



Study of the Effects Created by the Sunlight Passing Through the Rose Windows of Mallorca Cathedral

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Accepted: 1 December 2023
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Abstract

This paper shows the light effects and geometric alignments created by the sunlight passing through the stained glasses of the eastern rose window in Mallorca Cathedral and projecting on the inner side of the cathedral's main façade and on the cathedral's floor. As well as providing more accurate information about these already known light effects, this paper makes use of laser scanning techniques and astronomical and geographical concepts in order to graphically display other novel effects which occur in coincidence with certain religious festivities throughout the year.

Keywords Mallorca Cathedral · Projection · Geometry · Light effect

Introduction

Throughout history, many buildings have been designed to interact with several celestial objects. Archaeoastronomy is the branch of science which studies these interactions, particularly in constructions dedicated to religious worship. Several examples can be cited which show how the design of certain constructions integrates the movement of stars: For instance, Magli (2016) reveals that the megalithic enclosure of Gobekli Tepe, probably the most ancient in the world, was designed to visualize the orbit of Sirius through the structures' orientation. Also, Catamo and Lucarini (2002) and Sigismondi (2012) describe the gnomon built by Francesco Bianchini in the Basilica of St. Mary of the Angels and of the Martyrs, which makes it possible to observe the meridian passage of the Sun and also of the stars Polaris, Arcturus and Sirius.

The star which has played the most relevant role in the history or architecture is the sun (Heilbron 1999; Torres 2000; Linares 2015). Due to its presence,

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