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Tempiric representations and the Connes-Kasparov isomorphism

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(With Nigel Higson and Robert Yuncken.) An important result of Vogan in representation theory for real reductive groups states that if K is a maximal compact subgroup of a real reductive group G, then the tempered irreducible representations of G with real infinitesimal character (the "tempiric" representations, as coined by Afgoustidis), up to equivalence, are in bijection with irreducible unitary representations of K up to equivalence (given by taking the unique minimal K-type). This is central to the Mackey bijection for general real reductive groups, proved by Afgoustidis. In this talk we will concisely reprove the Mackey bijection and, going further, we will prove that the "linearized" version of this Vogan bijection is equivalent (in a simple way) to the Connes-Kasparov isomorphism, which has striking implications in both directions of the equivalence. In one direction, thanks to Lafforgue this gives an almost completely index-theoretic proof of Vogan's (linearized) bijection, a purely (and deep) representation theoretic result, and in the other direction it shows that Vogan practically proved the Connes-Kasparov isomorphism (before it was even conjectured).

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