

# Luigi Moretti, from History to Parametric Architecture.

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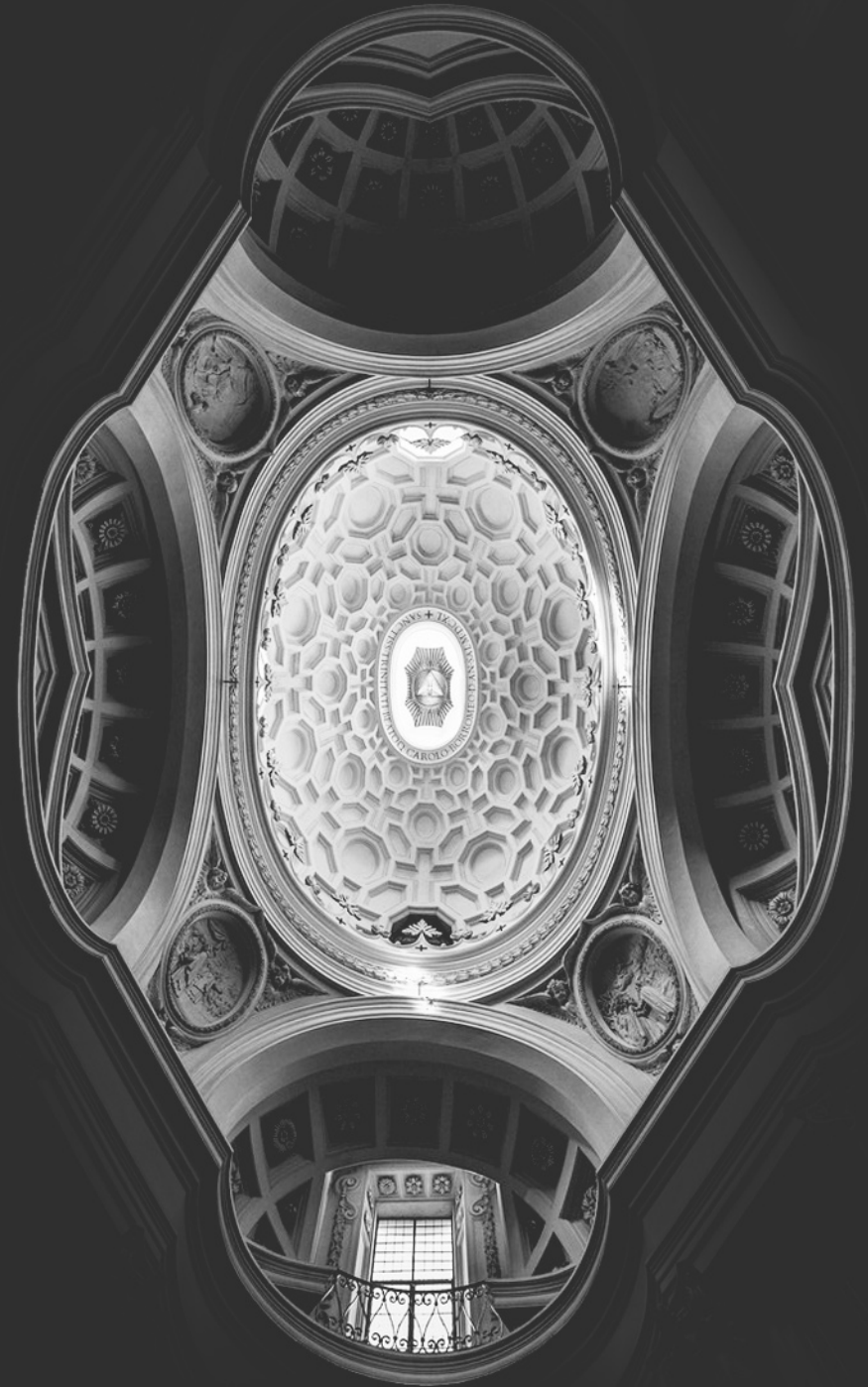
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Art, Science and Tradition.

Balilla House, Luigi Moretti, Rome, 1933  
Luigi Moretti Archive.

# 1. Moretti, man of Italian Culture

Dome of San Carlo alle Quattro Fontane,  
Borromini, Rome.







