

ASTR 312

ANCIENT OBSERVATORIES

Courtney, Rue, & Liv

ASTR 312 - History of Astronomy
Gregory Arkos

Vancouver Island University
December 3, 2024

Ancient
Observatories

CONTENT



Nabta Playa
courtney

5000 BC



904 CE

Chich'en Itza
rue

Serpent Mount
liv

1070 CE



NABTA PLAYA

Nabta Playa is an ancient archaeological site located in the Nubian desert of southern Egypt. It is home to one of the oldest astronomical observatories in the world, thought to have been built during the Egyptian Neolithic Period around 5000 BC. Evidence suggests that those who built Nabta Playa had a sophisticated understanding of astronomy, with the site likely serving both as a means of timekeeping and a focal point for ritual and social gatherings.

Nabta Playa: Is The World's Oldest Astronomical Site Found in Africa? (2021, December 16). The Archaeologist.

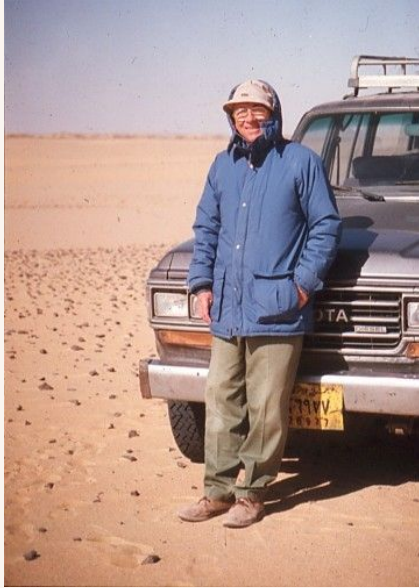
<https://www.thearchaeologist.org/blog/nabta-playa-is-the-worlds-oldest-astronomical-site-found-in-africa>

The Human Origin Project. (2018, November 24). *The Ancient Astronomy of the Nabta Playa Stone Circle in Egypt.*

Humanoriginproject.com. <https://humanoriginproject.com/nabta-playa-stone-circle/>



<https://www.astronomy.com/observing/nabta-playa-the-worlds-first-astronomical-site-was-built-in-africa-and-is-older-than-stonehenge/>



<https://www.thetravel.com/egypts-ancient-stone-circle-is-the-worlds-oldest-observatory/>

<https://www.discovermagazine.com/the-sciences/nabta-playa-the-worlds-first-astronomical-site-was-built-in-africa-and-is>

Discovered in 1974 by an archaeology team led by American professor of anthropology, Fred Wendorf.

Later excavation of the site in the 1990s revealed a “stone circle” that appeared to have a special alignment with celestial objects and astronomical phenomena.



<https://humanoriginproject.com/nabta-playa-stone-circle/>

The site shows early connections to astronomy as well as symbolic associations with death, water, cattle, the sun, and stars.

The Human Origin Project. (2018, November 24). *The Ancient Astronomy of the Nabta Playa Stone Circle in Egypt*.

Humanoriginproject.com. <https://humanoriginproject.com/nabta-playa-stone-circle/>

Cultural Significance

Regional ceremonial center during Middle Neolithic (6100–5600 BC)

People gathered during the wet season for rituals

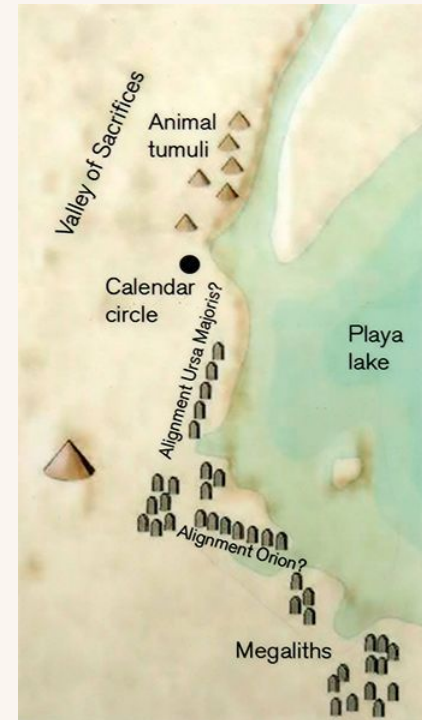
Cattle as symbols of wealth and power (sacrifices and rituals)

Surviving in the desert likely required the ability to navigate by the stars, as the nomads travelled across vast, featureless sand dunes without clear paths or landmarks. While there was no bright star directly at the North Pole of the sky at that time, they could have determined the direction of North by observing how the stars moved around that area.

