1035-11-1289 **Benjamin Smith*** (ben.smith@rhul.ac.uk). *Isogenies and the Discrete Logarithm Problem in genus three.*

We describe the use of explicit isogenies to reduce Discrete Logarithm Problems (DLPs) on Jacobians of hyperelliptic curves of genus three to Jacobians of non-hyperelliptic curves of genus three, which are vulnerable to faster index calculus attacks. We provide algorithms which compute an isogeny with kernel isomorphic to $(\mathbb{Z}/2\mathbb{Z})^3$ for any hyperelliptic genus three curve. These algorithms provide a rational isogeny for a positive fraction of all hyperelliptic genus three curves defined over a finite field of characteristic $p > 3$, significantly reducing their security in cryptological applications. (Received September 19, 2007)