

TORSION STRUCTURES OF ELLIPTIC CURVES OVER NUMBER FIELDS

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We say that a torsion structure on an elliptic curve over a number field K is either a K -rational torsion subgroup or a $\text{Gal}(\overline{K}/K)$ -invariant cyclic subgroup (which is also the kernel of a cyclic isogeny defined over K) of E . Recent years have seen a great deal of progress in many directions, by work of many people, in understanding torsion structures of elliptic curves over number fields.

I will talk about some of these recent results: which torsion structures are possible over number fields of fixed degree or over certain fixed number fields, about elliptic curves with special“ torsion structures and how they were constructed, which properties can prescribing the torsion structure imbue on an elliptic curve with that torsion structure, and about the number of twists with large torsion that an elliptic curve can have.

Joint work with Peter Bruin (Universiteit Leiden, Netherlands).