

Department of Mathematics, BGU

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# AGNT

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**On** *Wednesday, January, 9 2019*

**At** *15:10 – 16:25*

**In** *101-*

Saurabh Singh (BGU)

will talk about

**Reconstruction of formal schemes using their  
derived categories**

Abstract:

**TITLE: RECONSTRUCTION OF FORMAL SCHEMES USING  
THEIR DERIVED CATEGORIES**

SPEAKER: SAURABH SINGH

We give a faithful embedding of the category of *separated (or of finite Krull dimension) noetherian formal schemes* into the category of *tensor triangulated categories with unit*. This can be viewed as a generalization of the work of Paul Balmer over ordinary schemes where he uses the category of perfect complexes to give an embedding. Over noetherian formal schemes, it is more convenient to use the derived category  $\mathbf{D}_{\text{qct}}(-)$  of modules whose homologies are quasi-coherent and torsion. In this context, we use the classification of localizing subcategories of  $\mathbf{D}_{\text{qct}}(\mathfrak{X})$  for a noetherian formal scheme  $\mathfrak{X}$ , as given by Leovigildo Alonso Tarrío, Ana Jeremias Lopez and Maria Jose Souto Salorio to define the topological space  $\text{Spc}(\mathbf{D}_{\text{qct}}(\mathfrak{X}))$  called the spectrum of  $\mathbf{D}_{\text{qct}}(\mathfrak{X})$ . We show that there is a natural ringed structure and an *adic* structure on  $\text{Spc}(\mathbf{D}_{\text{qct}}(\mathfrak{X}))$  which makes it into a formal scheme and  $\text{Spc}(\mathbf{D}_{\text{qct}}(\mathfrak{X})) \simeq \mathfrak{X}$ .

This is a joint work with my PhD supervisor Prof. Suresh Nayak.