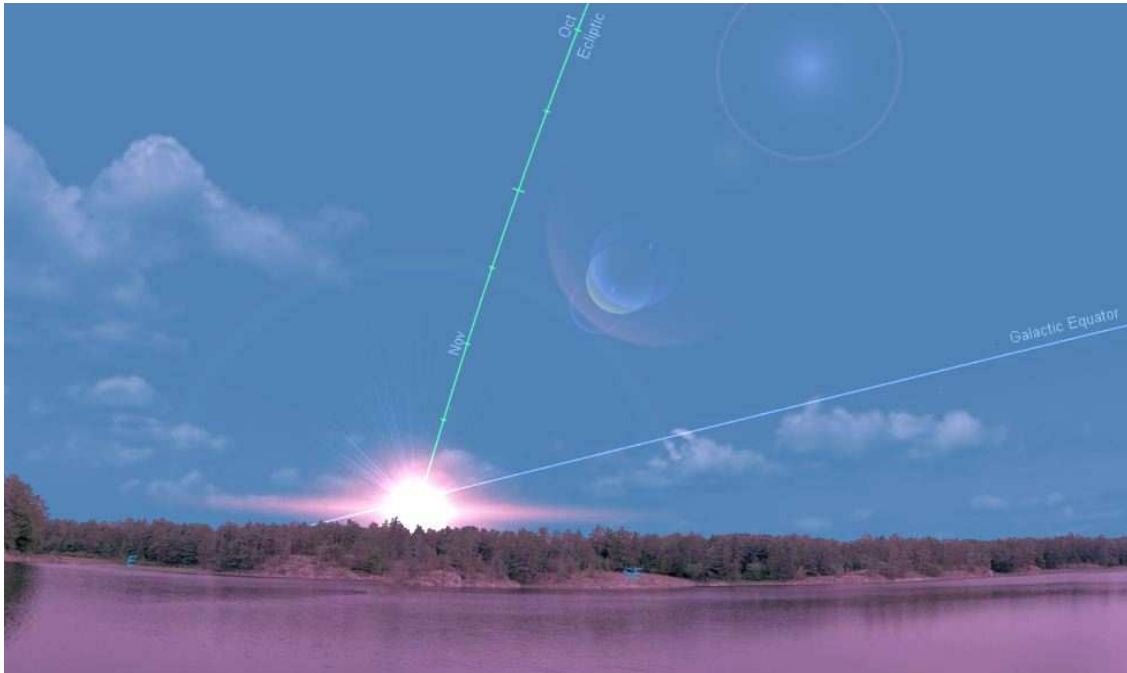


# Astronomy in the Tortuguero Inscriptions

## John Major Jenkins

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Organizer: Dr. Robert Benfer. Chair: Rubén Mendoza.



*December 1, 612 AD. The sun aligned with the cross formed by the Milky Way and the ecliptic*

### Abstract

First, my “2012 alignment” hypothesis will be clearly defined. I will present evidence in the Classic Period inscriptions of Tikal, Copán, and Quirigua, with a special focus on Monument 6 from Tortuguero, for the use of the dark rift in the Milky Way as a reference point for planetary, lunar, and solar alignments. Using a new method of schematically diagramming a complex hieroglyphic inscription, an analysis of a repeating astronomical theme in the thirteen dates recorded on Monument 6 strongly suggests an awareness of the sun’s future alignment with the dark rift in the Milky Way on the solstice of 2012 AD, the 13-Baktun period ending recorded in the right flange of that monument. The methodology acknowledges and incorporates textual references that are not exclusively phonetic, namely astronomy and astronomerology, enabling a fuller reading of the intended meaning.

**Note.** Dates in this paper are given according to the 584283 correlation and in the Julian calendar (with the exception of the 13-Baktun period-ending date (December 21, 2012), which is given in the Gregorian calendar). © John Major Jenkins. 2010

# Astronomy in the Tortuguero Inscriptions

John Major Jenkins

## Part I. Maya Conceptualization of the Dark Rift in the Milky Way

In this brief presentation I will cite evidence for a simple idea that has far reaching implications. It is this: An astronomical feature called the dark rift in the Milky Way, or the Great Cleft, was recognized and utilized in Classic Period inscriptions. My previous research argues that the dark rift was utilized in pre-Classic iconography.

The dark rift in the Milky Way is visible to the naked eye. It is caused by the thick accumulation of interstellar dust along the galaxy's mid-plane. It begins at the ecliptic between the constellations of Sagittarius and Scorpio and extends northward along the Milky Way.

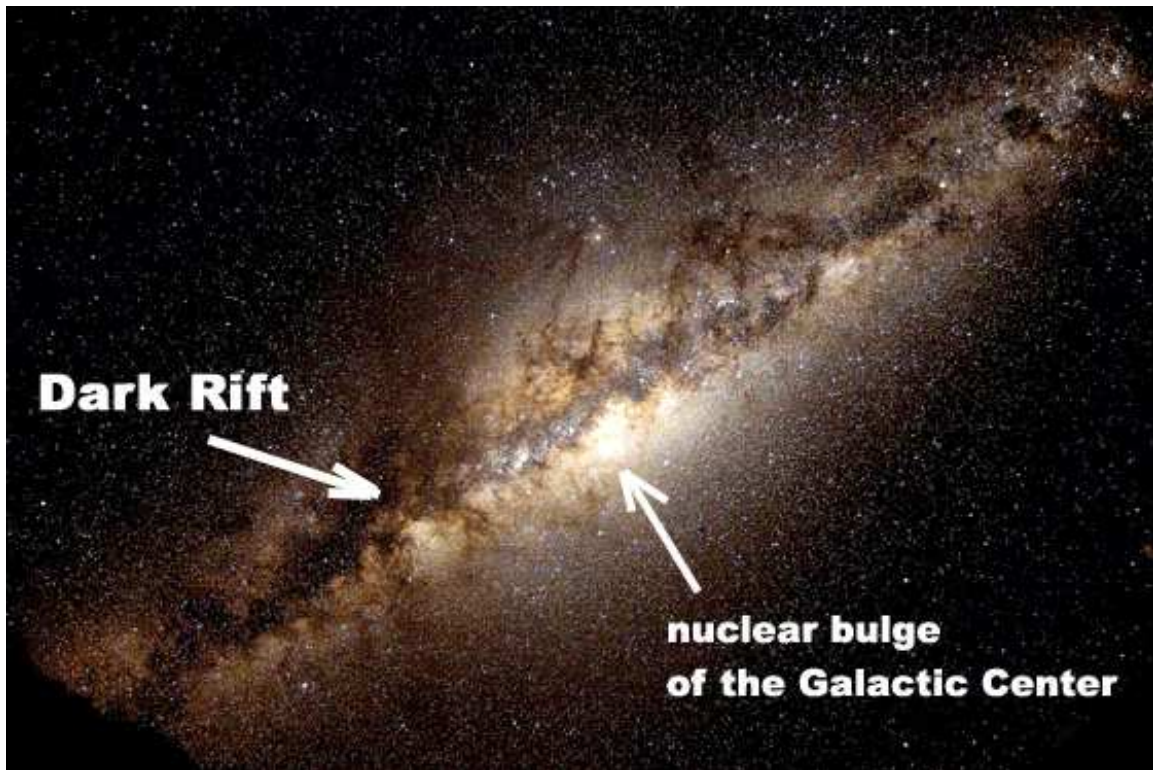


Diagram 1. The dark rift and the nuclear bulge of the Galactic Center at the Crossroads of the Milky Way and the ecliptic: perceivable to the naked eye.

