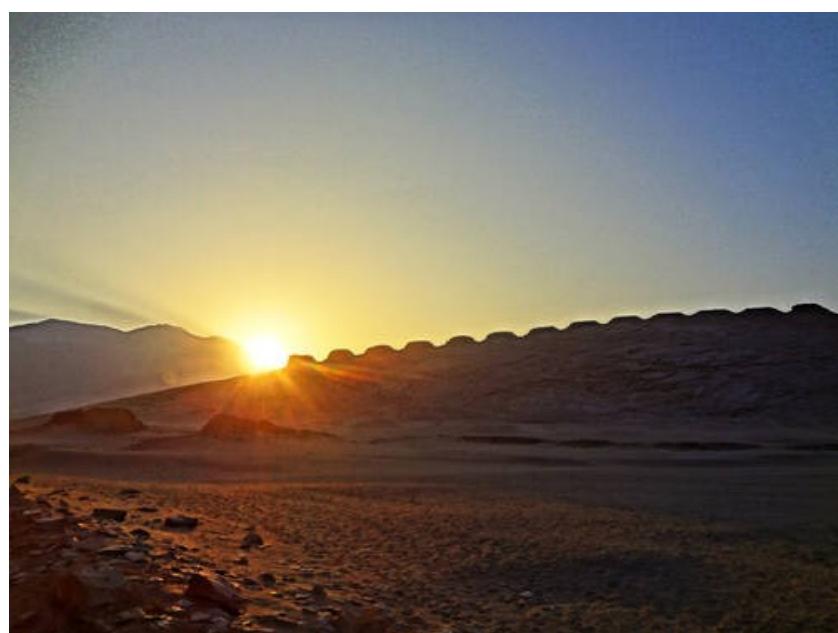


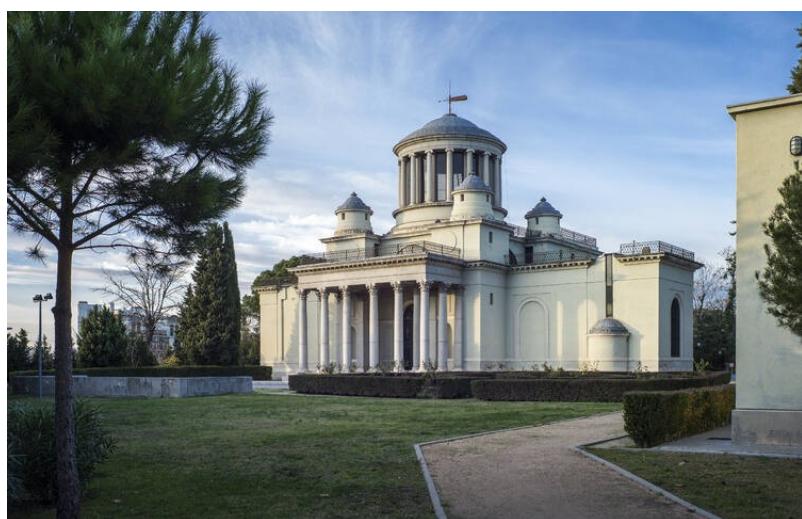
ACTIVITY REPORT OF COMMISSION C4 “WORLD HERITAGE AND ASTRONOMY”

In these last months, a series of relevant facts happened related to the potential activities of CC4, in which members of IAU CC4 developed a series of activities related. In the following paragraphs, a comprehensive but certainly incomplete series of these items are reflected.

First, and most important, two of the properties included in the last World Heritage list by the UNESCO in July 2021 include astronomical referents. The first one is the [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. The [Paseo del Prado and Buen Retiro](#) (Madrid, Spain) was included as a ‘cultural landscape of Arts and Sciences’. It is in this second aspects that the Royal Astronomical Observatory stands out, including the 18th century building, and the William Herschel’s last preserved telescope.



June Solstice sunrise in Chankillo. Author: Monica Suarez, © IDARQ



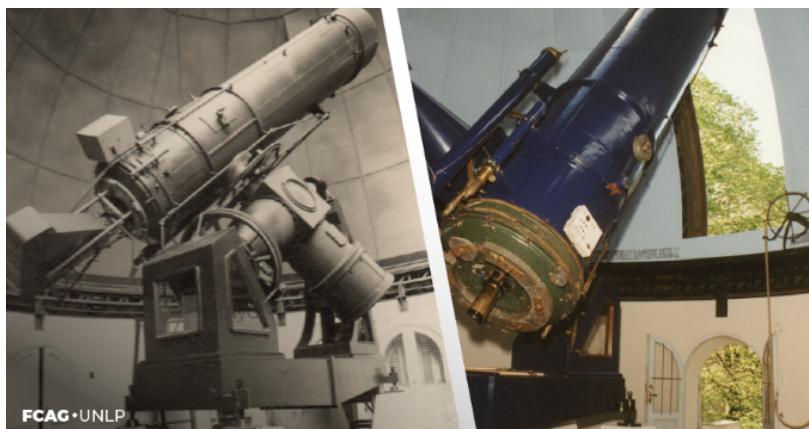
Madrid Royal Astronomical Observatory. Image, Ayuntamiento de Madrid.

