

Title: Self-points on elliptic curves

Abstract: Let  $E$  be an elliptic curve of conductor  $N$ . Given a cyclic subgroup  $C$  of order  $N$  in  $E$ , we construct a modular point  $P_C$  on  $E$ , called self-point, as the image of  $(E, C)$  on  $X_0(N)$  under the modular parametrisation  $X_0(N) \rightarrow E$ . If  $N = p$  is prime, we prove that the point is of infinite order in the Mordell-Weil group of  $E$  over the field of definition of  $C$ . The study of these points in the  $PGL_2(\mathbb{Z}_p)$ -tower inside  $\mathbb{Q}(E[p^\infty])$  continues earlier work of Harris.