1086-15-139 **Eric M Evert*** (everte@vt.edu), **Kileen A Berry** (kylie.berry@vikings.berry.edu) and **Son T Nghiem** (nghiems@berea.edu). *Factor Posets and Dual Frames.* Preliminary report.

A frame in $\mathbb{R}^n$ is a redundant spanning set. Equivalently, a frame is a sequence of vectors $\{f_i\}_{i=1}^k$ for which there exist constants $0 < A \leq B < \infty$ such that, for every x in $\mathbb{R}^n$, $A\|x\|^2 \leq \sum_{i=1}^k |\langle x, f_i\rangle|^2 \leq B\|x\|^2$. A frame is tight if $A = B$. We will present results about the combinatorial structure of tight frames using factor posets. A factor poset of a frame is defined to be a collection of subsets of I, the index set of our vectors, ordered by inclusion so that nonempty $J \subseteq I$ is in the factor poset if and only if $\{f_i\}_{i\in J}$ is a tight frame in $\mathbb{R}^n$. We will then discuss some results on dual frames. A set of vectors $\{g_i\}_{i=1}^k$ is said to be a dual frame if for a frame $\{f_i\}_{i=1}^k$ we have that $x = \sum_{i=1}^k \langle x, g_i\rangle f_i, \quad \forall\ x \in \mathbb{R}^n$. We will relate the two topics by discussing the connections between the factor posets of frames and their duals. Additionally we will discuss duals with regard to ℓ^p minimization. Finally, we extend the notion of diagram vectors for frames in infinite dimensions. The diagram vectors of a frame are used to determine if any given subframe of the frame is tight. (Received July 27, 2012)