

# On the Isbell conjugation adjunction for monad-quantale-enriched categories.

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*Abstract.* In this talk we give an analysis of the notions of completeness and cocompleteness for monad-quantale-enriched categories. Under some conditions, we characterise representable categories (in the sense of Nachbin for topological spaces respectively Hermida for multicategories) as the cocomplete ones with respect to a certain class of presheafs. We also show that the totally cocomplete categories are precisely the relational algebras with an action of the quantale (this is joint work with Gonçalo Gutierres). Curiously, the dual concept of completeness does not generalise easily to the monad-quantale setting. In this talk we will explain some of the difficulties and how to overcome them. In particular, we construct the “copresheaf functor” which in our setting is not defined for all categories but only for the tensor-exponentiable ones, show that it is the part of a monad defined on representable categories, and discuss the Isbell conjugation adjunction between the category of presheafs and the opposite (in an appropriate sense) of the category of copresheafs.