

THE IMPACT OF ECONOMIC AND CULTURAL REVIVAL ON DARK SKIES

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In the early 1930's Palomar Mountain was selected as the site for the California Institute of Technology's (Caltech) new 200-inch (5.1 meter) telescope. The brightening skies around Los Angeles and Mount Wilson meant that dark skies were a significant factor in this choice: The lack of people and development in the area meant that Palomar Mountain then competed for the darkest of observatory sites.

Urbanization of Southern California has resulted in a significant increase in the amount of sky glow in the area with light intrusion from San Diego and other, nearer developments. In the 1980s, the Observatory and Caltech worked with civic groups and local governments to pass legislation to enforce low pressure sodium lighting in the vicinity of the Observatory, and to curb the growth of light pollution caused by urban development and expansion.

Several Indian tribal lands surround Palomar Observatory, and lack of economic development in those areas helped perpetuate dark skies around the observatory. Following the Indian Gaming Regulatory Act of 1988, however, there has been increasing economic development in the tribal areas. Further expansion followed arrangements made in 2004 with the State of California to permit more casinos and gambling in return for tax revenue. This has brought six casinos to the Observatory's front door, with one more under construction. The casinos bring tremendous financial gain to the members of the tribes. However increased light pollution from casinos and associated developments are an increasing concern for astronomers and local people used to pristine skies.

Each of these casinos is located less than 30 km from the Observatory. Although falling within the most stringent lighting code areas, local Indian lands and casinos are legally immune from local lighting ordinances. Nevertheless, we have achieved some success in limiting the impact of casinos on the Observatory, in sensitizing all residents to the environmental and cultural benefits of preserving dark skies, and in continuing to educate developers about efficient lighting practices.

In 1928, George Ellery Hale secured a six million dollar grant from the Rockefeller International Education Board to build "an observatory, including a 200-inch reflecting telescope." Eight years later the Palomar Observatory was founded. It is owned and operated by Caltech, based in Pasadena, California, USA. The Observatory is currently home to six research telescopes which include the 5.1-meter (200-inch) Hale Telescope, the 1.2-meter (48-inch) Samuel Oschin Schmidt Telescope, the Palomar Testbed Interferometer, and a 1.5-meter (60-inch) telescope.

From 1930 until 1934, various sites were considered for the Observatory. Palomar Mountain was selected for its clear weather, steady seeing and dark skies. Palomar



The Palomar Observatory's 5.1 Meter Hale Telescope.

Mountain is located in Northern San Diego County, approximately 70 km (45 miles) north of the city of San Diego and about 160 km (100 miles) from the Los Angeles area. Even in the 1930s the lights from the city of Los Angeles were already greatly affecting the work at the Mount Wilson Observatory near Pasadena, California. The lights from Los Angeles were at that time considered too remote to disturb viewing at Palomar. At the time construction began on the Hale Telescope, the population surrounding Palomar numbered less than 300,000 people. It was not expected to grow significantly or to cause an impact on sky brightness.

By 1980 the population in the immediate vicinity of the observatory had ballooned to more than two million people. At that time, Caltech began to work with local governments to enact legislation to curb the growth of light pollution. Ordinances passed by local cities and counties called for the use of low-pressure sodium and fully shielded lighting in the vicinity of the Observatory.¹ Today, the population of the region exceeds five million people. The light pollution laws passed in the 1980s allows the Observatory to continue operations under skies that would otherwise have become much brighter.

Much of the land immediately surrounding the Observatory has traditionally been undeveloped. It includes lands preserved by the United States Forest Service as part of the Cleveland National Forest which covers some 1900 km (46,000 acres) and many Indian reservations. San Diego County includes 18 Indian reservations—more than any other county in the United States. For many years, lands held by the Indian reservations have been largely undeveloped and economically depressed. This has changed significantly bringing new developments to the Palomar area as a result of the Indian Gaming Regulatory Act.

The Indian Gaming Regulatory Act was passed into law by the United States Congress in 1988. It was enacted to “promote tribal economic development, tribal self-sufficiency, and strong tribal government” by giving “Indian tribes the exclusive right to regulate gaming activity on Indian lands.”² The introduction of gambling onto the reservations was introduced to bring their residents, who have been economically disadvantaged for many years, out of poverty. At the recent dedication ceremony of a casino in the Palomar area one tribal member remarked “This is an avenue for all the members of the tribe to have an education, to have infrastructure, electricity -- to have a future.”³

In a few short years, Indian gaming has become the single largest revenue-producing activity for Indian tribes in the United States. The casino industry has been so successful that the state of California has formed agreements with Indian tribes to tap into their revenues in exchange for expanded gambling operations.

Laws in the United States are complex in their dealings with native tribes. Indian tribes are largely considered to be sovereign nations and thus immune to many of the laws that govern their non-tribal neighbors. Six Indian casinos, all within 30 km (19 miles) of the Palomar Observatory, have been built since the year 2000. A seventh casino is currently under construction. All six of the Indian casinos near the Palomar Observatory are located within the region of greatest controls on outdoor lighting. Yet, because the tribes are sovereign nations, they are immune to local legislation that regulates outdoor lighting.

The Native American tribes have each had to face the decision to build a casino or not. The eventual results of the way those decisions were carried out may or may not allow them to continue to honor their environmental heritage, including the night sky. Living in harmony with the land and preserving the environment is often cited as important part of the Native American heritage. The tribal groups today try to continue that tradition and stewardship. The quotes below were all recently obtained from websites of Native American tribes with casinos in the Palomar area:

“Tribal Government operations such as Pechanga’s monitor programs and resource management exist to fully honor and protect the land and our culture upon it.”⁴

“The Pala Tribe works diligently to anticipate any environmental damage they might create.”⁵

“The religious year was observed by solstice and equinox ceremonies, all managed by the shaman. . . . They were also astronomers, knowing the movements of the stars through the seasons and phases of the moon, which determined the timing of harvest and ceremonies such as naming, puberty rites and marriage.”⁶

In building casinos, have the tribes acted to preserve, embrace or deny their heritage of starlight? The results are mixed. A wide range of lighting practices have been employed at these casinos. Astronomically-friendly, fully-shielded, low-pressure sodium lights have been installed in several locations forming a stark contrast to other lighting employed on the site. These other sources of lighting include brilliant LED billboards,



white lighting in parking garages and even an illuminated hotel. Yet in other cases, the members of the Indian tribes have acknowledged the value of their lighting choices in preserving the night sky both for the nearby observatory and as an important part of their heritage.

We have found that with education, most of these Indian tribes, particularly those with local management, are very willing to make lighting choices that can preserve the night sky for everyone. The Palomar Observatory will continue to work with them to protect our common heritage of starlight.

References

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