On modular skew lattices and their coset structure

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Modular lattices are of great importance in many branches of mathematics, from Algebra to Topology. There are many well-known examples of lattices that are modular but not distributive: the lattice of subspaces of a vector space, the modules over a ring, the normal subgroups of a group, and many others. Modularity is a lattice property of somewhat topological flavour where, in the finite case, maximal chains have the same size, and decomposition theorems as the Krull-Schmidt-Remak for modules over a ring are derived from the modularity properties of its subspace lattice. In this talk, we will discuss several approaches to the generalisation of modularity to the non-commutative context of skew lattices, relate it to the known properties of skew distributivity and skew cancellation, and derive topological-like properties from that generalised concept. We will also discuss aspects of the coset structure of skew lattices of this nature, and derive some of their combinatorial properties.