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Title: A quantization of coarse structures and uniform Roe algebras

Abstract: A coarse structure is a way of talking about "large-scale" properties. It is encoded in a family of relations that often, but not always, come from a metric. A coarse structure naturally gives rise to Hilbert space operators that in turn generate a so-called uniform Roe algebra.

In ongoing work with Bruno Braga and Joe Eisner, we use ideas of Weaver to construct "quantum" coarse structures and uniform Roe algebras in which the underlying set is replaced with an arbitrary represented von Neumann algebra. The general theory immediately applies to quantum metrics (suitably defined), but it is much richer. We explain another source of examples based on measure instead of metric, leading to a large and easy-to-understand class of new C^* -algebras.

I will present the big picture: where uniform Roe algebras come from, how Weaver's framework facilitates our definitions. I will focus on a few illustrative examples and will not assume any familiarity with coarse structures or von Neumann algebras.