Equivariant Higher Dixmier-Douady Theory for Circle Actions

Continuous fields of operator algebras have found applications in various different areas: among them representation theory, index theory, twisted K-theory and conformal field theory. While the classification of all continuous fields of simple C*-algebras over a topological space is out of reach, section algebras of locally trivial bundles provide a family that is open to classification by methods from homotopy theory. Classical Dixmier-Douady theory is an example of this and gives a full classification of such C*-algebra bundles with compact operators as fibres by third cohomology. In joint work Marius Dadarlat and I showed that this and other results by Dixmier and Douady generalise to the much larger family of bundles with fibers isomorphic to stabilized strongly self-absorbing C*-algebras. A joint project with David Evans has produced interesting examples of such bundles over the Lie groups SU(n) that are equivariant with respect the adjoint action of the group on itself. This motivates the question whether the classification theory has an equivariant counterpart. As a starting point for a programme in this direction David Evans and I looked at circle actions on infinite tensor products of matrix algebras and proved that a lot of the theory still carries over. I will report on the progress in this direction.