Maps on positive definite cones of $C^*$-algebras preserving the Wasserstein mean

Lajos Molnar  
*University of Szeged*  
molnarl@math.u-szeged.hu

In the past years, we have obtained some structural results for bijective maps between positive definite cones of operator algebras which preserve some specific Kubo-Ando means (power means, geometric mean).

Recently, Bhatia, Jain, and Lim have introduced a new mean for positive definite matrices called Wasserstein mean. Its importance lies in its close connection to the Bures-Wasserstein metric.

In this talk, we give the complete description of all (continuous) isomorphisms between positive definite cones of $C^*$-algebras with respect to the operation of the Wasserstein mean and present a result concerning the nonexistence of nonconstant such morphisms into the positive reals. Comments on the algebraic properties of the Wasserstein mean relating associativity are also made.