

Exposé court

33 **Bounds for rational points on algebraic curves and dimension growth**

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I will present new work with Binyamini and Novikov on a question by Salberger, about (optimal) bounds for the number of rational points of bounded height on algebraic curves. In more detail, for height up to B on an integral curve of degree d , the upper bound is $d^2 B^{2/d}$ times a poly log B factor. In this bound, the d^2 factor is new and the bound is optimal (apart from the poly log B factor). This leads to corresponding improvements and simplifications to so-called dimension growth results. The dimension growth conjecture was coined by Browning but initially raised as a question by Heath-Brown and Serre, and almost all degrees are known by now, except most importantly the uniformity in degree 3. In work in progress with Dèbes, Hendel, Nguyen and Vermeulen we present a question on curves that would lead to further simplifications, strengthenings, and generalizations of the dimension growth results, in particular in degree 3. In this approach we generalize the affine situation (unconditionally), using a new effective, higher dimensional variant of Hilbert's irreducibility theorem.