

Chilean Public Involvement in Controlling Light Pollution

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Abstract

A brief summary is given of the impact of light pollution outreach in Chile, particularly in the Regions containing the major international optical observatories.

A detailed, illustrated, successful example in Chile of the care needed in choosing and preserving a site for a public, optical observatory is presented here.

Introduction

After initial efforts in the 1960s and 1970s by Victor Blanco and Athur Hoag to document light pollution and give early warnings to the local authorities in Chile, a 5-year effort led from CTIO (1993-1998) resulted in the signing of Supreme Decree 686 (the "norma luminica") by then President Frei Ruiz-Tagle. This decree provides a legal basis for the protection of the night sky over all the major, professional, optical observatories in Northern Chile. Following the example of Tucson (especially David Crafword's leadership of the International Dark-Sky Association) and the work of the OTC in the Canary Islands, it became possible to get the public involved - first via the Mamalluca public observatory. Its work was extended via a network of (initially) local schools (RedLaSer, now CADIAS) and a national office for dark-sky protection (OPCC), supported by the international, professional observatories in Chile and Chile's National Environment Commission (CONAMA).

Six Public Observatories in the Coquimbo Region of Chile

Recognizing the economic opportunity arising from the contrast between light pollution in North America, Europe and Japan versus the near-pristine skies of northern Chile, several locally-funded, public observatories have sprung up over the last fifteen years. (The second such observatory in the Coquimbo Region, Collowara, was opened by the then President of Chile). Most foreign visitors, at least (currently >15,000 per annum), have to pay to sleep and eat somewhere locally, so local hotels and restaurants now understand the economic benefits. (There are also 27,000 Chilean visitors per annum).

Our night-time photographs, taken at the Mamalluca Observatory, illustrate the fine economic balance needed when siting public observatories - between being close enough to a town's infrastructure so as to be readily accessible to the general public, yet not so close as to suffer from excessive light pollution for at least a couple of decades. Current SQM mean readings at zenith = 21.3mag (~21.6mag when corrected for galactic anticenter in beams, even fainter when corrected for stars in the SQM beam).

Observatorio Cerro Mamalluca.	http://www.mamalluca.org
Observatorio Collowara.	http://www.collowara.cl
Observatorio Cerro Mayú.	http://www.cerromayu.cl
Observatorio del Pangue.	http://www.astronomicasur.cl
Observatorio Cruz del Sur.	http://www.observatoriocruzdelsur.cl
Observatorio Cerro Cancana.	http://www.cancana.cl

Co-ordinating public outreach organization:

