

# Protection of Northern Chile as an ICOMOS/IAU “Window to the Universe”

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**Abstract.** Over the last two decades, La Serena’s population has increased by about 70 per cent. A site description of the AURA Observatory in Chile as a “Window to the Universe” is now available on the recently-launched UNESCO-IAU Astronomical Heritage Web Portal, [www.astronomicalheritage.net](http://www.astronomicalheritage.net) This can serve as an example of possible material for the Chilean authorities, should they wish to propose the dark skies over much of northern Chile for protection as a World Scientific Heritage site. Some of the steps involved are discussed briefly here.

**Keywords.** Site protection, Light pollution, astrotourism, national parks

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## 1. Overview

On 24th August 2012, during this General Assembly, a press release was issued by the IAU announcing the launch of the UNESCO-IAU Astronomical Heritage Web Portal. This effort - led on the IAU side by Clive Ruggles and the Astronomy and World Heritage Working Group and by the IYA2009 Astronomy and World Heritage Cornerstone project - is a response to an accord set up between UNESCO and the IAU in 2008. This launch follows the publication in 2010 of the Thematic Study on Astronomical Heritage produced by the IAU working together with ICOMOS. ICOMOS is UNESCO’s advisory body for cultural sites. The press release indicates “Endorsed by UNESCO’s World Heritage Committee in 2010, the Thematic Study provides guidelines for UNESCO member states on the inscription of astronomical properties. Much of its content has been incorporated onto the portal”.

Astronomy is being seen once again as an ally in putting the “S” back into UNESCO - originally put there after much work by astronomer Bart Bok. Work is currently in progress on two-way links between the World Heritage Centre’s own website (<http://whc.unesco.org>) and the new portal. Ruggles is quoted “The portal is not only aimed at the public, but also at UNESCO National Commissions seeking to nominate astronomical heritage sites for inscription onto the World Heritage List. It will provide guidance and comparative material. Scientific heritage is not just important in itself, but often relates to sustainability, landscape conservation, tourism and even biodiversity”. The press release goes on to mention that the portal will not only feature sites and monuments, but will also include dark-sky places.

These studies cover not only ancient heritage sites but also the sites of modern, large, international observatories. “...For example, members of the AWHWG have been working over the past year to develop nine much more detailed Extended Case Studies which will be brought on line one they have been discussed and approved at the IAU General Assembly. Several of them, it is hoped, will be a direct help in stimulating new World Heritage List nominations.”

Included among the Extended Case Studies are three modern observatory sites, designated as “Windows to the Universe” - Mauna Kea, Hawaii, the Canary Islands and Northern Chile. These are all places with large numbers of international telescopes with at least one having a primary mirror of 6.5m or larger equivalent diameter. The international community has selected these sites with their pocketbooks. The international community will want the IAU to continue to help protect them in the future

*Windows to the Universe.*

Of the existing major international observatory sites in Northern Chile, that occupied by the AURA Observatory in Chile is the most threatened by light pollution. AURA was the first of the large optical astronomy organizations to build an observatory in Chile - it was a bold venture, siting an observatory at the southern edge of the Atacama desert in the early 1960s. The AURA property was already beyond the limit of paved roads at that time. The town of La Serena, was quite small and, at a line-of-sight distance of about 50km, it was not a significant source of light pollution over Cerro Tololo or any other part of the AURA property. The recent boom years of growth in northern Chile - particularly that derived from the copper-mining industry - has driven the current population of the La Serena/Coquimbo conurbation to well over 400,000; 70 percent of that growth has occurred in the last two decades. Thanks to an intervening coastal range of mountains, most of the source of this light is not directly visible from Cerro Tololo or Cerro Pachon. This may change as a proposed new tunnel under the Andes helps open up trade still further between China and Brazil and the development boom moves up into the Elqui valley towards the observatory.

The useful sky accessible above normal limit-switch settings on telescopes on Cerro Tololo and Cerro Pachon (around 75-degree zenith distance) is still unpolluted (Kriscuinas *et al.* 2008). The observatory is thus on an excellent, but threatened site which serves as an appropriate Extended Case Study. We will learn much over the next three or four decades about attempting to control light pollution in Chile. At the very least, these lessons will be valuable for observatories further north in Chile such as the Carnegie Southern observatory and the European Southern Observatory sites on Cerro La Silla, Cerro Paranal and Cerro Armazones. Models of the development of the light pollution as population increases have correctly predicted that light pollution of the sky over the AURA observatory site will not be a problem for some time, even without taking into account the beneficial effect of screening by the coastal mountain range. However, if blue-rich lighting such as delivered by LEDs is permitted by Chilean authorities, more careful modelling will be advisable.

## Reference

Kriscuina, K., Bogglio, H., Sanhueza, P., & Smith, M. G. 2010, *PASP*, 122, 373