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Torsion and Galois representations of genus 2 Jacobians

Given an abelian variety A defined over a number field K and a positive integer d, it turns out that the set $\{P \in A(\bar{K})_{\mathrm{Tors}} : [K(P) : K] \leq d\}$ of low-degree torsion points is finite. It is natural to want to compute this set, and also to want to compute when an Abelian variety has torsion points of unexpectedly low degree. The answer to the latter question is encoded in the image of the Galois representation(s) associated to A. For elliptic curves over $\mathbb{Q}$, the L-functions and Modular Forms Database (LMFDB) has a wealth of information about both the low degree torsion and the Galois representation. For Jacobians of genus 2 curves over $\mathbb{Q}$, the data is much sparser. In this talk, I will discuss various recent and ongoing projects aimed at remedying this discrepancy.