HOLOMORPHIC DYNAMICS IN SEVERAL COMPLEX VARIABLES

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Abstract. We will discuss two aspects : dynamics of maps and dynamics of holomorphic foliations. Holomorphic dynamics in several variables has interractions with ergodic theory, dynamical systems, algebraic geometry and number theory. It is indeed a special chapter in dynamics, but the tools from complex analysis and geometry permit to answer questions which are out of reach in real dynamics.

As a sample, we will discuss dynamics of holomorphic endomorphisms of complex projective spaces, polynomial automorphisms of Euclidian spaces and more generally dynamics of meromorphic maps on compact Kahler manifolds. We will consruct in these cases Green currents, compute the entropy of the maps, introduce the measure of maximal entropy and develop some precise ergodic theory (exponential decay of correlation, central limit theorem). We will discuss equidistribution problems. Let f be a meromorphic map of a compact Kahler manifold M. Let S be an analytic set of codimension p in M. The problem is to describe the distribution of (normalized) preimages of S under the iterates of f. Even the case of points is subtle. We will treat this question for holomorphic endomorphisms of $\mathbf{P}^k$ and for polynomial automorphisms of $\mathbf{C}^k$. We will introduce the theory of Super-potentials which provides a useful calculus on positive closed (p, p) currents for arbitrary p. It permits to obtain quantitative results on the speed of equidistribution. The background is described in the notes with T.C Dinh: Dynamics in Several Complex Variables: endomorphisms of projective spaces and polynomial like mappings:ArXiv 08100811.v

Dynamics of foliations: We will introduce foliations by Riemann Surfaces on Projective spaces. The main goal is to prove a unique ergodicity result for generic holomorphic foliations of $\mathbf{P}^2$. This is joint work with J.E Fornaess. The background is described in the recent survey by the authors which appeared in the Journal of Geometric Analysis (April 2008).

Dates: 22 December 08 - 2 January 09, MWF (starting on 22 December)
Time/Venue: 4:00 - 5:00 pm in LH I