Alexandre Afgoustidis: *The Mackey bijection for real reductive groups: deformation of geometrical realizations*

The Mackey bijection is a natural one-to-one correspondance between the irreducible admissible representations of a real reductive group G, on the one hand, and those of its Cartan motion group $G_0 = K \ltimes (\mathfrak{g}/\mathfrak{k})$, on the other hand (here K is a maximal compact subgroup of G).

The bijection maps the tempered dual of G on to the unitary dual of G_0. Its existence was first suggested by George Mackey in the early 1970s, in part motivated by quantum-mechanical considerations based on the existence of a continuous family $(G_t)_{t \in [0,1]}$ interpolating between $G = G_1$ and G_0.

The merits of Mackey's idea appeared only in the early 1990s, when Alain Connes and Nigel Higson pointed outs its connection with the Baum-Connes conjecture for G. Progress on the Mackey bijection came in the late 2000s for complex groups thanks to Higson's efforts, and more recently for real groups.

I will start by giving a description of the Mackey bijection. The rest of the talk will focus on realizing the bijection as a deformation, at the level of geometrical realizations: I will show how any irreducible tempered representation can be 'deformed' into the corresponding G_0-representation using the family $(G_t)_{t \in [0,1]}$. The methods will be mainly analytical, using real analysis on the riemannian symmetric space G/K and complex analysis on elliptic coadjoint orbits.