

# Cobordisms with chronology and a functorial description of odd link homology

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I will enrich cobordisms with special projections on the closed interval  $I = [0; 1]$  to break the symmetry of oriented cobordisms. This creates a new category, which in case of dimension two has a nice presentation by generators and relations. This category can be used to give a functorial description of the construction of odd link homology as well as to define a new type of TQFT's.

I will build the Khovanov complex  $Kh(T)$  for a given tangle diagram in the category of cobordisms with chronology. It is invariant under Reidemeister moves up to chain homotopies, relations analogous to Bar-Natan's S/T/4Tu and a condition given by a chronology change. Then any chronological TQFT satisfying these additional conditions defines a complex in the category of modules and we can compute its homology. This procedure generalises both Khovanov and odd link homology theories.

1:00 p.m.  
Math 520  
Columbia University