J. McKim Malville, Schild, R., Wendorf, F., & Brenner, R. (2007). Astronomy of Nabta Playa. *Springer EBooks*, 11(10278389), 131–143.

https://doi.org/10.1007/978-1-4020-6639-9_11

Wendorf, F., & Schild, R. (1998). Nabta Playa and Its Role in Northeastern African Prehistory. *Journal of Anthropological Archaeology*, 17(2). <https://doi.org/10.1006/jaar.1998.0319>



<https://donsmaps.com/egypt1.html>

Ceremonial Centre

Connection to life, death, and celestial cycles

Tumuli for ritual and symbolic purposes

Human and cattle burials aligned with the northern sky

Stela, thought to be grave markings that represent spirits of the dead



Wendorf, F., & Schild, R. (1998). Nabta Playa and Its Role in Northeastern African Prehistory. *Journal of Anthropological Archaeology*, 17(2). <https://doi.org/10.1006/jaar.1998.0319>

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Astronomical Alignments

Early evidence of astronomy and skywatching

The calendar circle: 4 meters in diameter with flat and upright stones around the edge

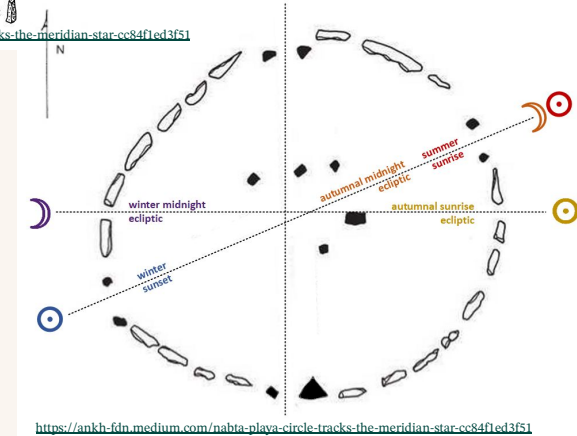
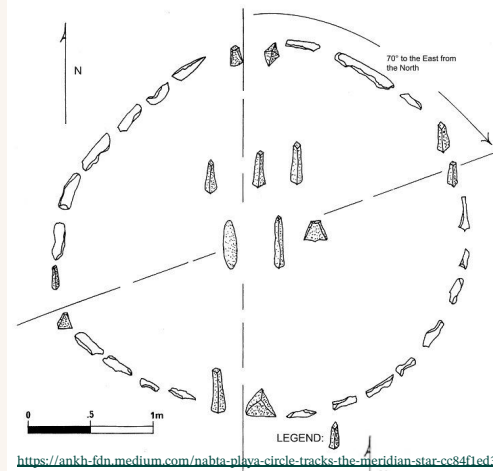
Aligns with the summer solstice sunrise

Sightlines at North and South

Vernal and autumnal equinoxes

Alignments with Orion's Belt and bright stars

Megalith structures align with the rise of Arcturus, Alnilam, Centauri, and Sirius. The brightest in the sky.



J. McKim Malville, Schild, R., Wendorf, F., & Brenner, R. (2007). Astronomy of Nabta Playa. *Springer EBooks*, 11(10278389), 131–143.

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Shatalov, A. (2023). Hypothesis of the dimensional-geometric scheme of the Nabta-Playa megalith landscape monument. *E3S Web of Conferences*, 402, 09002–09002.

