1035-22-3   **James G. Arthur***, University of Toronto, Bahen Centre, 6th Floor, 40 St. George St., Toronto, Ontario M5S 2E4. *Semisimple groups as universal examples.*

Semisimple Lie (and algebraic) groups provide a rich source of examples from many different areas of mathematics: differential and algebraic geometry, topology, combinatorics, finite groups, spectral theory, representation theory, and number theory. The examples often have the uncanny ability to illustrate exactly the kind of phenomena that most interest us.

In fact, these examples are sometimes universal. Contrary to our intuition, which suggests that examples from semisimple groups are very particular, they can sometimes give rise to a profound classification of everything in a given area. This is true to some extent in the recently established geometrization conjecture of Thurston. It is true without reservation in the Shimura-Taniyama-Weil conjecture established by Wiles and others, and more generally, in the extraordinary conjectures that make up the Langlands program.

We shall try to get a sense of the many diverse examples that arise in this way. We shall also discuss recent progress in the Langlands program, specifically in the comparison of trace formulas on different semisimple groups. (Received March 21, 2007)