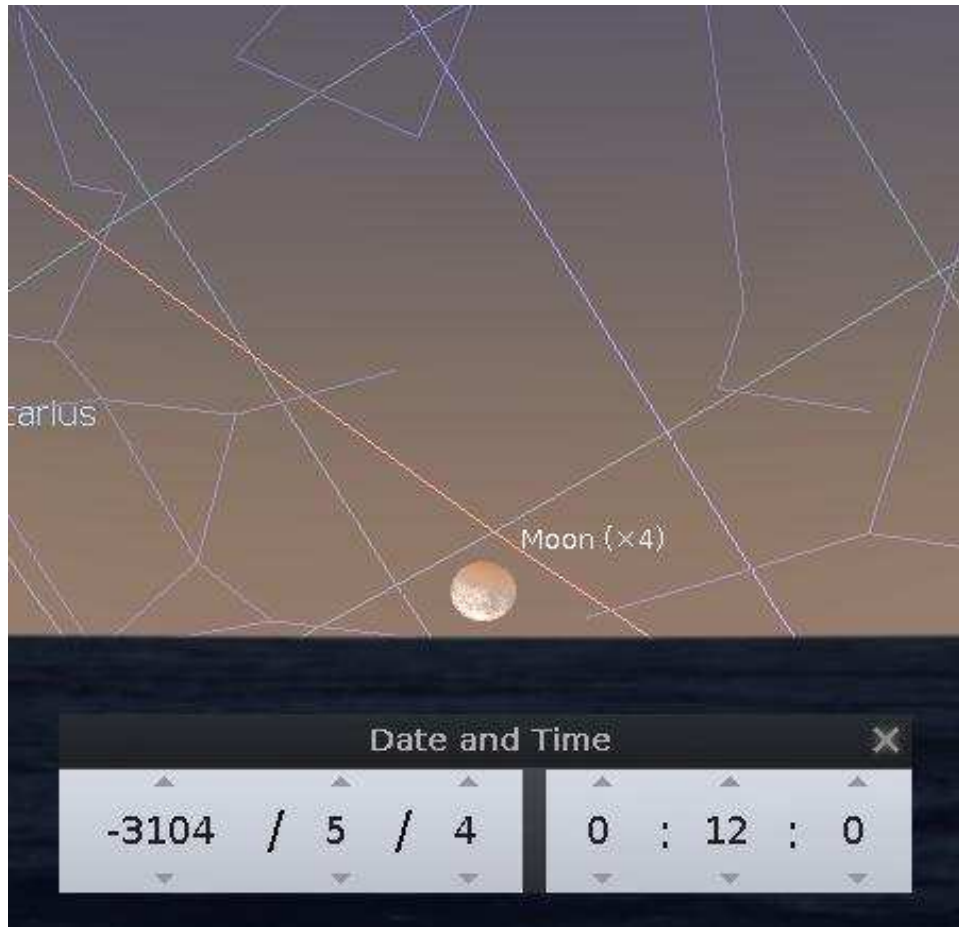
We stand at the geographical location of Kurukshetra, India on **April 20, 3105 BC**. It is the first New Moon after the Vernal Equinox where the indicated Solar Eclipse is indeed seen to occur right at the break of dawn as modern astronomical software *Stellarium* shows. The Sun rises that day partially eclipsed by the Moon, and, as expected, and in complete accordance to the indications of the Mahabharata texts, there are precisely 13 days between this Solar Eclipse and the next Lunar Eclipse of May 4 which occurs right before the 14th sunrise. On May 4, 3105 BC (third image), the shadow of the Earth partially eclipses the Moon as it comes to descend below the horizon, offering any astronomer of the time the unique opportunity to actually witness two eclipses within the margin of a 13 day (sunrise) interval.



