## Results and open problems passing from a local ring to its associated graded ring

MARIA EVELINA ROSSI, Università degli Studi di Genova

Let (A, m) be a complete local ring and  $G = \operatorname{gr}_m(A)$  its associated graded ring. The problem of the descent of a property from G to A was extensively studied and the answers are predominantly positive. The problems arise passing from A to G, because we may lose many good geometric and algebraic properties. We present an overview up to a recent work with A. De Stefani and M. Varbaro. We introduce a homogenization technique which allows to relate G to the special fiber and A to the generic fiber of a "Groebner-like" deformation. Using this technique we prove sharp results concerning the connectedness of A and G.