COMMISSION C4

WORLD HERITAGE AND ASTRONOMY (C.C4)

PATRIMOINE MONDIAL ET ASTRONOMIE

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COMMISSION C4 WORKING GROUPS

Commission C4	Windows to the Universe:
	Classical and Modern Observatories
Commission C4	Astronomical Heritage in Danger
Inter-Commission C1-C2-C3-C4	Astronomy in Culture (WGAC)
Inter-Commission C1-C3-C4	Ethnoastronomy and
	Intangible Astronomical Heritage

TRIENNIAL REPORT 2021-2024

1. Introduction

This is a brief report on highlight activities of the Commission for World Heritage and Astronomy (C.C4) during the past triennium.

The Commission has achieved important milestones, in particular the continuing inscription on the UNESCO World Heritage register of properties (this is the terminology used by UNESCO to refer to sites inscribed for World Heritage) that have an astronomical connection.

In the last triennium IAU C.C4 members undertook a series of activities. In the following paragraphs we summarise these and reflect on their achievements. The Commission now has four Working Groups. Brief reports on them are provided at the end of this report since these Working Groups are expected to produce their own reports. The Commission webpage – the Portal to Heritage of Astronomy – has also been updated in this period; see the URL https://www3.astronomicalheritage.net.

2. UNESCO World Heritage Inscriptions over the Past Triennium

First, and most importantly, has been the inscription in the World Heritage List of a series of properties related to Astronomy and Heritage. These were inscribed either in



its cultural or scientific aspect. Several members of C.C4, including the President, were either directly involved in the candidatures in high responsibility positions, were advisors during the process, or acted as external reviewers for UNESCO.

The properties related to astronomy, or where astronomical aspects were fundamental attributes of the inscription, included in the World Heritage List by UNESCO, either in July 2021 in Fuzhou (China) or in September 2023 in Riyadh (KSA), are:

• Chankillo Archaeoastronomical Complex (Peru). Chankillo is a prehistoric site (250–200 BC) that functioned as a calendrical instrument, using the Sun to define dates throughout the year. This is the first property inscribed where archaeoastronomy has played the most important role in the inscription as an attribute justifying the Outstanding Universal Value (the key attribute applied by UNESCO to determine whether a site merits World Heritage designation).

• The Paseo del Prado and Buen Retiro (Madrid, Spain) was included as a Cultural Landscape of Arts and Sciences. It is in this second aspect that the Royal (now National) Astronomical Observatory stands out, including the 18th century building by Juan de Villanueva, and William Herschel's last and unique preserved telescope. Although within a much wider general context, this is the first classical observatory to be declared as a UNESCO World Heritage site.

• Talayotic Menorca: a cyclopean island odyssey (Balearic Islands, Spain). This has been an inscription where the role of astronomy in the orientation of the cyclopean monuments of the island – dating from the Iron Age – based on the original work of the late Michael Hoskin, Science History Professor at Cambridge University, is one of the fundamental attributes applied to justify the Outstanding Universal Value of the property.

• Eise Eisinga Planetarium (Francker, The Netherlands). Built between 1774 and 1781, this property is a moving mechanical scale model of the Solar System as it was known at the time. Conceived and built by an ordinary citizen – the wool manufacturer and amateur astronomer Eise Eisinga – the model is built into the ceiling and south wall of the former living room/bedroom of its creator. The model fills the entire ceiling of the room, making it one of the earliest predecessors of the ceiling and projection planetariums of the 20^{th} and 21^{st} centuries.

• Astronomical Observatories of Kazan Federal University (Kazan, Tatarstan, Russian Federation). The property is comprised of two component parts. One is in the historical centre, the Kazan City Astronomical Observatory, built in 1837, located on the University campus. The other, the suburban Engelhardt Astronomical Observatory, includes structures for sky observations and residential buildings, all located within a park. The observatories have been preserved complete with astronomical instruments and today perform mainly educational functions.

• Hopewell Ceremonial Earthworks (Ohio, USA). This property is a series of eight monumental earthen enclosure complexes built between 2,000 and 1,600 years ago. They are the most representative surviving expressions of the Indigenous tradition now referred to as the Hopewell culture. These earthworks served as ceremonial centres where there are alignments with the cycles of the Sun and the far more complex cycles of the Moon.

