

## **t-STRUCTURES IN THE BOUNDED DERIVED CATEGORY OF A COMMUTATIVE NOETHERIAN RING**

The concept of t-structure in a triangulated category is the analogue in the 'triangulated world' of what a (hereditary) torsion pair is in the 'abelian world'. The problem of classifying the t-structures in the bounded derived category of coherent sheaves on an affine space  $\mathbf{X} = \text{Spec}(R)$  is open. We shall approach the Noetherian case, by showing that if  $R$  is a commutative Noetherian ring then we can assign to every t-structure in  $D_{fg}^b(R)$  a uniquely determined decreasing filtration  $\phi : \mathbf{Z} \rightarrow \mathcal{P}(\text{Spec}(R))$  satisfying the following two conditions:

1.  $\phi(i)$  is stable under specialization, for every  $i \in \mathbf{Z}$
2.  $\phi$  satisfies the weak Cousin condition: if  $\mathfrak{p} \subset \mathfrak{q}$  is an inclusion of prime ideals, with  $\mathfrak{p}$  maximal under  $\mathfrak{q}$  and  $\mathfrak{q} \in \phi(j)$ , then  $\mathfrak{p} \in \phi(j-1)$

We will finally show that if  $R$  has a dualizing complex, then the above assignment is exhaustive and, hence, establishes a bijection between t-structures in  $D_{fg}^b(R)$  (equivalently in  $D^b(\text{coh}\mathbf{X})$  for  $\mathbf{X} = \text{Spec}(R)$ ) and filtrations  $\phi : \mathbf{Z} \rightarrow \mathcal{P}(\text{Spec}(R))$  satisfying properties 1 and 2.