

The privileged astronomical position of Ecuador known from the time of the Aboriginal culture Quitu-Cara, and how this can stimulate the young people to study astronomy.

UN Austria Symposium : " Access to Space: Holistic Capacity- Building for the 21 st Century

Graz – Austria , 6 septiembre 2017

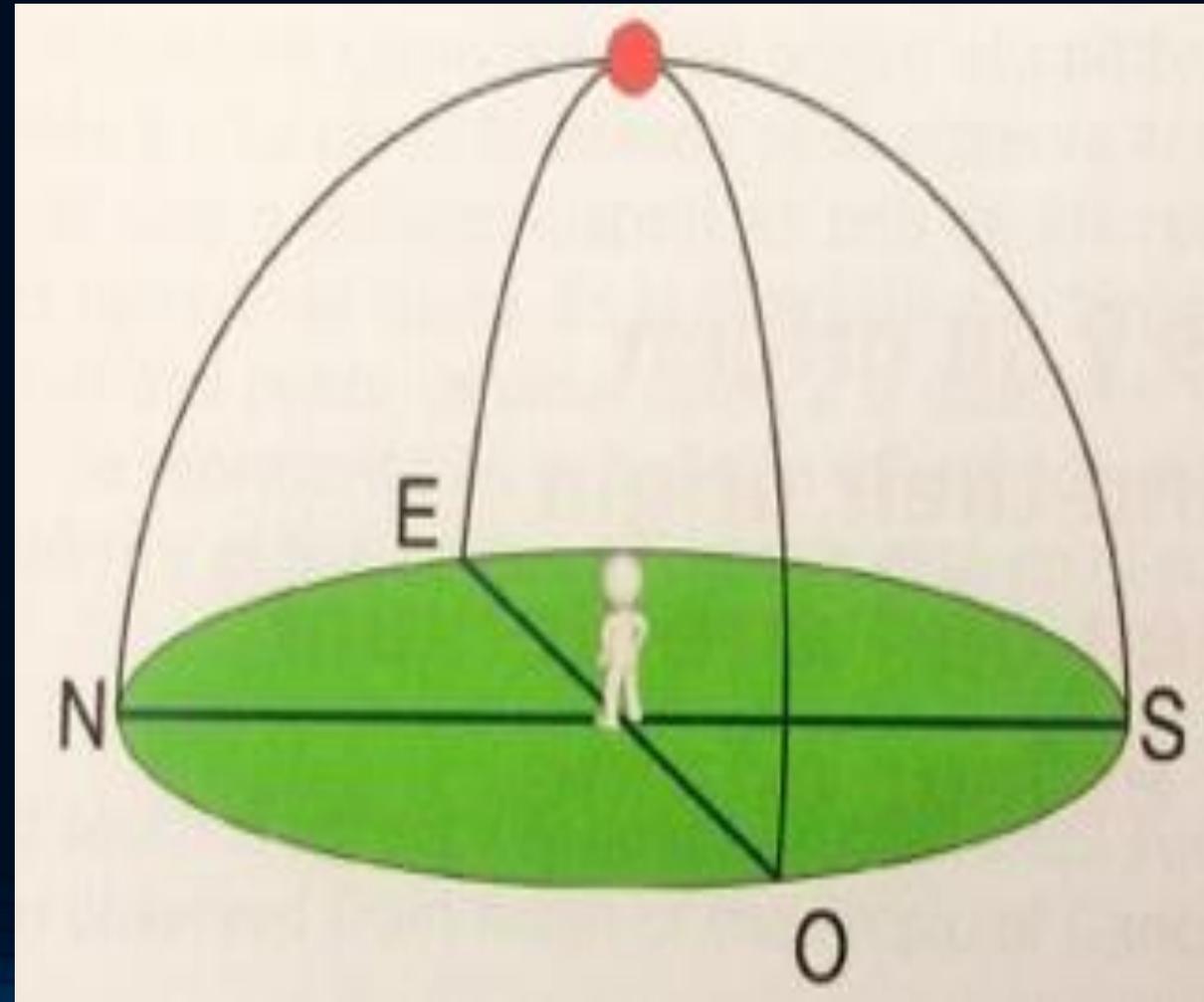
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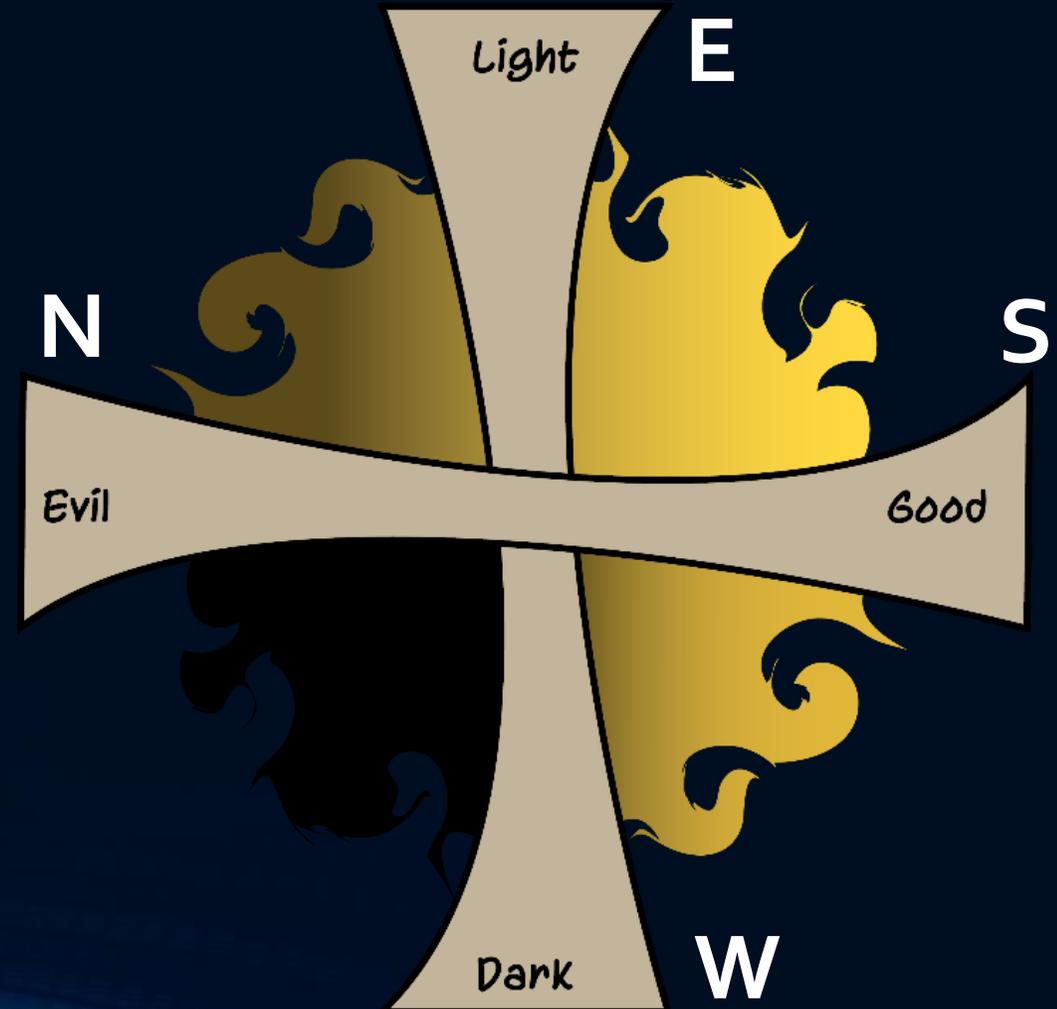
Using East as Geographic Reference