3. Current Activities

Other aspects pertaining to preparing for potential future World Heritage inscriptions have also been undertaken during the last triennium.

Gudrun Wolfschmidt, Past President of C.C4, added a considerable number of observatories to the IAU list of "Outstanding Astronomical Heritage"

(OAH: https://web.astronomicalheritage.net/heritage/outstanding-astronomical-heritage). In C.C4, we offer help to proceed with potential nominations and we plan to progress with inscriptions on the World Heritage List. As a first step, **Hamburg Observatory**, under monument protection since 1996, was acknowledged as national heritage in 2008. We started – in cooperation with the monument protection office – to write an application for the national UNESCO list as a precondition for applying for the WHL. The result was presented to the German UNESCO Commission on October 31, 2021. We are currently waiting for the evaluation.

It is worth noting the support provided for the **Observatory of La Plata** as a UNESCO Candidate within the Astronomy and World Heritage initiative (an initiative promoted by C.C4 Secretary Lydia Cidale). The Observatory of La Plata, one of the largest astronomical institutions in Argentina, has been one of the cradles for modern astronomy and home to renowned researchers whose contributions have been substantial. This splendid infrastructure was declared in 2023 an Argentine National Monument (just waiting for the signature of the President of the Republic). This additional protection is needed before going ahead with the process of WH nomination. In this sense, in October 2021, the President of the University of La Plata (Argentina) expressed to the Argentine Committee for World Heritage the interest that the Astronomical Observatory of La Plata be incorporated into the UNESCO World Heritage Indicative List. Currently, the proposal is under evaluation by the National Committee.

Also, as reported by Michael Burton, C.C4 VP, in Ireland, the three historic observatories of **Armagh**, **Birr and Dunsink** have come together and have resolved to seek UNESCO inscription as a transnational nomination involving the Republic of Ireland (RoI) and the UK. An application has been prepared for the RoI UNESCO tentative list, with the aim of being placed on the register of properties that the RoI will bring to UNESCO for consideration in the coming decade. The application draws upon the synergies and complementarities of the three observatories, particularly their interactions during the 18^{th} and 19^{th} centuries when they pioneered the development of the observatory dome and the clock-driven equatorial telescope. Armagh & Dunsink are the first representatives of the modern observatory building. Birr contains the Leviathan, the largest telescope in the world for over 70 years, with which the enigma of the spiral nebulae was revealed, leading to the birth of extra-galactic astronomy. These facts may substantiate the required Outstanding Universal Value.

In 2021, a team led by Areg Mickaelian managed to include **The First Byurakan Survey (FBS or Markarian Survey)** 1874 low-dispersion spectroscopic plates collection in the UNESCO Memory of the World Documentary Heritage list. These objective prism photographic plates contained, at that time, the largest number of spectra, 40 million. C.C4 should also include in our plans inclusion of such heritage (plate archives) in UNESCO and/or the IAU OAH register.

4. Activities for the Next Triennium

As already mentioned, in C.C4, we offer help to proceed with nomination projects, and we plan to progress with inscriptions on the World Heritage List in the years to come, socio-political situations permitted.

There are three obvious cases:

• Hamburg Observatory: promoted by former C.C4 President Gudrun Wolfschmidt, who has expressed her wish to continue as a member of the OC. She also deals, together with Clive Ruggles, on the Outstanding Astronomical Heritage initiative in a process to identify sites to be promoted and defended.

• La Plata Observatory: promoted by C.C4 Secretary Lydia Cydale who has expressed her wishes to continue working with C.C4, either as vice-President or as a member of OC.

• The Astronomical Observatories of Ireland: This is possibly the most elaborate and advanced of the future proposal. It is also perhaps the one with the highest probabilities of success in the mid-term. Michael Burton, C.C4 VP and future President is the promoter behind this initiative. In this sense, the three Irish Observatories of Armagh, Birr and Dunsink, have now come together under the moniker of The Astronomical Observatories of Ireland in order to pursue a UNESCO bid.

So, there are a series of candidatures for astronomical observatories which are well positioned for the future and that will certainly count on the advice and support of distinguished C.C4 members to help with their progression. Other alternatives will certainly be explored in the years to come.

