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Poset Topology and Left Regular Bands

Over the past 15 years, it has been noticed that several combinatorial objects admit a particularly nice monoid structure. These monoids are known as left regular bands. The representation theory of left regular bands has found applications to probability (for example, spectra of random walks on hyperplane arrangements) as well as algebraic combinatorics (for example, the descent algebras of finite Coxeter groups).

This talk will begin by surveying several examples of these monoids and then explore representation-theoretic aspects of their monoid algebras. This involves mixing combinatorial and algebraic tools: poset topology; Leray numbers; and cohomology and classifying spaces of small categories.

This is joint work with Stuart Margolis and Benjamin Steinberg.