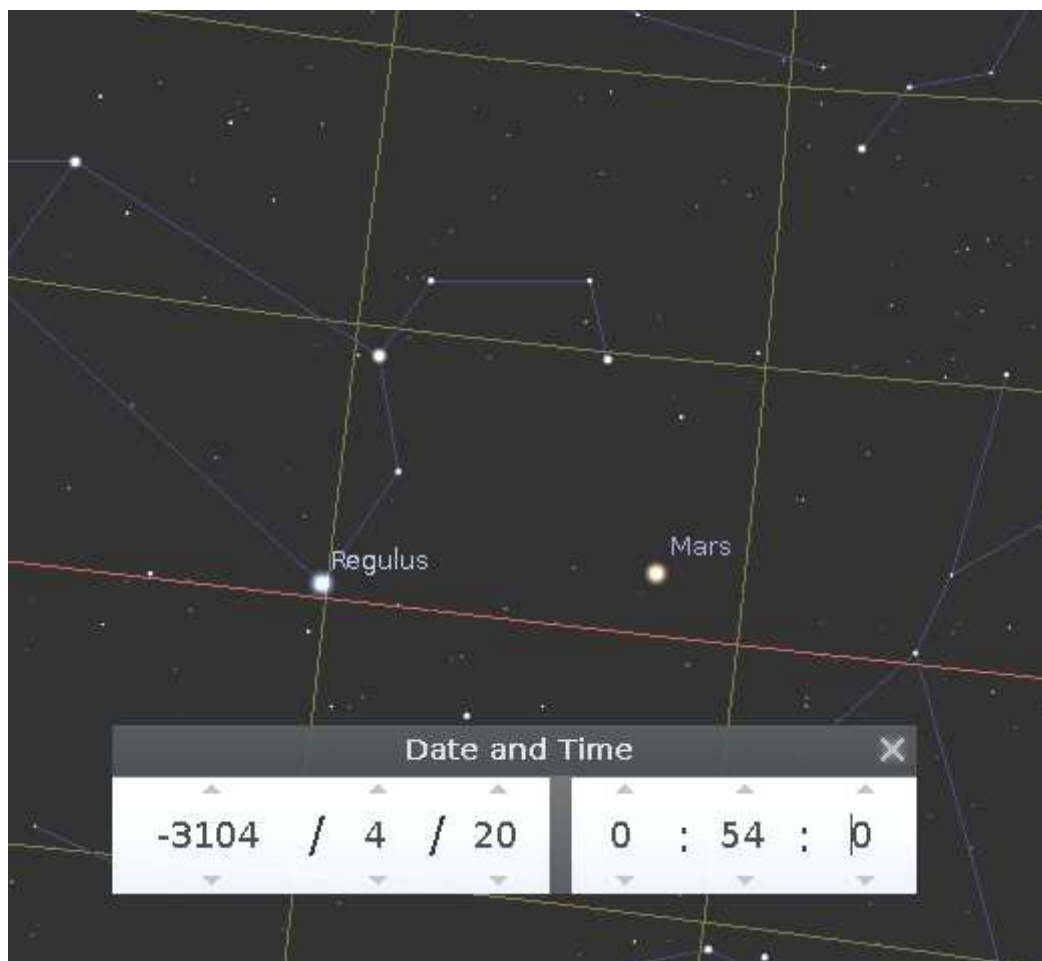
Simulation of the sunrise at Kurushethra, India, on April 20, 3105 BC (or -3104 in astronomical year dating). The sun rises eclipsed in the morning and the moment of maximum eclipse is just a couple of hours later in the morning.



