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Relative Cuntz-Pimsner algebras: a systematic classification and its applications

In this talk, we investigate relative Cuntz-Pimsner algebras, for which we provide a systematic classification of their lattice of gauge-equivariant representations in terms of (kernel-covariance) pairs, and so equivalently also of their lattice of gauge-invariant ideals. With this classification (as a combinatorial tool at the level of correspondences) we then uncover a construction by Katsura as a canonical dilation, which arises as a tractable combinatorial object further below the maximal dilation. As a second application we then present a classification of pullback diagrams, and demonstrate their failures in the context of absolute Cuntz-Pimsner algebras. We then further explore Morita equivalence among relative Cuntz-Pimsner algebras, and its connections to the absence of corresponding short exact sequences. Finally, we briefly touch upon Morita equivalence arising from higher tensor powers, and conclude our talk with ongoing work about those not arising from any finite tensor powers whatsoever.