

# TOWARDS A RENORMALIZATION THEORY FOR QUASI-PERIODICALLY FORCED ONE DIMENSIONAL MAPS

*PAU RABASSA*

(Johann Bernoulli Institute for Mathematics and  
Computer Science, University of Groningen)

This talk focusses on the study of quasi-periodically forced one dimensional unimodal maps. These are maps on the cylinder where the periodic component is a rigid rotation and the other component is a quasi-periodic perturbation of a map in the interval. For certain one parametric families of maps in the interval, it is well known that their bifurcations exhibit a universal behavior, in the sense that the behavior is the same for a wide class of families. This universal behavior can be explained as a consequence of the dynamics of the renormalization operator. We discuss what happens to this phenomenon when we add a q.p. perturbation to the one dimensional family of maps. Concretely we show numerical evidences of self-similarity and universality. We also propose an extension of the renormalization operator to the q.p. forced case, which gives a suitable explanation to the previous numerical observations.