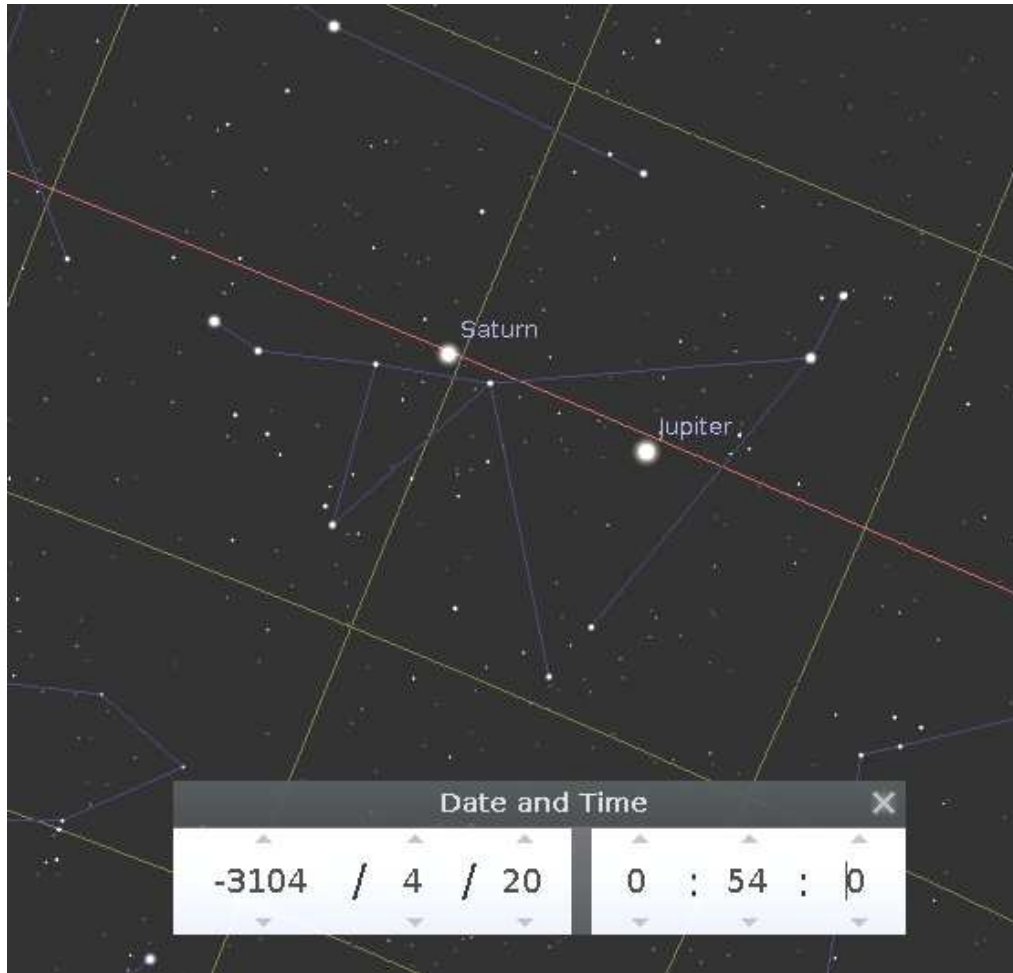
The solar eclipse occurs in Taurus. The eye of the celestial bull, the star Aldebaran, marks the location of the equinox point and the Hindu asterism or nakshatra named Rohini. The eclipse occurs in Rohini as the original text says, but also on the first new moon of the year as the Mahabharata text also specifies. The sun has just crossed the point of equinox which is the intersection of the equatorial plane (blue) and ecliptic plane (red), and so this eclipse is occurring on the first new moon of the year.



Right before the 14th sunrise, the Moon begins to be overshadowed by the Earth just before it descends below the horizon, and this makes for the Lunar Eclipse falling within 13 days (sunrises) according to the testament of the Mahabharata.



An important part of the astronomical data is the proximity of Mars to the star Regulus or α Leo. Here we can appreciate how the date of the 13-day eclipse anomaly correctly places Mars in this location as the ancient text stipulates.



Another one of the most important clues in the ancient text is the position of Jupiter and Saturn. Here, at the moment of the solar eclipse, both are in Capricorn as the text suggests, and they will come into conjunction later in the same year, on December 7.

An in-depth look at the astronomical references in the Mahabharata text

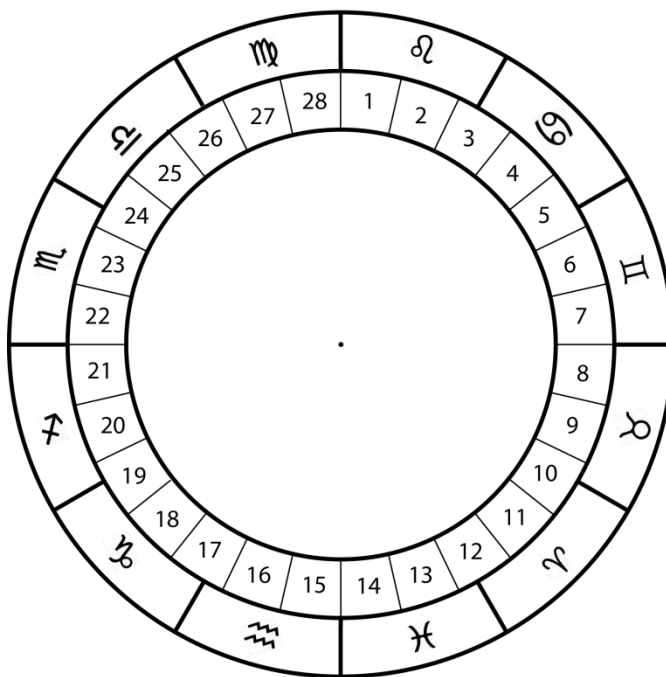
The information regarding the Mahabharata eclipse dated to Apr. 20, 3105 BC (JD 587432) is found in books 5 and 6 of the Mahabharata Epic which are called the Udyoga Parva and Bhishma Parva.

In this following exposition of the data offered by these ancient texts, we will first quote the content itself from the English translation by Kisari Mohan Ganguli published between 1883 and 1896. Afterwards we will isolate the astronomical references in sentences and show their corresponding dates according to the astronomical phenomena they describe.

