



Received: 16 July 2018
Accepted: 09 June 2019
First Published: 14 June 2019

*Corresponding author: Blas Herrera,
Departament d'Enginyeria Informàtica
i Matemàtiques, Universitat Rovira i
Virgili, Tarragona, Spain
E-mail: blas.herrera@urv.cat

Reviewing editor:
Peter Stanley Fosl, Transylvania
University, Lexington, USA

Additional information is available at
the end of the article

VISUAL & PERFORMING ARTS | RESEARCH ARTICLE

Justification about the existence and location of Chartres' cathedral labyrinth based on astronomy and geometry

Blas Herrera^{1*}, Albert Samper² and Joan M. Seguí²

Abstract: We present a geometric-astronomical correlation between the rose window on the main façade and the labyrinth of Chartres cathedral. This correlation existed throughout the building's construction—epoch *J1200*-. Since classical mythology relates the labyrinth to the Taurus constellation, we will project the daily orbits of the stars of this constellation through the center of the rose window, thus finding their paths on the cathedral's floor plan. We will show that Elthor—"the bull" at the center of the constellation—was projected on the center of the labyrinth. We will consider possible mythological motivations to purposely create this alignment.

Subjects: Geometry; Theory of Architecture; Architectural Design, Drawing and Presentation

Keywords: Chartres' Cathedral; rose window; labyrinth; archaeoastronomy

1. Introduction

It is hard to say when drawings and engravings of labyrinths began to appear or which civilization was the first to use them. The earliest known depictions date from the late Neolithic period and the early Bronze Age (approximately in the second millennium B.C.) (Reed, 1992). Labyrinths began to be used in churches and cathedrals during the Roman period. The first known labyrinth within a Christian context was built in Algeria in the Basilica of Reparatus in Orleansville (324 A.D.)

ABOUT THE AUTHORS

Blas Herrera is Geometer who obtained his D.Sc. in Mathematics at the University Autònoma of Barcelona in 1994. Presently, he is a full professor of Applied Mathematics at the University Rovira i Virgili of Tarragona. His main fields of research interest are: Classical and Differential Geometry, and the application of Geometry to Architecture, Fluid Mechanics and Engineering.

Albert Samper is an Architect who obtained his Ph.D. in Architecture at the University Rovira i Virgili of Tarragona in 2014. Presently, he is an assistant professor of Architecture at the same university and his main fields of interest are: Fractal Geometry and the application of Geometry to Architecture.

Joan M. Seguí obtained his Ph.D. in Architecture at the University Rovira i Virgili of Tarragona in 2017. His main fields of interest are: Astronomy, Gothic Cathedrals and the application of Geometry to Architecture.

PUBLIC INTEREST STATEMENT

Nobody knows for sure why a labyrinth was built on the floor plan of Chartres cathedral, or why it was positioned at that precise location. This paper shows that a geometric-astronomical alignment existed during the period when Chartres cathedral was built, 1200 CE. We show the existence of the alignment $Elthor - \mathcal{O} - \mathcal{L}$, where $Elthor$ is the central star of the Taurus constellation, \mathcal{O} is the center of the cathedral's main rose window, and \mathcal{L} is the center of the labyrinth. At the end of the paper, we suggest a possible mythological motivation. Despite this, it is not our intention to claim or deny in this paper that the medieval master builders intentionally took this alignment into account when designing the building. We simply intend to show the geometric existence of such an alignment.