Skew morphisms of finite groups with applications

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A skew morphism of a finite group $G$ is a bijection $\varphi : G \to G$ fixing the identity element of $G$ and having the property that $\varphi(xy) = \varphi(x)\varphi^{\pi(x)}(y)$ for all $x, y \in G$, where $\pi(x)$ depends only on $x$. Skew morphisms generalise group automorphisms and were introduced in the context of topological graph theory by Jajcay and Širáň (2002). In this talk, I review some recent results on skew morphisms and also mention some applications. These applications include a connection with the complementary product of a group with a cyclic group, the classification of regular Cayley maps for dihedral groups, and a connection with block transpositions (well-known sorting operations with relevant applications in Bioinformatics).