In this sense, it is worth noting the movements ahead performed for the Observatory of La Plata as a UNESCO Candidate within the Astronomy and World Heritage initiative. The Observatory of La Plata (IAU code 839, Argentina) was founded in 1883. It was early included in the design of the city of La Plata (1882) and built as an ensemble of buildings distributed in a 7-Hectares' park, many of which still remain just like they were at the time of its foundation.



Panoramic view of the Observatory's park. The main building has a rectangular shape oriented in the N-S and E-W directions. Picture taken around 1940.

At the end of the 19th century, under the direction of its first director F. Beuf (1883-1899), the Observatory was largely equipped with state-of-the-art technology of the epoch. Both the large Gautier Refractor (43 cm) and Zeiss-Gautier Reflector (80 cm) Telescopes, ranked among the largest in the southern hemisphere. The equipment was complemented with several French and German made instruments devoted to positional astronomy (such as meridian circles, zenith telescopes and an astrophotometric telescope).



The 80 cm Zeiss-Gautier Reflector Telescope. Photos taken in the early 20th century and at present.

In 1905, the Observatory became part of the National University of La Plata, a new Institution which developed a strong profile in exact and natural sciences. In 1935, the "Escuela Superior de Ciencias Astronómicas y Conexas" (the School of Astronomy and Related Sciences) was created and it was the first and most important school committed to the teaching of astronomy and geophysics in Latin America. Graduates from that school laid the foundations on which other national astronomical institutions were created and contributed to the formation of human resources. This school is currently named the "Facultad de Ciencias Astronómicas y Geofísicas" (Faculty of Astronomical and Geophysical Sciences). It offers PhD studies and has a high profile in advanced astronomical and geophysical research.

After the creation of the Observatory of La Plata, it soon became a center of attraction for scientists from around the world (W. Hussey, J. Hartmann, A. Wilkens, among others) who played an important role in the development of astronomy and geophysics. At first, the Observatory contributions focused mainly on providing the meteorological service and the time service of the city, the conduction of the geodetic survey of the province of Buenos Aires (Argentina) and the development of cartographic maps. Then, by using the Gauss-Krüger plane coordinate system (created by Félix Aguilar) it undertook a major geodetic survey throughout the country.



The Large Refractor Telescope. Photos taken in 1940's and today.

Photographic observations done in La Plata led to the discovery of 23 asteroids, the second appearance of Westphal's comet in 1852 and a new comet named Devalan 1913f. Other duties involved follow-up and studies of double stars, the creation of catalogues of thousands circumpolar stars, and the update of the "*Bright Star Catalogue*" (fourth edition). It also participated in campaigns to follow total solar eclipses, such as the expeditions of 1912 in Minas Gerais (Brazil), and that of 1947 in Entre Ríos (Argentina) and was always committed to outreach activities with schools and communities.

With the emerging modern technologies, the Observatory of La Plata fostered astrophysics leading to outstanding results. The spectroscopic activities carried out in La Plata between 1950 and 1970 contributed mainly to the spectral classification of around 2000 southern Be stars, the discovery of different types of chemically peculiar stars (by Jaschek & Corvalán-Jaschek), the study of galactic interacting binaries (by J. Sahade) and WR stars of the Magellanic Clouds (by V. Niémela).

Various novel techniques developed by Argentinian astronomers enabled the creation of the first spectrograph made entirely with mirrors, known as Platzeck-Littrow spectrograph. In addition, E. Gaviola and R. Platzeck developed famous methods to control astronomical optical surfaces that was used to correct the optical problem of the secondary mirror of the Large Reflector Telescope in 1936 and then to check the 1.5-m primary mirror for

the telescope of the "Estación Astrofísica de Bosque Alegre" (Córdoba, Argentina) and the 5 m-diameter mirror of the Monte Palomar telescope.

The Observatory of La Plata, one of the largest astronomical headquarter in Argentina, has been one of the cradles for modern astronomy and home to renowned researchers whose contributions have been substantial.

Nowadays, its history and buildings of great architectural and historical value, its instruments, catalogues, archives, own publications, as well as a large photographic and spectroscopic plate collection, comprise a significant cultural and scientific heritage. In a global context, the observatory of La Plata would be a very good candidate for a serial transnational application for the UNESCO Cultural Heritage List with the topic "Astronomical Observatories around 1900 - from Classical Astronomy to Modern Astrophysics" together with other Observatories such as Hamburg (1906/12, Germany) and Bosscha (1923-1928, Java, Indonesia). Both are mentioned later on. Three good examples of modern astrophysics observatories of the late 19th and early 20th centuries in three continents.

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.