According to Maya scholar Barbara Tedlock, the contemporary Maya in highland Guatemala refer to it as *xibal be* or *xibalba be*, the “road to the underworld” (1982:181). Dennis Tedlock has also identified, in his recent book *2000 Years of Mayan Literature*, the various roles of the dark rift in the Dresden Codex, the Madrid Codex, the Paris Codex, and in the Creation Myth inscriptions of Palenque and Quirigua. For example, a

deity utilized in the almanacs of the Dresden Codex is named “Tz’up’e,” meaning “Split Down the Middle,” and Tedlock argues that he is placed at the dark rift, which splits the Milky Way down the middle.



<= Diagram 2. God Q, Tz’up’e, “Split Down the Middle.”

Found in the Dresden Codex and the Madrid Codex.

Located at the southern terminus of the dark rift.

Why? Because the ecliptic abuts the southern terminus and the inscriptions describe planetary and lunar alignments with Tz’up’e.

From D. Tedlock, 2000 Years of Mayan Literature (2010).

The dark rift is also found in the astronomical topography that serves as a backdrop for the Maya Creation Myth—the *Popol Vuh*.<sup>1</sup> In these manifestations, the dark rift has various identities including a cave through which a river passes, a crook between two branches of a tree, a speaking mouth, a Black Road, and the passageway to the underworld.

My “2012 alignment” theory, first published in 1994, utilizes the dark rift in the Milky Way and argues that the creators of the Long Count intended the end of the current 13-Baktun period (in 2012) to target the rare precession-caused alignment of the December solstice sun with the dark rift in the Milky Way.<sup>2</sup> I do not assert that this alignment necessarily has empirical effects, nor do I associate it with doomsday ideation.<sup>3</sup> The theory does not rest on an assertion of absolute precision regarding the ability of the ancient Maya to have made a forward calculation in precession. At this stage it is good to emphasize that the Crossroads (of the Milky Way and the ecliptic) is an equally compelling marker for these alignments. Thus, to be clear we can also use the phrase “dark rift/Crossroads” to reference the alignments discussed in this paper.

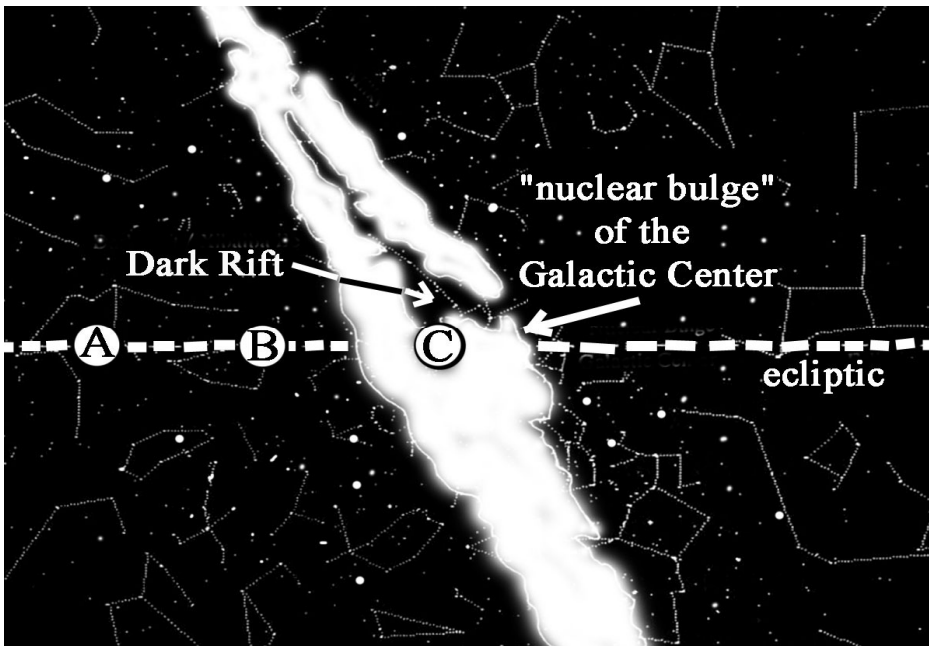
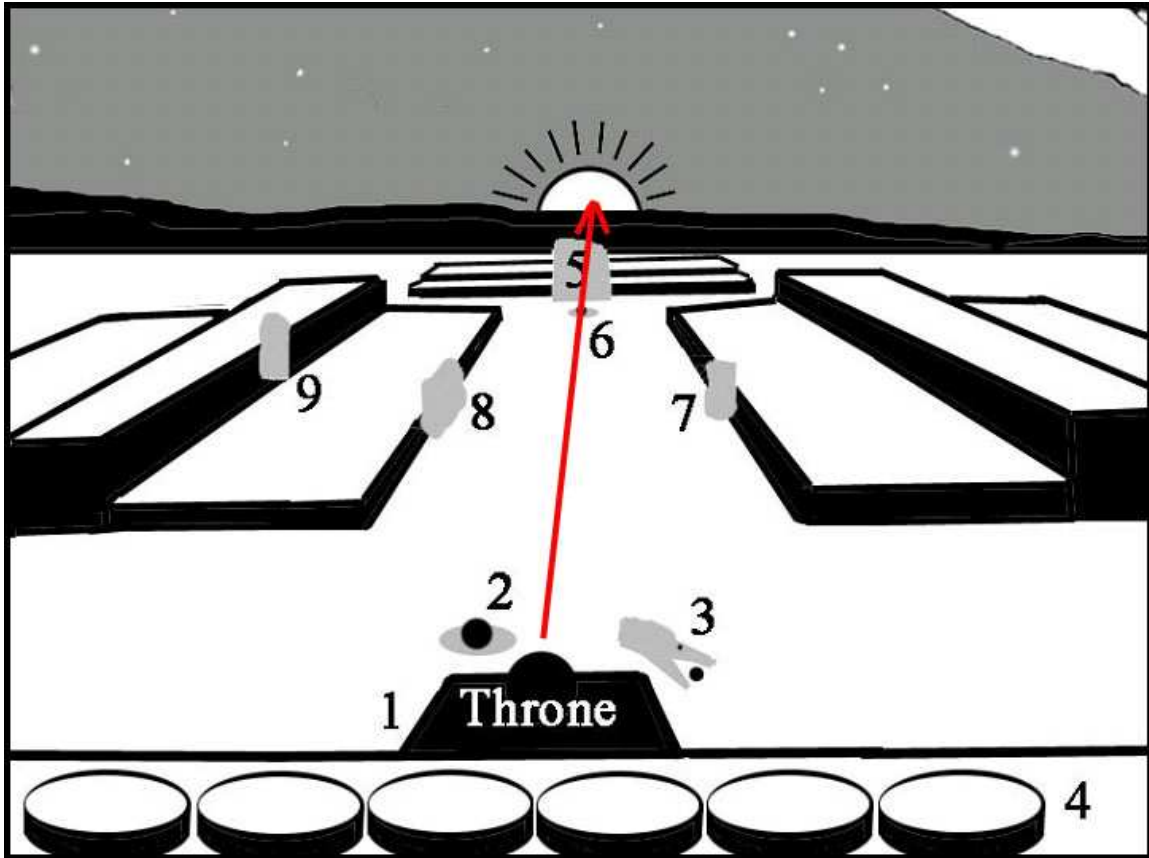


Diagram 3. The precession of the sidereal position of December solstice sun (A = 4000 BC; B = 1000 BC) into alignment with the dark rift/Crossroads in era-2012 AD (at position C).

