

# AST-MET<sub>3</sub> Field examples

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# Field Examples of Solar Cultural Astronomy

# Inca Astronomy





# Quespiwanka Pillars

Sixteen solar pillars once stood on the Cusco horizon, but all were destroyed during the Catholic extirpation of idolatry

Well beyond Cusco two pillars survive near Urubamba on the *Cerro Saywa Ridge* as viewed from the palace of *Quespiwanka*

They mark the rising Sun at June solstice when viewed from this palace of the Inca ruler *Huayna Capac*

Their existence validates the Spanish chronicle reports of the Cusco pillars



A large, light-colored granite boulder is the central focus of the image. It has a rough, weathered texture with some darker spots and a prominent crack running down its side. The boulder is situated in front of a modern chapel, which is visible in the background as a dark, textured wall. To the left, a portion of a red-tiled roof is visible. The foreground consists of a grassy area with some small rocks and debris. The overall scene is brightly lit, suggesting a sunny day.

# Granite Boulder

The white granite boulder  
of Quespiwanka in front of  
a modern chapel

A landscape photograph of the Quespiwanka Pillars. The scene shows a valley with a small, dark structure on a hillside. The sky is overcast with grey clouds. In the foreground, there are blurred green leaves on the left and dark, out-of-focus shapes on the right. The text "Quespiwanka Pillars" is overlaid in white at the bottom center.

# Quespiwanka Pillars





# Kenko Grande

*Kenko Grande* is a large limestone outcropping that was carved in situ

It has two carved gnomons with an intentional effect of light and shadow at June solstice sunrise

“The Awakening of the Puma”







Carved Fissure



# Kenko Grande Cave

There is also a cave within Kenko Grande

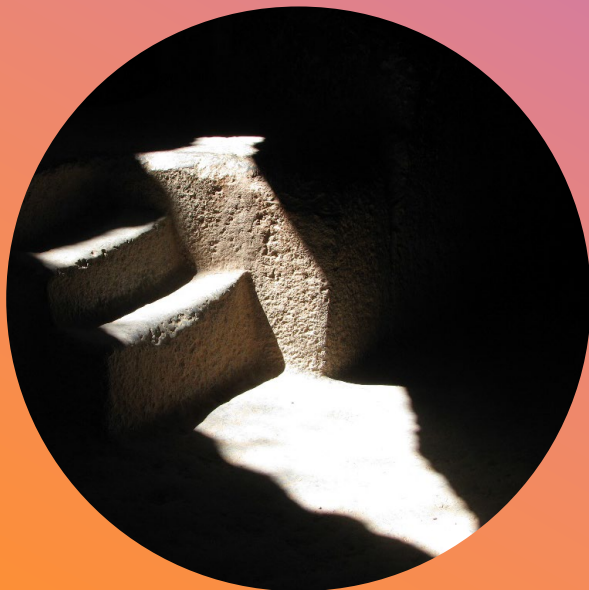
It contains a finely carved altar and three stairs

Around the time of the June solstice at local noon sunlight climbs the stairs





# Stairs



# Lacco

## Southwest Cave

Lacco is another large limestone outcropping

The Southwest Cave contains a light-tube directed at a small altar

Crescent Moon looking out through light tube



*Lacco* with Nevado Ausengate





# Northeast Cave

Lacco's Northeast Cave's opening is oriented exactly for the June Solstice Sunrise

The point of sunrise draws closer on the horizon each day from the right until it "stands still" at the solstice, then it reverses course and moves back to the right eventually reaching the point of the December solstice

At sunrise the Sun illuminates an altar and the cave's interior for just over two hours





