Introduction to C^*-algebras

3-4 hours of lectures per week.

Lecturer
Klaus Thomsen

Content
A C^*-algebra is a Banach space A which is also an algebra with an involution $*$ which respects the norm in the nicest possible way: $\|xx^*\| = \|x\|^2$. Examples include the continuous functions $C(X)$ on a compact Hausdorff space X, where the involution is given by complex conjugation: $f^*(\cdot) = \overline{f(\cdot)}$, and the norm is the supremum norm, $\|f\| = \sup_{t \in X} |f(t)|$, as well as the algebra of complex $n \times n$-matrices and more general $*$-algebras of linear operators. The course will introduce other classes of examples and develop the basic tools for the abstract study of C^*-algebras. The field has developed strong connections with topology, and we shall describe one of the first serious applications of algebraic topology to the structure theory of C^*-algebras; the classification of AF-algebras (a certain type of C^*-algebras) through their K-theory (a notion from algebraic topology).

Prerequisites
Analysis 1