Seminari de Geometria Algebraica 2007/2008 (UB-UPC)
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Growth of degrees of polynomial maps of $\mathbb{C}^2$ and dynamics II

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General abstract

Suppose one is given a dominant polynomial map $F : \mathbb{C}^2 \to \mathbb{C}^2$. Its degree $\deg(F)$ then determines its general behavior F near infinity.
When interested in the dynamics of F, one is naturally lead to study the sequence $\deg(F^n)$ and try to control it when n tends to infinity. The general aim of this mini-course is to describe in details this sequence following my recent work in collaboration with S. Boucksom and M. Jonsson. In particular we shall show that the sequence $\deg(F^n)^{1/n}$ admits a limit (called the asymptotic degree) which is always a quadratic integer; and that $\deg(F^n)$ satisfies a finite linear recurrence relation with integer coefficients. These results are the building blocks for a finer dynamical analysis of the map F.

Talk 2: Valuative methods

We introduce the space V of all normalized valuations at infinity. Following Berkovich's idea to study non-archimedean analytic spaces, we prove V is a real tree. We then start studying the action of a polynomial map on it. We show how this technique can be used to get information on the asymptotic degree.