In my early approach to the 2012 question I was led to examine the pre-Classic site of Izapa for the origins of the Long Count system. The Brigham Young University studies of Izapa by Gareth Lowe and Garth Norman<sup>4</sup> provided maps and azimuth data, such that I was able to extrapolate that the ballcourt at Izapa aligns with sunrise on the December solstice. I traveled to Izapa and observed the solstice sunrise and took measurements to confirm the alignment.<sup>5</sup>



*Diagram 4. The ballcourt at Izapa is aligned to sunrise on the December solstice. (The throne on the west end and the six seating stones behind it orient the viewpoint)*

When I was doing my research in the 1990s I was unaware of Tortuguero Monument 6, which contains a specific date reference to the end of the current 13-Baktun period in 2012.<sup>6</sup> Since I believed there were no Classic Period inscriptions that referred directly to the 2012 period ending, I based my investigation on the iconography and archaeoastronomy at Izapa. Now there is an opportunity and a need to analyze the inscription on Tortuguero Monument 6, and see what it may tell us about how the 2012 date was being utilized in a 7<sup>th</sup>-century hieroglyphic text.

## **Part II. Tortuguero Monument 6**

Tortuguero Monument 6 is a T-shaped stone carving originally consisting of some 176 glyph-blocks. The right flange contains two dates, one of which is 4 Ahau 3 Kankin, also indicated with a 13-pik designation (meaning the end of the 13<sup>th</sup> Baktun period). The

tzolkin-haab combination of 4 Ahau 3 Kankin places this date at December 21, 2012 according to the 584283 correlation.

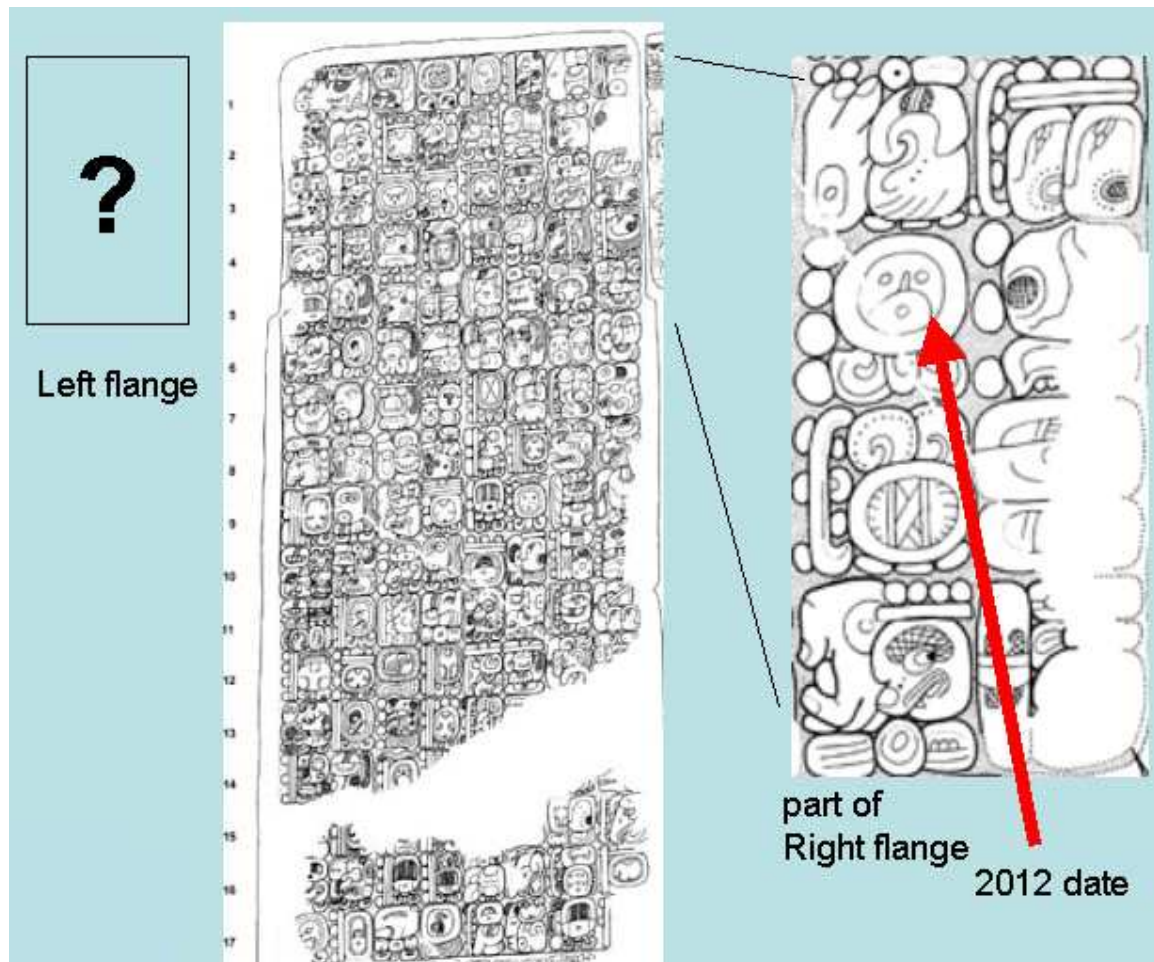


Diagram 5. Left and right flanges and central inscription of Tortuguero Monument 6, making 176 total glyph blocks. Line drawing adapted from Gronemeyer (2004).

The other date in the right flange is December 5, 510 AD (Julian). On this date a sweat bath ritual was performed by a person named Ahkal K'uk. The left flange is missing and was never documented. The main body of the text in the large central panel begins with a statement about Bahlam Ajaw as the Lord of Tortuguero and a Distance Number resulting in the accession date of Bahlam Ajaw. He was a seventh-century king of Tortuguero and a contemporary of Janaab' Pakal at nearby Palenque.<sup>7</sup>

Bahlam Ajaw's accession is stated as occurring on February 4, 644 AD (J). Sven Gronemeyer first suggested that the Distance Number preceding this date can be subtracted from the date to reach an earlier date that would have been recorded in the missing left flange of the monument—his birth date.<sup>8</sup> Michael Grofe noted that an ambiguity in the day position of the Distance Number allows a 10-day range of possible dates for his birth, November 23 to December 3 of 612 AD.<sup>9</sup>

The T-shape of the monument is a structural statement in and of itself, meaning wind, or perhaps breath or life-spirit. Tortuguero Monument 6 is clearly about the life and royal career of Bahlam Ajaw, chronicling his war achievements in expanding and transforming his kingdom while relating him to distant calendrical events in both historical and mythological time. The inscription brings his life up to 669 AD, when the monument was carved and the temple it was placed in was dedicated.

With Bahlam Ajaw's birth date reconstructed, Tortuguero Monument 6 contains a total of 13 dates. In order to understand the astronomical patterns of these dates, we can recognize the structural frame provided by the left and right flange.

