

Title: Session 2 - Youssef Mousaaid

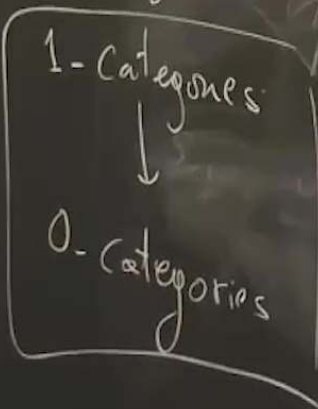
Speakers: Youssef Mousaaid

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2- Categories



Set

category

functions

functors

equations

isomorphisms

decat

K_0

Grothendieck

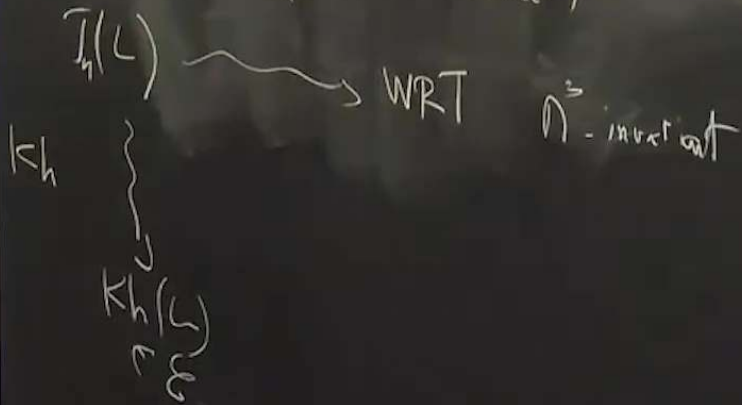
tr

trace functor

$$g \longrightarrow \mathcal{U}_q(\mathfrak{g}) \longrightarrow \hat{\mathcal{U}}_q(\mathfrak{g})$$

KLR defined 2-cat \mathcal{E}_g s.t. $K_0(\mathcal{E}_g) = \hat{\mathcal{U}}_q(\mathfrak{g})$

Notations (Crane-Frenkel)

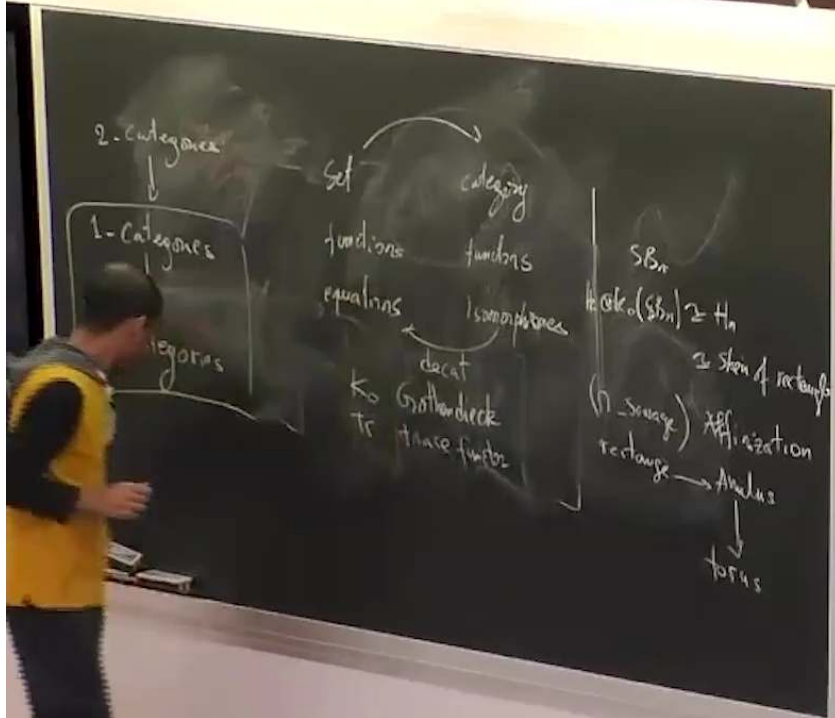


$$L \simeq L' \implies \text{Kh}(L) \simeq \text{Kh}(L')$$

$$L \longrightarrow \text{Kh}(L) \longrightarrow [\text{Kh}(L)] \in K_0(\mathcal{E})$$

$$\begin{array}{ccc} \parallel & & \parallel \\ \mathbb{Z} & & \mathbb{Z} \\ \mathbb{Z} & & [\mathfrak{q}, \mathfrak{q}^{-1}] \end{array}$$

Categorify
 Skein model of the
 torus



$g \rightarrow \mathcal{U}_g(\mathcal{E}) \rightarrow \mathcal{U}_g(\mathcal{E})$

KLR defined 2-cat \mathcal{E}_g s.t. $K_0(\mathcal{E}_g) = \mathcal{U}_g(\mathcal{E})$

Notations (Plane-Frenkel)

$\mathcal{I}(L) \xrightarrow{\text{WRT}} \mathbb{N}$ invert

Kh

$\mathcal{K}_h(L)$

$\rightarrow \mathcal{M}$

$L \simeq L' \rightarrow Kh(L) \simeq Kh(L')$

$L \rightarrow Kh(L) \rightarrow [Kh(L)] \in K_0(\mathcal{E}_g)$

\parallel

$\mathbb{Z}[q, q^{-1}]$

Categorify

Skein model of the

torus