Nielsen numbers of iterates and Nielsen type periodic numbers of periodic maps on tori

Abstract:
The Nielsen number $N(f)$, and the Nielsen type numbers $NP_m(f)$ and $N\Phi_m(f)$ of a self map $f : X \to X$, are homotopy invariant lower bounds for respectively the number of fixed points of $f$, the number of periodic points of $f$ period exactly $m$, and the number of periodic points of $f$ of all periods dividing $m$. Tori are very well behaved in this regard. For example for tori these lower bounds are sharp in that the respective minimum numbers can be realized by a canonical representative of the homotopy class of $f$. In fact for a fixed $m$ there are simple well known formulas for each of the numbers $N(f)$, $NP_m(f)$ and $N\Phi_m(f)$. A map is $f$ is said to be periodic if the $n$th iterate $f^n$ is equal to the identity. This talk explores the fascinating patterns that emerge when one seeks to determine the numbers $N(f^m)$, $NP_m(f)$ and $N\Phi_m(f)$ for all $m$, for periodic maps on tori.