

Work plan
Finding the Relatedness between the Modern calendar and Surya Siddhanta

BACKGROUND

We use calendars daily to see our schedule, recall significant occasions, and, most importantly, reflect on the past and plan for the future. We have been doing this since the dawn of civilization for humans. There is extensive written evidence from before humans began counting days, but the calculation has always been accurate. Ancient Indian astronomers are still the pride of the whole world. The introduction of astronomical calculations based on spherical trigonometry marked the beginning of a new age of siddhantic astronomy, then Mayasura's Surya Siddhanta later revolutionized Indian astronomy. Mayasura observed a rare conjunction of the sun and the moon, and all planets except their nodes and absidies were in conjunction with Aries (Mesha) on the new moon day of Chaitra month at the end of the 28th Krita yuga.

Software simulations using the JPL Horizons (a web application) and the ephemeris system established that such conjunction on Chaitra Shukla Pratipada occurred only once in the last 16000 years, that is, on 22nd February 678 BCE. It is thus established that Mayasura wrote Surya Siddhanta in 6778 BCE.

The calendar of Surya Siddhanta completes 8800 years in the year 2022. All these calculations were done way back in time without using computers or advanced astronomical equipment. If our ancestors could do this back in time, why not us? So, this project aims to figure out how Surya Siddhanta can be helpful in quickly figuring out the dates and then verifying its accuracy and relatedness with modern calendar.

OBJECTIVES :

1. Acquiring knowledge of Spherical Trigonometry, an ancient Indian mathematical technique.
2. Verifying the coordinates and geometry of the celestial bodies and comparing it with ancient information given in Vedas and Purana.
3. Computing planetary motions and positions to check calendar system.
4. Determining the precision and similarity between ancient astronomy and the present calendar with the help of modern simulations and calculations

DESCRIPTION:

We intend to solve Trigonometric equations and problems using instructions from the Vedas and Puranas to determine Planetary positions, resulting in accurate date and time predictions.

We would use calculation software such as MATLAB and Python libraries to validate the Surya Siddhanta results. The first requirement for understanding the concepts in Surya Siddhanta is to learn Spherical Trigonometry, which is the initial step of this project and then we would explore Surya Siddhanta in depth.

As we know, Astronomy is a field of study that encompasses everything outside of the surface of the earth. Every planetary motion and the solar event takes place in three-dimensional physical space, and most planets and their orbits are spherical or elliptical. However, certain planets have odd but well-defined orbits. With the aid of contemporary technology, it is possible to correctly predict objects' past and future positions by treating these motions as motion in spherical dimensions. We would calculate and verify the calendar system by determining the planetary motions and positions. Based on Mayasura's Surya Siddhanta from 6778 BCE, Lata Deva wrote the Surya Siddhanta, now known as A Synopsis of Mayasura's Surya Siddhanta. The primary distinction between these two Siddhantas is that Lata Deva described a deva yuga of 4 lakh 32,000 years, whereas Mayasura described an asura yuga of 1 lakh 80 000 years. Surya Siddhanta was written by Lata Deva on Chaitra Prapada, or February 18th, 3101 BCE, while observing the approximate conjunction of the planets. Here we will figure out which of the Siddhanta is more accurate. Learning and solving spherical trigonometry will help us see how some Ancient civilizations had the concept of periods that were truly enormous by contemporary standards at that point of time. Apart from the Mayans, the ancient Hindus appear to be the only people who dared to think beyond a few thousand years.

TIMELINES:

- We will attempt to solve spherical trigonometry problems throughout the first month to comprehend how it is used in practical situations.
- The second month will be devoted to exploring Surya Siddhanta and determining the planetary motion to calculate the calendar using spherical trigonometry.

Weeks 1 and 2 - Reviewing spherical trigonometry theorems and methods using Ancient Astronomy textbooks.

Weeks 3 and 4 - Problem-solving and verification using the computational software MATLAB.

Week 5 - Learning Surya Siddhanta spherical trigonometry

Weeks 6 and 7 - Understanding the Vedic and Puranic calendar concepts based on the positions of planets, stars, and constellations in the sky and using Surya Siddhanta to predict upcoming celestial events.

Week 8 - Final Report preparation, as well as revising and summarising all previous work.

OUTPUT

The project will aid in the verification of the accuracy of the ancient methods implied by Indian astronomers. A better insight into the Indian calendar will be gained with the knowledge of spherical Trigonometry. The goal of reclaiming our past glory would be realized because Indian Astronomers would be credited with laying the strong scientific foundations in ancient times that may have led the world to modern advanced sciences. This will lay the groundwork for future generations to adapt Indian astronomical science.