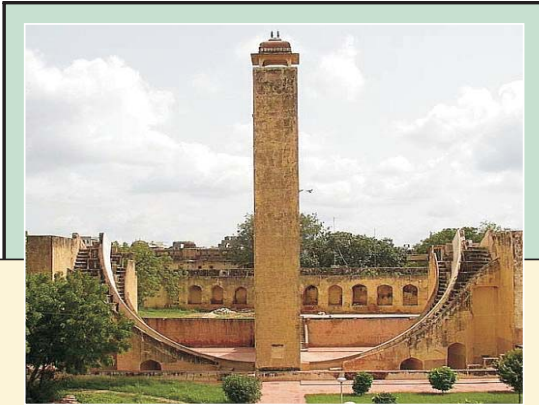


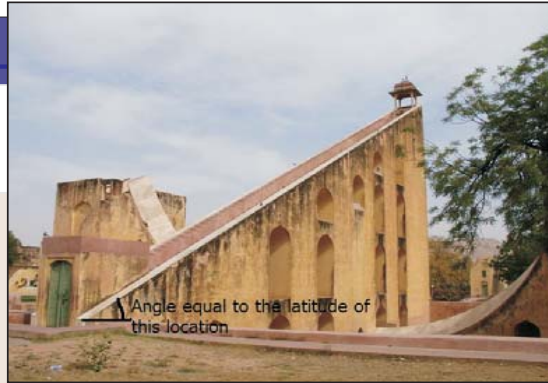
# Brihat Samrat Yantra

The largest sundial in the world!



A view of the Samrat Yantra exactly from the North

The Brihat Samrat Yantra is a gigantic equinoctial sundial built into an excavation in the ground. Facing us here, is the perpendicular of the right angled triangle that forms the gnomon of the instrument. The arcs on either side are the quadrants. The movement of the shadow of the gnomon (the triangular wall) on the arched quadrants has been calibrated to read the time to an accuracy of 2 seconds!



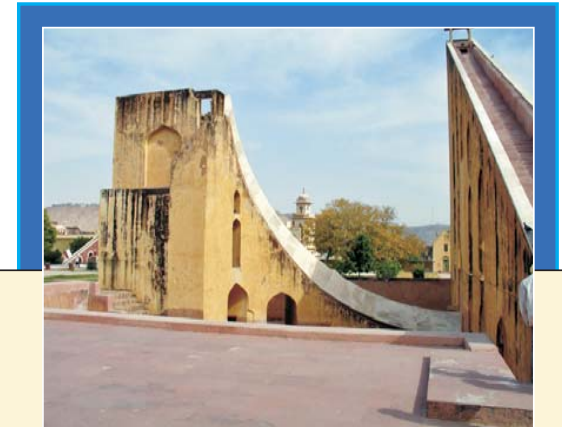
How does the Samrat Yantra tell the Time?

A view of the Brihat Samrat Yantra from the South East

The triangular gnomon of the Yantra is constructed in such a way that the Hypotenuse points towards the North Celestial Pole. This is achieved by making the angle inside the right angled triangle equal to the latitude of this location.

The “Staircase to Nowhere”, in fact, points to the Pole Star! The arched quadrants are perpendicular to the inclination of the Gnomon and are parallel to the plane of Earth's Equator.

What is achieved by such a configuration? The shadow of a gnomon pointing towards the North celestial pole, falling on the arched quadrants, moves equal distances in equal intervals of time. This movement can therefore be calibrated in a very simple manner, to read the time.



The shadow can be seen in this photograph, to be midway on the western quadrant. When the shadow is at the top of the western quadrant, the local sundial time would be 6:00 AM. When the shadow disappears at the Gnomon, it is 12:00 Noon, Local Solar Time. The quadrant is therefore calibrated to read six hours of time. The least count of the calibration is 2 seconds. Following the local solar noon, the shadow reappears on the eastern quadrant, which shows the time from solar noon to 6:00 PM Local Solar Time.

The Local Solar Time, however, differs by a small amount, from our standard clock time. This difference between the two times changes everyday. The daily correction to be added to the sundial time is displayed for that day, in the observatory (under the gnomon of the Laghu Samrat Yantra)

## References

1. The instruments of the Jantar Mantar Observatory, Jaipur
2. The Jaipur Observatory and its Builder, by Lieut. A. F. Garrett, R.E. and Pundit Chandradhar Guleri, Pioneer Press.
3. Sawai Jai Singh and His Astronomy, by Virendra Nath Sharma, Motilal Banarsidass Publishers.

Calibration work in progress by Nehru Planetarium, New Delhi