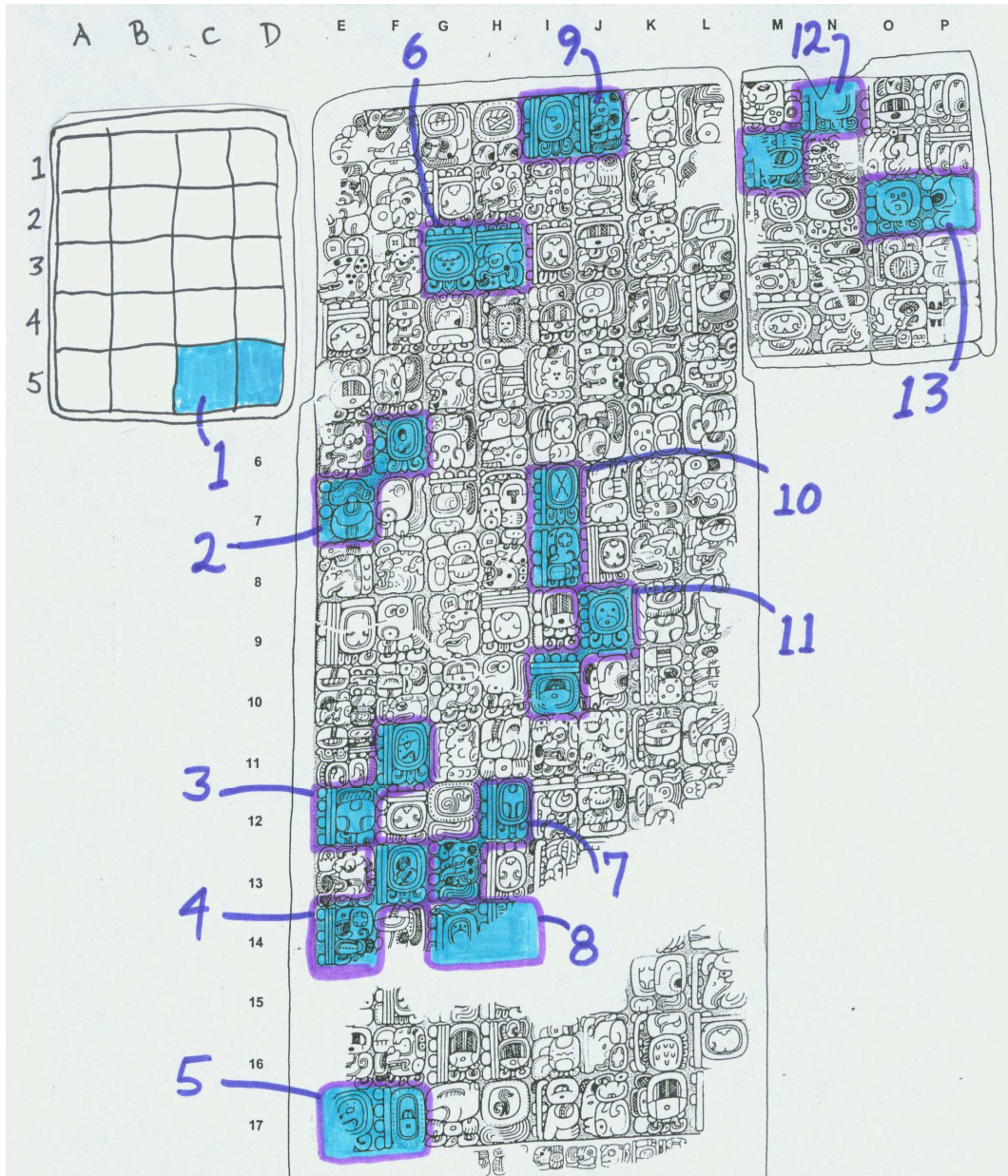


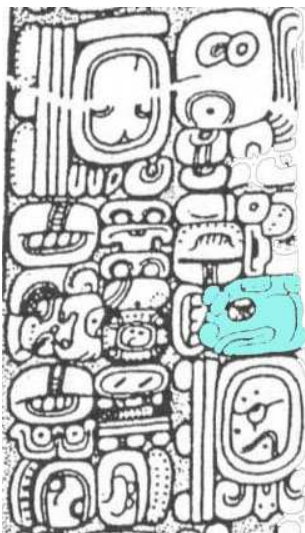
Diagram 6. The tzolkin-haab locations of the 13 dates on Tortuguero Monument 6.

These two sections literally bracket the main text. The first date, putatively located at the end of the left flange, is Bahlam Ajaw's birthday. The last date, in the analogous position on the right flange, is the 13-Baktun period ending in 2012. In an email communication of early 2009, and in his paper investigating the astronomy of Tortuguero Monument 6, Michael Grofe noted that, astronomically, there is a parallel between these two dates.<sup>10</sup> On both dates the sun was in alignment with the southern terminus of the dark rift in the Milky Way, between Sagittarius and Scorpio. Bahlam's birthday, as mentioned, contains a 10-day ambiguity, but even within this range the sun was still reasonably within the visual parameters abutting the southern terminus of the dark rift. Furthermore, I noted that on both dates Jupiter was at station near the Pleiades, about to move direct. Jupiter, it turns out, plays an important role in the astronomical patterns evident on Monument 6.

Curiously, the other date on the right flange (December 5, 510 AD) is also a date on which the sun was aligned with the dark rift.<sup>11</sup> The event recorded in the inscription for this date was a sweat bath rite. Sweat baths were seen to be underworld places. Upon emerging from the sweat bath a person was considered to be emerging from the underworld, much like a rebirth experience. The doorway of the sweat bath was thus a portal into the watery underworld. The inscriptional content is thus reinforced by the astronomy. In other words, the astronomy associated with dated inscriptions can help elucidate an often missing dimension in the purely phonetic decipherment of texts.

The performer of the sweat bath rite was a person, probably an ancestor or lord, named Ahkal K'uk in the text. A king named Ahkal Mo' Naab ruled Palenque from 501 to his death in 524.<sup>12</sup> Gronemeyer (2004) wrote that it is probable that Tortuguero was founded by an early Palenque king (the two sites share a place name), and thus these two may be the same person. The sweat bath rite at Tortuguero occurred during Ahkal Mo' Naab's reign, in 510 AD. It may have been the foundational rite that began the dynasty at Tortuguero, separate but related to Palenque.

Curiously, when Ahkal Mo' Naab acceded to the throne in 501 AD, Jupiter was aligned with the dark rift. He died in 524 AD almost exactly 88 years before Bahlam Ajaw's birth. As with the Tortuguero king's birth, Ahkal Mo' Naab died when the sun was aligned with the dark rift. These astronomical parallels may underlie the reason why



Bahlam Ajaw referenced him on his biographical monument.<sup>13</sup> It was of great interest to Maya kings to draw parallels between the lives of ancestor-kings and their own.

The first event after Bahlam Ajaw's accession is his first war campaign and victory. It occurred on May 30, 644 (J). As epigrapher Michael Grofe pointed out, just three days prior to this victory, there was a lunar eclipse with the eclipsed moon's position falling between Sagittarius and Scorpio, in alignment with the dark rift. (The sun was therefore opposite the dark rift on this date.) Grofe translates the associated inscription as "in the caiman."<sup>14</sup>

*Diagram 7. Three days after eclipse, "in the caiman." May 30, 644*

In the iconography of Izapa, I have argued that the celestial caiman is the Milky Way and the dark rift is its mouth. This observation is supported by David Stuart’s statement that Izapa Stela 25 was an early version of the Starry Deer Crocodile—the Milky Way (Stuart 2005:72-73).