- Topocentric perspective.
- East, west, north and south.
- Zenith and nadir.
- This perspective uses the human as its center, as an observer of his surroundings.



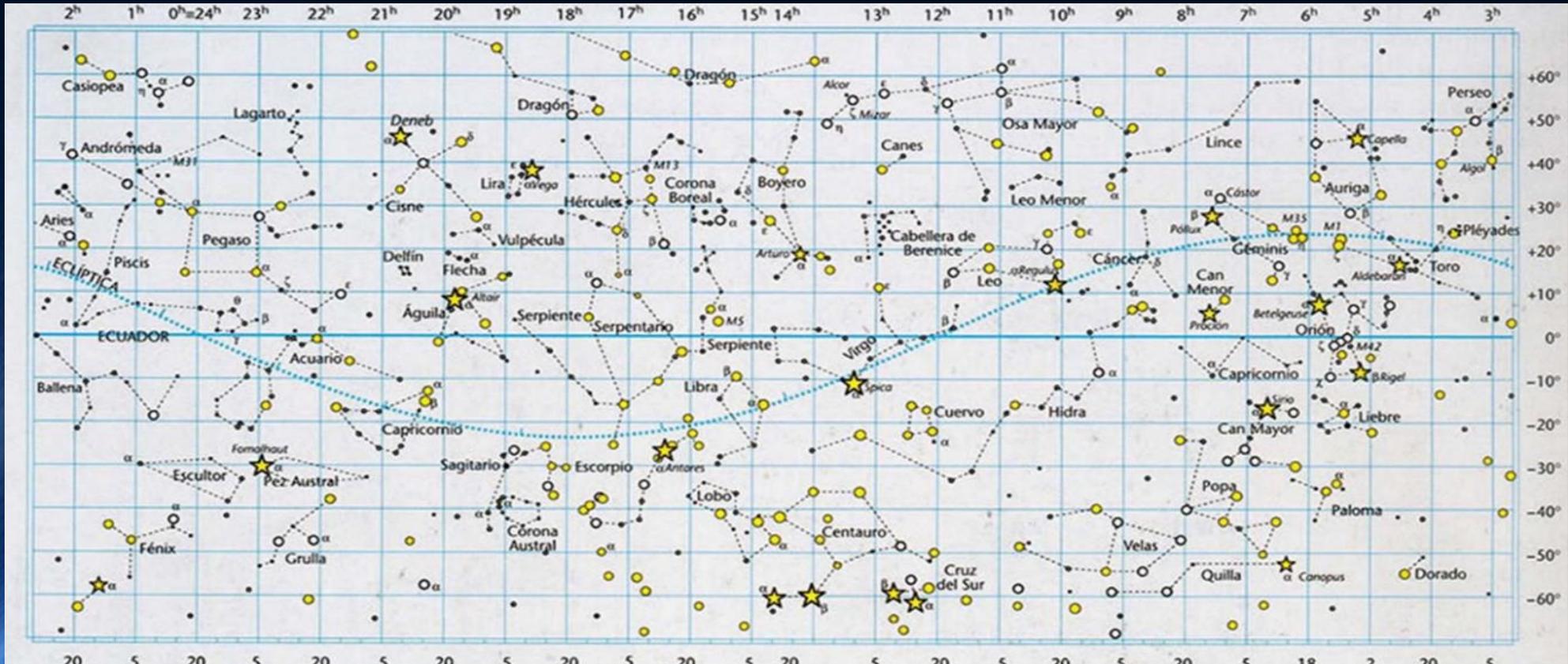
Using East as Geographic Reference

- East at the top of maps.
- Pre -christian polytheistic cultures worshiped the sun.
- Pre-hispanic cultures of the Americas were aligned towards the east.



