1037-14-21 **Samar M El Hitti*** (samar@math.missouri.edu), Department of Mathematics, University of Missouri, Columbia, Columbia, MO 65211, and **Steven Dale Cutkosky**. *Resolution of formal ideals along a valuation.*

Let X be a possibly singular complete algebraic variety, defined over a field k of characteristic zero. X is nonsingular at p in X if $O_{X,p}$ is a regular local ring. The problem of resolution of singularities is to show that there exists a nonsingular complete variety X, which birationally dominates X. Resolution of singularities (in characteristic zero) was proven by Hironaka in 1964. Let v be a valuation of the function field of X, v dominates a unique point p, on any complete variety Y, which birationally dominates X. The problem of local uniformization is to show that, given a valuation v of the function field of X, there exists a complete variety Y, which birationally dominates X such that the center of v on Y, is a regular local ring. Zariski proved local uniformization (in characteristic zero) in 1944. His proof gives a very detailed analysis of rank 1 valuations, and produces a resolution which reflects invariants of the valuation.

We extend these methods to higher rank in our thesis to give a proof of local uniformization which reflects important properties of the valuation. We simultaneously resolve the centers of all the composite valuations, and resolve certain formal ideals associated to the valuation. (Received December 10, 2007)