INSTITUTE OF MAYA STUDIES
NEWSLETTER
An Affiliate of the Miami Science Museum

Article from: Volume 36, Issue 12 • December 2007 • Page 2 Quote the source: *http://mayastudies.org*

Just How Precise is Maya Astronomy?

by Susan Milbrath
Curator of Latin American Art and Archaeology
Florida Museum of Natural History

In Vol. 36, No. 11 of the IMS newsletter, John Major Jenkins misrepresents my quote in J. Jeffrey MacDonald's article in *USA Today*. He says "Susan Milbrath is quoted in the article as stating that it would have been 'impossible' for the Maya to have been aware of the precession of the equinox." In the 2007 *USA Today* article I say that "astronomers generally agree that it would be impossible for the Maya themselves to have known that [the sun will be aligned with the galactic equator on Dec. 21, 2012.]"

My quote addresses specifically the issue of precision in Maya predictions. As Jenkins knows very well, in *Star Gods of the Maya* (1999:249, 257, 259), I discuss Maya records of long cycles of time that might have been useful in calculating precession of the equinox. The Dresden Codex and certain Classic monuments record pictuns (8,000 x 360 days) and there are also records of much longer cycles of time. In the book, I even refer to a record of a long cycle of 30,000 years involving the Pleiades that may have been an effort to calculate precession of the equinox.

The issue here is that Jenkins implies that the Maya were able to calculate the precession cycle with exact precision. Nowhere do we see a Maya record that accurately records the cycle of precession of the equinox known to us today. This cycle was not known in the West as such until the Renaissance (see James Evans, *History and Practice of Ancient Astronomy,* 1998). It does seem likely that the Maya recognized that star rise azimuths and heliacal rise/set dates changed through time, but they left no precise records of calculations involving such observations.

Jenkins implies an astonishing level of astronomical precision by saying that the Maya were able to predict the exact location of the sun in the background of stars on December 21, 2012. The Maya visualized the Milky Way in quite a different way than we do, seeing it as a road,

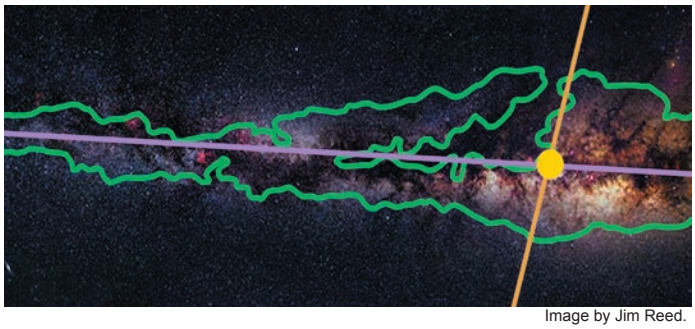

Image by Jim Reed.

a river, or a serpent. Without NASA photos they could not have known the true shape of the Milky Way and it would have been impossible for them to determine the location of the galactic equator. Jenkins tells us that the window for the sun crossing the galactic equator is a scant 26 years, citing Jean Meeus's *Mathematical Astronomy Morsels* (1997:216). This page illustrates only two tables showing the inclination in orbit for two of Jupiter's satellites between 1875 and 2175.

Setting aside the inaccurate page citation, we must ask how the Maya calculated the position of the sun relative to the galactic equator. We can use computer programs and NASA photos to illustrate this effect. Just what mechanism does Jenkins think the Maya used and how did they record this knowledge? Furthermore, tying the 2012 galactic event to the end of the baktun cycle implies that the Maya had precisely calculated precession of the equinox by around AD 300, more than 1000 years before this was achieved in western science. We do know that the Maya purposely set the calendric odometer to "roll over" at end of the baktun cycle on the winter solstice in 2012. This date was predetermined when the first Long Count inscriptions were recorded in the third century AD in the Maya lowlands (even earlier in the areas of Veracruz and Chiapas).

The end of the baktun on the winter solstice is not a coincidence, and this mathematical feat is certainly a sign of a sophisticated link between Maya astronomy and mathematics. The Maya must have set the baktun "end" at the same time they back-calculated a starting point for the baktun around 3000 BC. We can admire the Maya for their highly developed astronomy and mathematics, but we should not attribute to them impossible feats and thereby diminish their true accomplishments.