

BASIC IDENTIFICATION**Site name:**

Scrovegni Chapel (Cappella degli Scrovegni), also known as Arena Chapel

Location:

Padua (Veneto, Italy), Via Enrico Scrovegni

Associated complex:

Scrovegni family palace and former Roman arena area

Geographical context:

Eastern sector of the medieval city of Padua, on the site of the ancient Roman amphitheatre, outside the episcopal and cathedral complex

Chronological range (site):

1302–1305, with later medieval repairs and extensive modern restoration campaigns

Focus period for roofing systems:

Early 14th century, with major structural and conservation interventions from the 19th to the 21st centuries



Figure 1. Padua, aerial view of the Scrovegni Chapel. (Source: [The Arteller](#))

1. HISTORICAL OVERVIEW

The Scrovegni Chapel is universally recognised as one of the masterpieces of medieval European culture, primarily due to the fresco cycle painted by Giotto between c. 1303 and 1305. However, beyond its artistic importance, the chapel constitutes an architectural artefact of extraordinary coherence, in which spatial conception, structural design, and roofing systems are intimately interconnected.

Commissioned by Enrico Scrovegni, a prominent Paduan banker, the chapel was conceived as a private family oratory dedicated to Santa Maria della Carità. Its construction on the site of the ancient Roman arena endowed the building with a strong symbolic dimension, reinforcing themes of redemption and continuity between classical antiquity and Christian civilisation.

From an architectural perspective, the chapel presents a deceptively simple form: a rectangular single-nave volume terminating in a polygonal apse, devoid of internal supports. This simplicity is deceptive, as it places the entire burden of spatial definition and structural stability on the roofing system, which becomes the key architectural protagonist.

Within the framework of CaMeRoofs, the Scrovegni Chapel represents a paradigmatic early Gothic solution in the Veneto, originally characterised by the pairing of a masonry barrel vault (soffitto) with an independent external timber roof (tetto), forming a layered construction of remarkable sophistication. While this typological configuration remains legible, the original timber trusses no longer survive, having been entirely replaced by a steel roofing system during the 1960s.



Figure 2. Padua, Scrovegni Chapel, exterior view. (Source: [Wikimedia Commons](#))

2. BUILDING PHASES AND CHRONOLOGY

2.1 Design and Construction (1302–1305)

Construction of the chapel commenced in 1302 and progressed rapidly, reflecting both the patron's financial resources and the urgency of the project. The building was conceived as a unified architectural and artistic enterprise, with the masonry envelope, vault, and roof designed simultaneously to accommodate Giotto's fresco cycle.

The walls are built of brick masonry laid in regular courses, with limited articulation and no internal buttressing. This choice necessitated a roofing system capable of spanning the entire width of the nave while carefully controlling lateral thrust.

The barrel vault was constructed soon after the completion of the walls, providing the continuous interior surface required for the frescoes. The external roof was originally erected as a separate timber structure, ensuring protection of the vault and contributing to the regulation of the interior microclimate; the original timber trusses, however, were entirely replaced by a steel roofing system in the 1960s.



Figure 3. Padua, Scrovegni Chapel, interior view. (Source: A. Passuello)

2.2 Medieval Repairs and Adjustments

Despite the technical sophistication of the roofing system, the chapel was not immune to the effects of time and environmental exposure. From the later Middle Ages onward, periodic

repairs were required, particularly to the roof covering and drainage systems, to prevent water infiltration that threatened both structure and decoration.

These interventions confirm that medieval custodians were acutely aware of the crucial role played by the roof in preserving the interior environment.

2.3 Modern and Contemporary Interventions

From the 19th century onwards, the Scrovegni Chapel became the subject of increasingly systematic restoration campaigns. These efforts culminated in the late 20th and early 21st centuries, when the restoration of the roofing system was integrated with advanced environmental monitoring and climate control strategies.



Figure 4. Padua, Scrovegni Chapel, barrel vault. (Source: A. Passuello)

3. STRUCTURAL AND TYPOLOGICAL ANALYSIS OF THE ROOFING SYSTEMS

3.1 The Masonry Barrel Vault (*Soffitto*)

The interior of the chapel is defined by a continuous masonry barrel vault, slightly pointed in profile. This vault spans the full width of the nave without intermediate supports, creating a unified and uninterrupted interior space.

Structurally, the vault operates under compression, transferring loads laterally to the longitudinal walls. Its pointed profile reduces horizontal thrust in comparison to a semicircular vault, allowing the walls to remain relatively slender.

The absence of ribs or transverse arches situates the vault within a hybrid Romanesque–early Gothic tradition, characteristic of Italian architecture of the early 14th century.

3.2 Construction Technique and Materiality

The vault is constructed of brick masonry, bonded with lime mortar. Its surface was carefully prepared to receive fresco painting, requiring exceptional regularity and stability. Any deformation or cracking of the vault would have had immediate and irreversible consequences for the frescoes, underscoring the structural precision required in its execution.

