On automorphic descent from GL(7) to G2

Abstract:

In this talk, I will introduce the functorial descent from cuspidal automorphic representations \( \pi \) of \( GL(7) \( with \( L^S(s, \pi, \wedge^3) \) having a pole at \( s=1 \) to the split exceptional group \( G_2(A) \), using Fourier coefficients associated to two nilpotent orbits of \( E_7 \). We show that one descent module is generic, and under mild assumptions on the unramified components of \( \pi \), it is cuspidal and having \( \pi \) as a weak functorial lift of each irreducible summand. However, we show that the other descent module supports not only the non-degenerate Whittaker integral on \( G_2(A) \), but also every degenerate Whittaker integral. Thus it is generic, but not cuspidal. This is a new phenomenon, compared to the theory of functorial descent for classical and GSpin groups. This work is joint with Joseph Hundley.