

Announcement of a lecture:  
**Categories of Sheaves**

Tuesday, 10:15h-11:45h in V4-116  
 Lecturer: Julia Sauter

The aim of this lecture is to make an audience more familiar with two very interesting examples of triangulated categories coming from algebraic geometry:

- (*Coh*) (bounded) derived categories of coherent sheaves on an algebraic variety and
- (*Con*) (bounded) derived categories of constructible sheaves (with respect to a fixed stratification) on a complex algebraic variety together with its perverse t-structure.

In these examples we want to study

**dg enhancements, support theory, Auslander-Reiten theory, tilting theory, recollements**

We might also look at comparism theorems: the Riemann-Hilbert correspondence or the Coherent-Constructible correspondence for certain toric varieties.

Our examples are (certain) toric varieties, hypersurface singularities or homogeneous spaces. Two classical examples are

- (*Coh*) The Beilinson tilting situation

$$D^b(\text{Coh}(\mathbb{P}^n)) \cong D^b(\text{mod } \Lambda(n))$$

$$\Lambda(n) = 1 \begin{array}{c} \xrightarrow{x_0} \\ \xrightarrow{x_1} \\ \vdots \\ \xrightarrow{x_n} \end{array} 2 \begin{array}{c} \xrightarrow{x_0} \\ \xrightarrow{x_1} \\ \vdots \\ \xrightarrow{x_n} \end{array} 3 \quad \cdots \quad n \begin{array}{c} \xrightarrow{x_0} \\ \xrightarrow{x_1} \\ \vdots \\ \xrightarrow{x_n} \end{array} n+1, \quad x_i x_j = x_j x_i$$

- (*Con*) The constructible sheaves on  $\mathbb{P}_{\mathbb{C}}^1$

$$D^b(\text{Con}_S(\mathbb{P}_{\mathbb{C}}^1)) \cong D^b(\bullet \begin{array}{c} \xrightarrow{u} \\ \xleftarrow{v} \end{array} \bullet, 1 + uv \text{ invertible})$$

where  $S = (\mathbb{P}_{\mathbb{C}}^1 \setminus \{\infty\}, \{\infty\})$  is the stratification given by a point and its complement.

**Homepage (under construction):**

<http://www.math.uni-bielefeld.de/~jsauter/CategoriesOfSheaves.html>