We must keep in mind that the text uses technical terminology from Hindu astronomy, so we cannot expect very clear references to zodiac positions, because the Hindu astronomers used a system of 28 constellations called *nakshatras* instead of the 12 zodiac constellations that we inherited in the west through the Mesopotamians and Egyptians.

The 28 nakshatras of ancient Hindu astronomy are fixed in accordance to the lunar orbital plane and not the ecliptic plane, so at times the analogy to western astronomy includes constellations which are not of the zodiac although they are right besides these constellations. For example, the Pegasus, Orion, and Aquila constellations are part of the nakshatra system and they are not in the zodiac. Thus, in order to translate the nakshatra coordinates, the best thing to do is note the particular stars which constitute that nakshatra. In the next page we encounter the correspondances between Hindu nakshatras and the zodiac system.

Nakshatras and Zodiac



N°	Name	Stars
1	Uttara Phalguni	Denebola
2	Purva Phalguni	δ and θ Leo
3	Magha	Regulus
4	Ashlesha	δ, ε, η, ρ, and σ Hydra
5	Pushya	γ, δ and θ Cancer
6	Punarvasu	Castor & Pollux
7	Ardra	Betelgeuse
8	Mrigashira	λ, φ Orion
9	Rohini	Aldebaran
10	Krittika	Pleiades
11	Bharani	35, 39, and 41 Aries
12	Ashwini	β and γ Aries
13	Revati	ζ Piscium
14	Uttara Bhadrapada	γ Pegasus & α Andromeda
15	Purva Bhadrapada	α and β Pegasus
16	Shatabhisha	γ Aquarii
17	Dhanishta	α to δ Delphini
18	Shravana	α, β and γ Aquila
19	Abhijit	α, ε and ζ Lyra - Vega
20	Uttara Ashadha	ζ and σ Sagittarius
21	Purva Ashadha	δ and ε Sagittarius
22	Mula	ε, ζ, η, θ, ι, κ, λ, μ and ν Scorpio
23	Jyeshtha	Antares
24	Anuradha	β, δ and π Scorpio
25	Visaka	α, β, γ and ι Libra
26	Swati	Arcturus
27	Chitra	Spica
28	Hasta	α, β, γ, δ and ε Corvi

*The reader will note that the clockwise numbering runs opposite the direction of the Sun and Moon during the year. Hence, the Nakshatras are listed here in their inverse order but nevertheless correspond to their Zodiacal location.

Source:

Book 5, Udyoga Parva, section CXLII (143) states:

“That fierce planet of great effulgence, Sanaishara (Saturn), is afflicting the constellation called Rohini [α Taurus], in order to afflict greatly the creatures of the earth. The planet Angaraka (Mars), wheeling, O slayer of Madhu, towards the constellation Jeshthya [α Scorpio], approacheth towards Anuradhas [Retrograde towards Libra], indicating a great slaughter of friends. Without doubt, O Krishna, a terrible calamity approacheth the Kurus when specially, O thou of Vrishni's race, the planet Mahapat afflicteth the constellation Chitra [α Virgo]. The spot on the lunar disc hath changed its position; and Rahu also approacheth towards the sun.”

Analysis of the text:

1) *That fierce planet of great effulgence, Sanaishara (Saturn), is afflicting the constellation called Rohini [α Taurus]...*

Here it says that Saturn is near the star α Taurus which is also known in western astronomy as Aldebaran. This occurred in 3125 BC, and as Saturn takes about 30 years to cross the zodiac, it may be found to recur in that time either forwards or backwards.

2) *The planet Angaraka (Mars), wheeling, O slayer of Madhu, towards the constellation Jeshthya [α Scorpio], approacheth towards Anuradhas [Retrograde towards Libra]*

Now the text says that Mars is in retrograde motion because it is said to move from Jeshthya to Anuradhas, that is, from α Scorpio or Antares towards β Scorpio which is the inverse path along the ecliptic. Mars was retrograde in this location between Mar. 5 and May 6 of the year 3114 BC.

3)... the planet Mahapat afflicteth the constellation Chitra [α Virgo].

Saturn, now named as Mahapat, was in Chitra which is the nakshatra of α Virgo or Spica when Mars was retrograde in 3114 BC. Hence this third description is contemporary with the second regarding Mars.

