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Cuntz-Pimsner algebras arising from C-correspondences over commutative C*-algebras*

The Cuntz-Pimsner algebra construction produces a C*-algebra from the data contained in a C*-correspondence. Many other constructions — for example, crossed products $C(X) \rtimes_\alpha \mathbb{Z}$ — can be viewed through a Cuntz-Pimsner lens. As such, results and approaches from crossed products can inform investigations of some Cuntz-Pimsner algebras. In this talk, we will concentrate on C*-algebras arising from C*-correspondences over commutative algebras $C(X)$.

Specifically, consider X an infinite compact metric space, $\mathcal{V}$ a locally trivial vector bundle over X and $\alpha : X \to X$ a homeomorphism (often assumed minimal). We can construct a C*-correspondence $\mathcal{E}$ over $C(X)$ from the module of sections of $\mathcal{V}$, where we use the homeomorphism α to twist the left multiplication. As we shall see, many tractable and interesting C*-correspondences over $C(X)$ do in fact arise in this manner.

In this talk, I will discuss some of the structural properties and classification of the resulting Cuntz-Pimsner algebra $\mathcal{O}(\mathcal{E})$. Under the additional assumption that $\mathcal{V}$ is a line bundle the Cuntz-Pimsner algebra is a generalized crossed product, suggesting additional means of investigation. For Cuntz-Pimsner algebras arising from line bundles we can construct orbit-breaking subalgebras of $\mathcal{O}(\mathcal{E})$ and show that they are centrally large in the sense of Phillips.

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