1084-05-33 **Lucas Kramer** and **Ryan R. Martin*** (`rymartin@iastate.edu`), 396 Carver Hall, Department of Mathematics, Iowa State University, Ames, IA 50011, and **Michael Young**. *Diamond-free families in the Boolean lattice.*

For a family of subsets of $\{1,\ldots,n\}$, ordered by inclusion, and a partially-ordered set P, we say that the family is P-free if it does not contain a subposet isomorphic to P. We want to compute $\mathrm{ex}(n,P)$, the largest size of a P-free family of subsets of $\{1,\ldots,n\}$. It is conjectured that, for any fixed P, this quantity is $(k+o(1))\binom{n}{\lfloor n/2\rfloor}$ for some fixed integer k, depending only on P. The conjecture has been verified by Bukh in the case where P has a "tree shape". There are some other small posets P for which the conjecture has been verified. The smallest poset for which it is unknown is Q_2, the Boolean lattice on two elements. We will discuss improved bounds on the size of a Q_2-free family, utilizing Razborov's flag algebra method. (Received August 09, 2012)