4) *The spot on the lunar disc hath changed its position; and Rahu also approacheth towards the sun.*

Rahu, the Ascending Lunar Node was located at this time in between the Gemini and Taurus signs. There had been a Solar Eclipse on Apr. 30, 3114 BC, followed by a Lunar Eclipse on May 13. The idea that Rahu “approaches the Sun” comes from the fact that the nodes themselves revolve around the ecliptic while the Sun is moving during the year. However, this statement seems quite useless as this happens all the time. What this surely means is that the Ascending Lunar Node (Rahu) was about to coincide with the Vernal Equinox point (the Ascending Solar Node). And in fact this occurred in Jul. 20, 3114 BC.

Book 6, the Bhishma Parva, section III (3) states:

...The earth is frequently trembling, and Rahu approacheth towards the sun. The white planet (Ketu) stayeth, having passed beyond the constellation Chitra [α Virgo]. All this particularly bodeeth the destruction of the Kurus. A fierce comet riseth, afflicting the constellation Pusya [Cancer]. This great planet will cause frightful mischief to both the armies. Mars wheeleth towards Magha [α Leo] and Vrihaspati (Jupiter) towards Sravana [Aquila/Capricorn]. The Sun's offspring (Sani) approaching towards the constellation Bhaga, afflicteth it. The planet Sukra [Venus], ascending towards Purva Bhadra [α Pegasus/Pisces], shineth brilliantly, and wheeling towards the Uttara Bhadra [α Andromeda/Pisces], looketh towards it, having effected a junction (with a smaller planet). The white planet (Ketu), blazing up like fire mixed with smoke, stayeth, having attacked the bright constellation Jeshtha [α Scorpio] that is sacred to Indra. The constellation Dhruva [Polar Star], blazing fiercely, wheeleth towards the right. Both the Moon and the Sun are afflicting Rohini [α Taurus]. The fierce planet (Rahu) hath taken up its position between the constellations Chitra [α Virgo] and Swati [α Bootes]. The red-bodied (Mars) possessed of the effulgence of fire, wheeling circuitously, stayeth in a line with the constellation Sravana [α Aquila/Capricorn] over-ridden by Vrihaspati [Jupiter].

(...)

Those two blazing planets, viz., Vrihaspati and Sani [Jupiter and Saturn], having approached the constellation called Visakha [α Libra], have become stationary there for a whole year. Three lunations twice meeting together in course of the same lunar fortnight, the duration of the latter is shortened by two days. On the thirteenth day therefore, from the first lunation, according as it is the day of the full moon or the new moon, the moon and the sun are afflicted by Rahu. Such strange eclipses, both lunar and solar, forebode a great slaughter.

(...)

Rahu of fierce deeds is also, O monarch, afflicting the constellation Kirtika [the Pleyades]. Rough winds, portending fierce danger, are constantly blowing. All these beget a war characterized by many sad incidents. The constellations are divided into three classes. Upon one or another of each class, a planet of evil omen has shed its influence, foreboding terrible dangers. A lunar fortnight had hitherto consisted of fourteen days, or fifteen days (as usual), or sixteen days. This, however, I never knew that the day of new-moon would be on the thirteenth day from the first lunation, or the day of full-moon on the thirteenth day from the same. And yet in course of the same month both the Moon and the Sun have undergone eclipses on the thirteenth days from the day of the first lunation. The Sun and the Moon therefore, by undergoing eclipses on unusual days, will cause a great slaughter of the creatures of the earth.

Analysis of the text:

5) Rahu approacheth towards the sun. The white planet (Ketu) stayeth, having passed beyond the constellation Chitra [α Virgo].

Naturally, this means that the Descending Lunar Node (Ketu) passed beyond Spica. This was already so in 3114 BC as we noted before.

6) A fierce comet riseth, afflicting the constellation Pusya [Cancer]. This great planet will cause frightful mischief to both the armies.

This comet is difficult to identify. It could be Halley's Comet (1P/Halley) which has a period of 75-76 years. Halley's comet became visible to us for the last time in 1986, but it was seen by Petrus Apianus in 1531, Johannes Kepler in 1607, and Edmond Halley in 1682.

Going back by steps of 76 years (from 1531), the closest date to 3114 BC is **3106 BC**. Counting back from 1682 we get **3105 BC**... By 75 year steps we get 3120 BC.

Halley's comet is believed to have been identified by Chinese astronomers in 240 BC, and counting back with 76 year periods from that date, we would find a date of -3126 BC. By 75 year periods we get 3128 BC.

Even though these estimations are weak, it is a fact that Halley's Comet is seen in the constellations of Cancer and Leo.

7) Mars wheeleth towards Magha [α Leo] and Vrihaspati (Jupiter) towards Sravana [Aquila/Capricorn].

