

## Cosmology of the Incas

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The Incas worshipped the Sun, with light and shadow effects in their constructs commonly denoting such events as the solstices and equinoxes. They as well honored and venerated many features of both natural and man-made landscapes that they felt to be endowed with superhuman powers. In Quechua, these shrines were known as huacas, and at the time of the Spanish conquest there were thousands of them. Soon after subduing the Inca empire, the Spaniards began a campaign against the indigenous religion that included a systematic eradication of huacas. Shrines that were large carved stones and outcroppings survived, however, and were subjects of this research for astronomical orientations marking significant solar events.

The Incas built multiple towers on the horizons of Cusco to mark the positions of the rising or setting Sun on specific dates of the year. They used these solar pillars to mark time passage for purposes of crop management and religious festivals. All were destroyed. Beyond Cusco, however, two solar pillars overlooking the modern village of Urubamba escaped the Spanish purge. This research has verified, when viewed from a large granite boulder in the center of the Huayna Capac's palace, Qwespawanka, that they mark the position of the rising Sun at June solstice. Additionally, from the same boulder and in the direction of the December solstice sunrise, are located enigmatic stone structures on the summit of Cerro Unoraqui.

Below Machu Picchu, near the Urubamba River, lies a large and complex shrine initially identified by Hiram Bingham as the Urubamba Intihuatana. The massive granite stone lies between the Sacred Plaza of Machu Picchu and the Sun Temple of Llactapata along the axis of the June solstice sunrise and December solstice sunset. With the scientific discovery of Llactapata in 2003 came the realization that a great ceremonial complex once existed between Machu Picchu, the River Intihuatana, and Llactapata.

These and other examples of Inca astronomy are explored in this paper. The approach is a holistic one in that it considers multiples levels of meaning including cultural motifs, topographic and astronomical contexts, sightlines, as well as light and shadow effects throughout the year, especially at times of the solstice, equinox, zenith and anti-zenith suns. Astronomy was thoroughly interwoven throughout many facets of Inca society.

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