

Guatemala

The Solar Eye

David Marín
Edgar Cifuentes

Escuela de Ciencias Física y Matemáticas
Universidad de San Carlos de Guatemala

Abstract

Astronomy has played an important role in the development of civilization, both for its practical applications in agriculture, social organization through the invention of calendars, and the technical developments associated with it, not only in ancient civilizations, but even now, when the technical challenges solved by scientists end up as gadgets in daily life. In Guatemala the subject of Mayan Astronomy has served as a bridge between cultures providing an introduction to science for the general public, and Mayan groups in particular, but also helping the Guatemalan society to appreciate and value the cultural legacy of Mesoamerican civilizations.

Visualizing the path of the Sun around the year

The connection to the sky has been eroded over time because people arrange their affairs around calendars and clocks, and in many industrialized societies the sky is no longer transparent enough. However, almost any human being when presented with a clear night sky shares the awe and inspiration running through all ages of human kind.

Astronomy has played a major role in the development of human civilization, and its importance in culture cannot be underestimated. Not only in ancient civilizations, but in the modern technical society represents a major drive in political, scientific, military and social agendas.

In recent years the study of cultural Astronomy, specially Archaeo Astronomy has proven to be a very effective bridge between ancient and modern cultures motivating the interest of a wider audience in both subjects, science, and culture, presenting a holistic view that in many cases it is relevant to everyday life, sometimes connecting with a forgotten collective memory.



Fig. 1: The Solar Eye sculpture is part of an introduction to Maya Astronomy, tied with the ritual activity at the Tzunen mountain in the Guatemalan Highlands.

This has been used successfully in many places as a way to introduce science in a non conventional way to very diverse groups of people. For example: The Solar Eye sculpture was designed by David Marín at the request from the School of Political Action for Mayan Women, in Guatemala, they wanted a course in astronomy as part of their project to better understand the rich cultural heritage of the Maya civilization in this subject. But not only for scientific or academic interest, but precisely because they recognize the importance of Astronomy in the organization of political life, and technological achievements of the ancient civilization.

However, they required an Astronomy course based on direct experience, tied to social and ritual activities in Mayan tradition, an approach that will promote the transmission of knowledge between elders and children using the traditional vectors of Mayan culture, native languages, textiles, oral tradition and the use of the ritual calendars.

With these ideas in mind the first sculpture was placed at an ancient observatory in the Guatemalan Highlands, where many traditional activities take place, thus presenting several opportunities a year to gather and talk about Mayan Astronomy.

The Solar Eye sculpture is a solar calendar, the play of light and shadows trace the motions of the sun over the year, and it marks eight important dates for the Mayan calendars: solstices, equinoxes and the passages of the sun through the zenith and nadir.