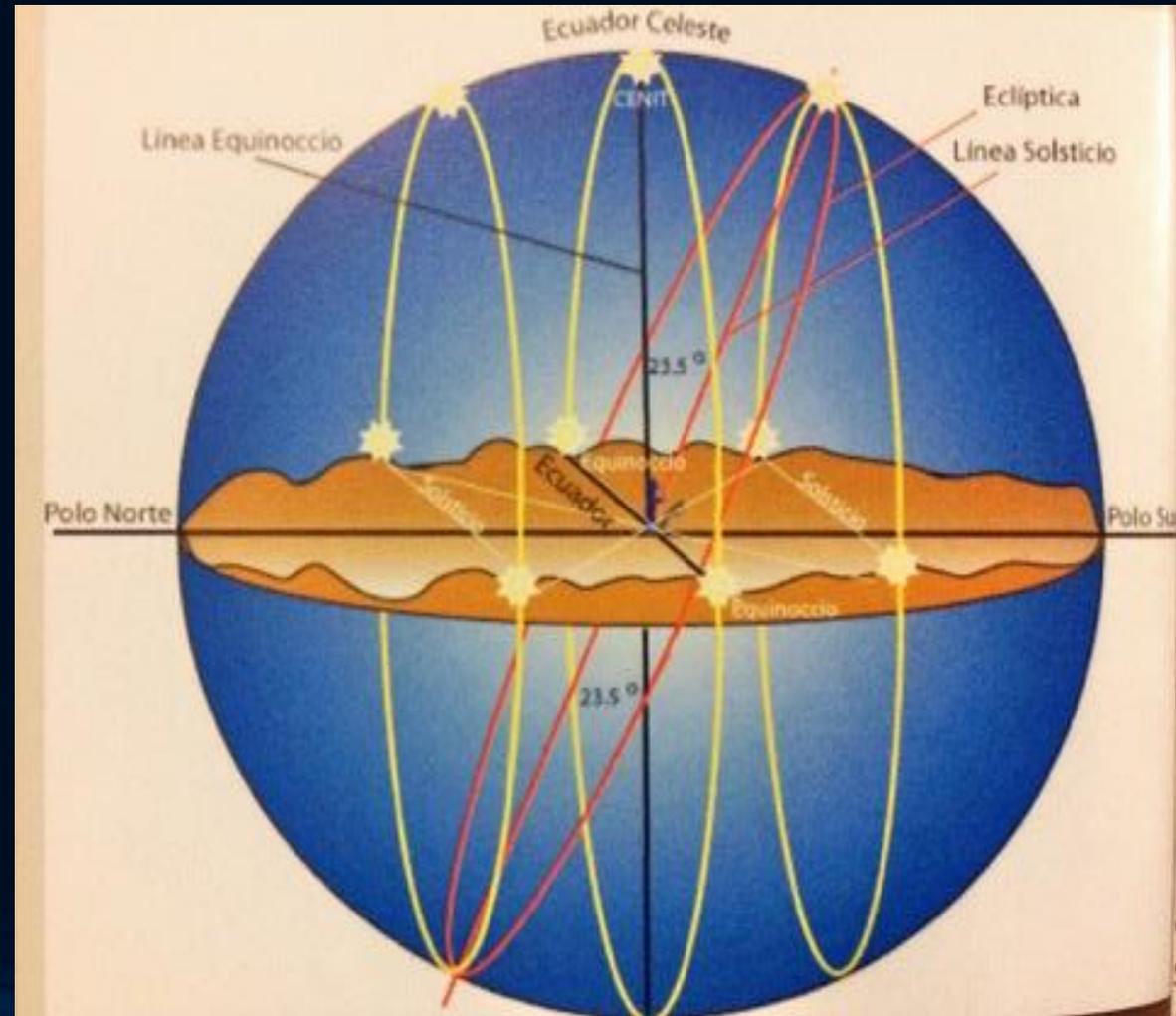
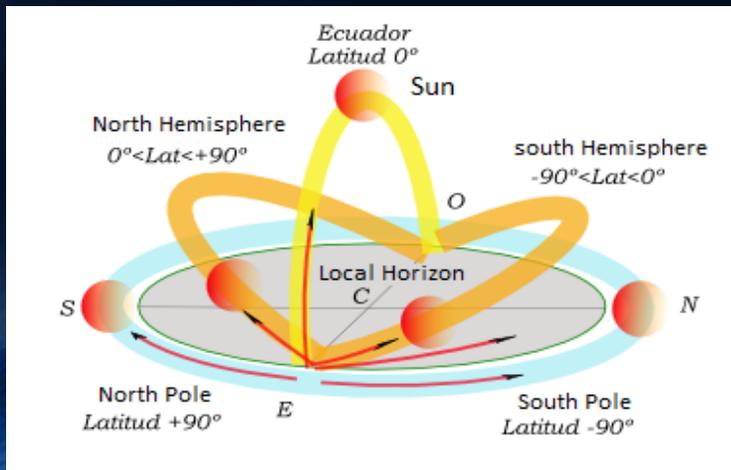
Privileged astronomical position of Ecuador

- Why is Ecuador considered the middle of the world if the equinoctial line passes for 17 countries?



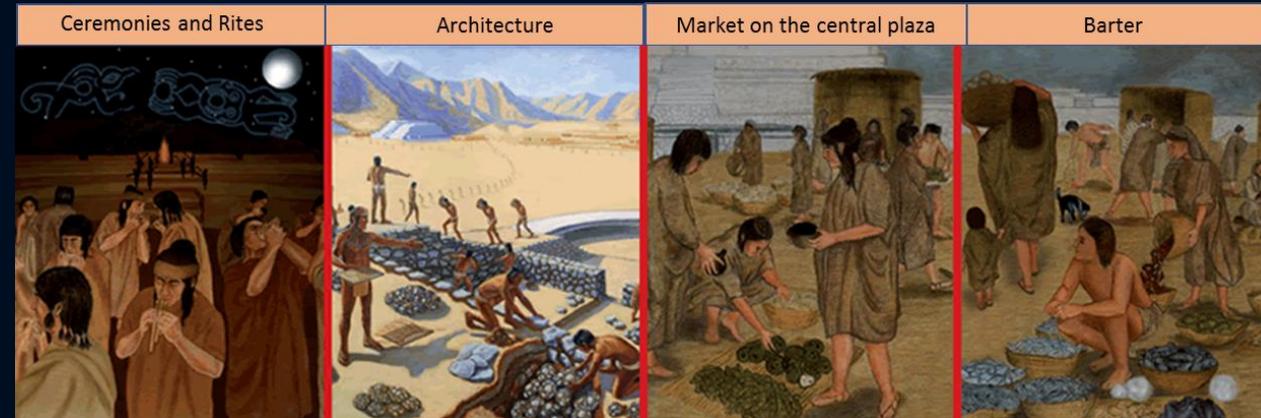
Privileged astronomical position of Ecuador

- We can observe the stars with a perpendicular traffic.
- If we go further north or south, we will lose that precision.
- Ascending and descending observations of the stars.



A view of Quitu-Cara culture

- The valley where is located Quito was populated from 900 BC.
- Refounded by Quitus and then by the Caras.
- The Quitus Caras had no army, this was a peaceful and scientific people.
- The "kingdom" of Quitu was absorbed by the Inca Empire who settled about 40 years.



