1086-VJ-2047 **Michael Landry*** (michaellandry@berkeley.edu) and **MurphyKate Montee** (mmontee@nd.edu). *Knot projections with a single multi-crossing.*

Introduced recently, an n-crossing is a singular point in a projection of a link at which n strands cross such that each strand travels straight through the crossing. We introduce the notion of an übercrossing projection, a knot projection with a single n-crossing. Such a projection is necessarily composed of a collection of loops emanating from the crossing. We prove the surprising fact that all knots have a special type of übercrossing projection, which we call a petal projection, in which no loops contain any others. The rigidity of this form allows all the information about the knot to be concentrated in a permutation corresponding to the levels at which the strands lie within the crossing. These ideas give rise to two new invariants for a knot K: the übercrossing number $\ddot{u}(K)$, and petal number $p(K)$. These are the least number of loops in any übercrossing or petal projection of K, respectively. We relate $\ddot{u}(K)$ and $p(K)$ to other knot invariants, and compute $p(K)$ for several classes of knots, including all knots of 9 or fewer crossings. (Received September 24, 2012)