

Thomas Zink

Grothendieck-Messing deformation theory for Hyper-Kähler manifolds

This is joint work with Andreas Langer. Let  $R$  be an artinian local ring with perfect residue class field  $k$ . We define Hyper-Kähler manifolds  $X$  and their Beauville-Bogomolov form over  $R$ . We give a lifting criterion in the spirit of Grothendieck and Messing. Over the small Witt ring  $\hat{W}(R)$  we associate a 2-display to  $X$ . If  $X$  is ordinary and  $S \rightarrow R$  is a surjection of artinian local rings we show that lifting  $X$  to  $S$  is the same as lifting the 2-display of  $X$ .