

# PRIMITIVE POINTS ON ELLIPTIC CURVES

**Peter Stevenhagen**

Universiteit Leiden, Netherlands

psh@math.leidenuniv.nl

Given a point  $P$  of infinite order on an elliptic curve  $E$  defined over a number field  $K$ , one may ask, after Lang and Trotter, whether the set of primes  $\mathfrak{p}$  of  $K$  for which the reduction of  $P$  generates the point group over the residue class field of  $\mathfrak{p}$  possesses a density. Unlike the density for the set of primes of cyclic reduction of  $E$ , the heuristical density in this case has not been proven to be correct, not even under GRH.

We will focus on the vanishing of the heuristical density. This is a question that can be answered without assuming GRH. It has more subtleties than the density of the set of primes of cyclic reduction of  $E$ .

*Joint work with Francesco Campagna (Leibniz Universitaet Hannover, Germany), Francesco Pappalardi (Roma 3, Italy) and Nathan Jones (University of Illinois at Chicago, USA).*