# Passion for Heritage and Commitment to a new Architecture.

**1907** - Born in Rome, Luigi Moretti  
lived his whole life in his City.

**1950** - Founded Spazio Magazine.

**1957** - Founded the IRMOU: Institute for Operations  
Research and Applied Mathematics Urbanism.

**1960** - Presented his Parametrical Models of Stadia at  
Triennale, Milano

**1973** - Died While at Work

Sant'Ivo alla Sapienza, Borromini, Rome.  
Spazio Magazine n. 7, Cover.





# Moretti's Theories and Parametricism.

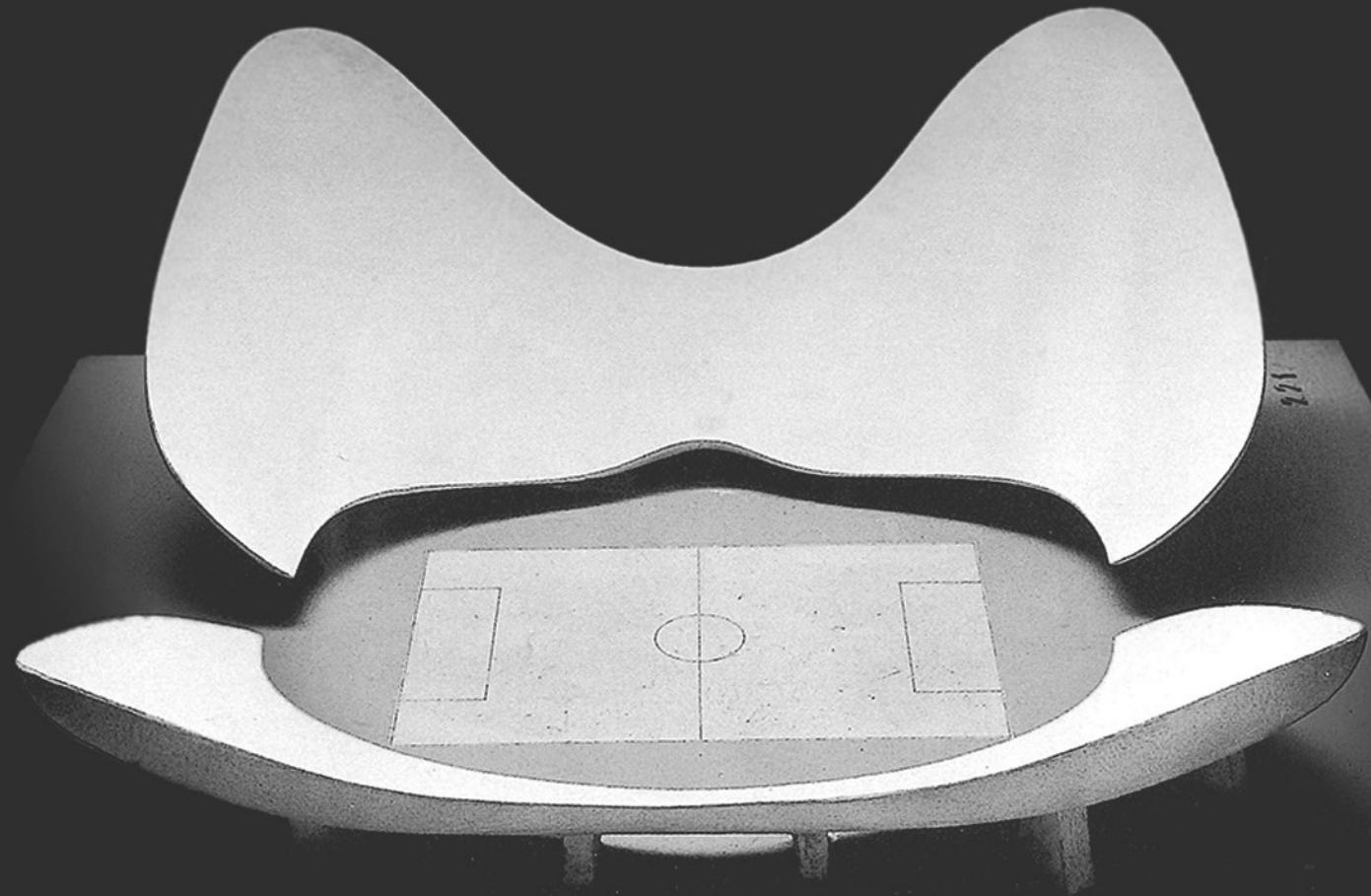
His Commitment to Parametric Architecture dissemination make him **comparable** to Patrik Schumacher.

