Bounded normal generation for commutator subgroups of unitary groups of C*-Algebras

Abhinav Chand
University of Louisiana at Lafayette

Essential simplicty, i.e. simplicity modulo the center, of the commutator subgroups of unitary and invertible elements of a C^*-algebra has been investigated by various authors, starting with Kadison's paper: "Infinite Unitary groups". In 2019, Leonel Robert answered these simplicity questions using the concept of Lie ideal and results that go back to Herstein. Among other things, Robert showed that if A is a simple unital C^*-algebra containing a non-trivial projection, then the commutator subgroup $(U_0(A), U_0(A))$ is essentially simple. In this talk we discuss how Robert's result can be improved on to obtain "bounded normal generation" for $(U_0(A), U_0(A))$, assuming that A has a non-trivial projection and further regularity properties on A. A group has the bounded normal generation property if for every group element $g \neq 1$ we can find a natural number n such that every element can be written as a word of length at most n using elements of the conjugacy classes of g and g^{-1}. We will give a sketch of the proof for A a purely infinite C^*-algebra in which case $(U_0(A), U_0(A)) = U_0(A)$.

This is joint work with Leonel Robert (University of Louisiana at Lafayette)