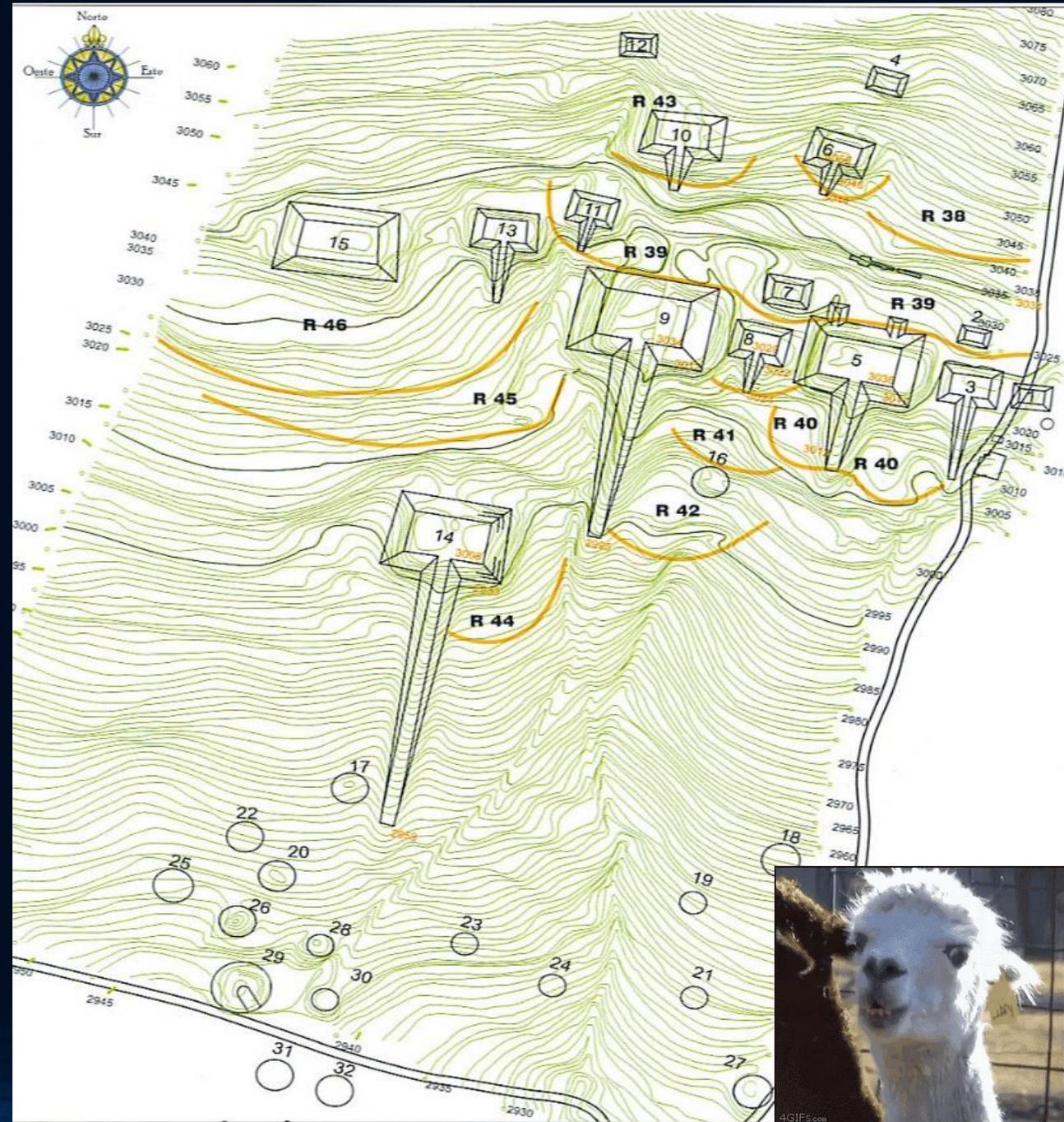
Quitu Cara astronomical knowledge

- Great astronomers.
- The most important evidences of this Pre-Inca civilization are the "Cochasqui" Archaeological Park, Pambamarca and the "Catequilla"



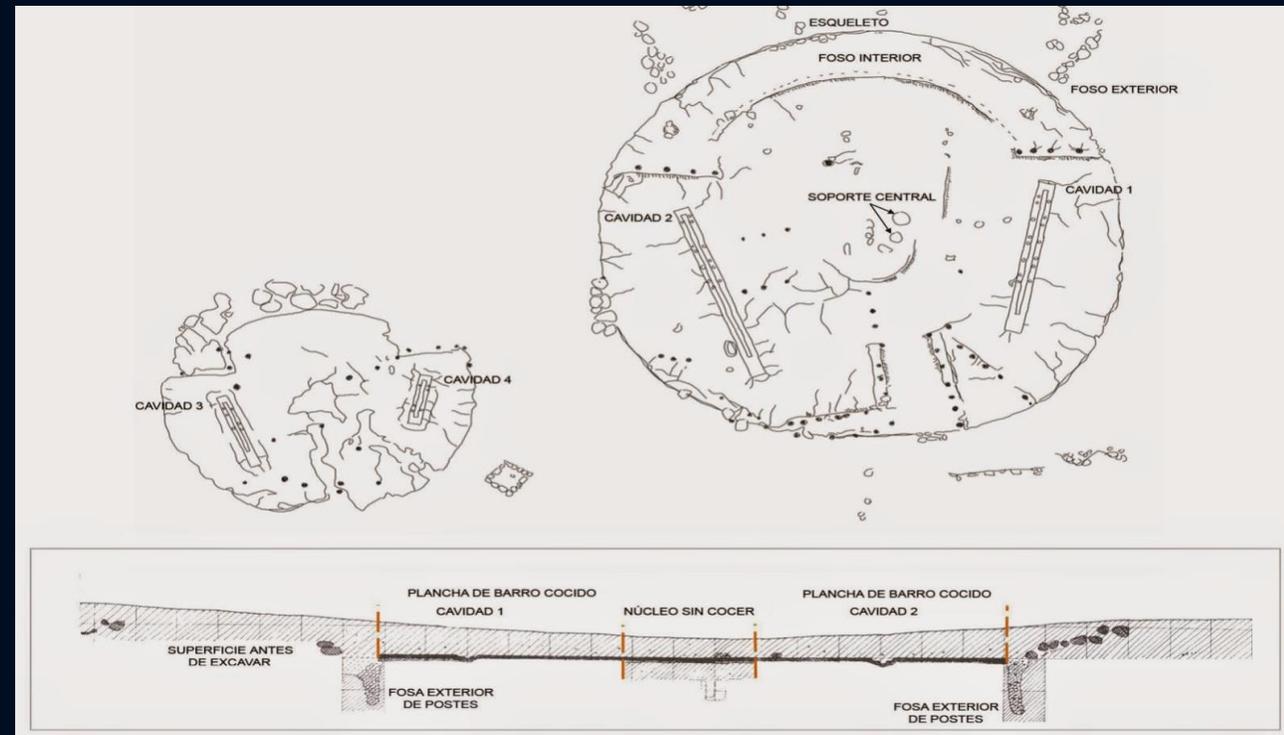
Cochasqui Pyramids

- Built of cangahua an chocoto.
- Shows the pre-hispanic architecture from the years of 500 to 1500 BC, and has two periods of development
- Nine of the pyramids are provided with ramp that constitute this great archaeological park.
- The pyramids or Tolas are covered with earth and grass for their preservation.



