

Jakub Świerzawski

MSC. Eng. Arch. PhD candidate

Faculty of Civil Engineering, Architecture and Environmental Engineering,
Technical University of Lodz

CURVILINEARITY IN ARCHITECTURE. HISTORY. PRESENT DAY. IDEAS. EXAMPLES.

Abstract:

The dissertation deals with curvilinear forms in architecture from the 15th century to the present in the context of the development of science and technology. It consists of two parts:

- Part 1 – History. Ideas. Examples
Developed under the supervision of Prof. Jan Salm, PhD. Eng. It covers the period from the 15th century to the 1980's.
- Part 2 – Present day. Ideas. Examples
Developed under the supervision of Prof. Eng. Arch. Nina Juzwa. This part covers the period from the 1980s to the present.

The parts are separated by the 1980s, the time when computer tools in architecture were popularized.

In the first part selected domes are analyzed on the background of technical and technological development. Representative domes are described, due to their important formal role in both architecture and town planning. They present important formal and structural solutions. The description begins with the fifteenth century, with the development of mathematics and physics, and the development of new design tools. The author's intention is to present those conditions in history that have made the curvilinear form possible. The chapter shows that curvilinearity of form did not appear in architecture with the computer as it might seem.

The second part deals with the curvilinearity in architecture after the popularization of digital design techniques in the 1980s. This is the main part of the dissertation. The description focuses on contemporary examples of representative curvilinear architecture. Issues are discussed in the context of formal, functional and structural aspects of curvilinear forms. They also show how modern science is inspiring architects. Own research consists of analyzing characteristic cases of curvilinearity in selected objects:

- curvilinearity seen in the solutions of the floor plan and cross-section of the object,
- the curvilinearity of the outer cover, which surrounds a rectangular inner structure of the object,
- autonomous curvilinear building element.

The dissertation shows that, both in history and contemporary curvilinearity of the architectural form emphasizes the uniqueness and significance of an object. Moreover, in history the possibilities to create a curvilinear object were restricted by the capabilities of known building techniques. Contemporary technical capabilities are setting human imagination as a new restriction.

