**Speaker:** Yiannis Sakellaridis

**Title:** Transfer operators between relative trace formulas in rank one

**Abstract:** I will introduce a new paradigm for comparing relative trace formulas, in order to prove instances of (relative) functoriality and relations between periods of automorphic forms.

More precisely, for a spherical variety $X = H\backslash G$ of rank one, I will prove that there is an explicit "transfer operator" which transforms the orbital integrals of the relative trace formula for $X \times X/G$ to the orbital integrals of the Kuznetsov formula for $\mathrm{GL}_2$ or $\mathrm{SL}_2$, equipped with suitable non-standard test functions. The operator is determined by the $L$-value associated to the square of the $H$-period integral, and the proof uses a deep theory of Friedrich Knop on the cotangent bundles of spherical varieties. This is part of an ongoing joint project with Daniel Johnstone and Rahul Krishna, who are proving instances of the fundamental lemma. Globally, this transfer will induce an identity of relative trace formulas and global relative characters, translating to an Ichino–Ikeda type formula that relates the square of the $H$-period to the said $L$-value.

This can be viewed as part of the program of relative functoriality, a generalization of the Langlands functoriality conjecture, predicting relations between the automorphic spectra of two spherical varieties when there is a map between their dual groups. The case under consideration here is the simplest non-abelian case of this, when the dual groups are equal and of rank one. If time permits, I will discuss how the transfer operator here and in a few examples of higher rank where it is known is a "deformation" of an abelian transfer operator obtained by replacing the spherical variety by its asymptotic cone (or boundary degeneration).