Modules with Pure Resolutions.

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Abstract: In 2008, Boij-Soderberg made some conjectures about the graded Betti numbers of modules over a polynomial ring over a field. This was proved by Eisenbud-Schreyer in 2009. This has given rise to a new perspective, when it comes to tackling problems relating to certain numerical invariants of graded modules. In this talk, we look at pure modules over a standard graded ring R, and see results that generalize to this setting. The main tool is a set of linear relation among the Betti numbers, called the Herzog-Kuhl equations. As an application, we will see that the property of R being Cohen-Macaulay is characterized by the existence of certain pure modules. This is joint work with Rajiv Kumar.

Pre-requisites :
Basic commutative algebra, familiarity with advanced concepts will be helpful.