Meeting: 1002, Pittsburgh, Pennsylvania, SS 2A, Special Session on Convexity and Combinatorics

1002-52-21 **Margaret M. Bayer*** (bayer@math.ku.edu), Department of Mathematics, University of Kansas, 405 Snow Hall, 1460 Jayhawk Blvd., Lawrence, KS 66045-7523. *Reconstruction of polytopes as Eulerian posets.* Preliminary report.

Results on combinatorial reconstruction for polytopes are of the following form: If P and Q are convex d-polytopes, P is in a specified class (e.g., simplicial polytopes, simple polytopes, zonotopes), and the k-skeletons of P and Q are combinatorially equivalent, then P and Q are combinatorially equivalent. (The k-skeleton is the subcomplex of the boundary complex consisting of all faces of dimension at most k.) In this talk we consider what happens if we relax the hypothesis on Q, requiring only that Q be an Eulerian partially ordered set. We show that if P is a simplicial d-polytope, then the face lattice of P is the unique Eulerian poset agreeing with P on all but the dimension r faces of P, for $0 \leq r \leq d-2$, and give a counterexample for $r = d-1$. (Received June 29, 2004)