The Hidden Structure of Finite Union-Closed Set Systems

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A set system is union-closed (U-C) if $X, Y \in S$ implies $X \cup Y = Z \in S$. These are incredibly simple commutative groupoids with identity, \emptyset . No inverses, nothing more. Yet, they have a definite internal structure separating them into two distinct classes (which is the key to proving Frankl's Conjecture) and including a semi-lattice of "forbidden" sets which cannot be members of the system.

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