Cochasqui Pyramids

- Solar and lunar calendars
- Solar: Solstice and equinox
- Lunar: the sowings.



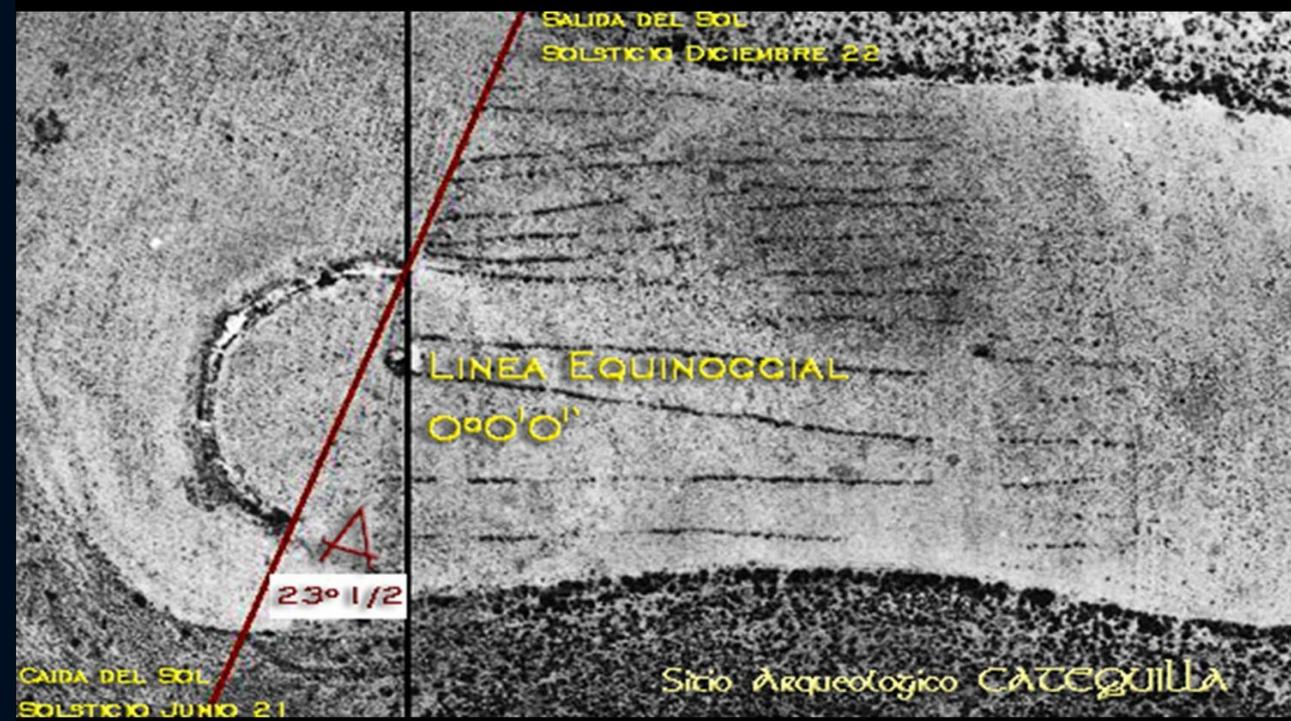
Catequilla

- Located at 2630 meters above sea level exactly on the equinoctial line.
- Its summit enjoys a 360 degree visibility from where you can observe 25 different ancient populations, absolutely all the archaeological sites of the region without help to optical instruments, so the observation is direct and simple.
- This is the only elevation in the world that has these characteristics.



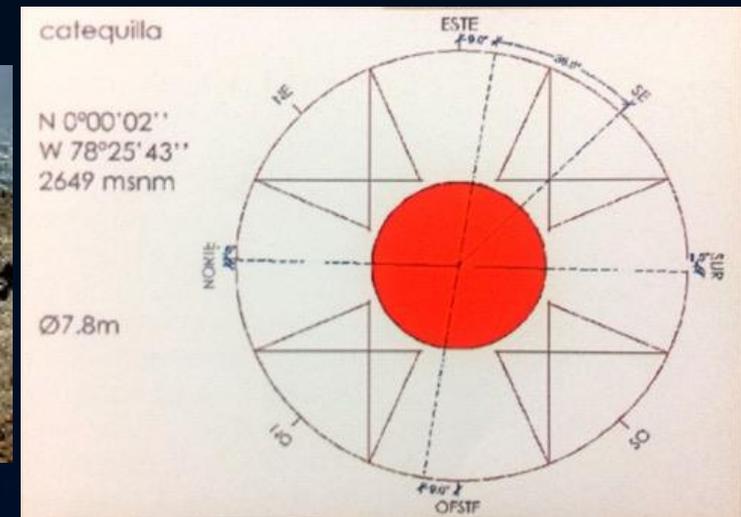
Catequilla

- There is a semicircular sandstone and pumice wall of about 107 m length stone, with an inclination from the eastern end to the south side, with an approximate azimuth of 293° .
- There is also a stone platform at an angle of 330° whereby, it crosses the equinoctial parallel exactly through one of the ends of the arc.
- The site could be built as an astronomical observatory.