But, Moretti his a Man of Italian Culture, his Ideas are **strongly related** to Architecture, while Schumacher lives in a interconnected technological world, and promotes a broader **global theory**, starting from Luhmann thoughts.

Inside his first Interview, for Quadrivio Magazine in 1936 he announces the arrive of a **new architecture**, and the **end of Rationalism**.

Watergate Building, Luigi Moretti, Washington

## 2. From Structure to Form (1951).



Model of *Stadio secondo le curve di  
equiappetibilità visiva*, Luigi Moretti, 1960.





# “Form follow Forces”

(Bletzinger, Ramm, 2014)

National Maritime Museum, Dok Architecten,  
Amsterdam, 2011, Photo by Arjen Schmitz.





# Wider relationships between the three qualities of Architecture.

Moretti states that Vitruvius Firmitas, Utilitas and Venustas have been misrepresented in a educational simplification by minor theorists of the 16th Century.

Architecture is then defined in **3 forms**:

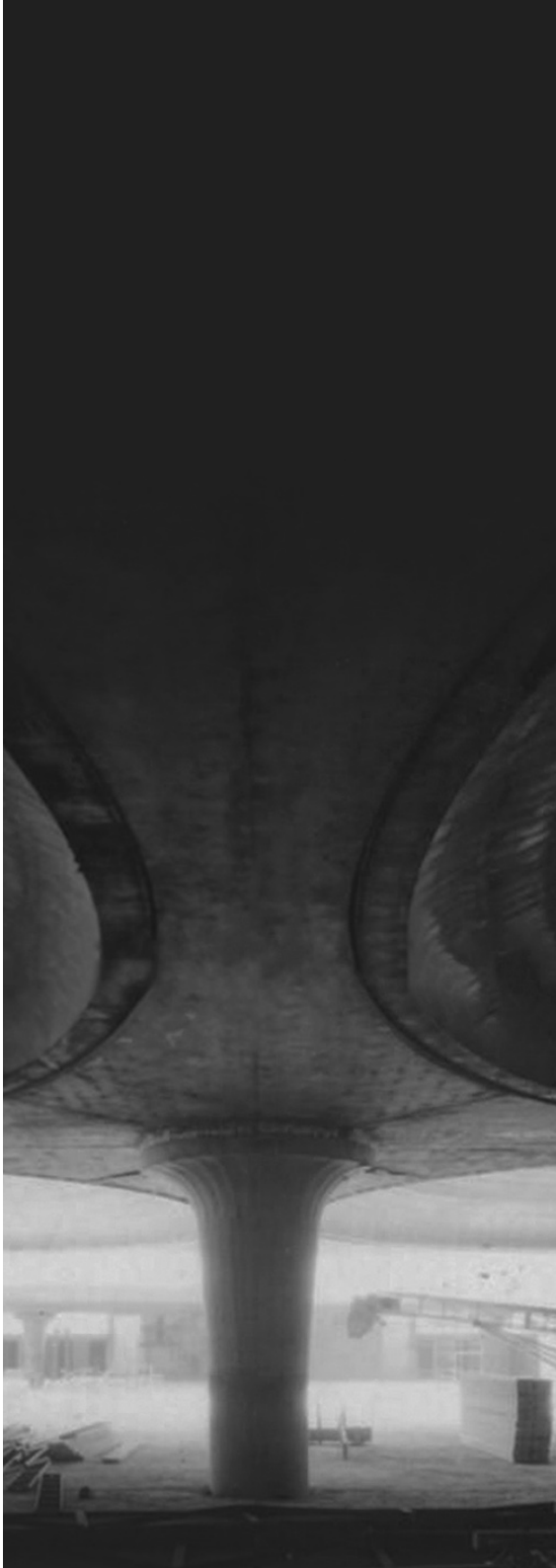
**The structural** form, one of the n possible.

