**DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
UNIVERSITY OF SOUTHERN DENMARK, ODENSE**

Mathematics seminar

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Cartan subalgebras and the universal coefficient theorem

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Abstract

Ever since its invention, Kasparov's KK-theory has played a fundamental role in both operator algebras and noncommutative geometry. One striking feature of KK-theory is that it admits various different descriptions, both of geometric or abstract nature, making it a useful tool in many situations. On the other hand, it is often computable in terms of K-theory, namely in the presence of the universal coefficient theorem (UCT) established by Rosenberg and Schochet. Although the class of C*algebras satisfying the UCT is known to be very large, in fact it contains all "known" seperable, nuclear C*-algebras, it remains a major open question whether actually all separable, nuclear C*-algebras satisfy the UCT. In this talk, I will show that separable, nuclear C*-algebras possessing a Cartan subalgebra, that is, a regular masa admitting a faithful conditional expectation, satisfy the UCT. By a remarkable result of Renault, these C*-algebras can all be described as twisted groupoid C*-algebras of amenable, locally compact, Hausdorff groupoids. This allows for applying Tu's striking techniques used in the proof of the Baum-Connes Conjecture for amenable, locally compact, Hausdorff groupoids. Moreover, I will discuss applications with focus on crossed product C*-algebras by finite cyclic group actions. If time permits, I will also show how the UCT for separable, nuclear C*-algebras absorbing the CAR-algebra tensorially relates to Cartan subalgebras and order two automorphisms of the Cuntz algebra O_2. This is joint work with Xin Li.

Host: David Kyed