The next war event occurred exactly 360 days (1 Tun) after Bahlam Ajaw’s accession, indicating a conscious use of numerological and calendrical intervals. Other dates throughout the late 640s include another date of the sun’s alignment with the dark rift (December 6, 647), this time along with Venus, and Bahlam Ajaw’s final victory on the December solstice of 649 AD. There are at least six dates on the monument that target astronomical alignments with the dark rift.

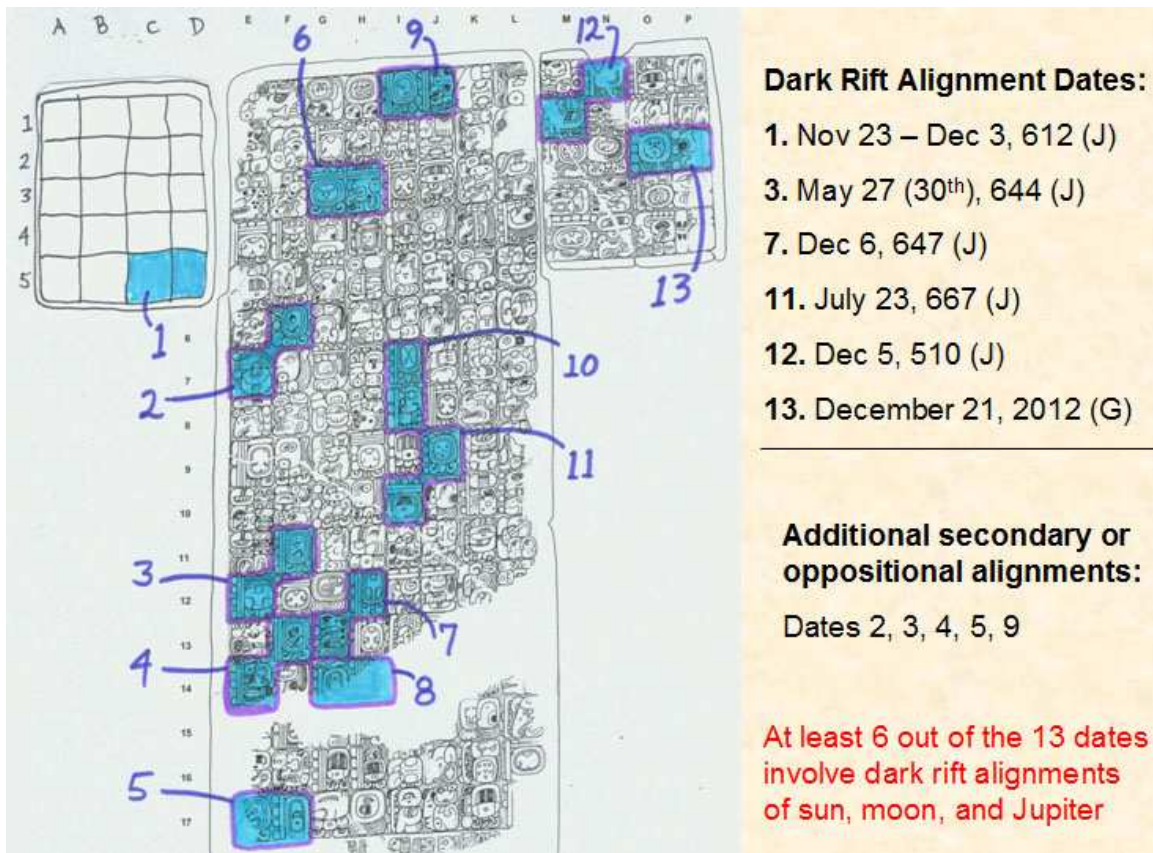


Diagram 8. Dates of alignments of sun, eclipse, and Jupiter with the dark rift / Crossroads area

The 2012 date—the last of the 13 dates—is, as mentioned, a date of the sun’s alignment with the dark rift, but unlike the other dates on which this kind of *solar-dark rift* alignment occurs, it occurs *on the solstice*. This is what defines the 2012 period ending as occurring in a unique era of precessional alignment. It is linked with a Distance Number to the building dedication event of January 11, 669, which in turn is linked with Distance Numbers to three other dates: Bahlam Ajaw’s accession, a nearby hotun ending on July 23, 667, and the sweat bath ceremony of 510 AD previously mentioned. The hotun ending of July 23, 667 is interesting, because although not directly connected to the 2012 date with a Distance Number, the interval between it and the 2012 date nevertheless



embodies several key divisors. The interval between the two dates is 491,400 days. This interval is divisible by key numbers in the recognized astronomerological canon utilized by the Maya: 260, 360, 364, 378, and 819. The use here of the 819-day count is very early and previously unrecognized, preceding its use by the son of Pakal at Palenque by over 20 years. Exactly 600 of these 819-day cycles separate the 667 date from the 2012 period-ending date.<sup>15</sup> The 667 hotun ending date is also characterized by Jupiter being at station close to alignment with the dark rift. As mentioned, Jupiter at station is also a characteristic of both Bahlam Ajaw's birthday and the 2012 period-ending date. I devised an efficient way to represent the otherwise confusing sequence of Distance Numbers and dates in the text, and a surprising symmetry emerges.