**The functional** form, answer to functional needs.

**The Expressive** form, Architect will of representation.

To have an Architecture, is necessary for these forms to be **Identical**, so that relationships and rhythms of one form are legible in the other two.

National Maritime Museum, Dok Architecten, Amsterdam, 2011.



# Hope in a return to the Structure→Form Approach

Moretti recognizes in succession of styles a continuous oscillation of the relationships between the three categories of forms, due to the two main generative directions of architecture:

**Structure → Form**, typical of Hadrian, Romanesque, Gothic architecture and Brunelleschi.

**Form → Structure**, main Path during Renaissance, Baroque and even Rationalism

Each Architecture can be obtained with a series of parameters, which are **infinite** and **sometimes not identifiable**, this make any Architectural shape solvable only through a

**Structure → Form** process.

Parking under Villa Borghese,  
Luigi Moretti, Rome, 1972.

3. A new meaning for  
the word “Structure”  
(1957).



Model of the inner spaces of Guarino Guarini's Saint  
Mary of the Divine Providence, Luigi Moretti.





# Perception of Forms and Mathematics.

Perception of objects and space is a theme of interest for Parametricism, as it was for Moretti, who affirms that as Human we understand form through the **differences** (relationships) between them.

Each form can be defined by its differences, so our perception of reality can be assimilated to a **system of ordered differences** in a rhythm that constitutes the law of form.

Moretti recalls Évariste Galois Theory, defining the system of differences as a **group**. The group is not a quality of form, but a set of **instantaneous relationships**.

Évariste Galois, French mathematician died at the age of 20 years.



## Parametric Architecture to manage the complex “Structure” of Form.

The group of differences that we can perceive simultaneously is limited and defines it as a **chain**.

The **set of chains** that define a non-elementary shape is therefore defined as **structure of form**.

Moretti enumerates different types of structures in architecture: **chiaroscuro** structure, structure of **static relationships**, structure of **spaces**, structure of **plastic relations**, structure of **surfaces**, structures of **light density**, etc.

All these families of relationships are **interdependent (isomorphic)** and a new approach is necessary to manage them all together: parametric architecture.

Residential Complex, Luigi Moretti, Rome

## 4. Parametric Architecture: Art, Science and Tradition.

Balilla House, Luigi Moretti, Rome, 1933  
Luigi Moretti Archive.

