1048-05-187 **Benjamin J Braun*** (braun@ms.uky.edu), Dept of Mathematics, University of Kentucky, Lexington, KY 40506, and **Richard Ehrenborg** (jrge@ms.uky.edu), Dept of Mathematics, University of Kentucky, Lexington, KY 40506. *The Complex of Non-Crossing Diagonals of a Polygon.*

Given a convex polygon P with n vertices, it is well known that there is an associated simplicial complex T(P) with vertices given by diagonals in P and facets given by triangulations of P. A theorem of C. Lee states that T(P) can be realized as the boundary complex of a polytope called the associahedron. We will investigate the topology of T(P) for non-convex polygons using tools from discrete Morse theory. This work is joint with Richard Ehrenborg. (Received February 06, 2009)