1068-05-227 **Jerrold R. Griggs**, **Wei-Tian Li*** (li37@mailbox.sc.edu) and **Linyuan Lu**. *The Largest Poset-Free Families and the Maximum Lubell Function Value.*

The Lubell function $\bar{h}(\mathcal{F})$ of a family $\mathcal{F}$ of subsets of $[n] = \{1, \ldots, n\}$ is defined to be the average number of times that a random full chain meets $\mathcal{F}$. This value provides an upper bound on the size of the family $\mathcal{F}$. Given a finite poset P, a family is P-free if it does not contain P as a subposet. By evaluating the value of $\max \bar{h}(\mathcal{F})$ of P-free families, Griggs, Li, and Lu obtain the exact sizes of largest P-free families for several diamond-shaped posets P. For these diamond-shaped posets P_is, we define the strong ordinal sum $P = P_1 \oplus_s \cdots \oplus_s P_k$: for $x, y \in P$, $x \leq y$ if either (1) $x, y \in P_i$ for some i and $x \leq y$ in P_i or (2) $x \in P_i$ and $y \in P_j$ for $i \leq j$. In addition, the maximum element of P_i is identified to the minimal element of P_{i+1}. In the talk, we will determine the size of the largest families that do not contain the new poset $P_1 \oplus_s \cdots \oplus_s P_k$ using the Lubell function method. (Received January 20, 2011)