I M B M istanbul matematiksel bilimler merkezi
istanbul center for mathematical sciences

A Short Intensive Course, May 24-27, 2010

The Kadison-Singer Problem, the State of the Art

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Abstract

The Kadison-Singer problem was first stated in 1959 but, in fact, it is implicitly contained already in the famous 1937 P.A.M. Dirac book on foundations of the quantum mechanics.

Originally, the problem deals with a property of C^*-operator algebras but, during the last 25 years, it was shown that it is closely related (and even equivalent) to a dozen unsolved and challenging problems in various fields of mathematics: matrix theory, combinatorics, Hilbert space metric geometry, harmonic and complex analysis, frames theory, and some others.

This short course is to give an elementary introduction/survey to the field, from the origins to its modern state.

Contents (a total of 10 class hours):

1. Pure states of C^*-algebras, the Stone-Cech compactification
2. Paving/quasi-diagonalization conjecture
3. Boundedness/invertibility Bourgain-Tzafriri theorem and problem
4. Hilbert systems, Riesz bases, and the Feichtinger conjecture
5. Reproducing kernel families and Carleson-type embedding theorems

Date: Monday-Thursday, May 24-27, 2010

Time: 15:00-17:00, followed by a discussion period of half-an-hour

Place: IMBM Seminar Room, Boğaziçi University