3.3 Interaction between Vault and External Roof

The external roof was originally supported by a system of timber trusses (*capriate lignee*), structurally independent from the masonry barrel vault and resting on elements placed at the wall-head and on the vault extrados. This medieval timber system, which played a fundamental role in maintaining a flexible and compatible interaction between roof and vault, no longer survives.

Between 1962 and 1963, the historic wooden trusses were completely dismantled and replaced by a new structural system consisting of steel trusses spanning the full width of the nave, supported by a reinforced-concrete perimeter ring beam cast at wall-head level. The intervention involved the permanent removal of the original timber elements and their auxiliary supports, resulting in a total replacement of the medieval roofing structure. While the present roof maintains the original external geometry, its structural logic, materiality, and mechanical behaviour differ substantially from the historic timber configuration.

3.4 The Intermediate Void and Environmental Regulation

The void between vault and roof plays a fundamental role in:

- buffering temperature fluctuations;
- preventing condensation on the vault extrados;
- allowing inspection and maintenance.

This layered roofing system demonstrates an advanced medieval understanding of environmental performance, anticipating principles that would only be formalised centuries later.

3.5 Structural Logic and Long-Term Performance

The longevity of the chapel's roofing system attests to its effectiveness. Despite periodic repairs, the fundamental configuration has remained unchanged, confirming the robustness of the original design and its capacity to protect one of the most fragile painted interiors in medieval Europe.



Figure 5. Padua, Scrovegni Chapel, timber trusses prior to the restoration campaigns of the 1960s. (Source: Colabich, Prosdociami & Saccomani, 1964)



Figure 6. Padua, Scrovegni Chapel, detail of the attic spaces with metal trusses. (Source: [University of Padua Thesis Repository](#))

4. CONTEXTUALIZATION OF THE ROOFING SYSTEMS

4.1 Italian Early Gothic Roofing Solutions

In contrast to northern European Gothic churches, where vaults and roofs often form a closely integrated system reinforced by flying buttresses, Italian architecture of the period frequently adopted layered roofing strategies, separating interior vaults from external roofs.

The Scrovegni Chapel exemplifies this approach at its most refined, combining structural efficiency with environmental control.

4.2 Comparison with Mendicant Architecture

The chapel's roofing system can be compared with contemporary Franciscan and Dominican churches, where barrel vaults and timber roofs were similarly combined. However, the Scrovegni solution is exceptional for its precision and its explicit integration with a pictorial programme.

4.3 Regional Comparisons within the Veneto

Within the Veneto, the Scrovegni Chapel occupies a distinct position between domed buildings such as the Baptistery of Padua and timber-ceilinged basilicas such as San Zeno and San Fermo in Verona. It thus functions as a bridge between different roofing traditions, linking centralised domes, masonry vaults, and timber roofs.

4.4 European Context

At a European level, the chapel diverges sharply from contemporary Gothic architecture in France and England. Its roofing system prioritises interior unity and surface continuity over structural exhibitionism, reflecting a distinctly Italian approach to Gothic form.

4.5 Symbolic Dimension of the Vault

The vault functions symbolically as the *vault of heaven*, a concept reinforced by Giotto's frescoes. The roofing system thus contributes directly to the theological meaning of the space, embodying the union of heaven and earth.

5. RESTORATION HISTORY AND CONSERVATION STATUS

5.1 Medieval and Early Modern Repairs

Historical documentation attests to frequent repairs to the roof covering, particularly to tiles and timber elements. These interventions aimed primarily at preventing water infiltration and preserving the frescoed vault.

5.2 Modern Restoration Campaigns

In the 19th and 20th centuries, restoration efforts became increasingly systematic. The roof was partially reconstructed, decayed timber elements replaced, and improved waterproofing introduced, while respecting the historical configuration.

5.3 Contemporary Conservation Strategy

The most recent conservation campaigns integrated the legacy effects of the 1960s roof replacement with advanced climate-control and monitoring systems. The current roofing system, in conjunction with these technologies, now plays a central role in maintaining a stable microclimate essential for the preservation of the frescoes.