This detail of both Mars and Jupiter allows us to notice that it was *not* the next arrival of Mars to α Leo or Regulus in 3113 BC, because in this year Jupiter was in Taurus (Rohini). The simple fact that Jupiter should be in Sravana (Capricorn) according to the text allows us to see that the date corresponds to 3105 BC. Mars was indeed in Magha (α Leo/Regulus) at that time.

8) The Sun's offspring (Sani) approaching towards the constellation Bhaga, afflicteth it.

Here, Shani is Saturn, the "son" of Surya, the name for the Sun in Hindu astrological mythology. The Bhaga constellation is the name for the planet's ruling mansion which is traditionally Capricorn. We will notice that this was just mentioned to be the location of Jupiter which is the next Nakshatra but still in Capricorn. The proximity of the planets alerts us of a proximate date where there is a Great Conjunction between Jupiter and Saturn.

Here is a significant confirmation that the year is 3105 BC, as it was in this year, on Dec. 6-7 that the Great Conjunction between Jupiter and Saturn occurred in Capricorn. This is one of the strongest indications of the year 3105 BC, as another encounter between Jupiter and Saturn in Capricorn does not occur for another 60 years. This is a perfect example of narrowing down dates in long scales of time by Jupiter Saturn conjunctions. Whoever recorded that date clearly knew this and allowed for a clear chance to reconstruct a date according to planetary configurations.

It is important to add on this point that the text is not describing the conjunction but the proximity of Jupiter and Saturn, and this configuration is precisely the one that is observed in reference to the 13-day eclipses.

9) The planet Sukra [Venus], ascending towards Purva Bhadra [α Pegasus/Pisces], shineth brilliantly, and wheeling towards the Uttara Bhadra [α Andromeda/Pisces], looketh towards it, having effected a junction (with a smaller planet).

This describes Venus' approach to Pisces which begins right on the very first day of year 3105 BC, and culminates on Jan. 28, 3105 BC with the approximation of Mercury.

On the other hand, this could be a description of a prior conjunction between Venus and Mars in Purva Bhadrapada and Uttara Bhadrapada (Pisces) which occurred on Apr. 3, 3106 BC, about 9 months earlier than the previous possibility.

10) *The white planet (Ketu), blazing up like fire mixed with smoke, stayeth, having attacked the bright constellation Jeshtha [α Scorpio] that is sacred to Indra.*

Here there is an anomaly in the description, because it states that Ketu, the descending lunar node should be in Scorpio, when it is the precise opposite: Rahu is in Scorpio. In fact, the Apr. 20, 3105 BC solar eclipse occurs on the *descending* lunar node which is traditionally Ketu, not Rahu.

However, this could be a reference to the Descending Solar node or Autumnal Equinox point which was by then in Jeshtha, but the confusion between lunar nodes continues in other statements as we will see.

11) *The constellation Dhruva [Polar Star], blazing fiercely, wheeleth towards the right.*

The Dhruva constellation is the name for the North Celestial Pole, which at that time when the Vernal Equinox was in Taurus, was the Draco constellation. The Polar Star in 3105 BC was of course Thuban or α Draconis. The “wheeling towards the right” says nothing as it happens every night because of the Earth’s own rotation...

But this observation could be a reference to the precession of the equinoxes which is also observed by the shifting of the North Celestial Pole.

12) *Both the Moon and the Sun are afflicting Rohini [α Taurus].*

Here the Sun and Moon are said to be in Taurus, more precisely in α Taurus which is the star Aldebaran. It is precisely here that the Apr. 20, 3105 BC solar eclipse will occur.

13) *The fierce planet (Rahu) hath taken up its position between the constellations Chitra [α Virgo] and Swati [α Bootes].*

Here, once again, the reference to Rahu (the ascending lunar node) is conflicting. It positions the ascending lunar node in Virgo, (a bit into Libra actually). The problem is that during the Apr. 20, 3105 BC eclipse this lunar node was in Scorpio, so this piece of data refers to some time after the event of the eclipse or some time before it. If it is a reference to a time after 3105 BC, it would be 3100 BC, while if it were a reference to a time before 3105 BC it would have to be in 3120 BC when the ascending node was at this location. As we pointed out earlier, the data in consideration to the lunar nodes is conflicting.

Perhaps the “fierce planet” is not a lunar node at all. We can see that the clarification of it being Rahu, the lunar node is made by the translator in parenthesis... But the only object that appears in this location is Pallas: the large asteroid discovered in 1802 AD. It appeared in December of 3105 BC at this location of α Virgo, but it is highly improbable that this object would have been observed with the naked eye.