<https://doi.org/10.1051/e3sconf/202340209002>

Overview

Cultural importance

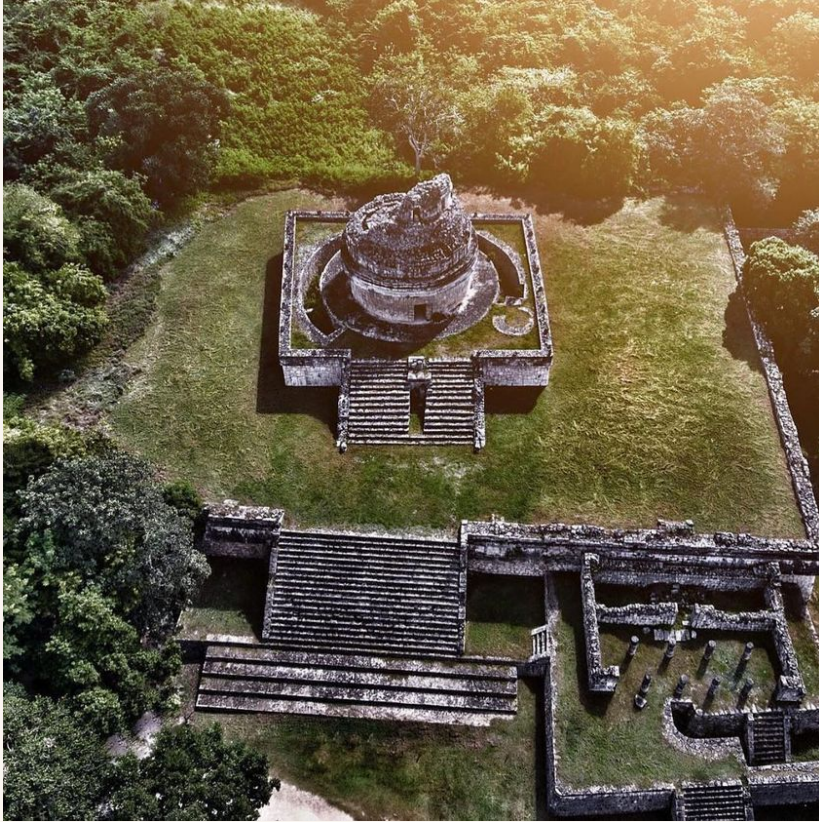
Nabta Playa represents one of the earliest known ceremonial and astronomical sites in the world. It served as a social gathering place for rituals

Astronomical Knowledge

Precise placements of megaliths show advanced astronomical knowledge. Alignments were likely used for navigation and also held deep symbolic meaning, linking the cycles of the heavens with life, death, and spiritual rituals.

Ceremonial place

Served as a central ceremonial hub during the Middle Neolithic period, with people gathering for rituals tied to cattle, which symbolized wealth, power, and spiritual status.



<https://yucalandia.com/2023/08/27/chichen-itzas-best-celestial-secrets-hidden-in-el-observatorio-el-caracol/>

the observatory / the snail

EL CARACOL

Known as "The Observatory," located in Chichén Itzá, Yucatán Peninsula.

"Snail" refers to the spiral staircase inside.

Cylindrical structure atop a rectangular platform, rare in Mayan architecture.

Built around 906 CE during the Late Classic Mayan period.

Continued into the Postclassic period.

Showcases Mayan architectural and cultural advancements at their peak.

<https://annex.exploratorium.edu/ancientobs/chichen/HTML/caracol.html>

Reason for Creation

Likely built as an astronomical observatory

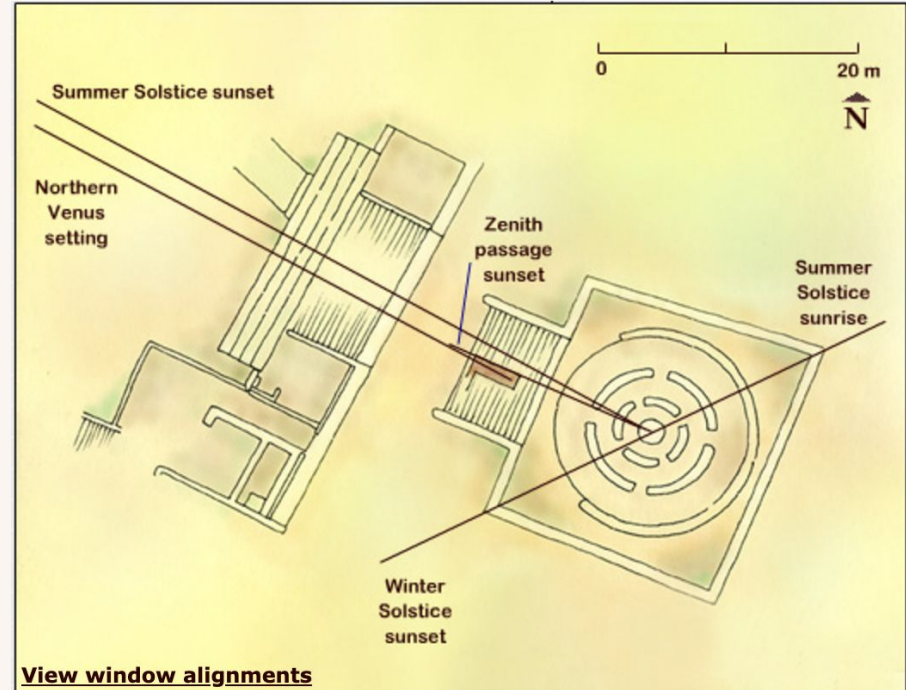
Designed to align with the Sun, Moon, and Venus movements.

