



ALGEBRA SEMINAR

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4:00 pm - 5:00 pm

315 Armstrong Hall

Thick subcategories of modules and characterizations of local rings

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Let (R, \mathfrak{m}, k) be a commutative Noetherian local ring. We say that a non-empty full subcategory of $\mathbf{mod}R$ (the category of all finitely generated R -modules) is a *thick subcategory* if it is closed under taking direct summands, and if it satisfies 2-out-of-3 property with respect to short exact sequences. For example, the full subcategory **FPD** of $\mathbf{mod}R$ consisting of modules that have finite projective dimension is a thick subcategory of $\mathbf{mod}R$.

It is a classical result that R is regular if and only if **FPD** contains the residue field of R . This result has been generalized to various kinds of classes of local rings. Motivated by this, we will recall the necessary definitions and discuss when a given thick subcategory of $\mathbf{mod}R$ contains the residue field of R . The talk is based on a joint work with Hayato Murata.