

# Research statement

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I am in the first year of my PhD in descriptive set theory, under the supervision of Julien Melleray and Itai Ben Yaacov.

Recently, Ben Yaacov and Usvyatsov [BYU10] introduced an analogue of model theory for metric structures (see [BYBHU08]), the idea of which is to replace a point by the function “distance to this point” and the classical truth values true and false by a continuum of truth values. This theory has proven very useful to study Polish groups, via the crucial observation that every Polish group arises as the automorphism group of a separable homogeneous metric structure. These ideas have been fruitfully used by Ben Yaacov, Berenstein and Melleray [BYBM10] in the context of topometric groups (i.e. groups equipped with both a Polish topology and a finer bi-invariant metric) : intertwining topology and metric, they give a notion of ample metric generics and obtain (among others) results of automatic continuity for  $\text{Aut}(X, \mu)$  (that is, any group homomorphism from it to a second countable group is continuous). Similarly, Tsankov showed in [Tsa11] the same property for the unitary group of a separable Hilbert space.

The aim of my work is to explore the links between continuous logic and descriptive set theory further, especially for the study of automorphism groups of other large (but still Polish) homogeneous structures such as the Urysohn space or other metric Fraïssé limits.

## References

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