

# Optics in Mexico: creating an identity

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**Abstract:** Optics in Mexico has had a fast growth for the last two decades, sustained basically by academic goals on education and research, and for a large electronic engineering students enrollment. The current socioeconomical demands creates conditions where more applied optical skills are favored.

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OCIS codes: (000.2060) Education

## Summary

From an early start in the mid 1960's, Optics in Mexico has developed systematically in the last 30 years. We like to believe that we have grown independently and boundless, however, that is far from reality.<sup>i</sup> Optics in Mexico has been quick on using the opportunities that have raise in that period. We already can distinguish two stages:

- the first one driven by Astronomy, its technical demands and expectations and
- the second one by government initiatives on academic quality for research and education,

and it seems that we are about to enter a new stage of expansion, defined by the demands of a more active socioeconomic participation of our Science and Technology (S&T) establishment, where Optics is supposedly better qualified because of its dual S&T character. At the international level, Optics is a privileged field because of that duality that allowed us to sort out successfully social and technological changes. However, at the national level, we have reached a good academic development but still lack an industry that could drive engineering, in spite of some success in applications.

Optics, because of its dual characteristics is highly concentrated in three CONACyT Centers The National Institute for Astrophysics, Optics and Electronics (INAOE, 1970), Center for Scientific Research and Higher Education (CICESE, 1973) and the Center for Research in Optics (CIO, 1980) and naturally they have been receptive to national initiatives. They were created with quite an active participation of Astronomy, and important Astronomers were associated with the first generations of Opticicist, as well as their professional interest. This period is fairly well known and is extensively reported<sup>ii</sup> and it represented an academic and industrial proposal, of limited industrial success but academically fruitful. Exponents of such activity are the optical liaison with Astronomy at INAOE and the optical manufacturing capabilities at CIO. The graduate programs in this period reached high standards and small enrollments. The economical crisis of 1982 basically closed this period and represented a low point in all the optical activity. It corresponds to the smallest dimensions of INAOE, the senior optical institution.

The 1980's brought major changes in the research practice for all S&T. Mexico become concerned with the low publications statistics as a research quality standard and the efficiency and quality of education. This created a demand for new graduates at universities and research centers and an actual certification of the graduate programs. The mechanisms favored the publications, the graduate education with those standards and the raise of new fields more related to physics such as Quantum Optics, Lasers, nonlinear optics, and Optical fibers. However, the large enrollment of the Optics graduate programs shifted from physics to electronic engineering, as the applications from optical components to engineering applications such as vibrations measurements and others. Optics spread out

among the universities, both in physics and electronic engineering departments and it was created the Mexican Academy of Optics.

The new government initiatives call for a more active social participation from our S&T, demanding a more integral approach of an optical engineering at the same stature than our optical sciences. Those changes of enrollment and applications should be considered in our programs at the graduate level and at the Bs.

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## References

<sup>i</sup> Elena Poniatowska. *La Piel del Cielo (The Heaven Skin)*. Aguilar, Altea, Taurus, Alfaguara S. A. de C. V., 2001.

<sup>ii</sup> A. Cornejo, Twenty years of Optics in Mexico. *Opt. News* 12, No. 6, 14 (1986)

A. Cornejo, Óptics in Mexico. *Optics and Photonics News* 9, No. 2, 42 (19998)

L. E. Regalado And D. Malacara-Fernández, *J. Opt. Technol.* 68 (11), 2001