UNITARITY AND CATEGORICAL SYMMETRIES

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The physical principle of unitarity plays a central role in the study of group-like symmetries in QFTs, imposing non-trivial constraints on how these can be represented. However, this foundational principle appears, at first glance, incompatible with non-invertible symmetries, which do not require the existence of an inverse. Understanding how these two notions are reconciled is thus crucial to ensure our study and classification of non-invertible symmetries is correct.
In this talk, I will review this issue and present ongoing work on how it can be resolved, together with some direct applications and consequences that follow from it. At its core will be the idea that symmetry defects are represented by TQFTs with additional structures that capture the ability to act on operators of the QFT on which they are embedded.