COSET LAWS FOR SKEW LATTICES

(Talk)

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(joint work with Karin Cvetko-Vah)

During the last three decades skew lattices proved to be the most successful noncommutative generalization of lattices. A *skew lattice* **S** is a set S equipped with two associative binary operations $\vee$ and $\wedge$ that satisfy the absorption laws $(b \wedge a) \vee a = a = a \vee (a \wedge b)$ and their duals. Moreover, $(S; \wedge)$ and $(S; \vee)$ are regular semigroups of idempotents. The Green's relation D is a congruence in any skew lattice S decomposing it into maximal rectangular algebras such that S/D is a lattice. Boolean versions of skew lattices have been systematically studied and permit an analogue to the Stone duality.

The study of the coset structure decomposition of a skew lattice has no similar approach in lattice theory or semigroup theory. It has revealed its importance, specially in the context of several recent discussions on the generalization of distributivity and cancellation that are independent properties in such noncommutative algebras. In this talk we review the main results regarding the varieties of skew lattices relevant to this research, and present characterizations based on identities involving cosets, to which we call *coset laws*, that provide a further insight to this study. Several interesting combinatorial results are also consequence of this characterization and shall be discussed.

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