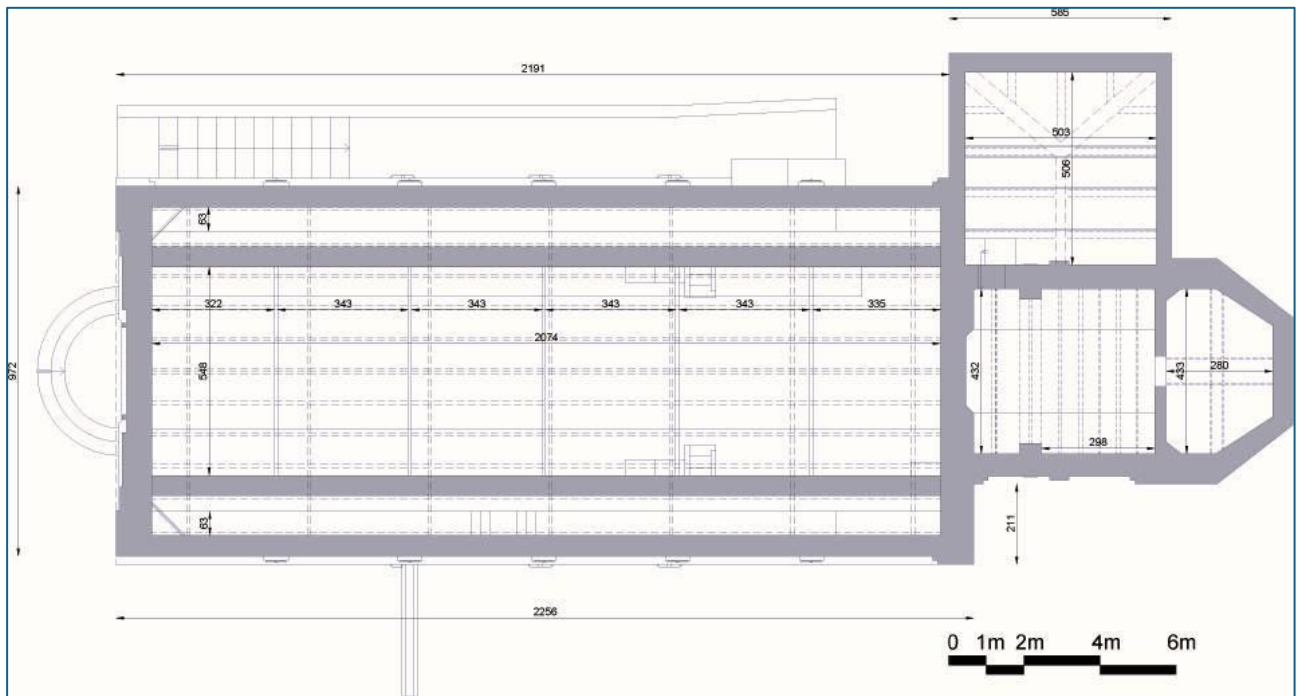


Figure 7. Padua, Scrovegni Chapel, attic plan with indication of the metal trusses. (Source: [University of Padua Thesis Repository](#))

6. ESSENTIAL/SELECTED BIBLIOGRAPHY

- Banzato, D., Baldissin Molli, G., & Bertazzo, F. (eds.) (2005). *La Cappella degli Scrovegni a Padova / The Scrovegni Chapel in Padua*. Modena.
- Bellinati, C. (2003). Nuovi studi sulla Cappella di Giotto all'Arena di Padova (25 marzo 1303–2003). *Quaderni dell'Archivio Vescovile e della Biblioteca Capitolare di Padova*, 2. Padova: Il Poligrafo.
- Borsella, S. (2003). L'architettura, le trasformazioni e i restauri dalle origini alle soglie del XXI secolo. In G. Basile (ed.), *Il restauro della Cappella degli Scrovegni: indagini, progetto, risultati*. Milano, 451–460.
- Colabich, G. F., Prosdocimi, A., & Saccomani, G. (1964). *I recenti lavori di restauro alla Cappella degli Scrovegni e le indagini esperite per la sua conservazione*. Padova.
- Dal Piaz, V. (2005). La storia e l'architettura della cappella. In D. Banzato, G. Baldissin Molli, & F. Bertazzo (eds.), *La Cappella degli Scrovegni a Padova / The Scrovegni Chapel in Padua*. Modena, 9–45.

- Grinzato, E., Bressan, C., Marinetti, S., Bison, P. G., & Bonacina, C. (2002). Monitoring of the Scrovegni Chapel by IR thermography: Giotto at infrared. *Infrared Physics & Technology*, 43, 165–169.
- Jacobus, L. (1995). Giotto's design of the Arena Chapel, Padua. *Apollo*, 142(406), 37–42.
- Jacobus, L. (2008). *Giotto and the Arena Chapel: Art, architecture and experience*. Turnhout.
- Jacobus, L. (2026). Roofing and re-roofing the Arena Chapel (Cappella degli Scrovegni) in Padua (1303–1305). In A. Passuello & M. Olympios (eds.), *Behind the Scenes of Medieval Roofs: An Overview of the Roofing Systems of Italian Churches*. Rome, 101–122.
- Simon, R. (1995). Giotto and after: Altars and alterations at the Arena Chapel, Padua. *Apollo*, 142(406), 24–36.
- Spiazzi, A. M. (1991). *La Cappella degli Scrovegni a Padova*. Milano.
- Urbani, G. (1978). Studio sullo stato di conservazione della Cappella degli Scrovegni di Padova. *Bollettino d'Arte*. Roma.
- Verdi, A. (2000). L'architettura della Cappella degli Scrovegni. In *Giotto e il suo tempo*. Milano, 118–138.
- Zampieri, G. (2004). *La Cappella degli Scrovegni in Padova: il sito e l'area archeologica*. Milano.