In the line of argument, during the last months, Gudrun Wolfschmidt, Past President of CC4, added a considerable number of observatories for the IAU list "Outstanding Astronomical Heritage" (OAH). The Commission has now four Working Groups. The Commission webpage has also updated (<https://www3.astronomicalheritage.org/>).

In CC4, we offer help to proceed with nomination projects, 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.



Hamburg Observatory

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 just presented to the German UNESCO Commission in October 31, 2021. Now we have to wait until 2023 for the evaluation.

In the southeast Asian region there have also been activities. Modern astronomy was formally initiated in Indonesia, with the establishment of Bosscha Observatory by the

Nederlandsch- Indische Sterrenkundige Vereeniging in the beginning of 1923 in Lembang, West Java. On the 18th of October 1951 the observatory was transferred to the Republic of Indonesia under the auspices of Institut Teknologi Bandung (formerly Technische Hogeschool) which then started a formal higher education in astronomy. We celebrated its 70th birthday with a series of seminars on the 29th – 30th of October 2021. Bosscha Observatory would be an excellent candidate for the Outstanding Astronomical Heritage initiative.

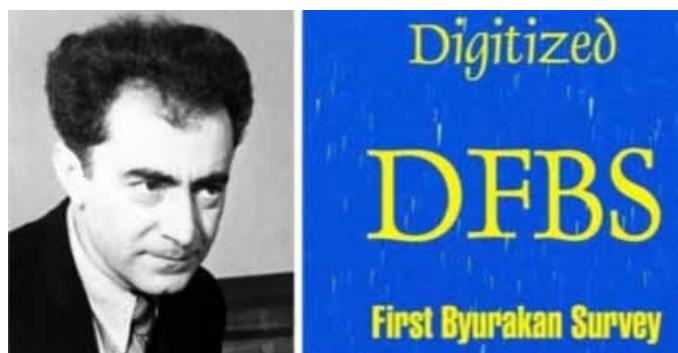
In other aspects, Michael Burton, Director of the Armagh Observatory and Planetarium and CC4 VP, was invited to give a public talk at the annual meeting of INAM (the Irish National Astronomy Meeting) entitled "Astronomy, Ireland and UNESCO World Heritage". The talk considered the merits of the Irish Observatories of Armagh, Birr and Dunsink as prospective candidates for seeking nomination for world heritage status. Further details at <https://astronomers.ie/public-talk/> and YouTube link for the talk at:

<https://www.youtube.com/channel/UCgLHzRrpQNpQRCzqHROuyGA/live>

Regarding activities on History of Astronomy South Africa 2020-21; on 20-23 October 2020 a virtual symposium was held to celebrate 200 years since the foundation of the Cape Observatory. This included a number of items of historical interest about several of the South African observatories. Proceedings including the individual presentations can be downloaded from <https://saa200.sao.ac.za>. Included was the unveiling of the historic observatory as a National Heritage Site.

The facebook page <http://www.facebook.com/Royal.Observatory.Cape> covers historical images and artefacts about the Royal Observatory, Cape of Good Hope, while the page <http://www.facebook.com/boyden123> has occasional historical items about the Boyden Observatory. Besides, a recent paper of historical interest would be: Glass, I.S., 2021. MNASSA **80**, 132-137. The Herschel "20-feet" Mirror at SAAO.

Travelling to Armenia, on 27.07.2021 we celebrated the 10th anniversary of the inscription of the First Byurakan Survey (Markarian Survey) in UNESCO's "Memory of the World" documentary heritage international register (<https://www.bao.am/about/unesco/unesco.php>). Its digitized version (DFBS - Digitized First Byurakan Survey) was created in 2002-2007, while the Armenian Virtual Observatory (ArVO) was created in 2005 based on the DFBS and other Armenian astronomical plate archives. FBS contains the records of a unique astronomical survey carried out in the Byurakan Astrophysical Observatory (BAO) by the great Armenian astronomer Beniamin Markarian and his colleagues in 1965-1988.



The survey involved the largest ever astronomical spectroscopic study of the nearby Universe and is considered as one of the most important achievements of the 20th century

astrophysics. It provides data on 40,000,000 low dispersion spectra for 20,000,000 objects. The records were carried out on BAO 1m Schmidt telescope. They cover the whole Northern Sky and part of the Southern Sky at high galactic latitudes and some part in the Milky Way areas. The FBS was conducted originally for search of galaxies with UV-excess (UVX). The discovery of 1515 UVX galaxies by Markarian and colleagues (later called Markarian galaxies) was the first and the most important work based on the FBS plates.

Finally, it is worth stressing that the first week of October, the candidature “Talayotic Menorca: a cyclopean island Odyssey” was evaluated *in situ* by ICOMOS. During one week, the evaluator was visiting the different components of the property. This include detailed explanations of the land- and skyscape relationships of Menorcan cyclopean monuments such as taula sanctuaries and burial navetas. CC4 President Juan Antonio Belmonte was a member of the team in charge of defending the property as one of the scientific advisors of the candidature. This wonderful initiative will be furthest evaluated by ICOMOS panel in the incoming weeks