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Powers of Ideals and Images of Rational Maps

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In this lecture, I will present results about powers of graded ideals. With an emphasis on the connection with Rees and Symmetric algebras and with the study of images of rational maps. The link between these questions will be explained from a geometric perspective and some mediator from algebra will be introduced, like the Koszul homology of ideals, or the Castelnuovo-Mumford regularity of a graded module, that also has interest toward other questions. Time permitting, we will present variations on Castelnuovo-Mumford regularity that has been useful for studying rational maps and toric Hilbert schemes.