



50th Anniversary Symposium of the
International Association for Shell and Spatial Structures (IASS)

Valencia, Spain, 28 September – 2 October, 2009

Evolution and Trends in Design, Analysis and Construction of Shell and Spatial Structures

IASS 50th Anniversary



Book of Abstracts



CEDEX

Editors
A. Domingo and C. Lázaro

**Evolution and Trends in Design,
Analysis and Construction
of Shell and Spatial Structures**

**IASS Symposium 2009, Valencia
Book of Abstracts**

Editors

Alberto Domingo, Carlos Lázaro

A Symposium under the auspices of:
the International Association for Shell and Spatial Structures (IASS),
Laboratorio Central de Estructuras, Centro de Experimentación de Obras Públicas
(CEDEX),
and the Universidad Politécnica de Valencia (UPV)

**28 September – 2 October, 2009
Universidad Politécnica de Valencia
Valencia, Spain
<http://www.iassvalencia2009.com>**

EDITORIAL UPV

Ref.: 2009.2298

The 50th Anniversary Symposium of the
International Association for Shell and Spatial Structures (IASS)
takes place at the *Universidad Politécnica de Valencia* (Spain)
from September 28 to October 2, 2009,
under the auspices of:

IASS
International Association for Shell and Spatial Structures
www.iass-structures.org

CEDEX
Centro de Estudios y Experimentación de Obras Públicas – Ministerio de Fomento
Laboratorio Central de Estructuras y Materiales. C/ Alfonso XII, 3 · 28014 Madrid,
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This book titled
Evolution and Trends in Design, Analysis and Construction of Shell and Spatial Structures IASS Symposium 2009, Valencia. Book of Abstracts
contains the extended (2-page) abstracts contributed by the participants in IASS
2009.

The corresponding full papers are included in a separate publication.

© Editors:
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Edita: EDITORIAL DE LA UPV
Camino de Vera, s/n
46022 VALENCIA
Tel.96-387 70 12
Fax 96-387 79 12

Imprime: REPROVAL, S.L.

ISBN.: 978-84-8363-459-2
Depósito Legal: V-3193-2009

The church of Longuelo designed by Pino Pizzigoni. An unknown example of outstanding structure

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Abstract

All during the XX Century, several Italian architects devoted their efforts in finding a synergy between structure and formal character, economically reasonable while rich of new architectural opportunities. Among the most notable there are personalities like Pier Luigi Nervi, Luigi Moretti and Sergio Musmeci, but also a lot of almost unheard-of architects, whose works are of utter interest. Here a very singular building of one of these designers, namely Pino Pizzigoni, is presented: the church of Longuelo (Fig. 1a, 1b).

