

# A complete characterization of connected Lie groups with the Approximation Property

Monday October 19 – 14h00-14h45

T. de Laat

The Approximation Property of Haagerup and Kraus (AP) is the analogue for groups of the Banach Space Approximation Property of Grothendieck. It was introduced by Haagerup and Kraus in 1994. At that time, no examples of groups without the AP were known. The first explicit examples of groups without the AP were given by Lafforgue and de la Salle in 2011. Indeed, they proved that  $SL(3, \mathbb{R})$  and lattices in this group do not have the AP. This result was extended by Uffe Haagerup and myself to connected simple higher rank Lie groups and lattices in such groups. After briefly discussing this work, I will explain a recent joint project with Uffe Haagerup and Soren Knudby, in which we consider the AP for connected non-simple Lie groups. By means of a strengthening of Kazhdan's property (T) that turns out to be a natural obstruction to the AP, we were able to give a complete characterization of connected Lie groups with the AP.