14) *The red-bodied (Mars) possessed of the effulgence of fire, wheeling circuitously, stayeth in a line with the constellation Sravana [α Aquila/Capricorn] over-ridden by Vrihaspati [Jupiter].*

Here there is a description of the opposition between Mars in Cancer and Jupiter in Capricorn. Mars entered Cancer in March 17, 3105 BC and approached the constellation or nakshatra of Ashlesha (opposite to Shravana) on April 5, 3105 BC, only a few days before the solar Eclipse of April. 20.

15) *Those two blazing planets, viz., Vrihaspati and Sani [Jupiter and Saturn], having approached the constellation called Visakha [α Libra], have become stationary there for a whole year.*

Now there is a Great Conjunction between Jupiter and Saturn in Libra. This would have occurred in the years 3144 BC or 3084 BC. In both occasions the planets held their positions in Libra for a year.

This piece of information is important because it shows that the astronomers recording these facts knew of the triangular disposition of the Great Conjunction cycle.

16) *Three lunations twice meeting together in course of the same lunar fortnight, the duration of the latter is shortened by two days. On the thirteenth day therefore, from the first lunation, according as it is the day of the full moon or the new moon, the moon and the sun are afflicted by Rahu. Such strange eclipses, both lunar and solar, forebode a great slaughter.*

Here is the first mention to the anomalous 13 day interval between eclipses. Once again the mention to Rahu (the ascending lunar node) seems strange although it is obviously involved in the lunar eclipse of May 4 that follows the solar eclipse of April 20, 3105 BC. Nevertheless, it seems that the nodes are switched and the following passage confirms this.

17) *Rahu of fierce deeds is also, O monarch, afflicting the constellation Kirtika [the Pleyades]. Rough winds, portending fierce danger, are constantly blowing. All these beget a war characterized by many sad incidents. The constellations are divided into three classes. Upon one or another of each class, a planet of evil omen has shed its influence, foreboding terrible dangers.*

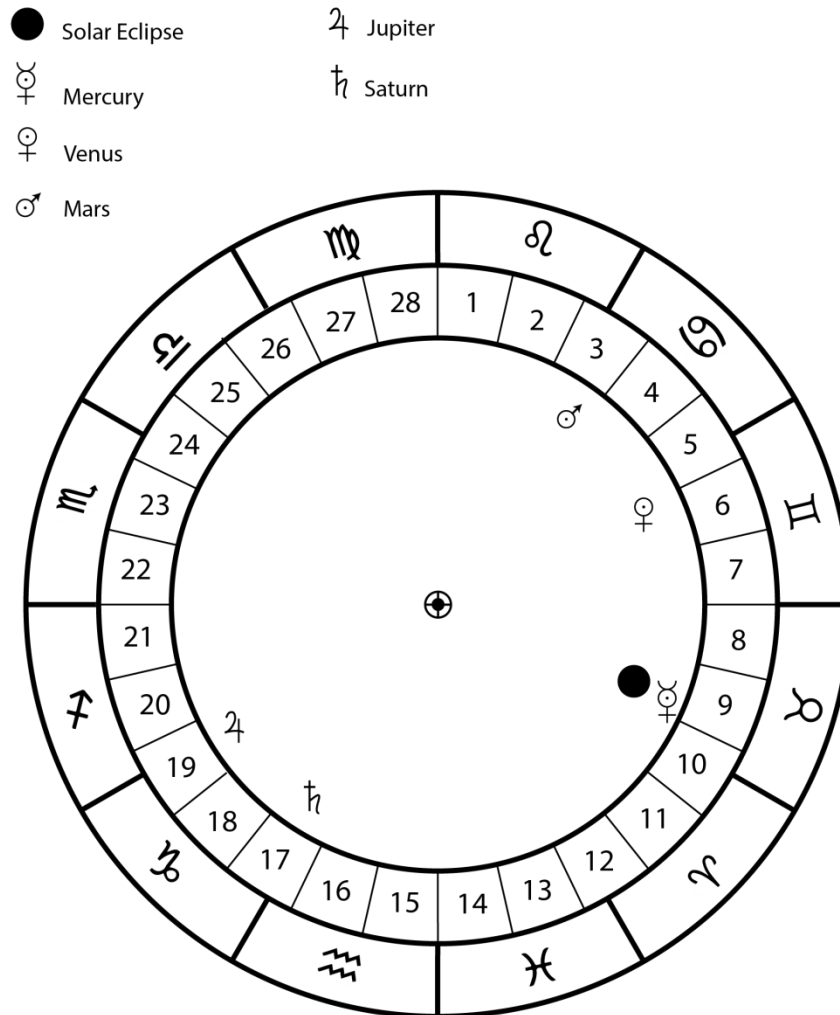
Here the ascending lunar node Rahu is said to be in the Pleyades, Krittika. Once again the nodes are switched around. Knowing that the lunar nodes complete a 360° cycle in 18.6 years, one could search for another situation in periods of 9.3 years different than that of 3105 BC in order to have the nodes aligned in the manner which the text supposes. However, after performing an extensive search for such an alternative possibility, it became clear that it was not the case. First of all, the eclipses were invisible to the location of Kurukshetra, and the other problem was that none of the other planetary formulas coincided at all. Thus we have come to the conclusion that *Rahu* was not considered an ascending or descending lunar node, but rather a lunar node without the ascending or descending connotation.