Regarding candidatures related to cultural astronomy, either intangible heritage as analysed from ethnoastronomy point of view, or tangible heritage as studied by archaeoastronomy, there may be a series of initiatives in the next years. There are two possibilities in this particular case. On the one hand, there is the possibility of enhancing the Outstanding Universal Value of a property already inscribed in the UNESCO WHL by including cultural astronomy aspects on it as new attributes, as was the case of Stonehenge – the only one so far. Certain Mesoamerican ceremonial sites or ancient Egyptian sacred sites are good examples. This is certainly a possibility to be explored.

On the other hand, there is always the chance of finding new sites where astronomy has played a fundamental role in enhancing the heritage value of a certain property and this has been a task for C.C4. An example, which has been already tentatively explored, might be the Seven-stone antas (aka dolmens) of the western faade of the Iberian Peninsula. These were the first monuments ever erected by humankind with an indubitable astronomical objective (indeed ceremonial) in mind. All of these (we know c.300 such monuments) were orientated facing the lunisolar arch of the horizon. This would be a transnational candidature involving both Portuguese and Spanish institutions. It will be a challenging endeavour. It is certain that other sites or group of monuments could be identified in the years to come, and C.C4 will be there to offer assessment and support.

Working as usual, a number of talks and lectures on Archaeoastronomy and Cultural Astronomy, and Astronomical Heritage have been and will be offered by members of C.C4 in different meetings and colloquia in an inspiring search for these potential properties.

5. Working Groups Highlights and Future Prospects

• Commission C4 WG Astronomical Heritage in Danger. The objective of the WG is to make visible sites with astronomical value relevant to Humanity that are currently in danger and are not part of the list of sites recognised by UNESCO as World Heritage. The purpose of this list is to influence governments, non-governmental organisations, international agencies, local authorities and decision makers, to achieve protection and care of these sites. Much progress has been made in the years 2021-2024. Indeed, the achievements of the working group extend beyond the mere accumulation of data on astronomical sites in danger. Most importantly, several WG members actively participate in the IAU-RAS-AAS committee on sensitive astronomical sites (that seeks to influence the way in which professional astronomers relate to situations where there are conflicts between large astronomical consortia and facilities and the local population).

The WGAHD would like to pursue these objectives in the next triennium since these activities have just started. In particular, the WG will try to achieve greater visibility within the community of professional and amateur astronomers, showing them the complexities of the astronomical heritage around the World and the importance of an interdisciplinary work and, notably, of the dialogue with local communities.

• Commission C4 WG Windows to the Universe: Classical and Modern Observatories. This WG was established to support the development and coordination of nominations of classical and modern astronomical observatory sites from the Renaissance to the 21st century for inscription on the UNESCO World Heritage List (WHL). The IAU Outstanding Astronomical Heritage (OAH) Portal is operated within this WG.

Since, as earlier stressed in this report, there are various initiatives promoting recognition for singular items in the OAH List, the WGWtoUCMO will certainly need to continue its activities in the next triennium.

• Inter-Commission C1-C2-C3-C4 WG Astronomy in Culture. This is by far the most active and largest working group of Division C. To explain all the activities executed by members of this WG would exceed the objectives of this report. Actually, WGAC has proposed to be transformed into a new Division C Commission, Cultural Astronomy (C.C5), which would certainly be the ideal environment for future activities on Cultural Astronomy at IAU. C.C4 has strongly supported the creation of this new commission.

• Inter-Commission C1-C3-C4 WG Ethnoastronomy and Intangible Astronomical Heritage. This is a most important WG within Division C supported by several commissions and handling with extremely important issues on the relationship of native people, both past and present, with their sky environment and how this fact was reflected in their tangible, and most relevant, intangible heritage. One of the WG's most important tasks has to do with sensitive aspects related to the observation of the sky with modern astrophysical devices in places of a cultural, mainly sacred, character for certain societies.

The continuity of this WG, integrated by a group of researchers who are extremely involved in the fight for the rights of indigenous peoples on their land- and sky-scapes, is important for the purposes of C.C4, in particular, and indeed for the more general scope of Division C. The study of first nations intangible astronomical heritage is fundamental to a better comprehension of the questions of who we are and where we want to drive our steps in the future?