# Contravariant Homotopy Theories and Quillen's Theorem A

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In this talk I will show how to construct a model structure on a locally presentable category with a suitable cylinder object such that the model structure behaves in a "covariant" or "contraviariant" way with respect to the cylinder. Examples of such model structures include the covariant and contravariant model structures on simplicial sets and the cocartesian and cartesian model structures on marked simplicial sets modelling presheaves with values in $\infty$-groupoids and $\infty$-categories respectively.

The model structures come with an abstract notion of cofinal functor which recovers the usual definition of cofinal functor for $\infty$-categories when applied to the covariant and contravariant model structures on simplicial sets. When applied o presheaves valued in $n$-types, one obtains a version of Quillen's Theorem A for $n$-categories.