**Northeast Cave altar nearing the  
end of illumination**



## Southeast Cave Inner Chamber

This cave is known as the Temple of the Moon

It has a light-tube and an altar

The light tube is oriented for the time of the zenith Sun

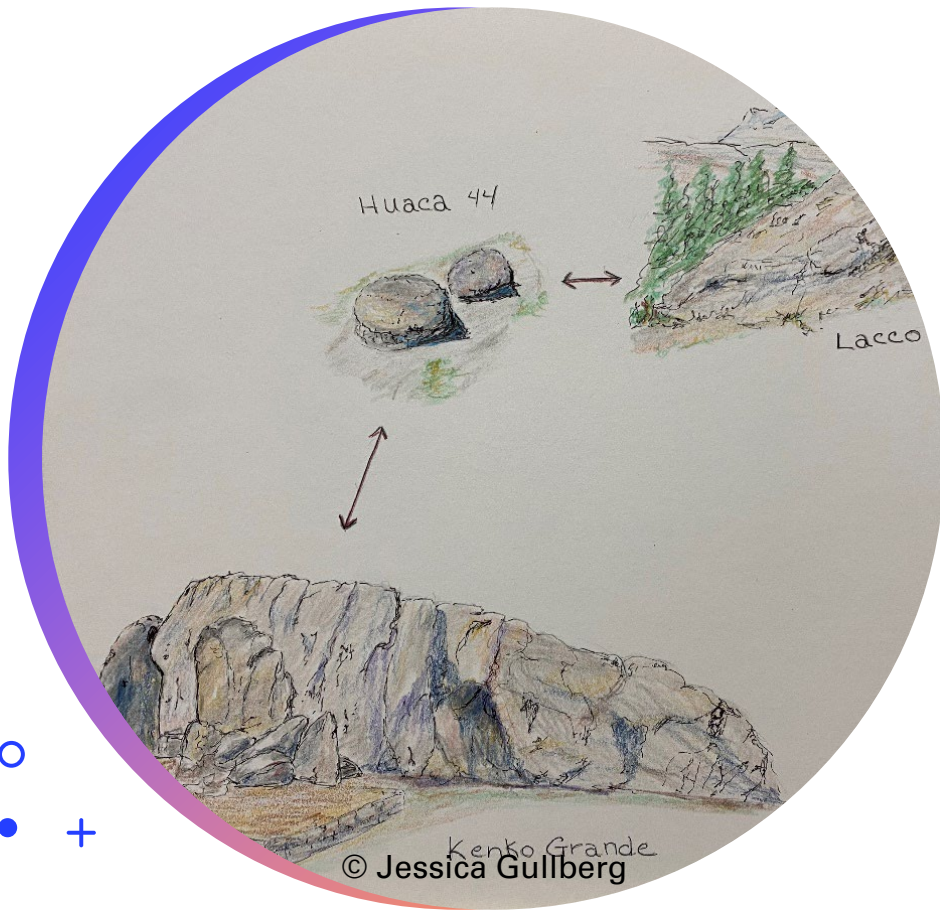








# Huaca 44

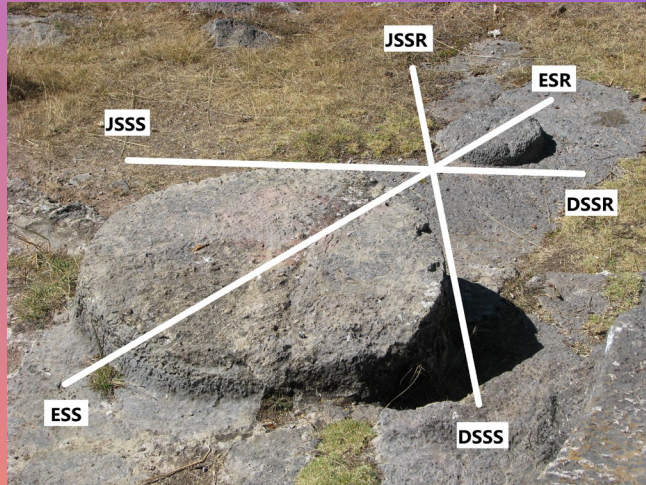


*Huaca 44* is another limestone outcropping

Its primary features are two carved circles, and it also has carved seats

It exhibits orientations of alignments for cardinal solstice and equinox horizon events