Tracked solstices, equinoxes, and celestial events essential for agriculture, ceremonies, and calendar-making.

01

02

03



<https://annex.exploratorium.edu/ancientobs/chichen/HTML/alignments-caracol-bldg.html>

<https://mayanpeninsula.com/en/observatory-chichen-itza/>
<https://www.theyucatanimes.com/2020/01/the-chichen-itza-series-4-el-caracol/>

Strategically Placed Openings

The windows and doorways in El Caracol were positioned to align with the points where Venus rose or set at its northernmost and southernmost extremes on the horizon. Observing these alignments allowed Mayan astronomers to measure Venus's oscillations across the sky.

Tracking the Synodic Cycle

By recording when Venus appeared as a morning star, disappeared, reappeared as an evening star, and disappeared again, they could map out the 584-day synodic period of Venus.

Repetition of the 8-Year Pattern

Observations made from El Caracol over long periods revealed Venus's 8-year cycle. By noting its northern and southern extremes repeatedly, they could predict when these positions would recur.

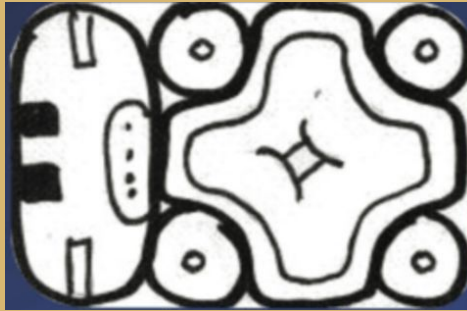
The Tracking of Venus



<https://annex.exploratorium.edu/ancientobs/chichen/HTML/caracol.html>

Cultural Significance:

El Caracol symbolizes the Mayans' deep connection between astronomy, religion, and daily life.



<https://www.mexicanist.com/l/mayan-universe/>

Astronomical Significance:

El Caracol's astronomical significance lies in its precise alignment with Venus and solar events, reflecting advanced Mayan astronomy.



History.com Editors. "Serpent Mound." *HISTORY*, A&E Television Networks, 3 Nov. 2017. www.history.com/topics/landmarks/serpent-mound. Accessed 14 Nov. 2024.

SERPENT MOUND

The Great Serpent Mound, one significant effigy mound in North America, is an Ohio State Memorial and National Historic Landmark. Early excavations by Putnam in 1890 linked its construction to the Adena culture of the Early Woodland Period, based on nearby artifacts. However, in 1996, radiocarbon dating of charcoal samples suggested a construction date around 920 BP, during the Late Prehistoric Fort Ancient Period. In 2011, researchers revisited this data, using Bayesian analysis on new samples, and reaffirmed its origins in the Early Woodland Period. This suggests the mound's history involves contributions from multiple cultural groups over time.

Herrmann, E. W., Monaghan, G. W., Romain, W. F., Schilling, T. M., Burks, J., Leone, K. L., Purtil, M. P., & Tonetti, A. C. (2014). A new multistage construction chronology for the Great Serpent Mound, USA. *Journal of Archaeological Science*, 50, 117–125. doi.org/10.1016/j.jas.2014.07.004

1.

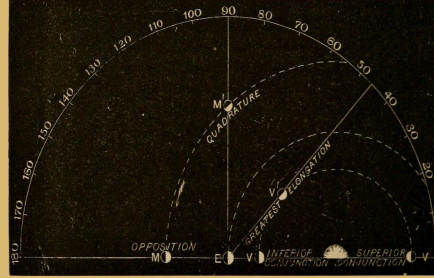


Religious and Ceremonial Significance

Site for rituals or ceremonies linked to serpent deities.

Resembles serpent mythology prominent in Native American cultures.

2.



