Homotopy automorphisms of E_2-operads & Grothendieck-Teichmüller groups

The little n-cubes operads have been introduced to encode operations acting on n-fold loop spaces. Operads homotopy equivalent to little n-cubes (called E_n-operads) are also used in algebra, in order to model a full scale of homotopy commutative structures, from fully homotopy associative but non-commutative (n=1) until fully homotopy associative and commutative (n=infinity).

The main objective of this talk is to explain that the Grothendieck-Teichmüller group, as defined by Drinfeld in the rational setting, forms the group of homotopy automorphisms of E_2-operads, and as such, represents the internal symmetries attached to our first level of homotopy commutative structures. The proof of this result relies on an interpretation of the classical Drinfeld-Kohno Lie algebras, occurring in the rationalization of braid groups, in terms of rational models of E_2-operads ...