Astronomica Chile <http://www.astronomicachile.com>

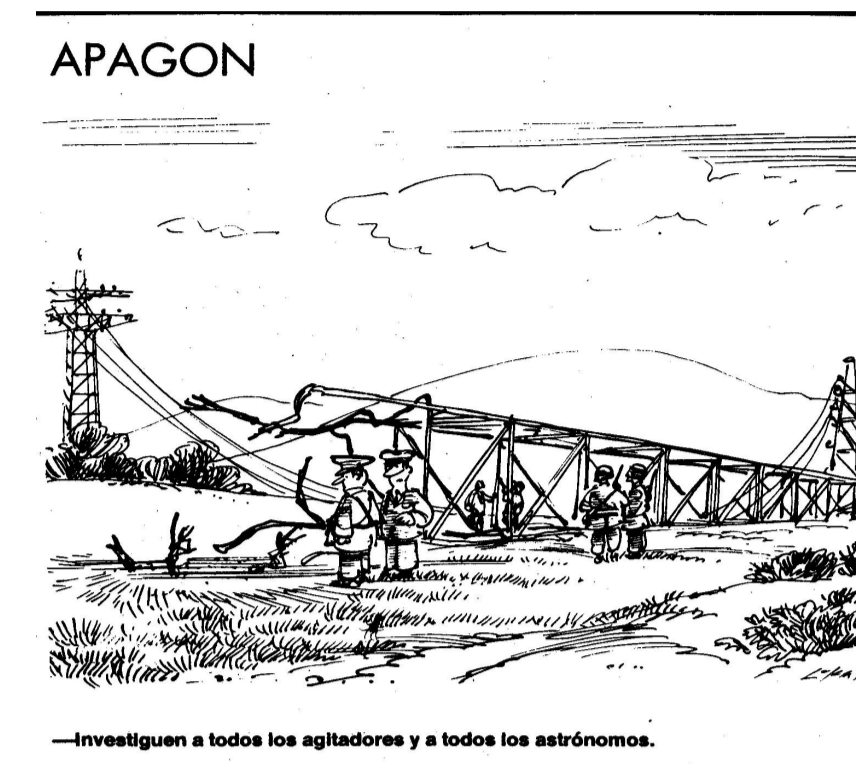
Summary

By appealing to the wallet, starlit skies are now, at last, beginning to be protected, by local people, in northern Chile. For example, the Coquimbo Region of Chile is now marketed, in an integrated manner, as "La Region Estrella" (the "Star Region"). Led by the director of the OPCC, Pedro Sanhueza, Chile has replaced about two thirds of its non-compliant street lights in the astronomically sensitive Regions of northern Chile. The professional, international observatories are benefitting from an extension – probably of several decades – of their useful life.

Astronomers are beginning to team up with biologists investigating the ecological impact of artificial night lighting.

Some reactions in the local press

These four supportive images provide examples of how the press communicates the issues to the Chilean public in an entertaining manner :



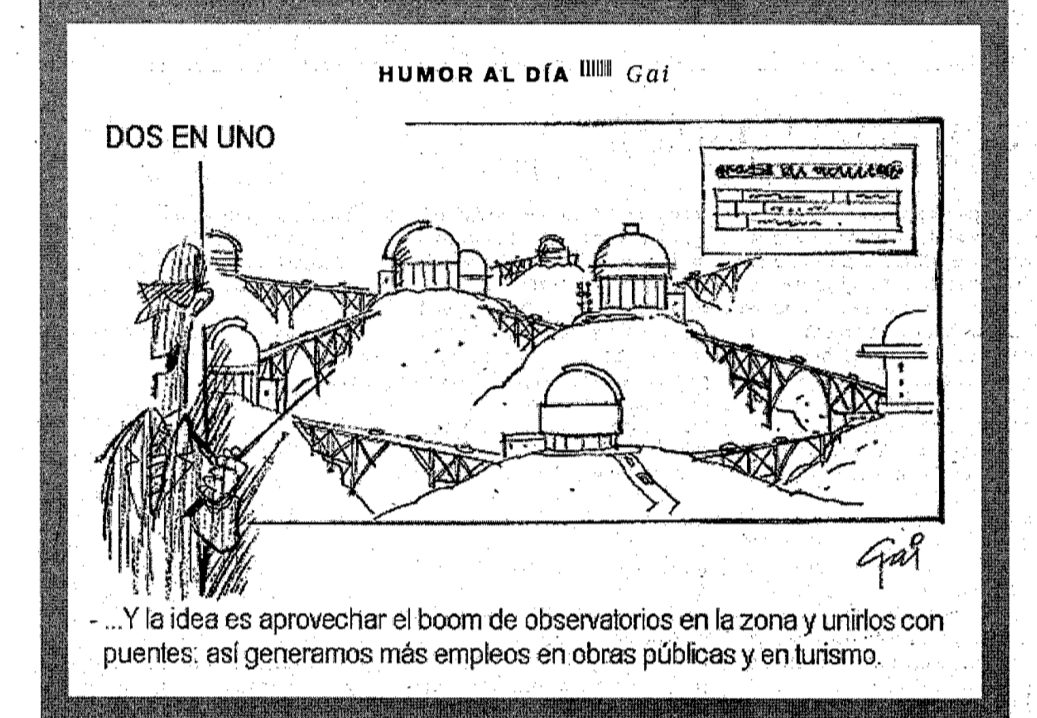
BLACKOUT. Investigate the (political) agitators – and the astronomers "El Mercurio".



OVERPOPULATION. Here's the bag of ice you asked for! Say, do you have any teabags you could loan us? "El Día".



SOLUTION. Temporary formula to avoid having the lights of Avenida del Mar affect the Tololo observatory. "El Día".



TWO IN ONE. ...And the idea is to take advantage of the boom of observatories in the area and join them with bridges; this way we generate more employment in public works and in tourism. "El Día".

