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**Patricia Hersh\*** (plhersh@ncsu.edu) and **Karola Meszaros**. *Posets from polytopes*. Preliminary report.

Given a polytope  $P$  and a generic cost vector  $\mathbf{c}$ , one obtains a directed graph  $G(P, \mathbf{c})$  on the 1-skeleton of  $P$  by orienting edge  $e_{u,v}$  from  $u$  to  $v$  if and only if  $c(u) < c(v)$ . Since  $G(P, \mathbf{c})$  is acyclic, it gives rise to a partially ordered set. We give conditions on such  $G(P, \mathbf{c})$  which guarantee that every open interval of the associated poset has order complex homotopy equivalent to a ball or a sphere, as well as examples meeting these conditions. In addition to briefly discussing this, we may also mention some possible connections to the diameter of the 1-skeleton of  $P$ . (Received September 24, 2017)