OBSTRUCTIONS TO LIFTING COCYCLES ON GROUPOIDS AND THE ASSOCIATED C^*-ALGEBRAS

In this talk that is based on joint work with Alex Kumjian I present the construction of groupoid twsts given a short exact sequence of locally compact abelian groups $0 \to A \to B \to C \to 0$ and a continuous C-valued 1-cocycle ϕ on a locally compact Hausdorff groupoid Γ. The twist is trivial if and only if ϕ lifts. The cocycle determines a strongly continuous action of $\widehat{C}$ into $\operatorname{Aut} C^*(\Gamma)$ and we prove that the C^*-algebra of the twist is isomorphic to the induced algebra of this action if Γ is amenable. We apply our results to a groupoid determined by a locally finite cover of a space X and a cocycle provided by a Čech 1-cocycle with coefficients in the sheaf of germs of continuous $\mathbb{T}$-valued functions. We prove that the C^*-algebra of the resulting twist is continuous trace and we compute its Dixmier-Douady invariant.