

## Title and Abstract

Title: On regularity, Barr-exactness and pretoposes for categories enriched in metric spaces.

Abstract: In recent years there has been a growing interest in various categories which can be viewed as enriched in the symmetric monoidal category  $\text{Met}$  of metric spaces and non-expansive functions. One class of examples is furnished by *quantitative algebras*, introduced by Mardare, Panangaden & Plotkin [MPP16, MPP17], while another consists of categories of *metric compact Hausdorff* spaces, introduced by Hofmann & Reis [HDR18]. A recent result of Adámek [Adá24] provides a characterization of quantitative varieties in the spirit of Lawvere's corresponding result for ordinary varieties, where the various ingredients are interpreted in an appropriate  $\text{Met}$ -enriched sense. In this talk, we will consider notions of  $\text{Met}$ -enriched regularity and Barr-exactness which are implicit in the work of Adámek, propose a corresponding notion of pretopos and discuss some work in progress and open questions concerning these notions.

## References

- [Adá24] Jiri Adámek. Varieties of quantitative algebras as categories. *arXiv preprint arXiv:2402.14662*, 2024.
- [HDR18] Dirk Hofmann and Carla D. Reis. Convergence and quantale-enriched categories. *Categories and General Algebraic Structures with Applications*, 9(1):77–138, 2018.
- [MPP16] Radu Mardare, Prakash Panangaden, and Gordon Plotkin. Quantitative algebraic reasoning. In *Proceedings of the 31st Annual ACM/IEEE Symposium on Logic in Computer Science*, pages 700–709, 2016.
- [MPP17] Radu Mardare, Prakash Panangaden, and Gordon Plotkin. On the axiomatizability of quantitative algebras. In *2017 32nd Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)*, pages 1–12. IEEE, 2017.