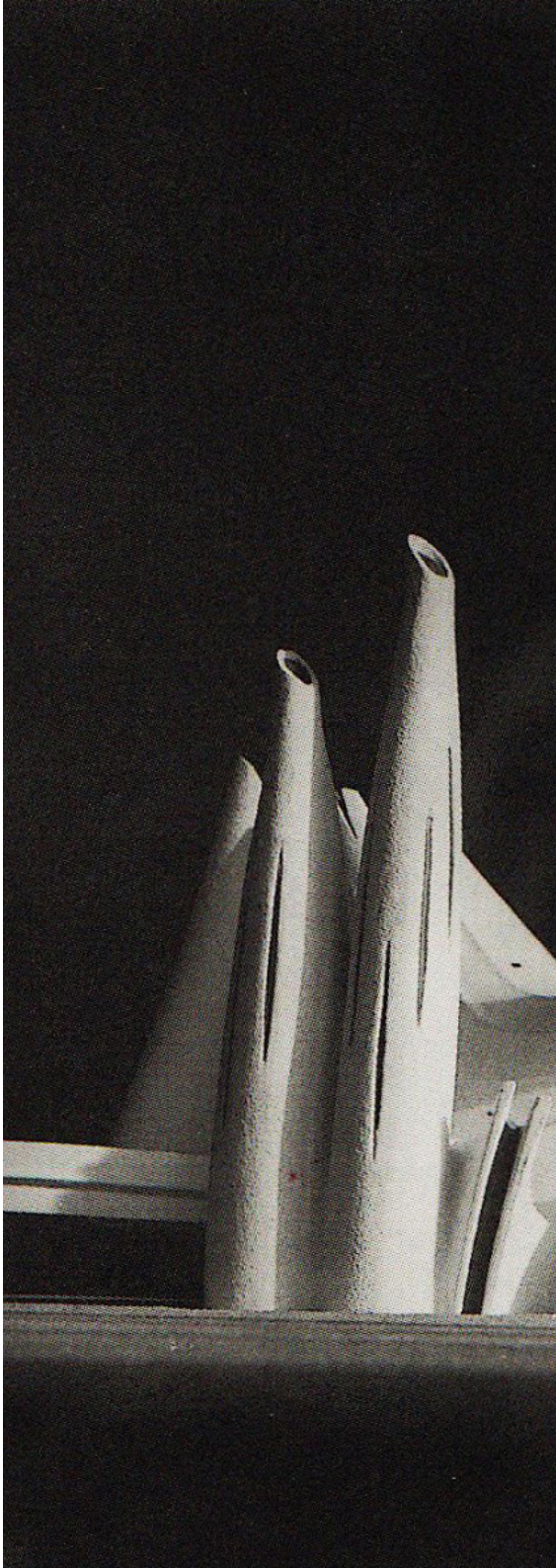




# 8 points for Parametric Architecture

- 1 - Rejection of empirical decisions.
- 2 - Assessment of traditional phenomena as objective facts based on interdependence of expressive, social and technical values.
- 3 - Exact and complete definition of architectural themes.
- 4 - Objective observation of all the conditioning elements (parameters) related to the architectural theme and identification of their quantitative values.
- 5 - Definition of the relationships between the values of the parameters.
- 6 - Indispensability of different skills and scientific methodologies according to the criteria of operational research to define conditioning elements and their quantities.
- 7 - Affirmation of the Architect's freedom in decision and expression, only if it does not affect the characteristics determined by the analytical investigations.
- 8 - Research of architectural forms towards a maximum, therefore definitive, exactness of relationships in their general "structure".

*Casa delle Armi, Luigi Moretti, Rome, 1937*



# Architect as an Artist who manages a scientific process.

Moretti wishes a method that guarantees the **best solution** to meet the needs of architecture, **rejecting any empirical choice**, choosing the scientific method for the functional solution of form and at the same time declaring the architect's freedom of expression, considering the **Architect as an artist** able to manage the whole architectural process.

This set a difference with Schumacher's parametricism, which states the need for a **differentiation between art and architecture**, as well as **between science and architecture**.

Model of Church of the Concilio Sancta Maria  
Mater Ecclesiae, Luigi Moretti, 1965.





## Traditional Phenomena as inspiration for Parameters.

If traditional facts need to be analysed according to dictates of parametric architecture, the same concept of Parameter as we have seen arises from the **observation and analysis** of the examples of the great masters.

For Moretti the parametric component of historical architecture is clear, as demonstrated by **Carpo**, who recognizes a **Classic and Medieval Parametricism**.

Sant'Ivo alla Sapienza, Borromini, Rome.



# Conclusions.

Moretti managed to grasp a **different relationship between form and structure**, arriving to conclusions which the current architectural culture has come to formulate through experiments and computational methods.

While today we can read a different relationship through parameter and tradition, Moretti **roots parametric architecture in history**, also declaring the need for a **multidisciplinary Architecture**, obtained through a pragmatic, rigorous and scientific approach.

Residential Complex, Luigi Moretti, Rome,  
Luigi Moretti Archive.



# Conclusions.

His **aversion to rationalism**, which throughout his life, usurped the role of Global Style of parametric architecture, lead him to underestimate rationalism power, same error we risk to commit today.

Almost 50 years after his death, it is perhaps possible to recover his theories and researchs on parameters which could find new space in the field of **data**, thanks to **Machine learning methods**, **artificial intelligence** and **robotics**.

Download the full Paper:

[Luigi Moretti, From History to Parametric Architecture](#)



# Giuseppe Gallo

Designer and researcher, MArch-Eng at University of Palermo, Phd In Architecture, Former visiting academic at the University of East London. Most of my Professional experiences are linked to [Mirabilia](#), communication agency founded in 2007 in Palermo, where as creative director I deal with communication design clients of different scale. Together with Mirabilia I have won several awards as Firefox Flicks, International design Award. My works have been published by Taschen, Design-Boom, Archdaily, World Architecture Community, Archilovers, and others. I am the main editor of [Archinerds](#), a curated social media gallery that deals with the relationship between image and architecture.

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Photo Marita Madio