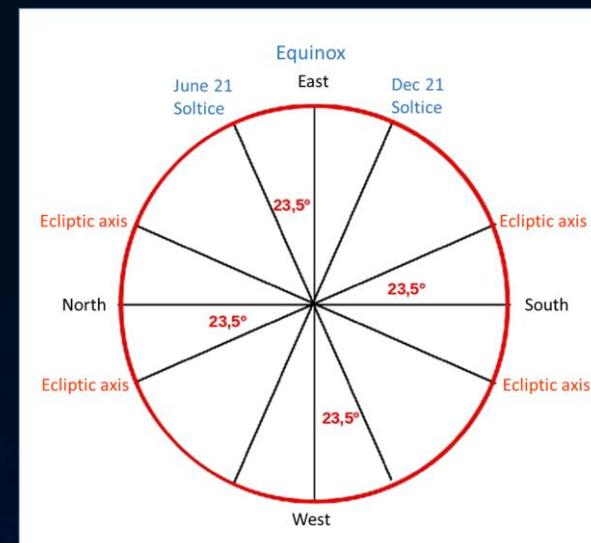
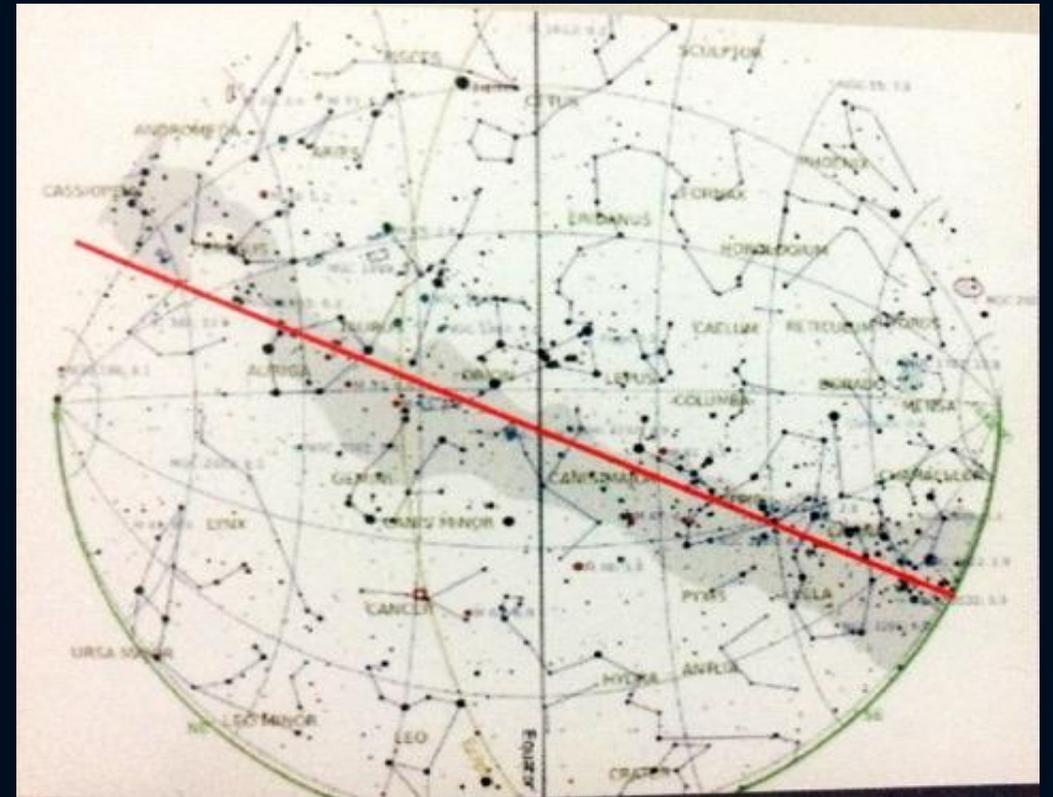
Catequilla

- In the Northwest sector of the site is a stone disc with a diameter of approximately 8 m, which has three lines of stones, two located diametrically and one located radially.
- In order to verify the alignments in the solstices and equinoxes, the site was visited on different dates from 1997 to 2012, and the exits and sunsets were marked with gnomons to determine the alignments.



Catequilla

- The axes of the ecliptic are the perpendicular lines drawn from the solar orthop of a solstice to the solar sunset of the next solstice.
- The milky way indicates the partition of the sacred spaces of these communities



Catequilla

- The Andean peoples built organized societies based on a fundamentally agricultural economy.
- Their astronomical science allowed the control of natural seasons and cycles.
- The lithic disc of the catechism is linearly linked with other lithic discs found in the region towards the south as they are the one of Jarata and the one of Pacpo, which share a same astronomical functionality as explained above.



