If $F: \mathcal{E} \to \mathcal{E}$ is any functor, we can look at its category $\text{Fix}(F)$ of fixpoints: objects $X \in \mathcal{E}$ endowed with an isomorphism $X \cong FX$. The first goal of this talk is to explain that, if $\mathcal{E}$ is a topos and $F$ is a pullback-preserving endofunctor which generates a cofree comonad, then $\text{Fix}(F)$ is again a topos. The proof builds on the material of [1].

Specific examples of this construction include the well-known Jonsson–Tarski topos, whose objects are sets endowed with an isomorphism $X \cong X \times X$; the generalised Jonsson–Tarski toposes of Leinster [2]; and the Kennison topos, whose objects are sets endowed with an isomorphism $X \cong X + X$. The second goal of this talk is to explain how such toposes give rise to objects of interest to algebraists, such as Cuntz–Kreiger $C^*$-algebras [3], Leavitt path algebras [4], and their associated étale groupoids [5].

References:


