

# International Conference: Astronomical Heritage of the Middle East, Republic of Armenia National Academy of Sciences, Yerevan, Armenia, 13–17th November, 2017

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According to UNESCO's Convention Concerning the Protection of the World Cultural and Natural Heritage, "the sky or the dark night sky or celestial objects or starlight as such cannot be nominated to the World Heritage List". That was in 1972, and UNESCO's position was reaffirmed in 2007 (UNESCO 1972; 2007). However, the introductory session of the international conference "Astronomical Heritage of the Middle East" included a presentation by Piero Benvenuti, General Secretary of the International Astronomical Union (IAU), on "UNESCO's Astronomy and World Heritage Initiative", in which he explained that any tangible and intangible astronomy-related world heritage could now be proposed for protection by nominating it for inclusion in the World Heritage List.

As part of this initiative, the conference brought together researchers from a variety of cultural backgrounds. The main focus of the discussion was the role of astronomy in Southwest Asia, and topics ranged from the astronomical interpretation of prehistoric archaeological sites to the construction of new observatories and strategies for astro-tourism and outreach. The event was organised by Armenia's National Academy of Sciences, the Byurakan Astrophysical Observatory, the Armenian Astronomical Society, Armenia's Ministry of Culture and the IAU South West and Central Asian ROAD (Regional Office of Astronomy for Development), represented by Areg Mickaelian and Sona V. Farmanyan. Held at the National Academy of Sciences in Yerevan, the conference was staged in a circular hall decorated with national flags, creating a strongly international and diplomatic atmosphere. The audience also included several ambassadors and international diplomats, together with scholars, students, journalists and members of the general public.

Between discussions on cultural astronomy, time was also set aside to conclude international affairs such as the celebration of Turkey's membership of the IAU's South West and Central Asian ROAD. Based in Armenia, the office promotes astronomical

development in Southwest Asia, and alongside Georgia, Iran, Kazakhstan and Tajikistan the inclusion of Turkey means that six countries are participants. Although unresolved political issues mean that the land border between Turkey and Armenia remains closed (Cheterian 2017), thanks to this event the potential for international unity through the universality of the sky (Brown and Neale 2010) became clear to all.

The local activities of the Armenian IAU office were described to the conference by Farmanyan, in particular the way in which astronomy-related sites in Armenia such as the Byurakan Astrophysical Observatory (BAO), built in 1946, are becoming centres of astronomical tourism. On the second day of the conference, Grigor Broutian led the group into the landscape of Mount Aragats to visit the BAO and its laboratory buildings, and to see a nearby museum located at the former house of astrophysicist Viktor Amazasp Ambartsumian (died 1996), who was the founder and director of the observatory (Mickaelian 2014). The BAO is part of Armenia's artistic as well scientific heritage: in 1978 the poet and painter Gevorg Emin attempted to capture the atmosphere surrounding astrophysicists and their work, and his paintings are a good example of how modern astronomical observatories can benefit from artists to inspire the general public by efforts to mediate between the rigours of scientific research and the wonders of deep space.

For this same reason, the National Academy of Sciences in 2017 hosted an exhibition of paintings by Lazar Mirzoyan, under the title *"Per Aspera Ad Astra"*. Using acrylics, the artist created a contrasting fusion of colours and emotions in his portrayal of awe-inspiring astronomical phenomena, such as planets, star formation, exploding supernovae and deep space objects. Other artistic initiatives in Europe have also attempted to illustrate the wonders of astronomy – for example, the international music festival Starmus, introduced by Garik Israelian, in which musicians, filmmakers, scientists and researchers are invited to inspire the general public. Combining art and astronomy in this way reveals the fundamental need to nourish the development of science with human values.

As such, outreach projects and educational strategies were also major topics of the conference. According to Ewelina Grandzka, the cognitive needs of human beings may be stimulated by observing the night sky. For this reason, she developed a project called *"Under the Common Sky"*, with the aim of training school teachers in Kyrgyzstan in astronomy and the use of telescopes. Outdoor stargazing activities can also be complemented by the use of virtual reality technologies. Levon Aramyan emphasised the importance of visualisation in astronomical education when he developed the Immersive Education Solutions project to promote a greater understanding of the universe, complete with 360° videos, full-dome shows and astronomical movies for planetaria. Although the experience of the open sky is irreplaceable, digital visualisation can provide exciting and inspiring educational content. As part of the outreach engagement strategies discussed, a didactic workshop on the construction of sundials was offered by Iraj Safaei and his Iranian collaborators, where the conference participants were given the challenge of producing a paper sundial. Bearing in mind the observation of sculptor and earthwork artist Charles Ross, that "if we want to achieve an integrated sense of reality, we

need multiple views of the world” (in Saad-Cook *et al.* 1988, 124), these sessions showed how transcending the differences between art and science can help to achieve the goals of outreach and the communication of astronomical knowledge.

A series of presentations explored the history of the cultural astronomy of some Middle Eastern and South Caucasian countries, from prehistory to modern times. These included Sadollah Nasiri-Gheydari on the astronomical heritage of Iran, Moh'd Al-khasawneh Awni on Jordan, Irakli Simonia on Georgia, Ahmed Abdel Hady on Egypt, Sinan Alis on Turkey, and several other contributions focusing on the history of Armenia. Areg Mickaelian described Armenia's astronomical heritage, remarking on a possible celestial alignment at the Tatev Monastery. At midnight on 11th August, the New Year date of the Minor Armenian Era after the calendric reform made by Hovhannes Imastaser (1047–1129) (Tumanian 1974, 95), Orion's Belt can be seen rising just above the monastery tower, acting as a natural marker of the beginning of the year. Even now, the original Armenian New Year celebration, in honour of the victory of Hayk, the legendary archer (Hacikyan 2000, 65, 72), is celebrated locally during the Navasard festival in August. Armenian traditional festivities include the Tarandes festival on 14th February, related to the return of sunlight.

