Upper bound graphs of posets

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McMorris and Zaslavsky introduced an intersection graph of a partially ordered set(poset) by using an undirected graph. For a poset $P = (X, \leq)$, the *upper bound graph* (UB-*graph*) is the graph $\mathrm{UB}(P) = (X, E_{\mathrm{UB}(P)})$, where $uv \in E_{\mathrm{UB}(P)}$ if and only if $u \neq v$ and there exists $x \in X$ such that $u, v \leq x$. We say that a graph G is a UB-*graph* if there exists a poset whose upper bound graph is isomorphic to G. They proved that for any graph G, there exists an upper bound graph H containing G as a subgraph. In this talk, we will discuss a 2-*upper bound graph* as an analogy of the upper bound graph. For a poset $P = (X, \leq)$, the 2-upper bound graph $\mathrm{UB}_2(P)$ is the graph on X such that vertices u and v of $\mathrm{UB}_2(P)$ are adjacent if and only if $u \neq v$ and there exist two distinct elements $x, y \in X$ with $u, v \leq x$ and $u, v \leq y$. In particular, we will talk about a property of a 2-upper bound graph.

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