

Seminari de Geometria Algebraica 2006/2007 (UB-UPC)

Divendres 1 de Desembre a les 15hs a l'aula B5

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The geometry of syzygies

Marc CHARDIN

CNRS & Institut de Mathématiques de Jussieu, Paris

This talk relies on joint work with Laurent Busé and Jean-Pierre Jouanolou. The method was set up by Jouanolou and Busé in the generality that I will present, inspired by earlier work of the geometric modeling community, and of David Cox, Laurent Busé and Carlos D'Andrea.

I will present this method to compute the implicit equation of a hypersurface defined as the image of a rational map. It uses algebraic and geometric properties of the symmetric algebra of the ideal generated by the polynomials giving the map. Important issues are to control the torsion in the symmetric algebra of this ideal, the Castelnuovo-Mumford regularity of powers of the ideal, to understand the geometry of the scheme defined by the symmetric algebra, etc. I will then present the sharp estimates we obtained on some of these issues, and some understanding of the geometry.