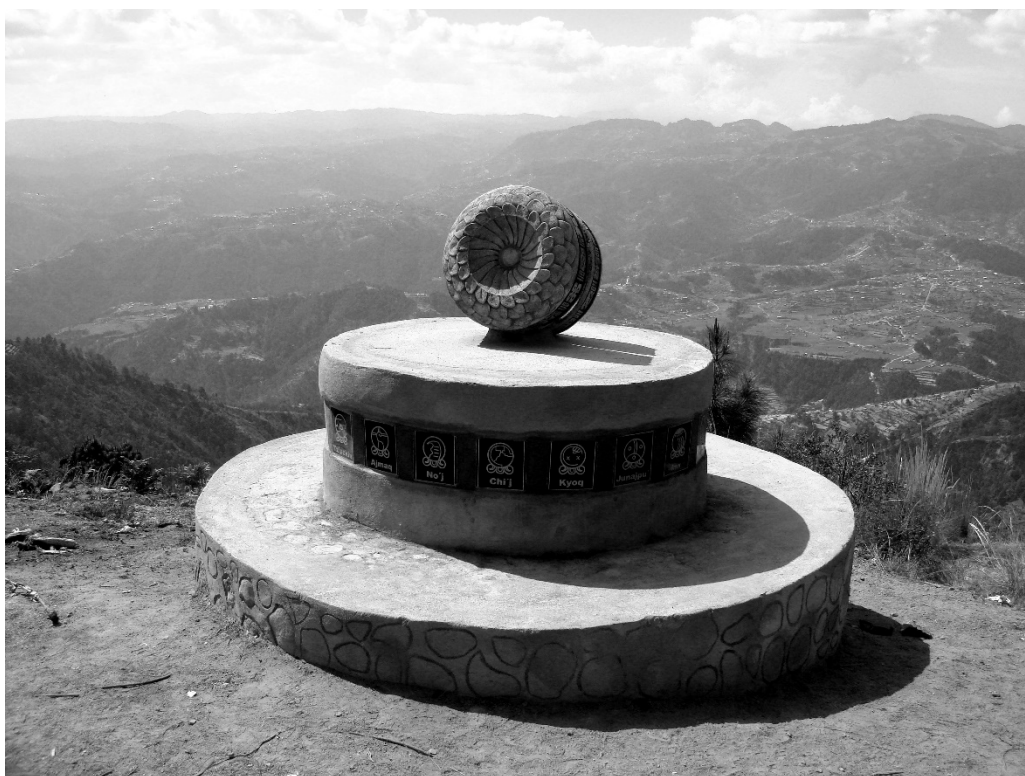


Fig. 2 The Solar calendar during the equinox. The path of the sun lies on a plane bisecting the sculpture producing a beam of light in the shadow.

At the latitudes near 15 degrees north, the passages of the sun through the zenith and nadir divide the year in periods of roughly 260 and 105 days. And 260 days is precisely the length of the ritual period called Tzolkin in Mayan languages, meaning the “count of suns”, and it is related to agricultural cycles like the more obvious 365 days Haab. In Guatemala the zenith passages of the sun occur April 30 and August 13, and the Nadir passages of the sun happen around November 1 and February 10. There are precolumbian celebrations that survive to this day in May first, the day of the cross and November first the day of the dead.

The Solar Eye and NASE

The NASE course is taught with the same content in all the countries where it takes place, except for a local part, "Astronomy in the city", where the idea is to visit a site that has some astronomical and cultural relevance to the country. However, in Guatemala City, despite being settled on the ancient Maya city of Kaminal Juyú, there is no surviving construction related to astronomy. And the subject of Maya astronomy has received little attention in Guatemala over the past years. However there has been a renewed interest in ancient Maya culture in general, partly due to the ending of the 13 Baktun cycle of the Maya calendar and there is a demand from the population to know more about this cultural heritage.

For this reason, the School of Physics and Mathematics (founded in 2015) as part of the San Carlos national university is contributing to bring this knowledge to wider audiences using the culturally relevant subjects of Maya astronomy, calendars and arithmetics as an introduction to science and astronomy aimed to diverse populations.

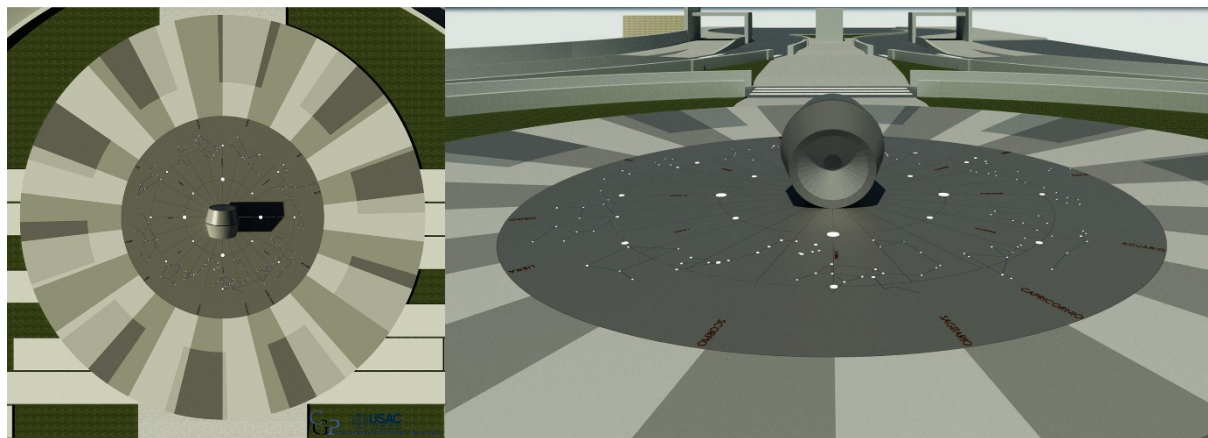


Fig. 3: The Solar Eye project at San Carlos University. This version is designed to mark eight important dates in the motion of the sun in the sky: equinoxes, solstices, and the days of zenith and nadir passage of the sun.

Placing the Solar Eye on the San Carlos national University campus is of particular importance because it represents a new attitude towards ancient knowledge, and connection with the ancient civilizations and a recognition that contemporary Maya culture is alive and evolving.

The solar calendar can be used as an introduction to naked eye astronomy, the motions of the sun through the year, Maya calendars and their relationship to agriculture and social organization of the indigenous populations.

References

1. Skywatchers, A. F, 2002, Aveni, University of Texas Press.