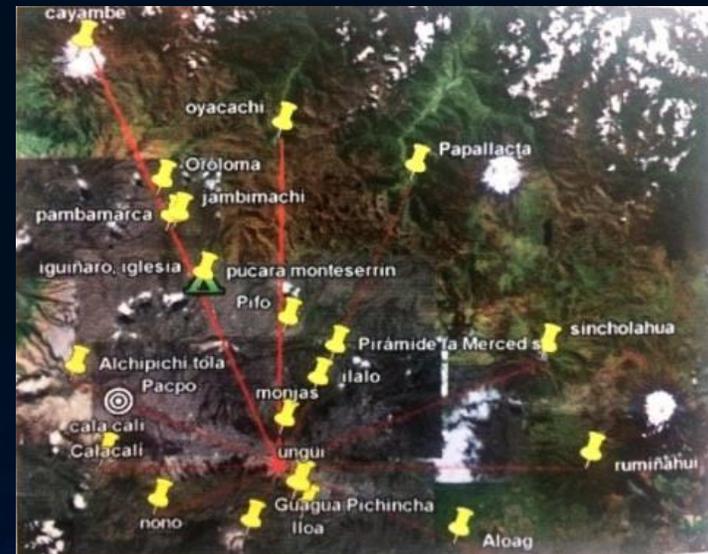
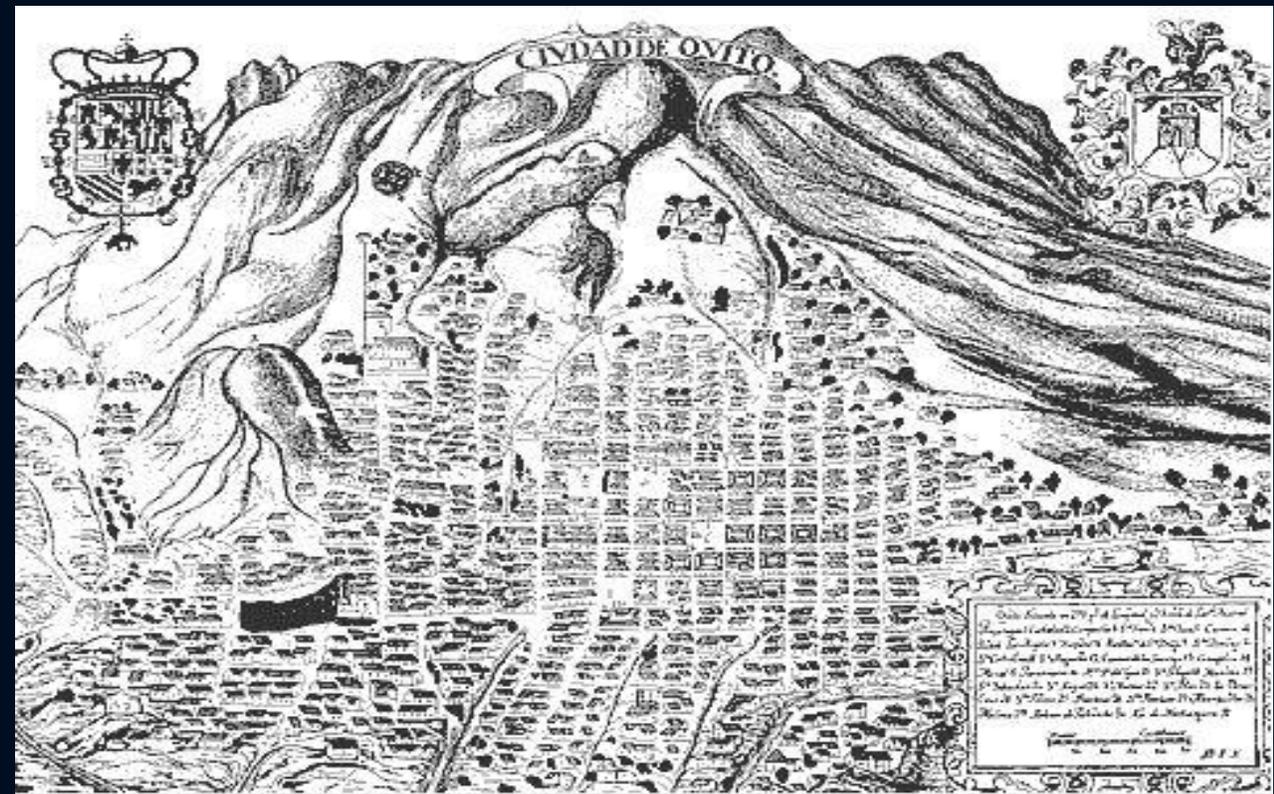
Catequilla

- The relationship between Catequilla and the different archaeological sites of the same equinoctial region was verified with the help of a theodolite and a GPS.
- The pyramids of Cochasquí and the archaeological site of Pambamarca, converge in the archaeological center of Catequilla following the falls and exits of the Sun at the solstices of June and December.



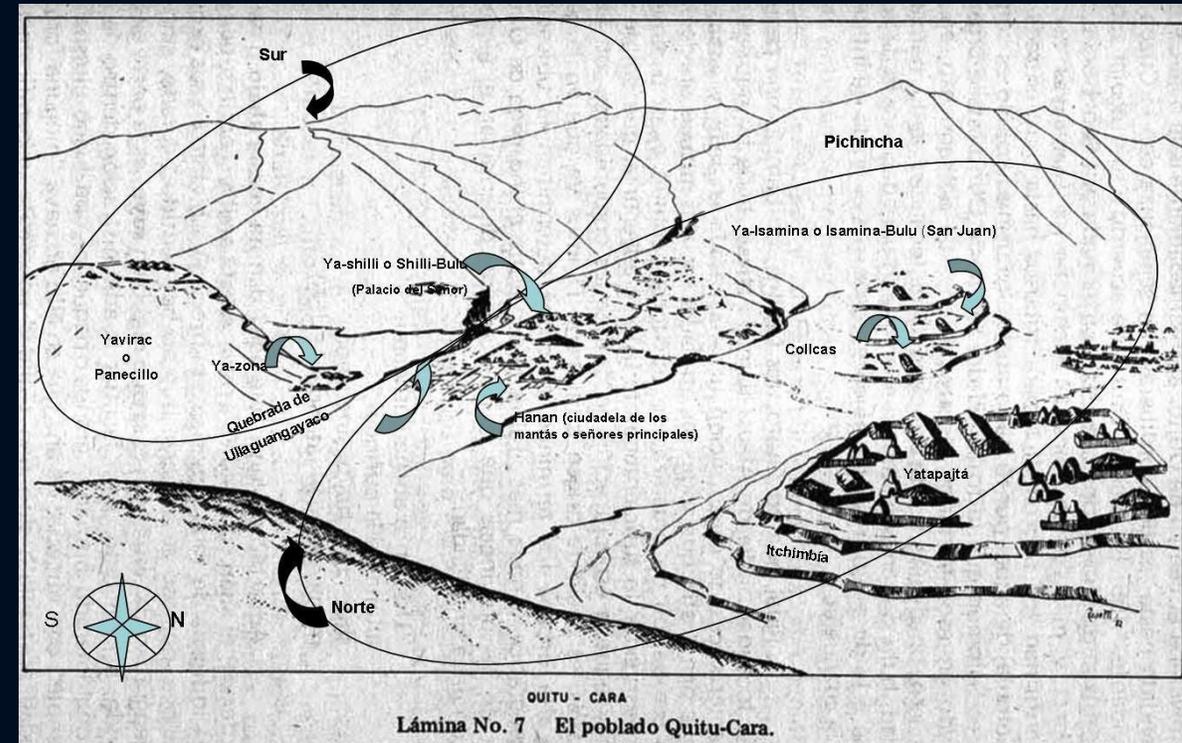
Quito

- The city of Quito is an important center for the equinoctial valley, since it is the protagonist of a millennial historical process, its name comes from KI = sun, TO = straight, means earth of the straight sun, its location is part of an extension of one of the alignments of the axis of the Ecliptic that projects the Catequilla.