Hakob Simonyan, from Armenia's Ministry of Culture, gave a presentation on the archaeological evidence for the relationship between the eastern orientation of graves and the date of burial according to the direction of the rising Sun. Additionally, Karen Tokhatyan spoke on the cognitive value of “Ancient Astronomical Knowledge and Rock Art in Armenia”. Examples included depictions of natural phenomena and celestial symbolism, such as solar swastikas, Moon crescents, rainbows, and star groups – all evidence for the importance of skylscapes among prehistoric Armenian highland societies. The conference tour of the stone circle at Zorats Karer in southern Armenia successfully complemented the contributions on local heritage.

Other presentations examined single case studies, extending the geographical focus of the conference and widening its horizons. By exploring literary sources from the Judeo-Christian tradition, Ariel Cohen discussed the possibility of dating the Year of Creation according to the position of the planets and other astronomical phenomena, such as the new Moon at the spring equinox. Vito Francesco Polcaro (1945–2018) spoke about a number of possible astronomical features at the recently excavated Bronze Age site of Tuleilat al-Ghassul in Jordan, including a large star painting. Xiaochun Sun presented a talk on the possible transfer of a star catalogue between the Dengfeng Observatory in China and the Ulugh Beg Observatory in Samarkand, Uzbekistan, along the Silk Road. Perhaps movements of that sort along a major trade route should not come as a complete surprise; but the transmission of knowledge does not always coincide with practical observation, and this was a problem faced by Ramesh Kapoor in his analysis of Ibn Sina's statement on the transit of Venus. Piero Benvenuti discussed a misleading identification between the modern cosmological notion of the Big Bang and St Thomas Aquinas' concept of *creatio continua*; as Massimo Capaccioli remarked, gaps may occur between mathematical, philosophical and physical interpretations. He described how the iconography of the frontispieces of ancient books can reveal cryptic cosmological

conceptions tacitly shared among scientists, such as the pluralistic understanding of the universe promoted by Giordano Bruno.

Indeed, minds ahead of their time have not always been able to express their theories openly and have often faced dogmatic opposition to their astronomical observations and philosophical inquiries. The life of the astronomer Vsevolod Viktorovich Stratonov (1869–1938), who was forced to emigrate in 1922 from Russia to Prague, was recounted by Martin Solc as an example of this. A similar case, involving two generations in Japan and Peru, was narrated by Jose Kaname Ishitsuka, who, in his efforts to set up a Radio telescope in Peru, is trying to follow in the footsteps of his Japanese father Mutsumi. Mutsumi Ishitsuka (1930–2018) established a solar corona observatory in Ica in the face of terrorist attack and struggle for recognition by the Peruvian Geophysical Institute.

Beyond the wide range of themes and cultural areas covered, the conference implicitly expressed the need for the reconstruction of historical astronomical knowledge to contextualise interpretations by considering the transmission of knowledge, syncretism, political environments, power relationships, erroneous predictions and cryptic cosmological information. Methodologically, addressing such broader concerns would benefit the whole discipline of cultural astronomy and provide better-grounded conclusions. Nevertheless, some methodological issues, such as the anachronistic problem of calling any prehistoric site an “observatory”, did not seem to have been fully overcome at the conference. As already pointed out by Juan Antonio Belmonte, who proposed that the term be used only when a practical astronomical purpose for a site is evident, such as time reckoning (Belmonte 2015, 142), calling a site an “observatory” may imply a misleading cosmovision of the culture under consideration. As Lucien Lévy-Bruhl also argued, primitive societies may have wanted to interact with the world around them with a sense of participation instead of simply observing it, which is more characteristic of a modern scientific approach (Lévy-Bruhl 1903). As such, observing and watching need to be regarded as different actions (Brown 2013) and such a distinction needs to be acknowledged in academic terminology if we want to be reflexive researchers and transcend our own specific historical context. In general, the term “skyscape” received little attention during the conference, implying that the term and its methodological consequences are not fully appreciated. The only explicit attempt to discuss methods relating to an understanding of astronomical heritage was presented by John McKim Malville, who highlighted the importance of attending to cultural context by avoiding the treatment of alignments as isolated phenomena.

In summary, the main achievement of this conference was to bring a group of international scholars together for academic discussions, irrespective of political and religious differences. However, the wide range of topics and the quality of the presentations – on occasion amounting only to a vague historical overview of a nation’s astronomical heritage – tended to produce a relatively “basic conference”, to use the words of Polcaro, in respect of the current global academic standing of skyscape archaeology and cultural astronomy. Nevertheless, by underlining the IAU’s aims of re-centring the role of astronomy as the leader and unifier in a field of multidisciplinary research, the conference did highlight the great value of astronomical heritage for the common development of

humankind. Taking place in an area of the world where ethno-territorial conflicts are a part of daily life, to bring scholars together from 20 different countries sharing the same passion for cultural astronomy, beyond political, religious and cultural boundaries, was an enriching experience. This conference was a step forward in an awareness of global citizenship – thanks to recognition of the universal value of the sky.

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