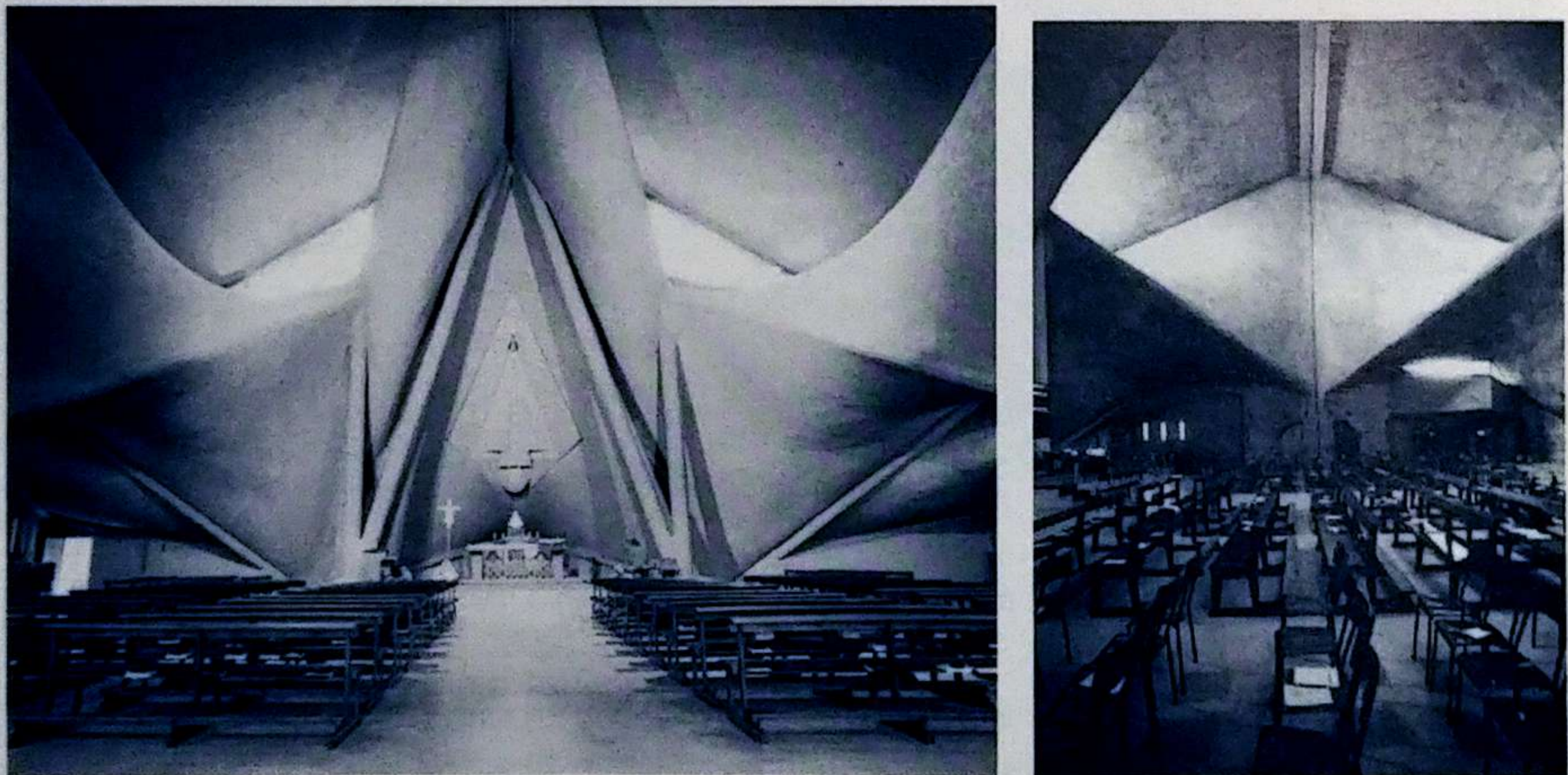


Figure 1a, 1b. Inside the Church of Longuelo: main entrance

Pizzigoni was born in Bergamo (Italy) in 1901, where he lived, worked for all his life and died in 1967. He studied Architecture at Politecnico di Milano since 1918 with some of the most notable Italian architects of the XX Century. Quite neglected by histories of architecture, he is usually, and grossly, described as a post-rationalist architect. After the second World War, Pizzigoni dedicated his interests in new structural typologies and,

following the rising 'philosophy of structures', experimented with thin concrete in many projects. He realized hyperbolic paraboloids as roof structures for stables in Zandobbio (1956-1960), for a Nursery School in Monterosso (1965), for pigsties in Torrepallavicina (1960-1964), as well as in other buildings.

The church of Longuelo, devoted to Maria Santissima Immacolata and completed in 1965, is the last main building by Pino Pizzigoni: the project dating 1961. The church spans over 900 square meters, with a maximum height of 18 meters: it is divided in 4 identical free parts, which form a perfectly symmetric, central layout church. Since the first sketches, dating 1961, it is clear that, all during the design process, three were the main suggestions: the use of hypar shells, the Möbius Ring and the metaphorical, biblical concept of the Tent, pitched by God, as described by The Gospel of John.

It is thereby quite unexpected that, despite the continuous references to hypars and the importance of the vaults, the entire design process is taken on only working on frame configurations of bars, without any thought about hypars indeed. The main point is the possibility to calculate the whole structured as a fixed-joint frame: all during the design, Pizzigoni tried to find a possible frame that is statically-determinate and aesthetically pleasant, not considering the presence of hypars but by adding axial stresses to the bars, calculating the shell apart from the frame. Unfortunately, the reportings written by Pizzigoni himself, when compared with the few diagrams found in his archive and with final building, show many inconsistencies, related the static determinacy of the spatial frame, the definition of structure loads and shells and bars' behaviour.