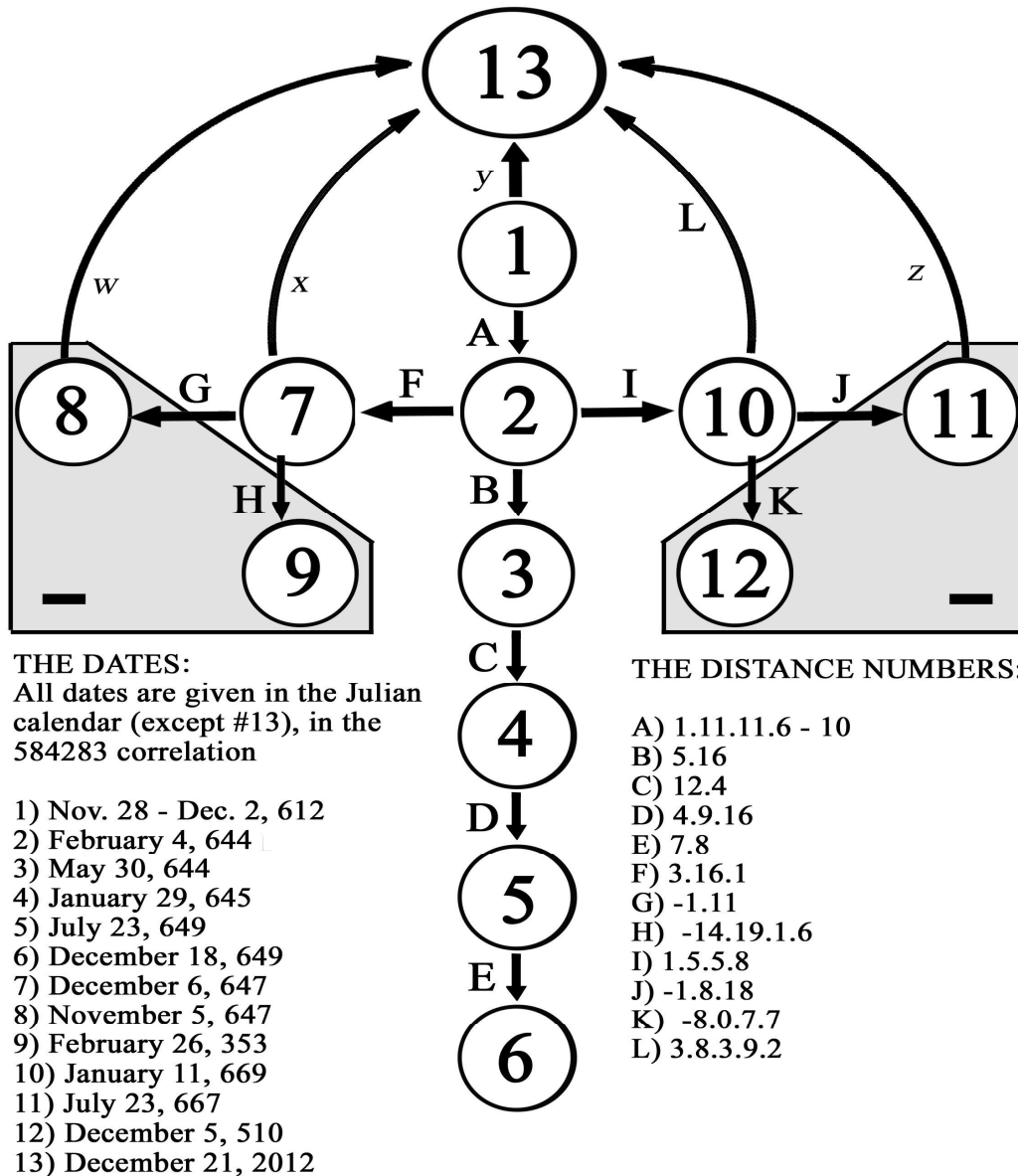


Diagram 9. Embedded symmetry in the occurrence of dates generated with negative Distance Numbers. The 2012 date (Date 13) is connected to eight other dates via astronomy, a DN, and astronomerology.

The hotun ending date of July 23, 667 occurs exactly 18 tropical years after another date recorded on Monument 6, the third event in Bahlam Ahaw's war campaigns (July 23, 649 AD). This and another tropical year relation between two dates on Tortuguero Monument 6 was noticed by Michael Grofe. The span between the two latter pair of dates (December 5, 510 AD and December 6, 647 AD) is *one day more* than 137 tropical years. Both are dates on which the sun was aligned with the dark rift. The latter date is one day forward, suggesting the kind of forward adjustment for precession, through the centuries, which would be necessary in order to project the sun's alignment with the dark rift on *the solstice* of 2012. Another property of the interval, noted by Michael Grofe, is that 137 tropical years of 365.242 days each equal 139 Tun of 360 days each. These kinds of observed relations between precise calculations of the tropical year and Tun periods provide the precedent for calculating the precession of the equinoxes. As explicated in his 2007 PhD dissertation and other essays, Grofe finds accurate precession intervals in the Serpent Series of the Dresden Codex, the inscriptions of Palenque, and elsewhere.<sup>16</sup>

Let's recall that Monument 6 is a chronicle and testimony of the life of Bahlam Ajaw. I have briefly sketched a framework of patterns involving solar, lunar, and planetary alignments to the dark rift and Jupiter stations. Bahlam Ajaw died on May 19, 679 AD, as recorded on the Tortuguero Wooden Box.<sup>17</sup> On this day Jupiter was aligned with the dark rift (see Diagram 10). This final circumstance suggests an intentional timing of his death date, or a manipulation of the actual death date to fit into the astronomical pattern evidently intentionally embedded into the 13 dates on Tortuguero Monument 6.

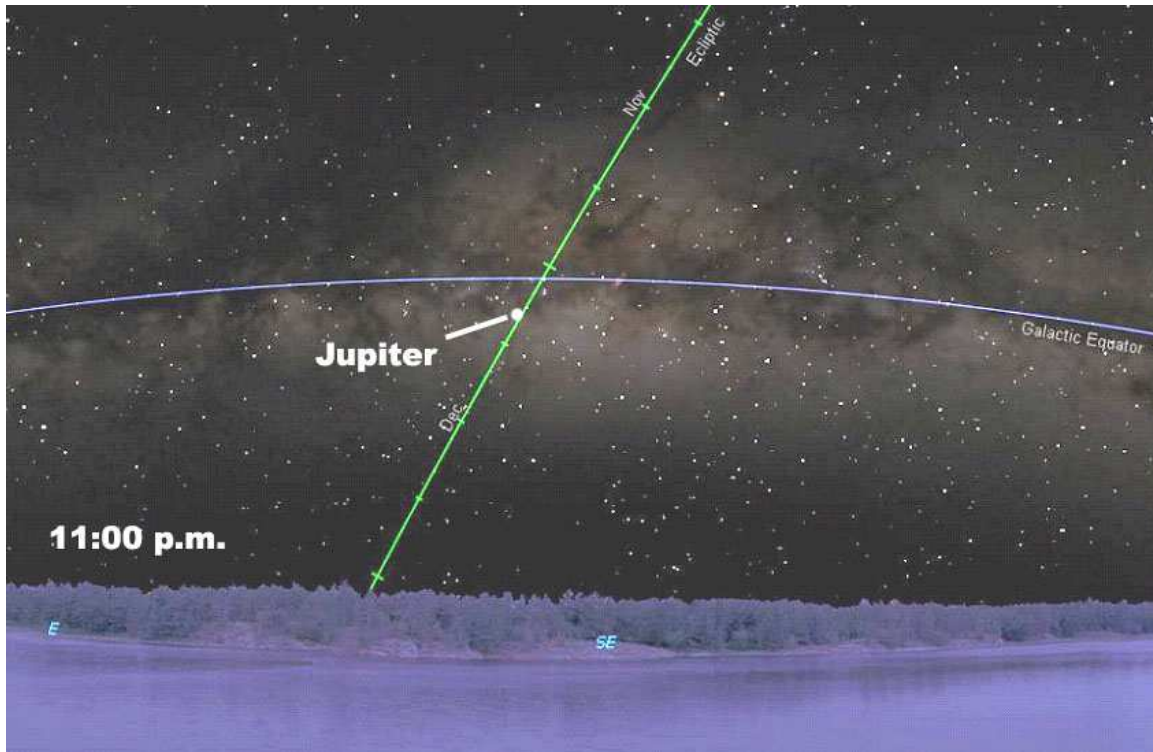
### **Part III. Additional Evidence**

Additional evidence for the dark rift's conceptual role during the Classic Period is found in the inscriptions and iconography of Tikal (Altar 16), Copán (Stela C), and Quirigua, especially in the use of the Long Count date 9.14.0.0.0.<sup>18</sup> This date is November 29, 711 AD (Julian) according to the 584283 correlation. Like many of the dates on Tortuguero Monument 6, including Bahlam Ajaw's birthdate, the date of the sweat bath rite, and the 2012 period-ending date itself, 9.14.0.0.0 is characterized by the sun being positioned at the southern terminus of the dark rift (at the Crossroads). The associated iconography on Copán Stela C affirms this astronomical alignment as a recognized characteristic of the date, and supports my interpretation that the dark rift was at times portrayed as the mouth of a caiman. This Long Count date also appears on Tortuguero Monument 2.

