5007-11-340 **James G Arthur*** (arthur@math.toronto.edu), Department of Mathematics, Bahen Centre, 6th Floor, 40 St. George Street, Toronto, Ontario M5S 2E4, Canada. *Classification of Representations.*

Automorphic forms are matrix coefficients of automorphic representations. But they are also eigenfunctions of natural families of commuting linear operators. Their simultaneous eigenvalues govern fundamental objects of number theory and arithmetic geometry, according to the Langlands program. We shall review these matters. We shall then describe a recent classification of the automorphic representations of classical matrix groups, which is a consequence of a complex comparison of trace formulas. (Received May 13, 2013)