The approach to the structure of Pizzigoni appears quite stunning: it seems that his consciousness of frame behaviour is more intuitive than rational. The synergy between structure and form in a very complicated shape (Fig. 2a, 2b) is obtained by an extreme conceptual simplification of simple concepts of spatial frame and hypars properties.

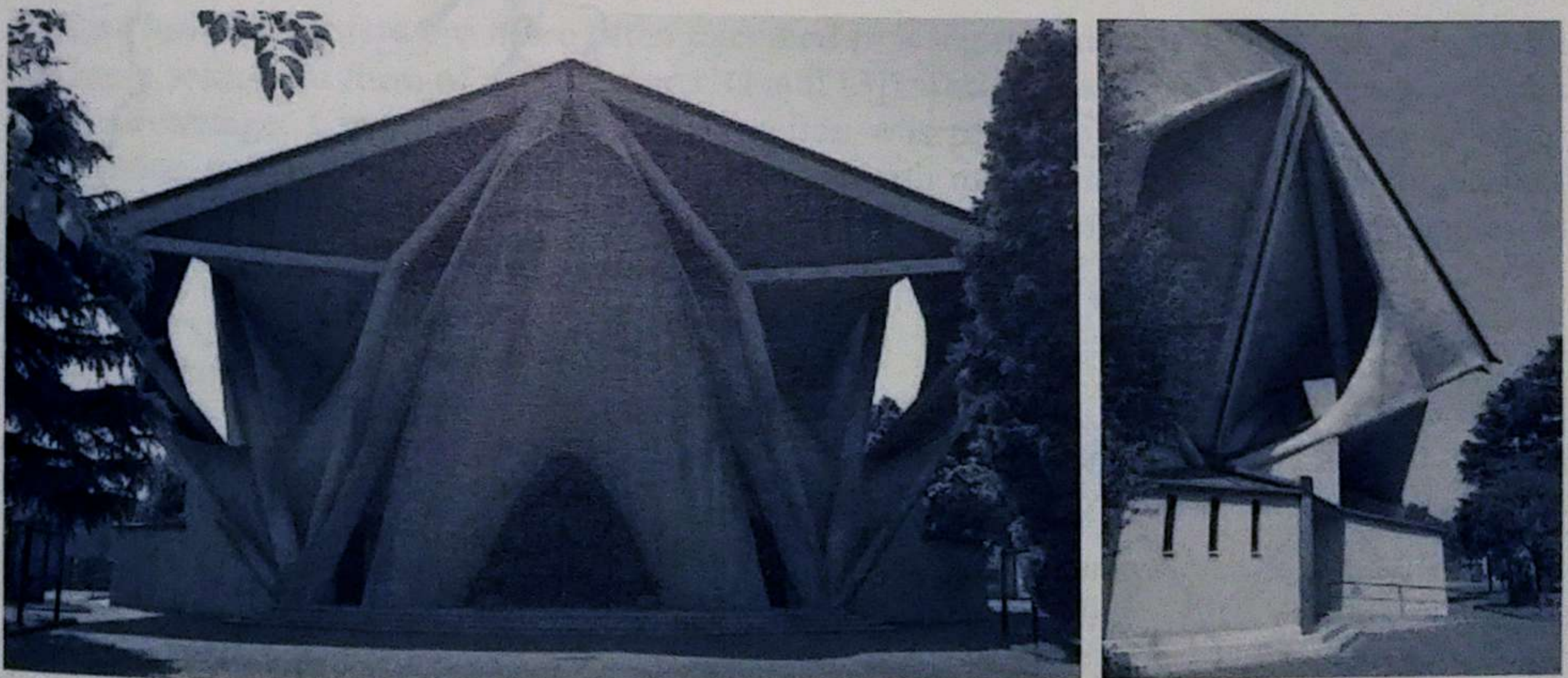


Figure 2a, 2b. Outside the church, front and side