

The existence of internal Homs in the localization of the category of dg categories (with respect to all quasi-equivalences) was proven by Toën in 2007.

In 2015 Canonaco and Stellari gave a simple proof via extensions of dg-functors.

In this talk we proved that, over a commutative ring, the localizations of the categories of dg categories and of A^∞ categories, with respect to the corresponding classes of quasi-equivalences, are equivalent. As a result we give a very explicit description of internal Homs in terms of A^∞ -functors between two dg-categories. This is a joint work with Alberto Canonaco and Paolo Stellari.