18) *A lunar fortnight had hitherto consisted of fourteen days, or fifteen days (as usual), or sixteen days. This, however, I never knew that the day of new-moon would be on the thirteenth day from the first lunation, or the day of full-moon on the thirteenth day from the same. And yet in course of the same month both the Moon and the Sun have undergone eclipses on the thirteenth days from the day of the first lunation. The Sun and the Moon therefore, by undergoing eclipses on unusual days, will cause a great slaughter of the creatures of the earth.*

It is worth noticing here that besides the remark of an unusual 13 day period between eclipses, there is also the mention to the “first lunation” which means the first of the year. The year had begun with the Vernal Equinox: Apr. 16, 3105 BC. Only four days later, on Apr. 20, the first new moon of the year was a solar eclipse, and the full moon turned into a lunar eclipse 13 days later.

Now, after analyzing these 18 points where astronomical data is provided in the Mahabharata, it became very clear that the 13 day anomaly should be searched for in the year 3105 BC. However, we would like to point out that the problem of the lunar nodes is a problem only when we consider that the text refers to Rahu as an ascending lunar node as is commonly interpreted by later astronomical texts of India. However, when we carefully read section 16), we will see that it says that both the Sun and Moon are affected by Rahu. Also, the descending lunar node which is Ketu only appears in parenthesis as a clarification by the translator when the text mentions a “white planet”. In any case, the alignment of the lunar nodes is between Scorpio and Taurus as it is mentioned in sections 10) and 17).

Planetary configuration on April 20, 3105 BC.



Conclusion

Now, the data, in synthesis, goes as follows. Items 1-5 indicate earlier astronomical events. Item **1)** gives a reference to 3125 BC, while Items **2) to 4)** from the Udyoga Parva, the fifth Book of Mahabharata gives dates for events occurring in 3114 BC. The first item from the Bhishma Parva, which is Book 6 of the Mahabharata is a vague reference to a moment in 3113 BC.

Then comes the mention to the comet in item **6)**, which as we have seen could be indicative of the year 3105 BC. Item **7)** which speaks of precise positions for Mars and Jupiter confirm the year 3105 BC, when Mars is near the star Regulus and Jupiter is in Capricorn. Item **8)** again confirms this year 3105 BC by stating that Saturn was also in Capricorn.

Item **9)** gives a position for Venus which could be 3105 or 3106 BC. Item **10)** makes a mention to a lunar node in Scorpio which is true for the year 3105 BC, and item **11)** makes a remark to the pole star.

Item **12)** speaks of the Sun and Moon in Taurus, precisely where the eclipse of Apr. 20, 3105 BC occurs. Item **13)** is a confusing remark about a “fierce planet” in Virgo which the translator clarifies to be a lunar node... Item **14)** again confirms the year 3105 BC by positioning Mars and Jupiter in opposition in Cancer and Capricorn respectively.

Item **15)** speaks of a Great Conjunction between Jupiter and Saturn in Libra which must have occurred either on 3144 BC or 3084 BC, and finally, items **16)**, **17)**, and **18)** mention the rare 13 day period between eclipses.

Now, the reality of the issue in the end concerns the eclipses themselves and the fact that they should fall within a 13 day margin from one another. But that is not all the necessary requisites. The eclipses must also be observable from the geographic location of Kurukshetra which is 30°00' N, 76°50' E.

As we have shown, there seems to be overwhelming evidence showing that Mahabharata texts relate astronomical data fitting a time for a solar eclipse that occurred on **April 20, 3105 BC**. This astronomical data confirms the less accurate dating estimates of Aryabhata (3102 BC)⁶ and Dr. S. Balakrishna (3129 BC), but it is clear that the matches for the astronomical information pinpoint a more specific date of April 20, 3105 BC.

⁶ Burgess, E., *Translation of the Sûrya-Siddhânta: A Text-book of Hindu Astronomy* (1860), p.18.