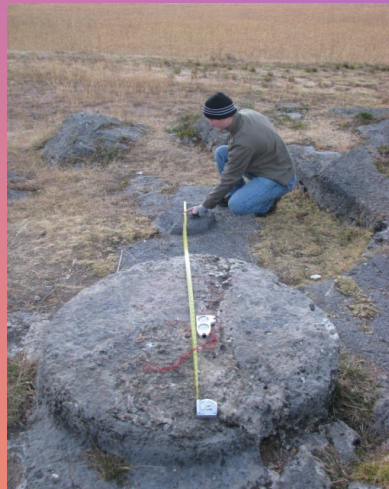
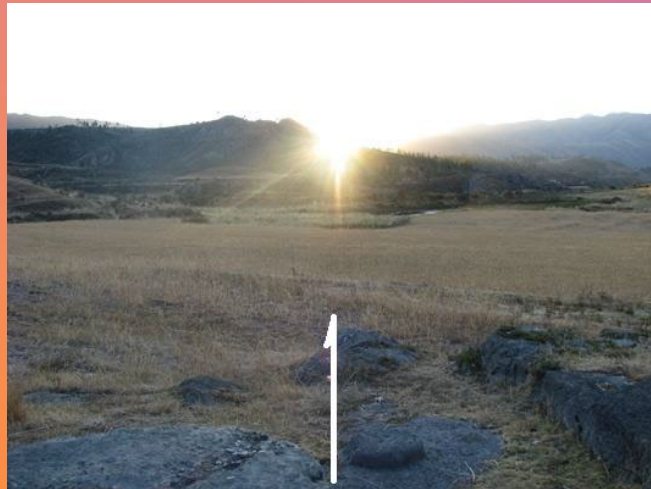


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# Huaca 44

June Solstice Sunrise



○



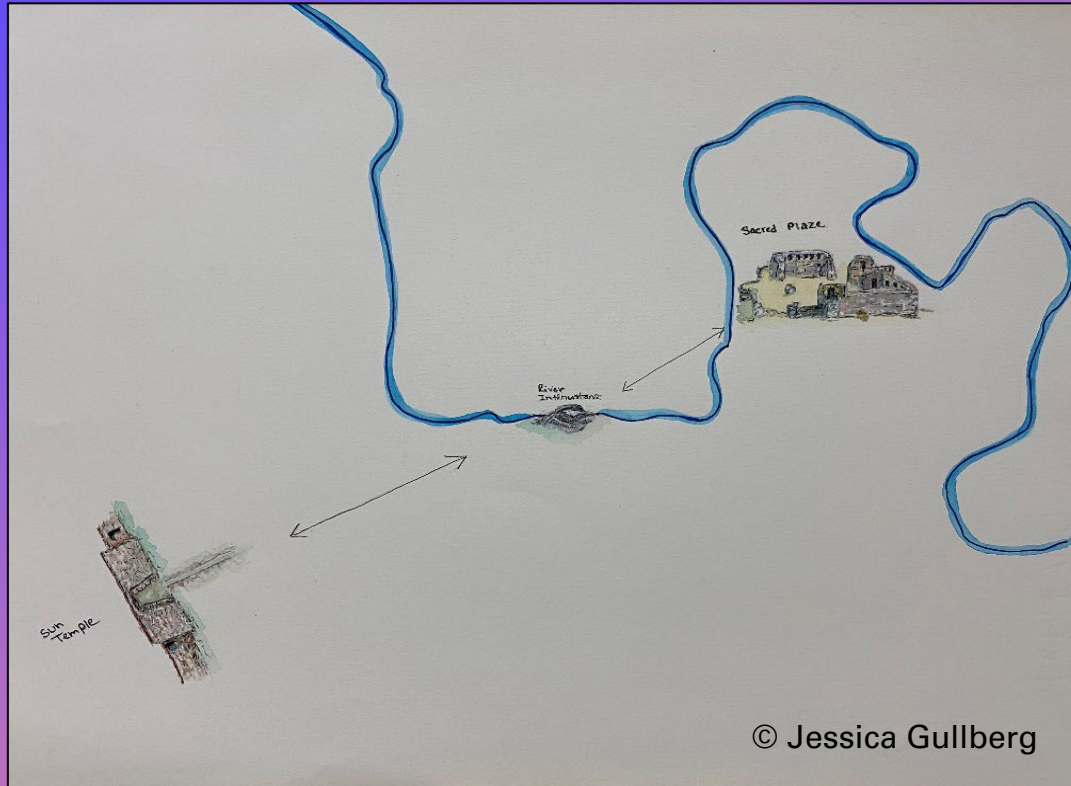
# Machu Picchu



## The Torreón (Temple of the Sun)

*The Torreón* includes a carefully fitted rock wall that has a window open to the horizon positions of the June solstice sunrise and the heliacal rise of the Pleiades