### **Part IV. Summary**

This has been a very brief treatment of a topic that deserves a more detailed presentation. Of the 13 dates on the Tortuguero monument, six involve alignments of the sun, Jupiter, and a lunar eclipse with the dark rift/Crossroads, with possibly five additional dates of significance to the dark rift. Based upon the pattern of astronomical references on the 2012 monument from Tortuguero, it's likely that the people of Tortuguero intentionally used an awareness of the sun's future alignment, on a solstice, with the dark rift in the political rhetoric of a 7<sup>th</sup>-century king. Furthermore, the pre-existing calendrical structure of the Long Count, having been developed centuries prior to Tortuguero, requires that the

knowledge of the 2012 alignment of the solstice sun and the dark rift/Crossroads was embedded into the Long Count at its very inception, over 2,000 years ago.



*Diagram 10. May 19, 679 AD (J) death date for Bahlam Ajaw. Jupiter rises at the Crossroads in alignment with the dark rift, just after sundown. Death date is from the Tortuguero Wooden Box*

The evidence presented here argues that the dark rift/Crossroads was utilized as a reference point by the Classic Period Maya in a veritable symphony of alignments involving the sun, the moon, planets, eclipses, and the solstice position of the sun. Overall, it appears to be involved in rituals and ideation relating to sacrifice, rebirth, transformation, period endings, building dedications, and king making. This Classic Period evidence invites a more serious and factually accurate assessment of my earlier archaeoastronomical reconstruction work on precession and dark-rift astronomy at Izapa.<sup>19</sup>

### **End Notes:**

1. Examples of various symbolic roles of the dark rift: The dark rift is the Black Road, it is a mouth because it speaks to the Hero Twins, and it also serves as the crook in the calabash tree where One Hunahpu's head was hung. These various uses suggest the dark rift was the astronomical reference point for a rather pliant symbolic complex that has many meanings. It is represented in Classic Maya iconography as a skeletal maw and is very likely to be the astronomical reference point, at least in some instances, of the "Black Hole" glyph. See B. Tedlock (1982:181), D. Tedlock (1985), and Jenkins (2009).

2. My previous research also argues that the dark rift was utilized in an astronomical alignment caused by the precession of the equinoxes that occurs in the era of the 13-Baktun period ending in 2012 AD (Jenkins 1995, 1998, 2009).
3. I have defined and discussed in my books, presentations, and articles, published and online, the various parameters of the alignment, ranging from a reasonable minimum of thirty-six years upward to five hundred years, depending on which astronomical features are utilized in ones definition. See, e.g., Jenkins, “The True Alignment Zone” <http://alignment2012.com/truezone.htm>. My argument for intention rather than coincidence, however, is based on the presence of the solar-dark-rift alignment concept in Maya traditions (the ballgame and the Creation Myth), iconography, and inscriptions.
4. See Gareth Lowe et. al (1982) and Garth Norman (1973, 1976).
5. An examination of the iconography of the Izapan monuments, combined with their preserved orientations to important astronomical horizons, provided evidence for my thesis, which is best known from my 1998 book *Maya Cosmogenesis 2012*. This book documented details on the fact that the ball court at Izapa aligns with the dawning December solstice sunrise, which was first recognized and published in Jenkins (1995).
6. Linda Schele’s 1982 catalog of Maya verbs contained a reference to 13.0.0.0.0 on the Tortuguero monument. Assuming that someone knew about this, it was never brought up in the many debates about 2012 that occurred as long ago as 1996 on the Aztlan forum (Foundation for the Advancement of Mesoamerican Studies) and later on in the University of Texas “Mesoamerica forum” online. Nor was it mentioned by Schele herself in her 1996 dismissal of the relevance of the 2012 date to the ancient Maya. See <http://alignment2012.com/app5.htm>.
7. Bahlam Ajaw lived from 612 AD to 679 AD while Janaab’ Pakal from Palenque lived from 603 AD to 683 AD. They were both rulers whose lives touched five Katuns, a rare occurrence which gave such Maya kings a special legacy and status.
8. Also, Erik Boot suggested that the entire left flange, containing twenty glyphs in parallel construction with the right flange, contained the correct amount of glyph blocks to express a complete Initial and Supplementary Series for Bahlam Ajaw’s birthday.
9. Michael Grofe, p.c. February 2009. See his article “Astronomical References in Tortuguero Monument 6,” n.d. [**Bahlam Ajaw’s birthday range was corrected during the Facebook Discussion to Nov. 28 – Dec. 2**]. Some of this material was summarized in Jenkins 2009 (Chapter 7). The date that corresponds to the sidereal position of the sun on 13.0.0.0.0 is November 30, 612 AD (J), which is the tzolkin day 1 Ik. I’ve suggested that the T-shape of Monument 6 might be a clue that Bahlam Ajaw’s birthday falls on this Ik day, because Ik is a T-shaped glyph. Interestingly, 1 Ik may have been the Calendar Round seating of 0 Pop at Tortuguero.
10. Grofe, “Astronomical References in Tortuguero Monument 6,” n.d..

11. Ibid. See also my forthcoming essays at *The Center for 2012 Studies* (<http://thecenterfor2012studies.com>).
12. See Martin and Grube (2000) on Ahkal Mo' Naab at Palenque and his possible role at Tortuguero.
13. The haab positions of Ahkal Mo' Naab's accession and death day are the same, suggesting that his death date was intentionally selected or the record of it was manipulated for political and rhetorical purposes.
14. Grofe noticed this eclipse date as well as the sun's position on Bahlam's birthday (personal communication February 22, 2009).
15. This 819-day observation is my own. It is unlikely that this is a coincidence and therefore it was most likely an intended connection with 2012, much in the way that the 3114 BC date was intentionally connected to other dates in both historical and mythological time. See Jenkins 2011.
16. Grofe 2007, and his "Astronomical References in Tortuguero Monument 6," n.d.
- 17.Looper 1991.
18. As mentioned, these types of dark-rift alignments were recognized and used beyond Tortuguero, as argued in the recent book of Dennis Tedlock and elsewhere. I have noted additional examples of dark-rift alignments in Maya inscriptions in various articles and in my recent book *The 2012 Story*. For example: the Long Count date 9.14.0.0.0, occurring at Tikal, Tortuguero, Copán, Calakmul, and elsewhere, is November 29, 711 AD—a date when the sun was aligned with the dark rift/Crossroads (Jenkins 2009:267-268). The caiman mouth iconography on Stela C at Copán reinforces this astronomy. This is underscored as an astronomically meaningful precedent when you consider that the Copán king 18 Rabbit's decapitation, on April 27, 738 AD (J), was a date on which Jupiter was aligned with the dark rift (Jenkins 2009:271-273)—*exactly as it had been 59 years earlier when Bahlam Ajaw died*. The inscription from Quirigua Stela F states that the decapitation "happened at the Black Hole," (Looper 2003:77) which very probably alludes to the dark rift. These are just a few examples.
19. Jenkins 1995, 1998, and my Web page: <http://www.Update2012.com>.

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### **Illustrations in the SAA 2010 Power Point presentation:**

Opening slide: The sun's alignment with the dark rift on Bahlam Ajaw's birthday.