Astronomical Alignments

Aligns with celestial events like solstices or lunar cycles.

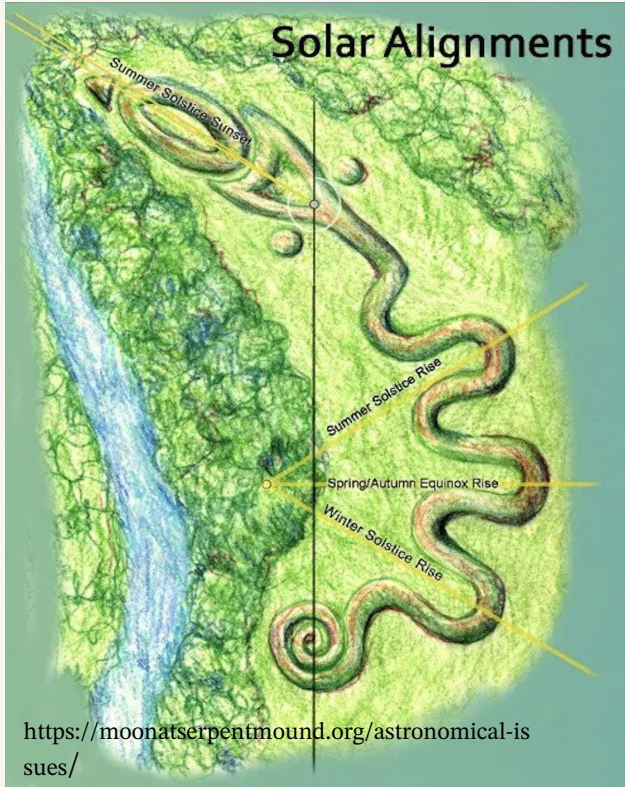
Potential use as an astronomical calendar.

3.



Territorial Marker

The Mound could mark tribal boundaries or areas of influence, claiming their rights to land and showing their territorial area



Solar Alignments

1. Solar Alignments

- **Solstices:** Researchers have proposed that parts of the mound align with the summer and winter solstices. For instance, the serpent's head points toward the sunset during the summer solstice, while its tail aligns with the winter solstice sunrise.
- These alignments suggest that the mound's builders used it to track the solar calendar, aiding in marking seasons for agricultural or ceremonial purposes.

2. Lunar Cycles

- Some scholars theorize that the mound's sinuous curves correspond to the phases of the moon or the lunar nodes (points where the moon's orbit crosses the ecliptic plane).
- The lunar connections may reflect a deeper understanding of the moon's role in shaping time and cycles, such as tides or planting seasons.

3. Astronomical Observations

- **Star Alignments:** Certain points on the mound could align with significant constellations or stars. Some suggest a connection to the constellation Draco, which has symbolic ties to serpents in various cultures.
- Such alignments might have been used to chart the night sky, facilitating navigation or the timing of rituals aligned with celestial phenomena.

Willoughby, Charles C. "The Serpent Mound of Adams County, Ohio." *American Anthropologist*, New Series, Vol. 21, No. 2 (Apr. - Jun., 1919): 153-163. Published by Wiley on behalf of the American Anthropological Association. www.jstor.org/stable/660267



Significance and Findings

- The Serpent Mound shows us the connections the native peoples were making with the universe and its amazing wonders. Their desire to keep track of where stars and planets were shows the commitment to understanding their world and the use of the site for rituals and ceremonies shows the deep interconnectedness with the universe and nature on earth.
- The effort put into making this effigy that still stands today and the multiple cultures and peoples that worked on it shows us just what significant understanding our universe meant to them.
- Artifacts, including copper ornaments, were found when the site was surveyed which points to sophisticated belief systems and ceremonial practices. This Mound is one of the greatest in America today.



Conclusion

The Great Serpent Mound is a testament to the ingenuity and spiritual depth of the cultures that shaped it. Whether as a sacred site, astronomical tool, or cultural symbol, it continues to inspire awe and curiosity. By studying its layers of history, we not only learn about the mound itself but also gain a richer understanding of the beliefs, artistry, and resilience of the indigenous peoples who built it.

Lepper, B. T. (2018). *Arguments for the Age of Serpent Mound*. Retrieved from ResearchGate:researchgate.net/publication/322709149_Arguments_for_the_Age_of_Serpent_Mound

ASTR 312



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Thank You
time for kahoot!

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