# Machu Picchu Region



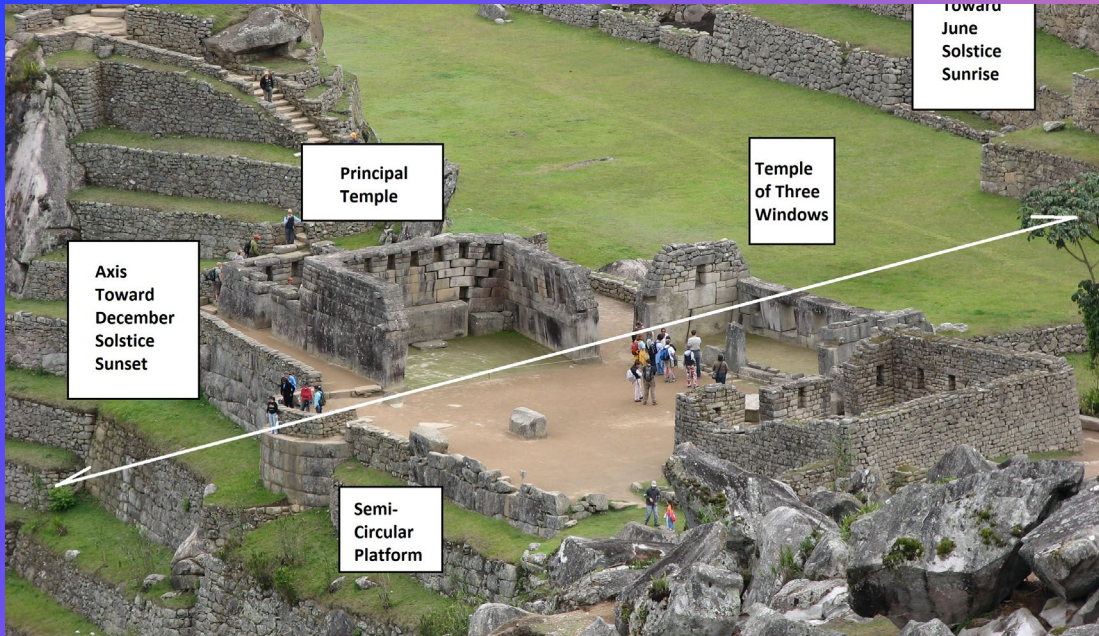
Llactapata Sun Temple

River Intiwatana

Sacred Plaza

The three are aligned for  
the axis of June Solstice  
Sunrise (JSSR) and  
December Solstice  
Sunset (DSSS)

Llactapata Sun Temple, River Intiwatana, and Machu Picchu Sacred Plaza



# Machu Picchu Sacred Plaza

- Temple of Three Windows
- Semi-circular platform

The white line shows the JSSR-DSSS Axis

June Solstice Sunrise over the Temple of Three Windows







# Machu Picchu Intihuatana and the Llactapata Ridge

The *Llactapata Ridge* is 5 km from Machu Picchu across the gorge below

This photo was taken from the Machu Picchu Intihuatana

# Llactapata Sun Temple

The *Llactapata Sun Temple* overlooks Machu Picchu

It is oriented for June solstice sunrise and the heliacal rise of the Pleiades





# Stone Channel

By our feet leading out from the Sun  
Temple's main doorway



The channel from the Llactapata Sun Temple is directed across the River Intihuatana below to the Sacred Plaza

This is oriented for June Solstice Sunrise and the heliacal rise of the Pleiades. A blurred appearance predicted a good season for crops, but a clear appearance predicted drought, the effect of El Niño.



The upper photo is of the June Solstice Sunrise



# The River Intihuatana



The *River Intihuatana* lies in the *Urubamba* (Vilcanota) River canyon

It is a carved granite huaca

It lies between Machu Picchu and Lactapata and the site also includes features such as a platform, steps, fountain, basins, and a cave

Hiram Bingham first noted this site in 1911 but its full significance was not realized until Lactapata was scientifically rediscovered in 2003.