1. Layout of galaxy with dark rift feature indicated
2. The Dresden Codex deity named *Tz'up'e*
3. The precession-caused galactic alignment process over thousands of years
4. Izapa's ballcourt alignment to the December solstice sunrise
5. Tortuguero Monument 6 w/ close-up of 2012 date (Gronemeyer 2004; revised 2009)
6. Line drawing of Tortuguero Monument 6 w/ 13 dates highlighted
7. Close up of the caiman and eclipse glyphs, w/ tzolkin/haab date
8. Dark rift alignment dates on Tortuguero Monument 6 indicated (6 out of 13 dates)
9. Depiction of symmetrical relations of the 13 dates on Tortuguero Monument 6
10. Jupiter-dark rift alignment on Bahlam Ajaw's death date, May 19, 679 AD (J)
11. Chart 1, simplified, alignment dates highlighted

Chart 1. Dates, DNs, and Astronomy on Tortuguero Monument 6 (see next page).

**Postscript. November 2010.** Most of the present paper was worked out in December 2009. Many of the ideas and discoveries presented in this paper grew out of conversations with Michael Grofe immediately after the Tulane "2012" conference in early February, 2009. It is at that time that the astronomical importance of Tortuguero Monument 6 was first realized. The events of the Tulane conference are described in Chapter 6 of my book *The 2012 Story*, released in October 2009. In Chapter 7 of that book, some of the astronomical reconstructions of the date sequences in Tortuguero Monument 6 were presented, for the first time in print. Researcher Geoff Stray summarized the key items of this work in an article which was posted online. Maya scholars revisited the Monument 6 inscription in two subsequent treatments, one being a self-published book by Mark Van Stone released in April 2010 and another being a study by Sven Gronemeyer and Barbara MacLeod, posted as #34 on the *Wayeb* website in August 2010. These studies did not mention or treat the astronomical content of Tortuguero Monument 6. Columbian researcher Carlos Barrera Atuesta released an essay in September 2010 which was an "Open Letter to Mayanists" exploring calendrical relationships between dates in the Tortuguero Monument 6 inscription and the Venus Tables in the Dresden Codex. This suggests Tortuguero was an important location for the practice of Maya astronomerology and Venus tracking.

The present paper was read at the 75<sup>th</sup> *Society for American Archaeology* conference in St Louis on April 15, 2010. It is a concise treatment of the astronomical strategies that underlie Bahlam Ajaw's rhetorical statements in his inscriptions. An expanded version of this material has been prepared for publication with the University of Florida Press.

### Chart 1. Dates, DN, and Astronomy on Tortuguero Monument 6

All dates are given in the Julian calendar (J) in the GMT2 correlation (JD# 584283).  
 DN = Distance number; L.C. = Long Count. (G) = Gregorian. DR = dark rift. MW = Milky Way.

Date and event	Derived from	Astronomy
1. L.C. Between 9.8.19.10.0 and 9.8.19.10.4 (Nov. 28 – Dec. 2, 612 AD (J)). 12 Ajaw 8 Kankin – 3 Kan 12 Kankin Bahlam Ajaw’s birthday = 1 Ik? T-shape.	DN 1.11.11. __ at E4-E5 subtracted from Date 2.	Sun in DR. Jupiter just reached STATION after retrograde period, below and slightly west of the Pleiades.
2. L.C. = 9.10.11.3.10 (Feb. 4, 644 AD). 1 Ok 3 Kumku. Bahlam Ajaw’s accession.	Established with tzolkin-haab date at F6-E7.	Uranus in DR. Jupiter & Venus conjunct, east of DR on edge of the MW.
3. L.C. = 9.10.11.9.6 (May 30, 644). 13 Kimi 14 Zec. First war event.	DN 5.16 at E9 added to Date 2.	Sun opposite DR. Lunar eclipse 3 days earlier, in DR (conjunct Uranus). Jupiter goes retrograde a few days earlier.
4. L.C. = 9.10.12.3.10 (Jan. 29, 645). 10 Ok 18 Kayab. Second war event.	DN 12.4 at F12 added to Date 3.	
5. L.C. = 9.10.16.13.6 (July 23, 649). 8 Kimi 9 Mol. Third war event, Yohm Pi “was chopped.”	DN 4.9.16 at F15-E16 added to Date 4.	
6. L.C. = 9.10.17.2.14 (Dec. 18, 649). 13 Ix 17 Muan. Big victory over Comalcalco. Skull piles.	DN 7.8 at G2 added to Date 5.	Winter Solstice. Moon and Mars close to Pleiades on the 19 <sup>th</sup> . Sun and Uranus conjunct 5 days later.
7. L.C. = 9.10.15.1.11 (Dec. 6, 647). 11 Chuen 4 Muan. Unknown event.	DN 3.16.1 at H9-G10 added to Date 2	Sun and Venus conjunct in DR. Jupiter at STATION, about to go direct.
8. L.C. = 9.10.15.0.0 (Nov. 5, 647). 6 Ajaw 13 Mac. Hotun ending.	DN 1.11 at H13 subtracted from Date 7.	Jupiter STATION. Sun & Mercury conjunct, Venus nearby, west edge of MW.
9. L.C. = 8.15.16.0.5 (Feb. 26, 353). 11 Chicchan 13 Muan. Event in the “Plaza of Baakil” (Palenque?).	DN 14.19.1.6 at H15-H16 subtracted from Date 7.	Jupiter just turned direct after STATION. Jupiter and Uranus (very close) and waxing moon conjunct, opposite the DR. Evening sky.
10. L.C. = 9.11.16.8.18 (Jan. 11, 669). 9 Etnab 6 Kayab. Building dedication event.	DN 1.5.5*.8 at I3-I4 added to Date 2.	Theoretical eclipse on Jan. 8, not visible. Sun will conjunct Jupiter in 5 days.
11. L.C. = 9.11.15.0.0 (July 23, 667). 4 Ajaw 13 Mol. Hotun ending. Six houses and images “laid down.”	DN 1.8.18 at J8-I9 subtracted from Date 10.	Jupiter at STATION in the DR (west side), about to go direct. Seen in mid-heaven at sundown.
12. L.C. = 9.3.16.1.11 (Dec. 5, 510). 8 Chuen 9 Mac. Ahku’ul K’uk does sweat bath ritual.	DN 8.0.7.7 at L16-L17 subtracted from Date 10	Sun in DR (east side). Mercury at evening station.
13. L.C. = 13.0.0.0.0 (Dec. 8, 2012 (J), Dec. 21, 2012 (G)). 4 Ajaw 3 Kankin. 13-Baktun period ending, Bolon Yokte event.	DN 3.8.3.9.2 at M5-P1 added to Date 10.	Sun in DR (on the solstice). Jupiter almost at STATION, after retrograde period, below and just east of the Pleiades (compare w/ Date 1).

\*This appears as “6” in the text, but is a scribal error; it must be 5 to reach the stated tzolkin-haab position.

Note: “DR” is shorthand for “dark rift.” A measure of specificity can be added to the actual location of a given celestial body’s alignment with the dark rift. For example, it is more precise to say that the alignments occur with the southern terminus of the dark rift. Several are some distance east or west of the galactic equator. The point is to highlight the astronomical region involved, which could be said to embrace the Crossroads and, conceptually, the larger nuclear bulge of the Milky Way’s center.