Groupoids are generalizations of groups that are useful in modeling (among other things) the time evolution of a dynamical system. Furthermore, many interesting examples of $C^*$-algebras can be constructed from groupoids and thus the study of groupoid $C^*$-algebras illuminates the study of a large class of $C^*$-algebras. In joint work with Astrid an Huef, we decompose the full and reduced $C^*$-algebras of an extension of a groupoid by the circle into a direct sum of twisted groupoid $C^*$-algebras. (Received September 08, 2011)