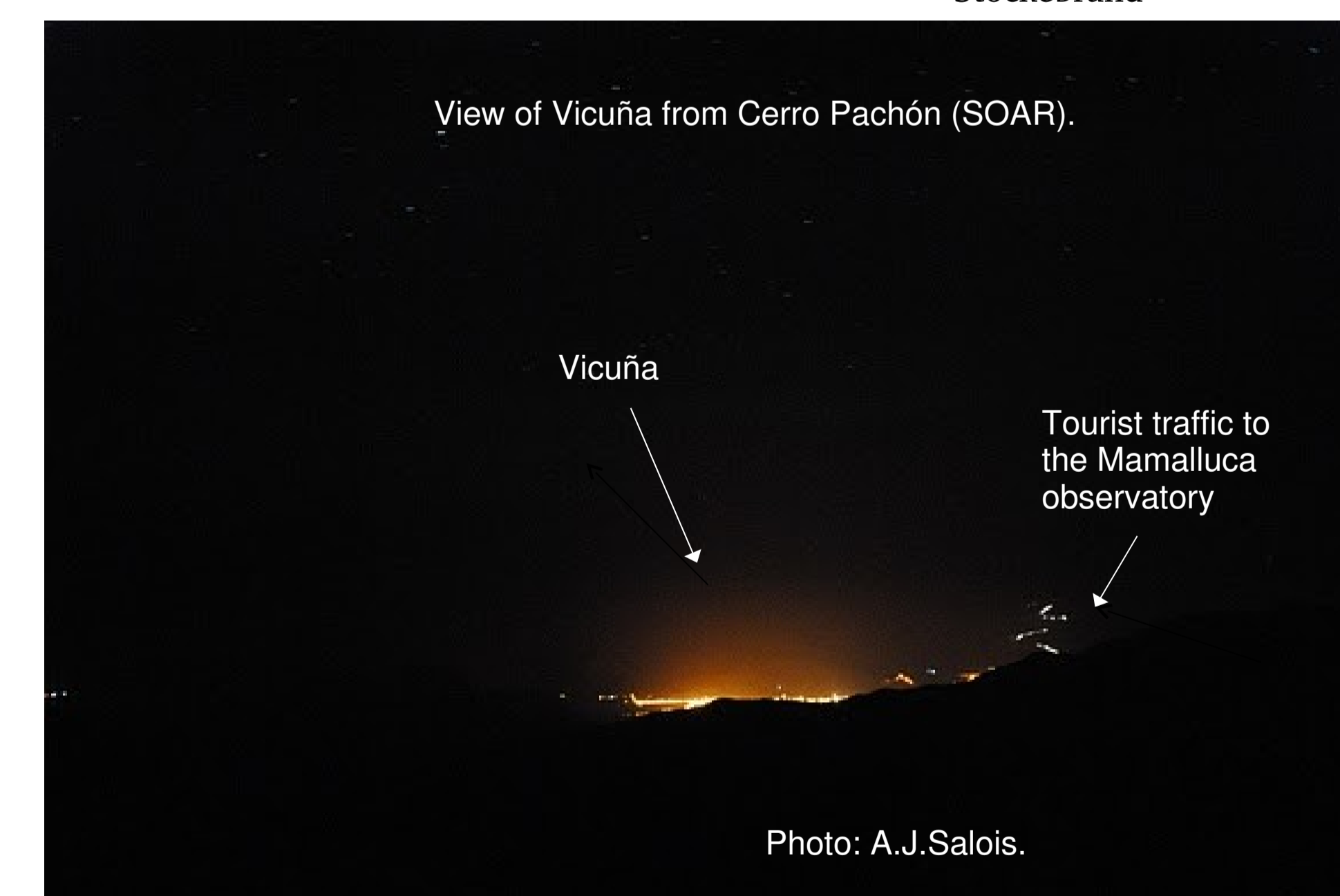
Accessibility vs. Interference from Artificial Light



View southward from Mamalluca over Vicuña:

At a distance of approximately 9 Km from the town, the public observatory is readily accessible, as shown in the following image. The Milky Way in the region of the Southern Cross and the southern coalsack are readily visible even in the most threatened part of the sky as seen from this site. The bright, reddish-white, horizontal streak in the foreground is from a scheduled group of arriving tourist vehicles. Photo: Hernán Stockebrand

View of the Mamalluca public observatory from near the SOAR telescope on Cerro Pachon. Lights from a group of tourist vehicles snaking up to the observatory can be seen on the right hand side. ~ 60,000 paying visitors come each year, ~25% from outside Chile. ~20,000 school children also benefit annually - free of charge. (Photo, Amee Salois).



References

Kriscuinas, K., Sanhueza, P., Bogglio, H. And Smith, M.G. 2010, PASP, in press.

Lugibuhl, C.B, Walker, C.E. and Wainscoat, R.J. 2009, Physics Today, 62, #12, p32.

Smith, M.G. 2009, Nature, 457, 27.