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Extended reductive groups and representation theory.

An *extended group* for a connected reductive algebraic group G is a group fitting into an exact sequence

$$1 \rightarrow G \rightarrow {}^\Sigma G \rightarrow \Sigma \rightarrow 1,$$

with Σ a finite group. I'll discuss first some old ideas for using such an extended group to keep track of representations of (real forms of) G . (The magic question is, "how do you tell a holomorphic discrete series from an antiholomorphic discrete series?") Then I'll discuss some problems arising in recent joint work with Lusztig about the representation theory of extended groups themselves.