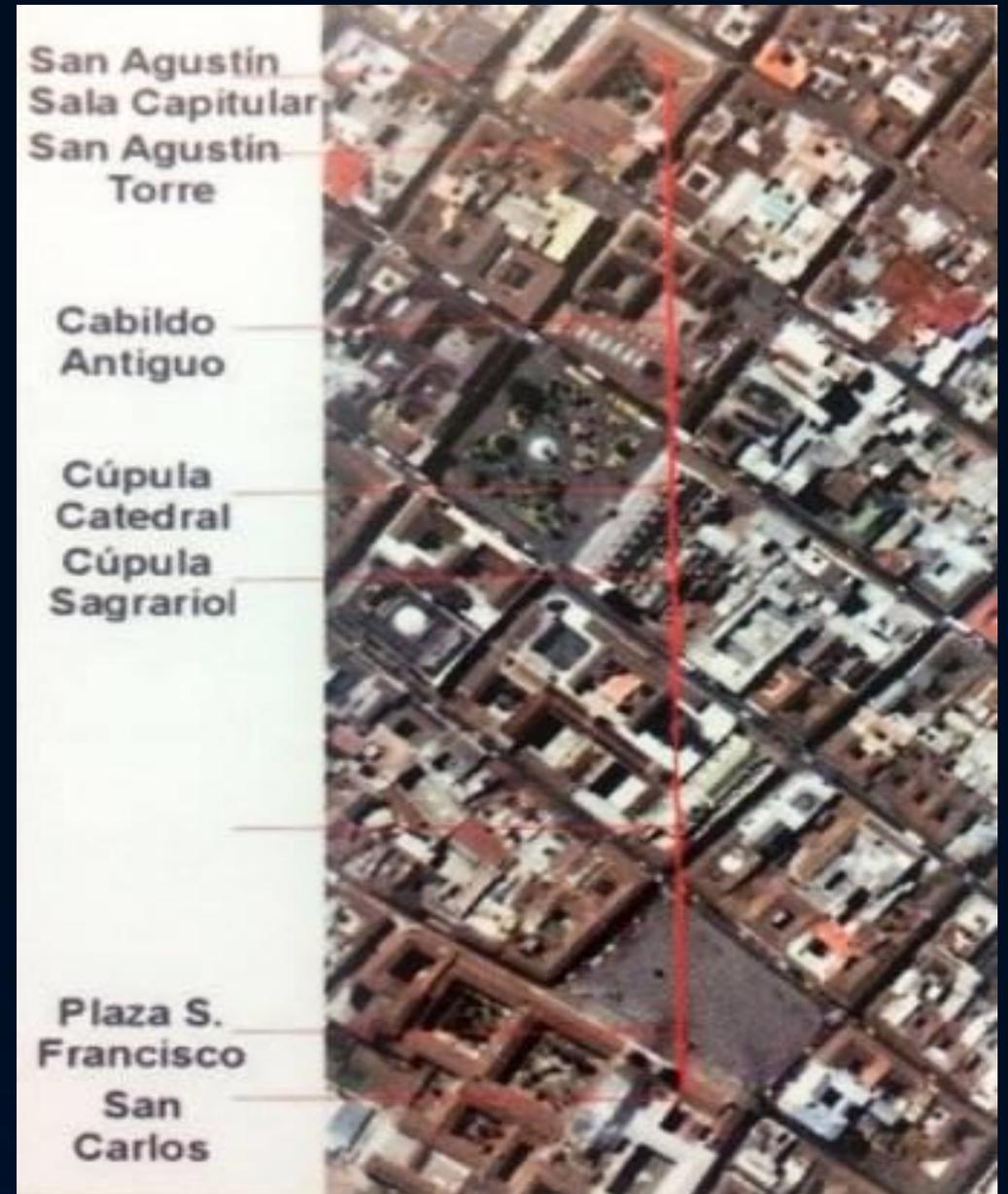
Quito

- It was founded and built in the middle of 4 hills that mark the 4 cardinal points and the 4 natural elements.
- Itchimbia.- is to the east and represents the fire element.
- El Placer.- is the west and represents the element Water.
- San Juan .- is to the north and represents the element air.
- Panecillo.- is to the south and represents the earth element, this one is the most important because it was a temple of adoration to the sun, whose entrance was located to the east, and is perfectly aligned with the pyramids of Cochasqui.



Quito

- In the historical center of Quito, was the first settlements of the city from the Quitus.
- Several temples of stellar cult were located, replaced by buildings of the new religion imposed by the Spanish conquest (churches) .
- They positioned themselves just above the old ones for a transition of cultures.
- The construction of the buildings was based on the equinoxes.



The Team



- Cristobal Cobo (Arqueologist)



- Jorge Enriquez (Physicist- Statistics)



- Geovanna Vásquez (Physicist)

WHAT IT'S BEEN DONE ?

Talks given until August 31, 2017								
Province	Canton	Assistants	Students	Participation rate	Educational Institutions	Institutions served	Talks Given	% Attention
Pichincha	Quito	13,248	661,382	2.0%	1,602	64	64	4.0%
	Rumiñahui	628	33,863	1.9%	76	12	4	15.8%
	Cayambe	759	31,297	2.4%	133	10	5	7.5%
	Mejía	924	27,535	3.4%	86	9	6	10.5%
	Pedro Moncayo	316	10,357	3.1%	48	8	2	16.7%
	Pedro Vicente Maldonado	330	5,089	6.5%	36	7	2	19.4%
	Puerto Quito	723	7,328	9.9%	63	5	2	7.9%
	San Miguel de Iloa Bancos	240	4,636	5.2%	33	3	2	9.1%
	Total		17,168	781,487	2.2%	2077	118	87



How can this knowledge stimulate the Young people to study astronomy?

- 1 talk every 10 days aprox. Since 2015.
- age range 7-17 years
- 10% of the schools in Quito
- In 2017 4 conferences were done for teachers.



How can this knowledge stimulate the Young people to study astronomy?

- Studying Astronomy through the eyes of our ancestor we can try to understand not just the beginning of the universe, but we can understand the relations between our land, our planet and the universe itself or a possible outcome of it.
- This is why we are taking this knowledge of the Quito- Caras and it's evidences to the schools with simple explanations for the youth.

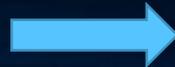


How can this knowledge stimulate the Young people to study astronomy?

- The society will be able to understand the importance of the existence and conservation of these goods, collaterally, clarifying information on the historical processes that have affected the region, which will allow us to understand many factors that have intervened to date, such as the use of geographic space, land use and natural resources.



Scientist with
Cultural Identity



Development



Better
Country

The history of a country,
builds and substantiates
identity in people, the
construction of the past is
the source of social
identity and historical
projection

Thank you for your
attention.

I wait for you in Ecuador.

For more information contact the
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