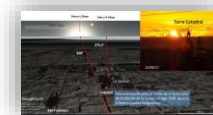




Cultural Astronomy in Northern Chile

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ABSTRACT

Since the dawn of civilization, Astronomy has played a leading role in the development of both science and humanities. In present-day Chile, thanks to the excellent quality of its northern skies and the longstanding presence of the most advanced international observatories in the world, Astronomy has become the science with the highest impact and international presence in the country. The astonishing development in both the quantity and quality of astrophysical research performed in Chilean Universities, however, has not been accompanied yet by a proportional academic interest in those equally important aspects of the discipline generally known as **"Cultural Astronomy"**, i.e., a truly interdisciplinary research field that study the way(s) in which human societies come to know and rationalize astronomical phenomena. In this poster contribution, we introduce our research activities in the field of ethno- and archaeo-astronomy, that are aimed at shining light on the main astronomical concepts and worldview of indigenous and rural communities in Northern Chile (i.e., Atacama and Coquimbo regions). Emphasis will be given on rock art sites, colonial-Hispanic churches and local community traditions: as a specific example, some preliminary results on a few petroglyphs located close to the Gemini-South telescope in Cerro Pachón will be briefly discussed.

Ethnoastronomy

The local indigenous tradition of observing the sky was crossed by the arrival of the Spanish in the colonial period. At that time, the first chapels and *animitas* were built, which were later transformed into churches on ancient indigenous places of worship, within the so-called "extirpation of idolatry", i.e., the order of the Catholic Church of destroying indigenous cults and temples in America in colonial times (XVI-XVII centuries).

In the Coquimbo region we are recovering part of the current astronomical tradition of the peasants and muleteers of the Combarbalá foothills, which accounts for the observation of the sky for agricultural and livestock purposes, together with the identification of some asterisms such as Belt of Orion, Pleiades, and Southern Cross, also present in the vernacular tradition of the community of La Jarilla (Andacollo).

About Cultural Astronomy

Cultural Astronomy can be thought of as a set of complementary research fields that study the way(s) in which human societies come to know and rationalize astronomical phenomena (Iwaniszewski 1991; Ruggles and Saunders 1993; Belmonte 1999, 2006). It has an intrinsic interdisciplinary character that has traditionally made difficult to balance its social and scientific aspects, to an extent that "integrating them into a coherent argument has always been a long-term difficulty for the scholars working in the area" (Iwaniszewski 1991).



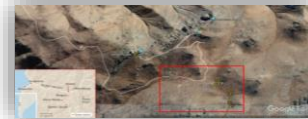
Left: A graphic representation of Atacameñan asterism as reconstructed from our ethnographic work with the local rural communities.



Right: R. Moyano & L. Arango acquiring data of a large rock art panel on Cerro Pachón, site of the Gemini South telescope

Rock Arts in Cerro Pachón

Topographic distribution of rock art panels in Cerro Pachón. Marked is also the position of several NOIRLAB facilities.



Previous studies developed in the Coquimbo Region have shown associations between rock art manifestation and astronomical phenomena, linked to the psychological response of *pareidolia* (i.e., patterns in a group of stars or natural forms, likes rocks, hills, mountain ranges and others). As a result, it has been possible to reconstruct some possible constellations of the Molle period (0-800 AD), based on petroglyphs and bedrock mortars, as well as orientations towards the position of the Sun in the solstices and Lunar standstills.

We have thus started a systematic exploration of several archeological sites in the Coquimbo region, including the one located on Cerro Pachón.



3D model of the rock art panel catalogued as CP06_02



False color image of a detail on CP06_01, where the rising Sun from the local horizon may have been well be represented. The panel is oriented towards the Winter solstice sunset.

Colonial Churches of La Serena

The orientation of urban traces and colonial churches (XVI y XVII centuries) has been a topic of debate for those who suggest cultural continuities among the indigenous and Hispanic worlds.

The urban layout of La Serena, the second oldest city in Chile after Santiago, differs from the orientation of some of its churches: as an example, the access of its Cathedral (former Matriz-El Sagrario church) is oriented at sunset on April 3 and September 9-10. In this and other cases - from the architectural plan - a logic of following the Sun is recognized for dates near the equinoxes within the Julian count, prior to the calendrical reform of 1582.