**Sightline to the  
Machu Picchu  
Intihuatana and  
the Sacred Plaza**

**Intihuatana**



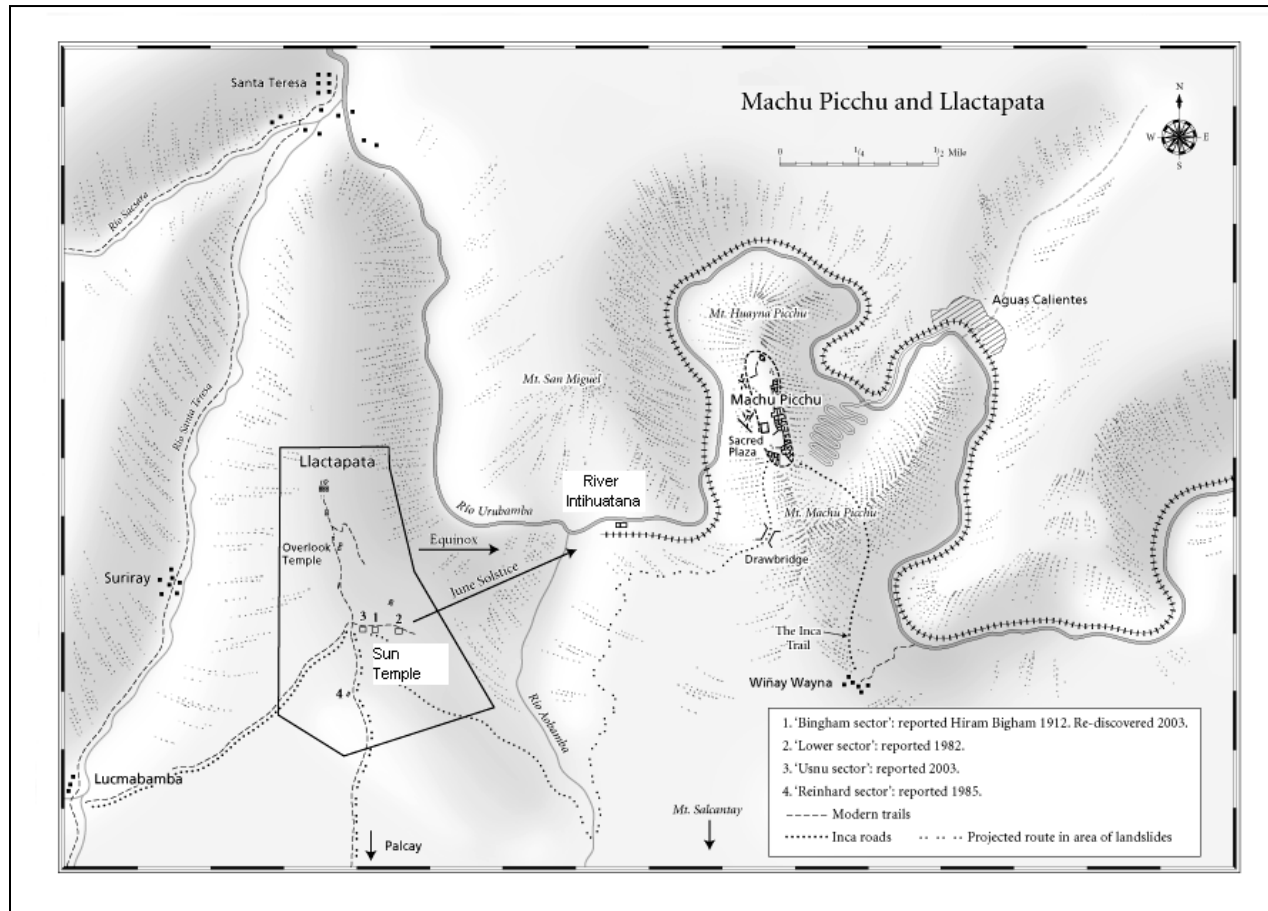
**Sacred  
Plaza**



**The Machu  
Picchu  
Intihuatana and  
Sacred Plaza  
Magnified**



# Machu Picchu Region



Llactapata  
River Intihuatana  
Machu Picchu  
JSSR-DSSS Axis  
Equinox Axis  
Ceremonial Complex

Llactapata Sun Temple, River Intihuatana, and Machu Picchu Sacred Plaza



# Conclusion

Solar Motion has been a key factor in Indigenous astronomy throughout history in cultures around the world, and you have seen examples of that here with Inca astronomy

You will find examples of cultures using the Sun at many global sites

Make sure that what you find is not coincidental, though. It must be supported both astronomically and be placed into cultural context. How did the people use astronomy and for what did they use it?

Enjoy your research!

# Credits



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## Design

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