1035-14-1565 **Antonella Grassi***, Department of Mathematics, University of Pennsylvania, 209 So, 33rd St., Philadelphia, PA 19104. *Birational Geometry: Old and New.*

The origin of algebraic geometry can perhaps be traced to Descartes, who noticed that certain geometric objects could be studied combining techniques from algebra and geometry. The fundamental insight is that equations represent relations among different quantities and their graph form results in either a curve, a surface or an object of higher dimension. When equations are given in polynomial terms, the graphs are called algebraic varieties.

Algebraic varieties are said to be birationally equivalent if they are isomorphic outside the complement of varieties of lower dimension. A classical problem in algebraic geometry is to describe quantities that are invariants under birational equivalence as well as to determine some convenient birational model for each given variety. One such quantity is the ring of objects which transform like a tensor power of a differential of top degree, known as the canonical ring. The solution of this problem has been classically known for the case of curve and surfaces, and more recently for threefolds.

Our talk will discuss some of the ideas involved, recent advances due to Siu and Birkar-Cascini-Hacon-McKernan on the finite generation of the canonical ring in higher dimensions and the ramifications of these results. (Received September 20, 2007)