

ID: MSCA-2020-KDCommer01

Title: Analytic theory of tensor C*-categories

Abstract: Tensor C*-categories are categories with a monoidal structure and a compatible operator algebra structure on their endomorphism spaces. One instance of a tensor C*-category is obtained by considering the category of finite dimensional representations of a compact group. Another instance is obtained by considering finite dimensional Hilbert spaces graded over a discrete group. Both these particular cases are subsumed by the example of representation categories of compact quantum groups, and these provide a large but non-exhaustive class of tensor C*-categories with duals.

In recent years, there has been an increasing interest in tensor C*-categories. One line of research, closely following similar developments in the purely algebraic setting of fusion categories, is geared towards classification results for finite tensor C*-categories up to an appropriate form of Morita equivalence. Such tensor C*-categories and their associated module C*-categories are modeled on subfactors of finite index and finite depth. Another line of research considers non-finite tensor C*-categories, and aims to understand better the analytic theory of tensor C*-categories. This approach is heavily inspired by (geometric) group theory, and has provided an important framework in which to consider for example the finer analytic structure of finite index subfactors (of infinite depth). There are however many opportunities and unexplored research questions related to the further analytic structure of tensor C*-categories, for example with regards to developing an associated equivariant KK-theory. This is particularly challenging in light of the rich inherent structure of tensor C*-categories, which calls for a categorification of many of the classical tools of operator algebra analysis.

Supervisor: Kenny.De.Commer@vub.be

Research Group: <https://we.vub.ac.be/en/tact-topological-algebra-functional-analysis-and-category-theory>

To apply: <https://www.vub.ac.be/en/european-liaison-office#apply-msca-if>