

Vincenzo De Risi  
Plenary Talk

*Drawing Lines through Rivers and Cities.  
The Meaning of Postulates from Euclid to Hilbert*

Abstract:

The talk attempts to sketch a history of the development of the meaning of mathematical principles from Antiquity to the Modern Age. Euclid's own conception of principles (definitions, postulates, common notions) was widely different from ours, and it requires some exercise to understand what did it mean for him to ground geometry on a set of principles. We will explore how Euclid's own views on the foundations of mathematics were interpreted and misinterpreted in Late Antiquity, and how a new conception of principles arose in medieval Scholasticism. Such interpretation of axioms and postulates, that stemmed in the commentaries to Aristotle's *Analytics*, was immensely influent in the early modern age, and was endorsed, with various degrees of variance, by authors such as Clavius, Wallis, Leibniz or Euler. In the 18<sup>th</sup> Century, on the other hand, a new conception of axiom began to rise in the works of Lambert and Bolzano. This last development in the meaning of a mathematical principle paved the way for some of the modern understandings of it, in the works of Frege, Hilbert and others. The talk will also present a survey of the main axioms employed in the modern age to ground elementary geometry, which greatly differed from Euclid's original principles and were later collected in the books of the foundations of geometry by Peano, Pasch and Hilbert.