

## **abstract**

Joint IAS/PU Number Theory Seminar  
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

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The trace formula has been the most powerful and mainstream tool in automorphic forms for proving instances of Langlands functoriality, including character relations. Its generalization, the relative trace formula, has also been used to prove functoriality between "spaces" (more precisely: spherical homogeneous varieties), which is a generalization of functoriality for groups, including relations between periods of automorphic forms. These methods are based on what one could call "standard" comparisons, and those comparisons seem close to exhausting their range of applicability; I will review them using a simple example of Jacquet. Then, I will describe a simple instance of a new, "nonstandard" comparison which bears resemblance to Langlands' "Beyond Endoscopy" project: nonstandard test functions tailored to produce L-functions, comparison via Fourier transforms and Poisson summation formulas, etc. The result is a new proof of Waldspurger's formula relating squares of toric periods in  $GL(2)$  and central values of L-functions.